Aaron, Heather  
Faculty mentor: Russell Tweed  

Afternoon, 3:30pm-3:42pm, duBois Room A  

Title: The Unconventional Intern: How to give your best as a non-traditional student  
Willow Bend Environmental Education Center, a non-profit, provides experiential learning for local K-12 students. The objective of my internship was to gain experience managing an environmental education organization focusing on curriculum design, developing relationships in the public and private sector and fundraising. My experience evolved into a marriage of my previous career in information technology and management, with projects to further the education objective of Willow Bend. Projects involved a walking tour, repair and reinstallation of the center's weather station and research and implementation for a stereomicroscope station to be used by visiting students. Through this internship, I learned to be flexible regarding my expectations and the needs of others. While I didn't achieve my original goals, I was able to utilize my technical skills in a way that could not have been foreseen or planned. Not all interns come equipped with over a decade of technical skills and years of management experience but if they do, they can provide a service above and beyond expectation. Sometimes, one must be creative in finding a solution that works best for all involved. I would recommend this internship to self-starters interested in working with young people.

Abalos, Joshua  
Faculty mentor: Becky Butcher  

Session I, 9:00am-11:00am, 115D  

Title: Recruitment and Retention of Detachment 027  
An empirical analysis of the recruitment and retention rates of the Air Force ROTC detachment 027 of Flagstaff, AZ. The analysis will also criticize how the incentives program aides the recruitment of cadets into the detachment and how Air Force standards and competition retains viable candidates for officerhip into the Air Force.

Acker, Dezirea  
Faculty mentor: Moran Henn, Hannah Perkins  

Morning, 9:06am-9:18am, duBois Meadows Room  

Title: Friends of Flagstaff's Future Internship  
For the Fall 2014 and Winter 2014 I was able to intern for a local non-profit of Flagstaff called Friends of Flagstaffs Future. Friends of Flagstaffs Future focuses on bettering the community of Flagstaff, Arizona through local outreach programs that focus on the sustainable lifestyles, protecting open spaces, supporting local businesses, and encouraging the democratic process. As an intern I got to work on many tabling and outreach programs, as well as speak in front of The Flagstaff City Council about the proposed plastic bag ban. I learned the importance of community is when it comes to environmental issues and our future, as well as improved my communication and public speaking skills within this internship. We must teach our children so that they grow up know how their actions impact the world. The local sustainably is important for a happy and healthy community, as well as planet. We must start local in order in influence other communities to become more sustainable.

Adib, Austin  
Faculty mentor: Britton Shepardson  

Session II, 2:00pm-4:00pm, 64A  

Title: The Archaeology of Music  
This project focuses on and explores the archaeology of music. The project will explain the types of instruments used, the potential meanings behind prehistoric music, and the types of occasions and situations prehistoric that involved prehistoric music. Additional facts about the archaeology of music will be provided. The purpose of this is to provide context and details about the history of music and illustrate the birth of today's music.
Aguayo, Michelle
Faculty mentor: Britton Shepardson

Session I, 9:00am-11:00am, 64B
Title: The Archaeology of Sexuality

This project is for Anthropology 104, Lost Tribes and Buried Cities. This project explores and investigates the concept of sexuality dating back to its early presence. I am personally interested in this subject because I identify as something other than heterosexual. The concept of sexuality today is intense and very complex as many people disagree with its variance. This project shows the historic value, effect, and influence of sexuality in the lives of those who came before us.

Aguilar, Mildred
Ann Chen, Mackenzie Huffman, Kristen Parks
Faculty mentor: Gregory Busath, Matthew Anderson

Session I, 9:00am-11:00am, 98A
Title: The Effects of Religion on Altruism

Research has explored whether people consider religious adherents more altruistic with equivocal findings. We are exploring whether or not this statement is true. Research methods (PSY 302W) students were given class time to participate in our study. Half of the participants were primed with a religious video clip and the other half were primed with a neutral video clip. They then took a questionnaire in which the participants answered questions about their perceived altruism and religiosity. We hypothesize that those who are religious will show more altruism regardless of which priming they receive. Our second hypothesis is that the participants who viewed the religious video clip will show a perceived increase in their levels of altruism. Results were analyzed using an independent samples t-test. These findings may be beneficial in society due to the knowledge of the effects of religion on altruism. The results of this experiment will be presented on a poster.

Al jubran, Zahra
Faculty mentor: Melissa Santana, Jessica MacKenzie, Sara Aleman

Session II, 2:00pm-4:00pm, 119B
Title: Summit Care: Continuing Care Retirement Community (CCRC) & A Country Club

Summit Care: Continuing Care Retirement Community (CCRC) & A Country ClubSummit care is a mix between Continuing Care Retirement Community (CCRC) and a Country Club. It is Net Zero Energy Buildings and Nun-Profit organization. Summit care focuses on ages 55+, at the same time feeling alive and still part of a community when seeing all ages in the country club. Continuing care retirement community has emerged as a necessity for older adults. The 'traditional' senior community is outdated and no longer seen as a viable choice for retirement, and new and innovated models have surpassed the old-fashioned establishments with a high monthly cost. To date, development of this sector has associated directly with extremely high monthly cost and yet not enough care giving, and most importantly fear of being forgotten. Summit care is a mix between (CCRC) and a country club. It is a place where seniors can be self-convinced by seeing the residents and the staff on a daily basis. Summit care is a multi-use-business that solves the emptiness of a country club and the loneliness of the senior community. With a Net-Zero-Energy building, the total monthly cost can be reduced and the quality of caregiver can improve. It is a Nun-profit organization, which make residents more confidants in paying the monthly cost. Summit care is not haven; however, it is a place of rest and comfort for all ages.

Alagna, Genevieve
Faculty mentor: Michael Vasquez

Session II, 2:00pm-4:00pm, 72D
Title: Biting Off More Than We Can Chew: Food Culture in America
My research will be examining the food culture in America and comparing it to different practices in other parts of the world. I will be using Eric Schlosser's ethnography, Fast Food Nation: The Dark Side of the All-American Meal, to look at food culture in America in terms of fast food and how that plays into the American lifestyle. I am also looking at the health of Americans and the correlation between fast food and potential health risks associated with consuming mass quantities of genetically modified foods. The risk and reward associated with consuming fast food in America will also be addressed, the reward being a cheap and efficient way to eat out and the risk being your health. From this research of American lifestyles I will also be comparing it to the food culture in places like Italy, where fast food is something that is seldom heard of, and across the world where there are multiple different views on food. This will also be the basis for examining the general health of the public in places with less of a fast food scene and the American public, where fast food is very much a part of our lives.

Alboucq, Cara

Faculty mentor: David Wagner, Joseph Busch, Nathan Stone

Session II, 2:00pm-4:00pm, 12A

Title: A Survey of the Prevalence and Diversity of Clostridium difficile in Flagstaff Dogs

Clostridium difficile (C.diff) is an obligate anaerobe that has become one of the most common infections in hospitals. Approximately 14,000 American deaths are linked to C.diff every year and the rate of infection has tripled in the last 10 years. One of the possible community reservoirs of human C.diff infections is household pets. Previous studies have demonstrated a connection between C.diff strains found in companion pets and strains that cause disease in humans. We systematically collected 200 dog fecal samples from the canine companion pet population of Flagstaff, AZ. Additionally, we collected 20 samples from dogs suspected to be carriers of C.diff from local veterinarians. We used an anaerobic chamber to successfully culture 43 isolates from 11 fecal samples and extracted DNA from all cultures. To genotype these C.diff isolates, we used a common microbial genotyping method known as multilocus sequence typing (MLST). This method uses polymerase chain reaction (PCR) to amplify and sequence fragments of seven housekeeping genes (adk, atpA, glyA, recA, sodA, dxr, and tpi). We compared the MLST types of Flagstaff dogs to other worldwide samples from the C.diff MLST database (www.pubmlst.org/Cdifficile). We identified eight MLST types present in our cultured isolates, including two instances of co-infection with multiple C.diff strains. Four of these strains are among the most frequently found MLST types in hospitals and are known to cause human disease.

Alkhaldi, Hathami

Faculty mentor: Melissa Santana, Roger Vitello, Alan Francis, Joshua David Spear

Morning, 9:00am-9:20am, Skydome Stage A

Title: Zero Net Energy Building

Architectural designs of buildings of the present times need severe considerations in respect to energy and sustainability of the houses. Thus, application of the Zero net energy concept would warrant use of minimal energy within the building's energy needs vis-a-vis its renewable energy systems' sources. Particularly, solar energy will be used based on the project's allusion to Tucson, Arizona that considers the regions subdivide climate and passive solar heating levels. As such, the design and performance of solar energy into the building project will relate to use of the solar panel system and significant passive solar heating, among other relatable components. Notably, all the energy will be generated by solar power. Nonetheless, other acute building designs will be incorporated into the project due to their merits. These are with the inclusion of G-02 Living wall to minimize exterior and interior heat, insulate and cool the building envelope, act as sound-proof barrier and build a habitat for birds, among other functions. Also, the Grey Water will be necessary in relation to recycling and heating of the solar cells; the HVAC Chiller System to cool the fluid for critical heat transfer; and thermal mass heating system for warming the house especially in winter. The ZO-E-Shield glass windows will be integrated into the project to boost the house's energy savings and control air circulation to infiltrate out of the building. Moreover, it is less costly; blocks 95%-99.9% of the sun's harmful UV-A and UV-B radiations; moderates fading of interior furnishing and substantially insulates against cold air flow and condensation. Finally, consultations with certified professionals on architecture, construction management and sustainability would complement the project prior to first visit to the site.
Session I, 9:00am-11:00am, 119C

Title: Women's Sanctuary: Designing the Ultimate Women's Shelter Facility

The United States is suffering from an increased rate of homelessness, and it has the largest number of homeless women among industrialized nations. The number one cause of homelessness for women is domestic violence. Other factors that contribute to women being homeless include poverty, racial backgrounds, drug abuse, and lately an increased rate of veteran women. Homeless shelter facilities are one method that provides temporary housing for these individuals. Recent research shows that many homeless women prefer staying on the street because they feel safer. Another problem was the lack of programs that aid in the progress of preventing homelessness. Women were often referred to offsite locations to attend therapeutic, rehabilitation or counseling programs. The problem will be addressed in the design idea that I am proposing; this is to build a shelter where women and their children can feel safe by providing high-end security and tall boundary walls covered with greenery. The design of the interiors in the shelter itself will help the women feel as if they are home rather than a governmental facility. Soothing natural scenery that surrounds the building, and soft colors are one-way to creating a relaxing environment where the women can begin their healing processes. The ultimate goal of the design is to include programs such as rehabilitation, therapeutic and counseling programs on site that encourage self-progress. This is to help women and their families regain control of their lives and become once again productive members of our society.

Session II, 2:00pm-4:00pm, 104A

Title: Identity and Cohesion Within the Workplace

Cohesion within the workplace has been a major area of study within psychology; however, a gap exists in the literature relating cohesion to group-level identity. Previous research has shown that a high level of social cohesion is associated with a decrease in task cohesion. In-group identification has also been proposed as a motivational state that drives the achievement of collective-level goals. This is closely related to the construct of task cohesion, but is not explicitly stated as such. I propose that an interaction between task cohesion and group-level identity is moderated by social cohesion. To investigate this issue, I measured group level identity as well as social and task cohesion (two important sources of cohesion) in participants working in restaurants. Implications and suggestions for future research are discussed.

Session I, 9:00am-11:00am, 60C

Title: Self-Esteem, Self-Concept Clarity and Interpersonal Dependency

Interpersonal dependency has been defined as the over-reliance on significant interpersonal relationships to define a view of the self. Interpersonal dependency has been linked to a variety of clinical issues including depression and low self-esteem. In Campbell’s landmark paper on self-concept clarity and self-esteem, she discusses how a low level of self-esteem in an individual is characterized by less clarity or certainty of the self-concept. It was our prediction that an individual with a low level of self-esteem, characterized by an unclear sense of self, would rely on their romantic partner to compensate for this uncertainty and thus would report greater dependency. The current study tested the hypothesis that self-concept clarity would be a mediator between low self-esteem and dependency on a romantic partner. Three types of dependency were evaluated using the spouse-specific dependency scale: anxious attachment, concerning feeling neglected by one’s partner and sensitivity to separation from them, emotional dependency, concerning the extent to which one relies on their partner for self-esteem, general functioning, and identity, and exclusive dependency, concerning the extent to which one relies on their partner as a social companion and excludes other important social relationships. Participants were required to be currently involved in a romantic relationship and asked to complete a self-report measure. The hypothesis was partially supported by the data; the analysis indicated that...
anxious attachment and emotional dependency were negatively associated with self-esteem and this association was mediated by self-concept clarity. Implications and future directions will be discussed.

Allen, Denny
Faculty mentor: Francis Smiley
Session I, 9:00am-11:00am, 69D

Title: Kazakhstan: Lack of Ethnographic Data

The poster presents a visual and textual examination of the material record of the ethnographically known Kazakh peoples of Central Asia. The Kazakhs are a nomadic pastoral society moving across wide areas of the Central Asian steppes and relying on their herds for nearly all of their material needs. Like most pastoral societies, the Kazakhs are patriarchal and operate in a complex tribal social structure. Archaeologists have long been interested in the Steppes of Central Asia and the nomadic peoples who have inhabited the steps for millennia. Archaeological evidence, however, of nomadic pastoral societies is notoriously scarce. Accordingly, at the beginning of the study, I predicted that the Kazakhs would leave little in the way of material record of their migrations and camps. My study of the material culture of the ethnographically known Kazakhs provides a model for future archaeological studies of prehistoric nomadic societies.

Allen, Kyle
Faculty mentor: Walter Vannette
Session I, 9:00am-11:00am, 72B

Title: Model for Vlax Romani Language Revitalization and Preservation

The intent of this poster is to present a language revitalization and preservation program model which focuses on the Vlax Romani language found in Central Europe. However, my long-term intent is to obtain the ability to adapt this model in a more general sense and utilize on endangered languages on a global scale. Less than 1/6 of Vlax Romani’s original group still speak the language and is at a high risk of extinction. My plan to prevent such a thing from happening is to develop said model and utilize it to allow native speakers more readily available access to one another as well as educate non-native speakers on the language and how to speak it. It is hopefully through these efforts that an environment can emerge which will allow Vlax Romani and other endangered languages to persist and thrive.

Alonso, Juan
Faculty mentor: Melissa Santana, Jessica Mackenzie
Session II, 2:00pm-4:00pm, 119D

Title: Retail Store Design- Outdoors Mall

We all know that retail stores can be therapeutic to some people, and to others just a plan store where one goes to pick up items. Although we all have different ways to describe retail stores there is much to take into considerations when designing such space. For starters lighting plays the biggest role when designing the space. Even though people don't pay much attention to the lighting around them, lighting helps allure customers to the merchandise being sold in stores. While having done research on the topic of retail store lighting strategies I have come across a few statistics. In which customers are more likely to handle merchandise displayed with bright lighting conditions rather than soft lighting conditions. Thereby having a higher percentage in customers purchasing items underneath brighter lighting conditions. Although one may think placing bright lights around a store may help with store earnings, soft lighting still has its own meanings. For example soft lighting is mostly used for items that a store is implying as high quality. Think back to designer stores and remember the type of lighting they use? Although it may not be all one sort of lighting they mixed both brightness up. The result for this project is to design a store for an online base store. The store will be placed in an outdoors mall located in Mesa, Arizona. The concept is to bring the culture of the store to real life and have customers experience the store first hand.

Alsabah, Khaled
Faculty mentor: Ryan Fitch
Session II, 2:00pm-4:00pm, 30A
**Title: Gambling with Water in the Desert**

Due to global warming, sources of water like rivers are slowly draining and becoming scarce. Being a city in the United States ranked third, with the worst drinking water according to the study by the daily finance. It is Important to examine the environmental, economic, and cultural implications or costs of depletion of water resources in Las Vegas.

Alsarraf, Ali  
**Faculty mentor:** Thomas Paradis

**Session I, 9:00am-11:00am, 89A**

**Title: Community Impacts from University Student Growth and Housing**

When colleges and universities increase student admittance, the increased needs for housing will affect both the campus and the surrounding community. In recent times, some colleges and universities have increased student enrollment at high rates, all the while construction and planning is either stagnant or delayed. The construction of additional housing sites is important as is ensuring that existing housing is convenient and affordable for students, and beneficial to the community as a whole. This research investigates the geography of student housing and how it affects students and the community. More specifically, this study reveals housing options in Flagstaff, Arizona and how the recently built student housing sites have impacted students and the community, both on and off campus. A series of semi-structured interviews and surveys have been conducted with community and university stakeholders, and a sample of students. This research provided insights into how the community of Flagstaff has been impacted by student growth.

Alvarez, Cynthia  
Kristin Van Sciver, Jeremy DeGeyter, Ramon Aguilar, Matthew Snyder  
**Faculty mentor:** Thomas Nelson, Mark Lamer

**Morning, 10:20am-10:45am, duBois Agassiz Room**

**Title: 2015 ASCE Concrete Canoe**

Each year a student chapter of the American Society of Civil Engineers hosts the National Concrete Canoe Competition in which students design and construct a concrete canoe to race. Regional conferences are hosted in order to determine the universities which will compete at the national level. Northern Arizona University participates in the Pacific Southwest Conference which was held this year at the University of Arizona. The purpose of this project is for students to apply the engineering concepts learned in the classroom to design a concrete canoe and gain hands on, practical experience with concrete and project management. This year, the team approached the project with the motto of 'fear nothing' inspired by the name of the canoe, Dreadnoughtus. This motto encouraged the students to work hard and produce a high-quality concrete canoe.

Alvarez, Sarah  
Alex Sequella, Calvin Martin, Sarah Hewitt  
**Faculty mentor:** Audrey Deterding

**Session II, 2:00pm-4:00pm, 57A**

**Title: Reaction to Proximity in Relation to Sex**

We want to see how sex and space affect each other in controlled areas. Our plan is to have one of our male and female group members invade the personal space of both sexes. The rest of our group, from afar, will observe the reactions of the test subjects. We want to see how interaction with the sexes affects the test subject's personal space. In terms of location, we plan to do observations in highly populated areas as well as lower populated areas. We will then compare the two.

Alves, Veronika  
Andrew Alonis, Shariq Jamil, Jason Travis  
**Faculty mentor:** Maggie Vanderberg

**Session I, 9:00am-11:00am, 9D**
**Title: Mother Road Brewing Company Sales Dashboard**

Flagstaff, AZ based Mother Road Brewing Company requires a web application to achieve their objectives of a transparent business model and a 24/7 real-time temperature monitoring system. Our dashboard allows employees to visualize sales data, set goals, and configure the temperature alarm system. If a brewing tank does not maintain a precise temperature, either the product quality will suffer or, in extreme cases, the entire batch may be ruined resulting in a significant financial loss. To prevent this, the temperature monitoring system notifies key personnel when a brewing tank falls outside temperature specifications so they may respond in a timely manner. The open-book management system improves employee communication and shows how their actions influence the company.

**Alves, Veronika**
Andrew Alonis, Shariq Jamil, Jason Travis  
**Faculty mentor:** Maggie Vanderberg

**Afternoon, 1:55pm-2:20pm, duBois Festival Room**

**Title: Mother Road Brewing Company Sales Dashboard**

Flagstaff, AZ based Mother Road Brewing Company requires a web application to achieve their objectives of a transparent business model and a 24/7 real-time temperature monitoring system. Our dashboard allows employees to visualize sales data, set goals, and configure the temperature alarm system. If a brewing tank does not maintain a precise temperature, either the product quality will suffer or, in extreme cases, the entire batch may be ruined resulting in a significant financial loss. To prevent this, the temperature monitoring system notifies key personnel when a brewing tank falls outside temperature specifications so they may respond in a timely manner. The open-book management system improves employee communication and shows how their actions influence the company.

Andrew, Jessica
Sydnee Wickstrom  
**Faculty mentor:** Michael Vasquez

**Session I, 9:00am-11:00am, 73A**

**Title: Where No MAN Has Gone Before: Women in the Star Trek Fandom**

The term fandom is heard seldom by the general population, but holds a high place within geek culture. As a general definition, fandom is the community of fans of a particular show, movie, comic, book, or even sports team. In her work Enterprising Women: Television Fandom and the Creation of Popular Myth, Camille Bacon-Smith describes the semantics and struggles of women in fandom. While women involved in all kinds of fandom face these problems, Bacon-Smith uses Star Trek as the primary example. Her focus on fan fiction, the ever famous Mary Sue, and the overall effect these have on the geek community and the women who participate in it, make valid points that anyone who doesn't know these terms and who aren't involved in geek culture and fandom, can easily understand and relate to. We will use this book as a basis for our research, exploring feminist and anthropological perspectives on Star Trek fandom. Fans of Star Trek have created an intricate community and subculture with women very much forming a large part of this community. Yet women within this community still often receive criticism from those within and outside of the fandom. We plan to explore the issues faced by women within this community and how the treatment of women within fandom reflects on our society as a whole.

Andrews, Christina  
**Faculty mentor:** Glenn Hansen

**Session I, 9:00am-11:00am, 107B**

**Title: Disney in Government**

I will be researching Disney's interactions with foreign governments. I will focus mostly on the countries where they have parks or investigate the reasons the company wants to develop theme parks in those countries.

Anunziato, Paige
Keith Hullenaar  
**Faculty mentor:** Christine Arazan, Keith Hullenaar
Title: The Criminal Justice and Criminology College Based Learning Community

The Criminology and Criminal Justice (CCJ) College Based Learning Community (CBLC) on Professional Development is a year-long opportunity for CCJ students. This college-based learning community partners with University and community resources and highlights opportunities that positively shape the outcomes of participating student's academic careers. Specifically, the CCJ CBLC focuses on facilitating internship opportunities, career planning workshops, and skill building to aid in student success post graduation. This project examines data collected during the first CCJ CBLC cohort convened during the 2014-2015 academic year. To illustrate student experiences and their professional development throughout the year, the poster compiles survey data, student testimonials, and photographs that document the overall outcomes and experiences of the students in the CCJ CBLC during the 2015 academic year. Students who participated in the program reported positive outcomes that were congruent with the goals of this college-based learning community. Overall, the CCJ CBLC helped students become more confident and secure in identifying and utilizing relevant University and community resources to aid in their academic and career development.

Anthony, Alyssa
Faculty mentor: Fredrick Lampe

Title: Fighting for Freedom in Namibia

This report will cover the time period in Namibia from German occupation until the time of Independence from South Africa in 1994. This will include many subsequent wars and genocides that have taken place in the fight for Namibian Independence. Namibia became occupied by Germany in 1884 under Otto von Bismarck in order to stop further British advances on the land in South Africa. The land that was obtained included pieces of South Africa and Botswana and was known as German South-West Africa or Deutsch-Südwestafrika. There were many wars against Germany from the natives in Namibia, most importantly being the Herero and Namaqua genocides where many aboriginals to Namibia were killed by their German occupiers from 1904 to 1907. After 1907, an apartheid began to form as the German occupiers forced labor and racial segregation. Natives were confined to allocated territories called Bantustans. Conditions for these people would worsen under South African rule. In 1962 Odendaal was appointed over a commission that was to look into South African Affairs, the Odendaal Commission. Enquiries were made until 1963 and contained proposals that territories should be set aside dedicated to 'separate development' of the different ethnic groups in German South-West Africa. Most of these territories are what Namibia is today. South Africa, who now governed Namibia after defeating the Germans in WWI, started formal implementation of Odendaal's plan in 1968. Ultimately the UN Security Council sought, after WWII, to help Namibia gain its independence.

Apple, Ariel
Alison Steinbacher
Faculty mentor: Walter Vannette

Title: Interdisciplinary Perspectives in Biomedical Anthropology

This poster presents an examination of interdisciplinary perspectives in biomedical anthropology, addressing the root causes of medical problems and the lack of anthropological perspectives in healthcare. Through an interdisciplinary and applied perspective, this poster suggests how to make medical and biological fields more holistic by applying theoretical biomedical anthropological ideas to applied medical practice. Such ideas include an upstream approach to health, ways to fix structural violence in healthcare, and addressing why basic needs aren't being met by the healthcare system in certain populations. Through this holistic perspective, we propose different ways to take the theoretical concepts of biomedical anthropology and apply them to the biological and medical fields, creating a symbiosis between all practitioners of biological and medical fields, including anthropologists.

Ares, Melissa-Ann
Russell Benford, Nashelly Meneses
Faculty mentor: Russell Benford, Nashelly Meneses, Andrew Krohn
Session I, 9:00am-11:00am, 6C

**Title: Molecular Identification of a Lepidopteran Herbivore on a Critically Endangered Tree**

Serianthes nelsonii is a critically endangered tree endemic to the Mariana Islands. Efforts to reestablish S. nelsonii have been ongoing with limited success primarily due to weather conditions, and various predators. Here, the identification of lepidopteran larvae that were continuously found preying on S. nelsonii, a sole inhabitant on the island of Guam, will be able to provide further contributions to the regeneration efforts. The lepidopteran of interest was unable to be identified based on morphological features alone; due to the similarities between known island species. To obtain the accurate identification, DNA sequencing techniques were utilized. Knowing the specific species name will allow for the development of individualized management and control strategies as to avoid impacting other Lepidoptera that are not active pests currently found on S. nelsonii.

**Armenta, Hilary**

**Faculty mentor:** Becky Butcher

Session II, 2:00pm-4:00pm, 114C

**Title: Health Affects of Uranium mining**

Uranium is a heavy toxic metal that is used in nuclear fuel to generate electricity in nuclear power stations. It is also the major material from which other synthetic transuranium elements are made. The use for uranium is very useful when it comes to the use for electrical power. However, different mining processes can be invasive to the land, while at the same time, miners can be at a safety risk. In order to explore uranium mining practices and subsequent hazards, this capstone project examines the different types of uranium mining processes and the risks associated with these practices.

**Arnold, Ashley**

**Faculty mentor:** Natalie Cawood

Session II, 2:00pm-4:00pm, 81B

**Title: Minor Investments**

When studying Social Work, it's crucial to understand the tremendous hardships people go through. Included in these hardships are behavioral changes that ultimately work to better the lifestyle of the person(s). As an aspiring social worker I decided to alter my very own behavior. I chose to track my minor investments and unnecessary purchases. The goal of this behavior change is to track my unnecessary spending and use the gained profit to invest into something more meaningful than daily fast food purchases. I have created a chart that tracks the progress of my spending. I have decided that with whatever money I save will go to charity and/or go towards my future involvement to be a humanitarian worker abroad this summer.

**Arpronphalitphan, Sotida**

**Faculty mentor:** Erika Hesse

**Afternoon, 2:36pm-2:48pm, Skydome Stage A**

**Title: The Importance of Slang-Education When Learning a Foreign Language**

Using interviews based on age groups, language spoken, and country of origin this project explores the importance of slang in the French, English, as well as other languages. Slangs, which sometimes seem frivolous, un-useful, and often neglected in an academic teaching environment have become a huge part of languages spoken today. Younger populations as well as the older have slangs that are used on a daily basis, some that have even become part of the norm. Although, it may appear that a speaker can survive without the knowledge and use of slang, in reality it has become ingrained into many native speakers to the point where it is used regularly. It is imperative that a language learning give importance to slang in order to have a better comprehension of a foreign language as well as an understanding of the social aspect of that culture.

**Arriaga Espinoza, Barbara**
Faculty mentor: Francis Smiley

Session II, 2:00pm-4:00pm, 69D

Title: The Zapotec of Ixtepeji, Mexico: Material Culture and the Archaeological Record

The poster presents a visual and textual examination of the material record of the ethnographically known Zapotec society of Ixtepeji, Mexico in comparison with similar archaeologically known societies. By examining the material culture of a living agricultural society, archaeologists can learn more about prehistoric farming societies. The Zapotec of Ixtepeji are an agricultural society of the Sierra Juarez in the state of Oaxaca in Mexico. The Zapotec depend on the land and local crops to survive. The Ixtepejanos cultivate typical Mesoamerican crops, like corn. The land in which the Zapotec farm, however, suffers from erosion, deforestation, as well as years of constant use. The Zapotec of the sierra region live in humble homes made from natural resources. Just like in many areas of Mexico, Ixtepeji was greatly impacted and influenced by the Spanish during the colonial era. Although the Zapotec town does contain some sturdy colonial structures, most of the community's material culture consists of natural resources. As a result, I predict that the archaeological record will consist of few visible remains. The purpose of the presentation is to set out a model of the kinds of material culture items produced by a society given the social organizational and other cultural factors that dominate the functions of that society. The poster also presents examples of archaeological research on similar societies to compare archaeological reality with the ethnographically derived model.

Artrip, Devon
Faculty mentor: Gerald Wood, JeanAnn Foley

Afternoon, 3:00pm-3:25pm, Skydome Roundtable R1

Title: The Elephant in Our Schools: Teacher Bullying and How it Affects Students

Anti-bullying campaigns are a common practice in the majority of schools today, but most programming focuses on how to deal with peer-to-peer bullying. But what do you do when the bully is your teacher? Teacher Bullying has been described as an 'undiscussable' topic in the educational field, but it is one that has dire consequences for both faculty and students alike. During one study conducted in 2005, Dr. Stuart Twemlow found that 45 percent of teachers surveyed admitted to bullying a student at some point during their career. Teacher bullying has been linked to student anxiety, low self esteem, and low academic achievement. This roundtable discussion will use reported facts, statistics, and anecdotal evidence to debate the severity of teacher bullying in today's classrooms and the lasting impact that it has on students as well as possible actions and policies that may help reduce the occurrences of teacher bullying.

Arvizu, Lucerito
Chance Frey, Paige Lorentzen
Faculty mentor: Brant Short, Paige Lorentzen, Chance Frey

Session I, 9:00am-11:00am, 79D

Title: It's On Us!

It's On Us' is a campaign that advocates and persuades individuals to stop sexual assault before it happens. The campaign was originally to stop sexual assault on college campuses but it has spread and gained momentum. The campaign creates message(s) to recognize, identify, intervene and construct an environment that is free of sexual assault. Their advertisements call for a personal commitment; 'The Pledge' to keep women and men free of sexual assault by being part of the solution. Well-known public figures advocate to abolish sexual assault claiming, It's on Us. Their website also lists 13 tips to help stop sexual assault and its partners advocating for the cause. Our methodology will be the deconstruction of the campaigns message(s) to understand its effectiveness through persuasion and advocacy. We will analyze the message(s) for the measurable persuasiveness, advocacy for the subject, source credibility, and message legitimacy. We will evaluate 'The Pledge,' its use of well-known figures, the setting in which the message is being conveyed, the effects of being personal experience and involvement.

Ashley, Mariah
Jason McVay, Jonathon Donald, Temuulen Sankey
Faculty mentor: Temuulen Sankey, Jason McVay, Nancy Johnson, Anita Antoninka

Session I, 9:00am-11:00am, 6A
Title: Snow Cover Estimates Using Landsat Satellite Images

Snowmelt in the semi-arid southwest is crucial in supplying water for the ecosystem and human population. Spring snowmelt contributes to increased groundwater recharge, providing up to 85% of annual water supply to Arizona (Serreze et al., 1999). Due to large tree canopies, snow is intercepted before it can replenish the soil. However, efforts like the Four Forest Restoration Initiative (4FRI), conducted by the U.S. Forest Service, is the nation's largest forest restoration effort that include prescribed fires and mechanical thinning techniques. Approximately 2.5 million acres of ponderosa pine forests will be restored in efforts to decrease the threat of large-scale catastrophic fires. The purpose of our study is to use satellite remote sensing data to estimate snow accumulation, snow water equivalence (SWE), and snow retention as a result of forest restoration treatments. Spanning 26 years from 1988 to 2014, 66 Landsat TM/ETM+ images were used to estimate snow accumulation at five local sites near Flagstaff, Arizona. Each of the five sites, approximately 10 hectares in size, contains three treatment types: control, thin, and thin-and-burn. Landsat images were analyzed using the Normalized Difference Snow Index (NDSI) algorithm which estimated snow accumulation at each site. NDSI analysis showed that the thin and thin-and-burn sites had greater snow accumulation than the control sites, continuing into the spring season possibly contributing to groundwater recharge (Sankey et al., 2015). Understanding snow cover is vital to the region because it is projected that temperatures will increase and snow season length will decrease due to global climate change.

Ashley-Willie, Briana
Faculty mentor: Michael Lerma

Session II, 2:00pm-4:00pm, 74D

Title: Factors Affecting Contemporary Navajo Nation Elections

This study will involve dissecting parts of the primary case study involving the ongoing 2014 Navajo Presidential Election controversy surrounding Christopher Deschenie. Initially, debate sparked due to his lack of fluency in the Navajo language, a requirement to hold the presidential office. However, the controversy has become more than a dispute over the definition of fluency. The actions of the Navajo Nation Supreme Court and the Navajo Nation Tribal Council ignite further questions on how the Navajo Nation is to define itself in a changing world. The research will take a look into the Navajo Tribal Code, Navajo Common Law, and Traditional Law to see how it shapes and affects contemporary controversial Navajo Nation Presidential elections. Statistics on voter participation and election results will also be utilized in addition to commentary from the Navajo public through media. The goal is to find out if the actions of the Navajo Nation government are justified through the Tribal Code or Traditional Law, what it means for the Navajo people, and if there are alternate solutions.

Ashlock, Nathan
Faculty mentor: William Cordeiro

Session I, 9:00am-11:00am, 105B

Title: The Morality of Breaking Bad

Breaking Bad, the popular television show, is infamous for its touchy subject matter. Despite its reputation, the events of Breaking Bad can be broken down and attributed to different moral systems.

Atout, Zein
Faculty mentor: Melissa Santana

Session I, 9:00am-11:00am, 120A

Title: The Student Avenue’s

Society today is allowing technology to replace personal interactions. Most of us spend our days walking around with our noses buried in our cell phones, tablets, etc. I want to create a community on our NAU campus where individuals can discover themselves and engage with others through different workshops and environments. The community center will be named 'The Student Avenue’s' and it will be a place where you can go to see people, and go to be seen. The Avenue's will consist of street cafes, local shopping stores, lecture halls, a multi-faith center, a greenhouse, Skate Park, food stands and more. I'm creating a space where people who share interests can relate and engage with each other. This is an environment that has a solid comfortable vibe to it because I'm bringing back the old town design and meshing it with a contemporary design that will correlate beautifully with Flagstaff. The Student Avenue's will be at
the heart of NAU, which will include a public space with public paths interconnected to form promenades. The unique point about The Avenue's is it's sustainable features such as streetlights that are powered by solar and wind. We are building a space that shall improve the health and diversity of the local ecosystem rather than degrade it. Welcome to the Student Avenue's.

Austin, Danielle  
**Faculty mentor:** Julie Moreau

**Session II, 2:00pm-4:00pm, 90B**

**Title:** Fossil Fuel Economies and Women's Rights in the Middle East

This research examines connections between the demand for fossil fuel in the West and the perceived lack of women's rights in the Middle East. A post-colonial approach is taken to better understand how the oil industries have shaped economies in the Middle East at a time when discourse on Muslim women's rights is popular in the West. At the same time, environmental discourses lack an inspection of economic systems, such as in Saudi Arabia, that have been shaped and will continue to be shaped by fossil fuel industries.

Austin, Regina  
**Faculty mentor:** Julie Moreau

**Session I, 9:00am-11:00am, 90A**

**Title:** The Reality of Foster Care: How Foster Care is used to oppress communities of Color.

Foster care is supposed to be a safe haven for children of all ages who have been abused, neglected, or have parents that are not able to take care of them for any other reason. It is meant to give children and youth opportunities that they would not have had otherwise. But is it really making a difference when upon aging out of the system 45% become homeless in a year, 35% are incarcerated (A Critical Look at Foster Care: Foster Care Outcomes), and 51% are unemployed (Henderson, 2013)? This paper looks at the cycle of oppression from when a parent is unable to care for his/her child to when a child exits care whether through adoption or emancipation specifically in communities of color. Foster care is another governmental tool that marginalizes families of color attempting to strip children of their culture or denying them resources, setting them up for failure.

Averett, Ashley  
Trinity Frazee, Tiana Hans  
**Faculty mentor:** Melissa Birkett

**Session II, 2:00pm-4:00pm, 97D**

**Title:** The Influence of Visual and Auditory Cue Salience on Iowa Gambling Task Performance

The purpose of this study was to investigate the effect of increasing salience of auditory and visual cues on performance on the Iowa Gambling Task (IGT). The IGT is a cognitive task involving four virtual card decks that is meant to simulate real life decision making. The IGT assesses a participant's decision making behavior by allowing participants to select cards from monetarily rewarding and punishing decks (labeled A, B, C, and D) to attempt to earn virtual money by maximizing rewards and avoiding losses. It was hypothesized that a high salience version of the IGT would enhance participant's performance on the task via increased attention to decision making cues. For this study, participants were instructed to complete two versions of the IGT (high salience and low salience) in a random order on a laptop computer using an existing Psychology Experiment Building Language (PEBL) version of the task and a PEBL version created to include high salience cues. For the high salience condition, a choice from a rewarding deck is accompanied by a rewarding auditory cue while a choice from a punishing deck is accompanied by a punishing auditory cue. Participants are prevented from making an immediate, subsequent choice following these cues (brief lockout period). For the low salience condition, no auditory cues are present and the participant can make selections immediately (no lockout period). 47 university students (61% female, 39% male) completed the study. Total IGT score and blocks of 20 selections were analyzed using paired samples t-tests. The results revealed no significant difference between participant's total scores on high and low salience versions of the IGT. However, there was an order effect between the two versions of the IGT. Participants who completed the low salience version first achieved significantly higher scores than those who completed the high salience version first (p<.05). The initial hypothesis was not
supported. The findings suggest that completing the low salience version of the IGT prior to the high salience version may positively influence performance.

Baca, Chelsey  
**Faculty mentor:** Scot Raab, Monica Lininger

**Session I, 9:00am-11:00am, 44A**

**Title:** Malignant hyperthermia: a case study of a high school football player

The purpose of this study was to explore, find cause of, and inform other pre-hospital health care professionals about malignant hyperthermia in the high school setting. Malignant hyperthermia (MH) is a potentially life-threatening muscular disorder involving calcium metabolism. This condition can lead to serious issues at the cellular level which will cause the patient to become symptomatic. Episodic symptoms include pinkish or flushed skin, tachypnea, muscular rigidity, rhabdomyolysis, metabolic acidosis, hyperthermia, hyperkalemia, tachycardia, and possible death. Early recognition of MH is key in helping to prevent episodes or decrease symptom severity of MH to improve outcomes of the medical emergency until emergency medical services arrive. Athletic trainers (AT) play an essential role in injury and illness prevention at the high school level. Malignant hyperthermia is rare but can be a life-threatening condition. Therefore, ATs must have a proper education of MH to allow for better care of clients during their athletic participation. Archived medical records pertaining to a high school football player over a year’s span of 2012 to 2013 were analyzed to ascertain an in-depth understanding of the patient’s medical background. The patient suffered from repeated episodes of muscular rigidity, myokymia (twitching eyes), fatigue, seizures, and unconsciousness. There were a series of differential diagnostic tests completed from April 2012 to March 2013, with the patient being diagnosed in March 2013 with stress-induced MH. The physician provided strict orders of adequate hydration, a well-maintained diet, and an AT on-site in order to resume play in football. The AT can recognize, treat, and help manage MH episodes per the emergency action plan protocol for immediate, first-responder care. Malignant hyperthermia, when medically cleared by a physician, can be a condition that may allow an athlete to participate in sports with ample, qualified staff at the high school level.

Bachmann, Ariel  
**Faculty mentor:** Anthony Barnhart

**Session II, 2:00pm-4:00pm, 93C**

**Title:** Illusions in The Eyes of Schizophrenia

This research project is testing whether or not schizophrenic patients perceive illusions and if there is a difference between paranoid schizophrenics and general schizophrenics. It was hypothesized that schizophrenics would not perceive the illusions and that the general schizophrenic patients would be less susceptible to the illusions. Recent studies show that because schizophrenics do not perceive images and objects using both the top-down and bottom-up processes, they may not perceive certain illusions that magicians present. The methods included a motion blindness illusion and a hollow mask illusion. To measure this, the researchers used an independent samples t test with an alpha level set to .05 (2-tailed). The participants were asked to watch two illusions on a screen and then answer a free-response questionnaire. The participants were given 10 minutes in between illusions and 10 minutes to answer the questionnaire. Answers were recorded with a 1 or 2 depending on if they perceived the illusion or not. There was a significant difference between the two groups of schizophrenics. These findings support the hypothesis. Future research needs to be conducted with a larger sample and with control group consisting of non-schizophrenics.

Bai, Bing  
**Faculty mentor:** Melissa Santana, Sara Maier, Wenqing Chen

**Session II, 2:00pm-4:00pm, 120B**

**Title:** Brand new school dormitory design in China

The school dormitory is the most important place for university student I think, but in China, because of the huge population, 8 students live in a one small room is very common, there are only 4 bunk and nothing else, from this point, I would like to design a dormitory that can use the space as much as possible can also make student comfortable when they live in the dorm. I will use small/tiny space design in this project, my first goal is don’t waste any space, and then try to keep a low budget.because no matter how comfortable the dorm is, it dose not work for the
students with a very high rent. For this project, the biggest challenges are some problems with Chinese characteristics, just like Chinese people do not use dryer, the students need lots of space to hang their clothes. Also some of the building was built long time ago, it is very poor and old building. This project is a big challenge for me, but with those Chinese problems, I will try my best to make a deal with it, it may change some reality problem for my country.

Bailey, Erin

Faculty mentor: Maggie Vanderberg

Session I, 9:00am-11:00am, 3A

Title: Sparking an Interest in STEM

Throughout the majority of STEM-related degrees, there is a large gender gap between men and women. I believe that this gap is derived from a lack of options with respect to classes offered in secondary education. My research focuses on creating tools to help bridge that gap by introducing topics such as Computer Science, Physics, and Math to young women so that they can develop a passion for STEM well before they decide what university they would like to attend. In order to capture the attention of these young women, I have chosen to implement this tool in the form of an educational video game that expands on the various topics mentioned above. I plan to continue my research in order to analyze whether or not this introduction to Computer Science, Physics, and Math has inspired women to pursue a path in a STEM-related field.

Bailey, Michael

Sara Hair, Shelli Kahler, Tosha Sanchez

Faculty mentor: Jay Sutliffe

Session I, 9:00am-11:00am, 45D

Title: Social Seniors

Social isolation and infrequent participation in social activities has been linked to depression and increased risk of other health problems in senior citizens. The goal of the program is to increase attendance rates of social activities in a local Flagstaff senior assisted living facility in an attempt to reduce the incidence rate of depression in senior citizens. The program is focused on building the self-efficacy of the participants by reinforcing positive behaviors, based on the Social Cognitive Theory. The SMART model will guide the planned activities as part of the intervention to increase social interaction between the senior citizens in the facility.

Baker, Amber

Desiree Cody

Faculty mentor: Jay Sutliffe

Session I, 9:00am-11:00am, 46A

Title: Mindful Eating

Obesity and diabetes are raising health concerns in populations within the US. This project attempts to lower the risk of elementary aged students developing these health problems. The efforts of this program will allow students and their families to become educated and empowered to make healthy food choices. The Nutrition Intervention is in partnership with Flagstaff Medical Center’s FIT Kids Program in the Flagstaff Unified School District and includes involved students and school staff facilitating learning modules such as the following; nutrition label reading; discussions on how to overcome food challenges; ways to reduce those barriers by empowering parents with skills to make adequate meals for their families; hands-on activities such as the “healthy snack preparation” (Kelder et al., 2005), combining hands on activities with information distribution and participation.

Ballesteros, Alexander

Faculty mentor: Francis Smiley

Session I, 9:00am-11:00am, 70A

Title: What Will Remain? An Ethnoarchaeological Investigation into the Swazi, a Tribal-Kingdom from Swaziland
This poster presents a visual and textual examination of the material correlates of the ethnographically known Swazi Kingdom of Swaziland in comparison with the archaeological correlates of similar prehistoric segmentary and chiefly societies. Elman Service's model of social organization, well known to anthropologists, hardly explains the extreme variation in Swazi culture. This project is designed to help archaeologists examine prehistoric segmentary and chiefly societies. The Swazi Kingdom is a centrally-ruled chiefdom that maintains a standing army, however, the foundational social order is more similar to segmentary societies. The Swazi subsistence strategy consists of pastoralism and light agriculture, but the Swazi also subsist on wild game and other wild foodstuffs in certain seasons. Swazi groups settle in semi-permanent villages surrounding one semi-permanent capital city and practice repetitive site abandonment and reuse. I predict the unique social structure of Swazi society will not be clearly evident in the archaeological record. I predict instead that the archaeological remains of the Swazi culture will likely be misinterpreted as a basic tribal or chiefly social structure. The purpose of this project is to develop a model of the material correlates left by the Swazi on the landscape and to compare that model to the archaeological records of Swazi-like societies.

Ballesteros, Alexander  
**Faculty mentor:** Michael Vasquez

**Session II, 2:00pm-4:00pm, 70A**  
**Title:** Why Must I? An Examination of the Illicit Drug Trade in the United States

This project is an anthropological analysis of drug subcultures in the United States that looks at major causal factors such cultures develop. Using Dr. Philippe Bourgois' ethnography In Search of Respect: Selling Crack in El Barrio' to establish foundational data, I examine the various issues and circumstances faced by drug-dealers and addicts. The so-called 'War on Drugs' has done very little to combat problems related to narcotics, aside from imprisoning thousands of people, with the added effect of forcing countless others into shadows of the Black Market. Much of the research into drug use and sales involves compiling data across various regions, cultures and demographics, with a strong focus on the community, in turn marginalizing individuals involved in the extremely dangerous profession. This project argues that drug subcultures must be viewed with objectively, because without objectivity one runs the risk of either romanticizing or demonizing individuals, without ever addressing underlying issues. This project concerns social, economic, psychological, and historical factors associated with the world of drugs. To avoid generalizations and academic disconnection, I analyze drug subcultures by applying different theories from various cultural anthropologists including Ruth Benedict and Julian Steward. This research may be used by social scientists, policy makers, police departments, drug dealers, drug addicts, community members and community leaders to analyze the illegal drug trade in an attempt to combat the socioeconomic conditions that foster the world of drug use and sales.

Banister, Kelsey  
Erik Lehmkuhl, Rebecca Beresic-Perrins  
**Faculty mentor:** Stephen Shuster

**Session II, 2:00pm-4:00pm, 18C**  
**Title:** Development and Characterization of Microsatellite Markers for the Leech, Helobdella stagnalis

Self-fertilization is rare among hermaphroditic animals and is poorly understood among leeches, including Helobdella stagnalis, a glossiphoniid species known to provide extensive parental care. After sequencing the genome of H. stagnalis in 2014, we identified hundreds of possible microsatellite markers widely distributed throughout this leech's genome. Microsatellite markers are highly variable DNA sequences that can be used to assign paternity within families, and allow detailed estimates of heterozygosity at a wide range of population levels, including the increases in heterozygosity that occur due to selfing. Here, we describe our methods for selecting and characterizing 15 microsatellite DNA markers from the H. stagnalis genome. With our optimized primer array we will document population structure and estimate the frequency of selfing in natural and laboratory H. stagnalis populations. These primers will provide a precise tool for estimating the frequency of selfing in H. stagnalis and will allow the ability to conduct a wide range of genetic and behavioral experiments that require lineage verification.

Baracco, Rebecca  
**Faculty mentor:** Nick Koressel, Abraham Henn

**Afternoon, 1:30pm-1:42pm, duBois Room A**
**Title: Internship Experience: Green NAU Energy Initiative, Sustainable Behaviors Program**

A recent plan has been implemented by the Green NAU Energy Initiative (GNEI), associated with Facility Services, in an effort to reach carbon neutrality on Northern Arizona University (NAU) campus by the year 2020. The focus of this plan is the promotion and management of the Sustainable Behaviors Program, a concept that encourages faculty, staff, and students at NAU to adopt conservation methods geared towards reducing costs and emissions related to energy waste. This report describes tasks and projects accomplished through an internship experience from January to May of 2014. Main responsibilities of the internship included general office tasks, setting up meetings, attending Energy Mentor training sessions, participation of GNEI related activities, and involvement of planning and participation in Earth Week events. The major project of focus during the internship was renovation and improvement of the GNEI website. This was accomplished through training of the NAU Web Content Management System and creating original materials and content. The progress of this internship can be furthered by future students through continued development of the GNEI website and potentially innovative ideas to increase involvement in the Sustainable Behaviors Program.

**Barandi, Brian**  
**Faculty mentor:** Deidre Hunter

**Session II, 2:00pm-4:00pm, 21D**

**Title: Breaks in radial stellar surface brightness in spiral galaxies.**

In both dwarf and spiral galaxies there are breaks in the radial stellar surface brightness profiles. The surface brightness of the starlight decreases exponentially before and after the break, but there is a sharp change in slope at the break. What happens at the break is not understood. Here we examine several spiral galaxies of different Hubble types with breaks in the V-band light. Comparing V-band surface photometry to FUV surface photometry from GALEX, we find the ratio of star formation per unit of V-band starlight interior and exterior to the break in order to look for changes in star formation at the break. We compare this ratio to values measured in a sample of dwarf galaxies.

**Baranowski, Jeffrey**  
**Faculty mentor:** Stephen Shuster, Kayla Ochoa

**Session I, 9:00am-11:00am, 18D**

**Title: Flesh Fly Pupal Weight Predicts Viability**

The flesh fly, Sarcophaga bullata is well known as an indicator organism in forensic entomology and because it is easily reared under laboratory conditions, it is often used to illustrate holometabolous insect life cycles. Flesh fly pupae are also widely used as hosts for laboratory cultures of parasitoid insects such as jewel wasps, Nasonia vitripennis. The success of wasp cultures depends on fly pupa viability, but fly pupa condition is difficult to assess in commercially available supplies. Inviable fly pupae appear to die and dry out during development and become conspicuously lighter than viable pupae by the usual time of eclosion (14 days). To determine whether weight predicts fly pupal viability we collected daily weights to the nearest ten thousandth mg for lab-reared pupae (N=110). We calculated the daily weight change for viable and inviable pupae and compared them using a 2 way ANOVA. Although pupae in both groups lose weight during development, we found that inviable pupae lost weight faster than viable pupae, with average inviable pupal weight becoming distinct from viable pupal weight as early as four days after pupation.

**Barbera, Dylan**  
**Faculty mentor:** Chad Woodruff, Taran DePaola

**Session I, 9:00am-11:00am, 58D**

**Title: An Event Related Potential Investigation of Self/Other Discrimination**

In order to understand one's own or another's intentions and emotions, one must first be able to discriminate between the two. This self/other discrimination is suggested by some to be a critical component of perspective taking and empathic processing. This study used electroencephalographic (EEG) event related potentials (ERPs) to investigate the time course for self/other discrimination of emotional human faces. Thirty-six right handed participants watched a series of short (1500 ms) videos showing either themselves or one of five 'others' turn their heads 90 degrees toward a
camera while making one of four emotional expressions (happy, sad, angry & neutral.) Participants were then asked to type a response identifying which of the emotions the person in the video was displaying. Participants completed the Interpersonal Reactivity Index (IRI) and the Empathy Quotient (EQ) after EEG recording. ERP's were time-locked to the onset of the stimulus with a 100 ms pre-stimulus baseline and then averaged across trials. Candidate self/other differences in waveforms were analyzed using repeated measure ANOVAs. It was found that four different evoked potentials were found to be significantly different between the self and other conditions both early and late after stimulus onset. While the current experimental design does not address a relationship between these ERP data and extant mu suppression data sets, future research should consider this possibility.

Barber-Winter, Jasmine  
**Faculty mentor:** Paul Donnelly

**Session I, 9:00am-11:00am, 126A**

**Title: Political Propoganda in Islamic Pilgrimage Architecture**

The roads leading to Mecca had long been used before Islam as trade routes. These roads were established and maintained by overseers of the region. From the seventh century of the Common Era until the twentieth century this responsibility was taken with pride by rulers of the Islamic world. Road administration enacted by Islamic Caliphates was a form of political propaganda and is evident in the architecture along pilgrimage routes in the Arabian peninsula. Pilgrims have long been a major motivation of Islamic infrastructure design, be it for ensuring safe travel or creating a destination worth the pilgrimage. The primary motivation for ruling elite to sponsor amenities to travelers was to fulfill a responsibility to the people. It also financed the development of Islamic art and architecture as a distinct style. Patrons of the arts had influence in the direction of development and often used the opportunity to promote their heritage, religion, and status. This project intends to draw a comparison between pilgrimage infrastructure built between the 7th-13th centuries and contemporary reflections of road administration.

Barnes, Amanda R.  
Michelle J. Lee, J. Richard Coast  
**Faculty mentor:** Richard Coast, Michelle Lee

**Session I, 9:00am-11:00am, 17C**

**Title: A Comparison of Plethysmography and Helium Dilution in the Measurement of Functional Residual Capacity in Humans**

Functional Residual Capacity (FRC) lung volume following passive exhalation. Standard methods, such as spirometry, cannot be used due to its limitations of only being capable of measuring expired volumes. Two methods used to measure FRC are helium dilution and plethysmography. The plethysmograph measures pressure and volume inside an enclosed cabinet to find lung volume through pressure changes. Helium dilution uses a rebreathing technique, in which helium is diluted by the FRC. Previous work in our laboratory showed that while the plethysmograph accurately measured most lung volumes, its measurement of FRC was highly variable compared to helium dilution. The purpose of this study was to more carefully control the techniques to determine whether there was a difference between the two. We measured FRC in 10 subjects using the plethysmograph and rebreathing techniques. Subjects had FRC measured 3-4 times per day using both techniques on two occasions separated at least one day. Care was taken to ensure that the same body position was used in all measurements. Our results showed that helium dilution consistently produced smaller measurements of FRC (Plethysmograph 3.6 ± 0.2 L; Helium dilution 3.3 ± 0.2 L P=0.002). One reason for the difference may be small closed airways that were not opened by the volume breathed in the helium dilution technique, but which would be seen using the plethysmograph method, which depends on expanding and compressing the chest against an occluded airway. Other researchers have found similar variance between techniques, indicating that this is likely a true physiological variation.

Barrios, Brianna  
Stephanie Kemsley, Marisa Bracewell, Keaton White  
**Faculty mentor:** Gregory Busath

**Session II, 2:00pm-4:00pm, 98A**

**Title: The Effects of Self-Esteem and Introversion on Romantic Relationship Duration**
The study currently being conducted is analyzing whether or not there is a correlation between self-esteem levels, introversion, and extraversion with romantic relationship duration (RRD). Extraversion and self-esteem are hypothesized to be significantly correlated with RRD. In order to achieve this, the study will include the McCrosky's Introversion Scale and Rosenberg Self-Esteem Scale, two established measures of their respective constructs. The survey will be administered to students who attend Northern Arizona University, via hard copy. Data will be analyzed by way of SPSS using a correlational design (Pearson r). Results will be presented at the NAU Undergraduate Research Symposium.

Barteaux, Brooke  
Emily Stevens  
Faculty mentor: Michael Vasquez

Session II, 2:00pm-4:00pm, 73A  
Title: Hadza: Tanzanian Hunter-gathers The Last of the First

The ethnography written by Frank Marlowe focuses on the Tanzanian group, Hadza with their way of hunting, social life and customs as well as the Tanzanian social ecology, and evolutions. The Hadza have been able to sustain over 50,000 years near the Rift Valley through only hunting and gathering. They have their own social organization, beliefs, practices, mating and parenting and so on. Extraordinary tribes such as the Hadza have managed to hardly migrate toward newer technologies. They live within the environment in which human evolution occurred. Archaeology, ethnographical, and cross-cultural analysis's prove to be imperative in discerning similarities along with the differences to past ancestors. Sharing a rich history with the land allows an ancestral lens. Cultural anthropologists that are studying the Hadza understand the importance between their culture today and possibly a link to the past, (though some anthropologists will argue otherwise). Theorists such as Julian Steward and Leslie White play a crucial part in understanding cultural ecology and cultural evolution. Steward's cultural ecology presented testable hypothesis regarding similarities and differences between functional relationship between the natural environment and culture in which the Hadza identify with. White disputed that cultural evolution emerges at the material base of a society. The amount of energy that a culture could obtain from the environment measures the evolutionary progress.

Bateman, Sara  
Mohammad Alsabah, Adam Cordero, Mary Strong  
Faculty mentor: Charles Schlinger

Morning, 8:55am-9:20am, duBois Agassiz Room  
Title: Sun Valley Water & Wastewater Project

A fundamental aspect of living for residents of Arizona is access to efficient water supply and wastewater systems. At the Sun Valley Ranch of Sun Valley, Arizona, however, there are no existing municipal water resources available. In order to ensure sustainable ways of living, both a wastewater and water system were proposed. Approximations of residential water use have been considered in order to develop the Sun Valley Water and Wastewater Systems. These systems will incorporate: water importation, rainwater collection, gray water reuse, and composting toilets. As a result of incorporating these systems, minimal energy is expended treating wastewater and minimal water importation is necessary. The designed systems adhere to all regulations while minimally affecting the environment and accounting for forecasted population growth rates for the Sun Valley Ranch.

Battle, Anders  
Faculty mentor: Becky Butcher

Session I, 9:00am-11:00am, 114D  
Title: Art Historic Learning Application

I will be creating a learning app directed towards teenagers learning important facts about art history. From experience I was one of those people who looked at art with hardly any intent to learn from something created decades ago. I've come to realize that some art, that has historical significant value, has taught me not to judge to quickly on anything. It's sounds a little cheesy but it's the best way I can describe it. I just find it interesting that some artist can take their inspirations to new (at the time) visual meaning. Though a lot of them made the same paintings or sculptures as others but you can tell who the define names of artist like Leonardo Da Vinci, Michelangelo, Van Gogh and Picasso.
Bay, Kelly  
Faculty mentor: Natalie Cawood

Session I, 9:00am-11:00am, 81C  
Title: Behavior Change: Self-Care  
Due to graduating in May, and going into the field of social work, I have chose to focus my behavior change on self-care. To create change, I set a goal and wrote out steps that I needed to take in order to achieve my goal. Next I developed a scale to measure my different activities. I will present my results and discuss how this behavior change will affect my career in social work.

Bayer, Brittany  
Dawn Birdsell, Jeff Foster, Faith Walker, Paul Keim, David Wagner, Yasemin Ozsurekci, Selcuk Kilic  
Faculty mentor: David Wagner, Dawn Birdsell

Session I, 9:00am-11:00am, 12B  
Title: Identifying Brucella species Causing Human Disease in Turkey  
Brucellosis is a rare disease in developed countries, but is highly prevalent in developing nations of the Middle East such as Turkey, where economically important livestock serve as the infection source to humans. The disease is caused by various species of Brucella and is spread to humans through unpasteurized milk products. The different species of the Brucella genus display specificity for particular animal hosts even though all Brucella species are known to cause the same disease in humans. For this reason it is difficult to identify the source of Brucellosis when it affects humans. Few studies have been done to characterize Brucella species in the Middle East and Turkey despite it being endemic to this region. In this study, we genetically characterized 137 Brucella strains isolated from human patients in Turkey to link them to animal reservoirs and identify geographic patterns associated with particular genetic subgroups. This knowledge will provide a means of trace-back analysis to narrow the possible origins of the infection source and allow for tracking of the spread of Brucellosis outbreaks in Turkey. We found that all of the Turkish samples were B. melitensis, a species that has host-specificity for goats and sheep. All strains but two belong to identical subgroups within B. melitensis indicating close genetic relatedness of Brucella throughout Turkey despite distant geographic origins. These results suggest that a single dominant genetic group of Brucella exists in Turkey and the host specificity (goats and sheep) is consistent with milk products as sources for human infections.

Beagles, Ian  
Faculty mentor: Lisa Chien

Session I, 9:00am-11:00am, 21C  
Title: Star Formation in Interacting Galaxies  
Merger-induced star formation can provide a history and timeline for galactic interaction. By using multi-spectral images obtained with the Hubble Space Telescope at 435 nm and 814 nm for galaxy pairs: Arp256, Arp299, and IC883, we can determine the ages of the merger-induced star clusters. These ages are obtained by performing photometry on the cluster candidates, constructing a color-magnitude diagram, and comparing to theoretical cluster ages for each galaxy pair. Our results for IC883 show that the clusters have masses of $10^4$ to $10^5$ solar mass and estimated ages between 100 Myr and 1 Gyr, with a few younger than 100 Myr. Obtaining cluster ages allows us to compare the observed galactic star formation history to the predictions obtained from galactic models.

Bean, Tyler  
Faculty mentor: Christine Lemley

Session I, 9:00am-11:00am, 52B  
Title: Indigenous Culture and Knowledge in the College of Arts and Letters  
I will be interviewing secondary education students enrolled in the College of Arts and Letters. I aim to answer the following question, how does your coursework prepare you to work with Native American students or in Native American communities, I plan to analyze the interviews to identify themes of how CAL students feel prepared to work
with indigenous populations and in indigenous communities. I will also look at required course offerings and electives that the interviewee's programs allow students to take. I plan to use Critical Oral History, bridging Critical Theory and Grassroots Oral History to collect my data. I will use Tribal Critical Race Theory to analyze my data.

Becker, Cynthia  
**Faculty mentor:** Marie Baker-Ohler

**Session I, 9:00am-11:00am, 78A**

*Title: Meanings Are In People, Not Words: An Intrapersonal Approach to Communication Competency*

The study of intrapersonal communication is essential to a comprehensive understanding of human communicative behavior, and thus warrants study within the field of Communication Studies. The focus of this project is in establishing a positive correlation between intrapersonal communication and communication competency. The purpose of this project is to argue for the inclusion of intrapersonal communication as an independent area of study within the field of Communication with the intent of improving students' communication competency. Research elements include definitions and attributes of intrapersonal communication and communication competence, arguments for and against the study of intrapersonal communication within the field of Communication Studies, and current statistical data reflecting intrapersonal communication course offerings at universities throughout the United States. Finally, this project addresses the benefits of teaching intrapersonal communication as an independent area of study within the Communication Studies discipline in relation to the development of students' communication competency skills.

Bednar, Katelyn  
Elizabeth Lozano, Victoria Davis, David Golle, Kyle Grove  
**Faculty mentor:** Linda Robyn, Victoria Davis, Elizabeth Lozano, David Golle, and Kyle Grove

**Morning, 9:00am-11:00am, Skydome SBS Table**

*Title: Environmental Crime*

Using information and research on Environmental crime, this project will consist of multiple articles that will form into a magazine. Each author will contribute by researching their own topic over environmental crime and creating an article. The topics of the articles that will be discussed through this magazine consist of: Uranium mining on the Navajo Nation, Oil Spills, the disposal of hazardous waste for the company Walmart, Alaska platinum mines that are killing off fresh salmon, and the illegal trade and exploitation of wildlife and forest resources. All articles will be put together to form a project that reflects the impact of these topics on our environment.

Beers, Rebecca  
**Faculty mentor:** Nancy Riggs

**Session I, 9:00am-11:00am, 23A**

*Title: Paleo-environment Reconstruction and Origins of the Chalk Canyon Formation Ash, Central Arizona*

The Chalk Canyon Formation in Black Canyon City, Arizona, possesses a poorly understood layer of blue vitric ash previously dated at 23.7 Ma. The ash is important because it contains Arizona's earliest known Cenozoic mammal, the oreodont. The oreodont was common in many parts of ancient North America, but was rare to ancient Arizona based on the scarcity of known oreodont fossils. These fossils occur at or below the blue ash. The purpose of the project was to find the parent volcano to the blue ash by analyzing its mineralogy and geochemistry. Geochemistry currently in progress will compare the chemical signature of the ash to that of the possible parent volcanoes. The mineralogy of the blue ash comprises volcanic glass, biotite, plagioclase, and clinopyroxene. The presence of biotite leads to the speculation that the blue ash originated from the Sullivan Buttes Latite now exposed 101 km to the northwest. In the field, root casts were found both in, and near, the blue ash. This suggests that plant life was present during the time of deposition. However, the abundance of root casts diminishes near the ash and in overlying units. This could be the result of an increasingly hostile environment for plants to take root and grow. The loss of plant life could correlate to the disappearance of the oreodont in the region due to the fact that the oreodont was herbivorous and would have depended on the presence of vegetation.

Begau, Sean Paul  
**Faculty mentor:** Linda Paul
Session I, 9:00am-11:00am, 48A
Title: Diabetes Prevention, Education and Management through Traditional American Indian Wellness
American Indians are facing multiple health disparities such as hypertension, obesity and Type II diabetes due to financial poverty and an inability to access adequate foods. As a way to mitigate the outcome of these health disparities, specifically Type II diabetes, American Indian tribes have engaged in prevention techniques that focuses on traditional wellness such as growing their own food crops, learning about nutritional foods, engaging in traditional practices and exercising on a daily basis. By engaging in these techniques, American Indian tribes hope to teach the youth about important cultural practices while promoting healthy eating habits.

Begay, Andria
Chelsi Tsosie
Faculty mentor: Karen Jarratt-Snider

Session II, 2:00pm-4:00pm, 74B
Title: Abandoned Uranium Mines on the Navajo Nation
Since the early 1900s, the Navajo Nation has been profoundly impacted by uranium mining. Navajo uranium miners unknowingly sacrificed their health and the health of their loved ones. The harsh effects of uranium mining resonated within the surrounding communities leaving the land of the Navajo people destroyed. Although the Dine Natural Resources Protection Act of 2005 banned uranium mining and milling on the Navajo Nation, thousands of abandoned mines still linger and cause health issues, environmental issues, economic issues, and harm to the Navajo culture and way of life today. The sad truth about the result of the uranium mining is that it revolves around the disproportionate impact of environmental racism. The values of the Navajo people were not taken into consideration as the horrors of uranium mining plagued the well being of all life on the Navajo Nation. Solutions for the damage done by uranium mining have yet to be initiated.

Beltran, Makenzi
Hussain Alkandari, Abdulaziz Alsaraf, Jiahao Zhang
Faculty mentor: Paul Gremillion, Bridget Bero

Morning, 9:45am-10:10am, duBois Agassiz Room
Title: Adsorptive Capacity of Orange Peels and Zero Valent Iron Filings
Orange peels have been proven to remove uranium from water, as zero valent iron (ZVI) filings have also been a proven removal method for arsenic from water. In order to utilize the two materials as removal methods, it is critical to know how much mass of uranium or arsenic can be removed per mass of orange peels or ZVI filings. Determining this removal capacity, or adsorption capacity, was the overall goal of the project. The removal capacity for both the orange peels and the ZVI filings was found by conducting a series of batch experiments. The batch experiments included varying the mass of orange peels or ZVI filings at a constant initial concentration of 100 mg Uranium/L, 10 mg Arsenic/L, or 50 mg Arsenic/L. Once the removal data was collected, isotherm models were created in order to analyze the data. Isotherm models serve as the standard form of analyzing adsorption, and will be the overall product of the work conducted.

Belus, Matthew
Faculty mentor: Bruce Hungate, George Koch, Andrew Krohn and Rebecca Mau

Session I, 9:00am-11:00am, 16C
Title: A Decade of Increased Temperature Affects Soil Fungal Communities
In the American Southwest, climate change is expected to intensify drought and elevate temperature. An understanding of ecosystem responses to long-term temperature augmentation is imperative for climate change research. Specifically, soil fungal responses to warming are poorly characterized in recent literature and knowledge of fungal community responses to warming is necessary to complement current climate change research. In Flagstaff, Arizona a natural elevation gradient exists where conditions associated with climate change in the Southwest can be simulated. The C. Hart Merriam Elevation Gradient was utilized by transplanting intact grassland communities down gradient to warmer
ecosystems. Soil was contained in sunken PVC cylinders for each control and experimental site across the Mixed Conifer, Ponderosa Pine, Pinyon-Juniper, Desert Grassland, and Great Basin Desert ecosystems. Samples were collected ten years after transplantation. Community composition and abundance were determined using ribosomal DNA. Statistical analyses of fungal communities from ambient and warmed treatments indicate a significant influence of warming on fungal community composition. Communities exposed to long-term warming no longer resemble their parent communities at ambient temperatures. Species richness increased at the Mixed Conifer site under warmed conditions, but not at other sites. There was a significant difference in the fungal community abundance between warmed and non-warmed soil types. Fungal abundance increased in the Pinyon-Juniper ecosystem under warmed conditions. Complementary research on plant community response indicates that warming alters plant community composition, richness, and evenness. A shift in plant and fungal communities due to long-term warming has important implications for ecosystem function in the Southwest.

Belus, Matthew  
Faculty mentor: Bruce Hungate, George Koch, Andrew Krohn and Rebecca Mau

Afternoon, 2:06pm-2:18pm, duBois Meadows Room

Title: A Decade of Increased Temperature Affects Soil Fungal Communities

In the American Southwest, climate change is expected to intensify drought and elevate temperature. An understanding of ecosystem responses to long-term temperature augmentation is imperative for climate change research. Specifically, soil fungal responses to warming are poorly characterized in recent literature and knowledge of fungal community responses to warming is necessary to complement current climate change research. In Flagstaff, Arizona a natural elevation gradient exists where conditions associated with climate change in the Southwest can be simulated. The C. Hart Merriam Elevation Gradient was utilized by transplanting intact grassland communities down gradient to warmer ecosystems. Soil was contained in sunken PVC cylinders for each control and experimental site across the Mixed Conifer, Ponderosa Pine, Pinyon-Juniper, Desert Grassland, and Great Basin Desert ecosystems. Samples were collected ten years after transplantation. Community composition and abundance were determined using ribosomal DNA. Statistical analyses of fungal communities from ambient and warmed treatments indicate a significant influence of warming on fungal community composition. Communities exposed to long-term warming no longer resemble their parent communities at ambient temperatures. Species richness increased at the Mixed Conifer site under warmed conditions, but not at other sites. There was a significant difference in the fungal community abundance between warmed and non-warmed soil types. Fungal abundance increased in the Pinyon-Juniper ecosystem under warmed conditions. Complementary research on plant community response indicates that warming alters plant community composition, richness, and evenness. A shift in plant and fungal communities due to long-term warming has important implications for ecosystem function in the Southwest.

Bem, Michelle  
Benjamin Pelletier  
Faculty mentor: Ashley DeBoard, Robert Sanford

Session II, 2:00pm-4:00pm, 7C

Title: Citizen Science: The FeederWatch Project Through The Cornell Lab of Ornithology

Our aim was to monitor movement, distribution and population of birds in Flagstaff, AZ and provide the data to a nation-wide effort to monitor and track bird populations. Cornell University's FeederWatch Project collects valuable material regarding winter migration patterns that will contribute to studies concerning population and ecosystem management. We chose to place an open seed feeder in the the Shand Garden at NAU, following general requirements to pick an area ideal for birds to visit, and observed bird activity for two consecutive days per week and an hour or more each day. Although we provided data for the winter season, we continued to observe for an additional two weeks into Spring. This provided us with data to support our hypothesis that as temperature increases, species number and diversity increase as well. The project was an interesting experience that gave us the opportunity to pay attention to the local bird communities in Flagstaff as well as contribute to a national database.

Berchman, Melissa  
Faculty mentor: Francis Smiley

Session I, 9:00am-11:00am, 70C
Title: The Paliyans of Kerala and Tamil Nadu, India: Ethnoarchaeological Investigations into Paliyan Social Patterns and Correlates

The poster presents a visual and textual examination of the material records of the ethnographically known Paliyan society of southern India, in comparison with similar archaeological societies. Archaeologists can learn a great deal about prehistoric societies by closely examining the material record of living societies. The Paliyans are a tribe in the southern India states of Kerala and Tamil Nadu. The Paliyans are indigenous to the Western Ghats, but have been inhabiting settlements and villages around the region. The Paliyans hunt, gather and manufacture goods for sale in nearby markets. Their interaction with the surrounding villages offer economic opportunities and the introduction of various materials and customs. Based on Paliyan ethnographic data revealing the settlement patterns in addition to the increase of economic activity, I predict that the archaeological record will contain a substantial amount of evidence. The purpose of the presentation is to set out a model of the kinds of material cultural items used and produced by a society given the social organizational and other cultural factors that govern the operation of that society. The poster also presents examples of archaeological research on similar societies to compare archaeological reality with the ethnographically derived model.

Bermudez, Amanda
Allie Jessen
Faculty mentor: Sumner Sydeman

Session II, 2:00pm-4:00pm, 102A

Title: A Systematic Review of Cognitive Therapy for Obsessive-Compulsive Disorder in Adults

The purpose of the current project is to conduct an extensive literature review on the effectiveness of treatments for Obsessive-Compulsive Disorder in adults. This systematic literature search follows the standards described in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The criteria for the search was limited using academic search engines (e.g., Medline and PsychInfo) to find peer-reviewed articles published in major journals from the year 2000 to the present. The focus of this search is on cognitive therapy in particular. Search terms include 'obsessive-compulsive disorder', 'cognitive therapy', 'clinical trials', and 'meta-analyses'. An initial review has identified strong research support in the efficiency and efficacy of the treatment of Obsessive-Compulsive Disorder. Published clinical trials are analyzed for their strengths and limitations. The poster will also provide direction for future research on this type of therapy based on the results of articles examined.

Berry, Rachelle
Faculty mentor: Ellen Vaughan

Session II, 2:00pm-4:00pm, 2B

Title: Solar Hot Air Heaters

The Campus Surplus has 6 Solar Hot Air Heaters on the side of the building that supplement the heating of the 10,000 square foot building. It is set up as a close looped system with air being gathered from inside the building into the panels, heated up about 60 degrees, and pushed back through the heating system into the building. These panels are able to displace 3 tons of CO2 per a cold season and tests a renewable energy option to natural gas.

Biasong, Patricia
Faculty mentor: Glenn Hansen

Session I, 9:00am-11:00am, 107C

Title: Societal Influence on Disney Animated Films

Examines how society influences how Disney represents gender in their animated fairytale films.

Bicoy, Dohna
Carter Doud, Daniel Kimball
Faculty mentor: Angie Moline

Session II, 2:00pm-4:00pm, 7A
Title: *Change the World Project: Cans to Cans*

As a group under the Change the World project, we came up with a way to generate profit back into the Freshman Outdoor Learning communities. We were all in a community when we were freshman and remembered going on fun hikes and excursions outdoors. We would all try and find a ride and throw in some money for gas. To better the experience for freshmen in these communities, our new way to generate money was to put recycling bins in the freshman dorms only designated for aluminum cans - taking these cans to the recycling center for money - then using that money for the outdoor communities. Talking to the management of these communities, they stated that they did not need more funds. We were then lead to the director of Louies Cupboard, hearing that they were in need of change and funds. Louies Cupboard is a student run food operation that provides simple free food for students in need. The director of Louies Cupboard was grateful to hear about our project and more than pleased to help us along. We placed four bins in one freshman dorm (Wilson Hall) for aluminum cans with a poster for its purpose above all of them. The money collected from the recycled cans was then taken to the stores to purchase non-perishable goods to put into the Cupboard. The Cupboard is connected with the Sustainability Department, ECO-house and representatives, and the outdoor communities - which were all helping and involved in our project as well.

**Bicoy, Dohna**
- **Faculty mentor:** Marie McCormick, Mansel Nelson

**Morning, 9:30am-9:42am, duBois Room A**

*Title: Defecation, Realization, Restoration: The Oak Creek Watershhe Council (OCWC)*

I was a volunteer and outreach inern with the Oak Creek Watershed Council (OCWC) from August to December 2014. The OCWC is an environmental non-profit organization dedicated to preserving and maintaining the Oak Creek Watershed (OCW) environmentally, socially and economically. It is run by the cooperation of more than 15 different agencies both federal and non-federal and located in an area of high relief along the canyon-cut margin of the Colorado Plateau. The purpose of my internship was to increase the number of participants and partnerships by reaching out into the community and raising awareness of OCWC issues, operations and opportunities. The responsibilities and tasks of the position were numerous and diverse. The physical work, such as maintenance and restoration, occurred within the boundaries of the watershed; whereas meetings and debriefings took place indoors. Majority of meetings I organized were located in the Flagstaff Chamber of Commerce, the Red Rock Ranger district, and occasionally the NAU campus. On a personal note, before the internship began my main goal was to complete it and receive the required credit for my major. However I can humbly say it grew into much more than just a requirement. Over the period of my position, I learned valuable professional skills having to deal with important leaders in the environmental fields; key conservation and restoration techniques in habitat and water quality; even technical aspects, such as water testing, GIS tools in forestry, and environmental policy pertaining to organizations like the OCWC. Overall, this internship was one of the best experiences I could have hoped for and benefited me in ways I did not think it would. I would recommend this position to any who are looking for adventure and preserving nature's simple wonders on a community scale.

**Bilagody, Cherae**
- **Faculty mentor:** Talima Pearson, Emily Kaufman, Heidie Hornstra

**Session I, 9:00am-11:00am, 14B**

*Title: Coxiella: Potential Transmission Across the Livestock-Wildlife Interface*

Coxiella burnetii, the causative agent of the zoonotic disease Q-fever, is found worldwide and transmitted between humans and animals through infected animal excretions (e.g. milk, genital, or fecal materials). Recently, in a previous study we discovered a trend of host-specificity among strains of C. burnetii, highlighting the need for more comprehensive investigation of other species to gain further insight into the transmission of C. burnetii. This research was conducted to better understand disease prevalence and potential routes of transmission between domestic and wildlife animals. Using real-time PCR, we found C. burnetii DNA in 47.1% of samples collected from animals on farms and in conservation areas, with levels of detection varying based on the sampling method used. Overall, genital swabs proved more sensitive in detecting the presence of C. burnetii than milk and or fecal samples. We found that C. burnetii collected from domestic and wild animals showed genetic similarity based on our genotyping assays, indicating that cross-species transmission of C. burnetii may have occurred. The potential for cross-species transmission has important ramifications in our ability to track and control the spread of this pathogen.
Billy, Tyanna  
Faculty mentor: Marina Vasquez

Session II, 2:00pm-4:00pm, 56D

Title: Natural Remedies are Better For You

There is always something that one thinks they need to change on their body. For me, I have struggled with unhealthy skin and acne since my freshman year in high school. Because that is when a teenager gets involved with physical education and extracurricular activities and the face and body needs to always be cleansed. Also, the body needs to intake healthy food at breakfast, lunch and dinner to maintain a healthy body to strive through the day and the exercise during the day. So since I met a Mayan elder who knows a lot about plants and a natural lifestyle having the Mother Earth in mind, my body has been changing in a positive way. There are a few plants I would like to define and expand on that have worked with my face, body, and my whole interior body. When getting rid of acne, people just buy products that only get rid of acne or calm it down. But these plants not only cure the acne and dark spots, they improve health and wellness in and out of the whole body. These plants can be taken in by salves, creams, food, teas, and inhalants. It is super important that one has knowledge on the plants so there are no problems when gathering, preparing, making and using the products.

Billy, Tyanna  
Faculty mentor: Michael Lerma

Session I, 9:00am-11:00am, 75A

Title: Clinical Services For Native American Youth on the Reservation

When it comes to the youth of the Native American people, there is hardly any positive promoting to keep them from making mistakes with the law or with their futures. So I wanted to research on clinical services that have been a success on the reservation and critique them to where they will be more effective. Then see what other clinical services from successful Native American communities to non-Native American communities have that might work on the Native American reservation schools. My main goal is to open eyes, mainly the Native Americans, that the youth is the future of their culture. There needs to be more people educating and guiding the youth to healthier thinking on choices they need to know the correct answer to. I have a few ideas on what needs to be focused on for the youth. The whole process of obtaining positive feedback from these experiences relies on support. If there is no support in guiding schools with healthier practices, programs, and policies from the parents, teachers, counselors, and the community, the youth has a hopeless future. So in order to have maximum support, I have researched about the five-step approach that will help guide the clinical services to being a success on the reservation. This is a difficult problem to enforce in schools but it needs to happen, the approach to building a council will have its difficulties but it is worth a shot when it is about the future of the world.

Binyom, Florent  
Muqrin Alsawa, Orion Tom, Ziyam Xiao, Fatemah Alsayegh  
Faculty mentor: David Willy

Morning, 11:10am-11:35am, duBois Festival Room

Title: Net Solar Charger

Everyone is having to charge their electronic device(s) more frequently due to their usefulness in our daily lives. If you're not at home when your device needs to be charged, there is no guarantee that there will be an available power outlet for use. So if you urgently need to charge your electronic device, why not utilize free solar energy. Our solar charger design uses the latest advances in solar panels and power electronics coupled with the convenience of a USB port. It can charge a typical cell phone in about 4 hours under sunny conditions. The charger is inexpensive, light and easy to bring with you in a personal carrying item such as a backpack. This charger will be beneficial to those that need to keep their devices operating when they are on the verge of powering down.

Blanks, Jennifer  
Suzanne Owen  
Faculty mentor: Suzanne Owen, Catherine Gehring
Afternoon, 1:54pm-2:06pm, duBois Meadows Room

**Title: Do High-Severity Fires Influence Patterns of Seedling Regeneration?**

For ENV 408, my internship was completed as a field and lab technician at USDA Forest Service Rocky Mountain Research Station located in Flagstaff, Arizona. Fire suppression has led to more catastrophic fires due to the severity and size of the burned areas they create. These high severity fires may have changed the spatial pattern of regenerating ponderosa pine seedlings and the composition of understory plant communities. High severity fires may have also changed soil physical and chemical properties and communities of soil organisms, such as mycorrhizal fungi, as well as the regeneration niches for fire-evolved species. To test these hypotheses, I was required to complete multiple tasks in order to gather more data to help the Forest Service prove or disprove these hypotheses. The sites where the samples for this project came from are the Rodeo-Chediski Fire and Pumpkin Fire in Arizona. During the course of my internship, I measured soil texture, carbon and nitrogen content, and pH of soil samples that I helped collect in the field. I also counted and measured tree heights in 200mx200m plots. So far, results show that some sites are heavily dense with oak and juniper seedlings or sparse ponderosa pine seedlings. This plant density raises concerns that high severity fires will continue to disrupt the spatial pattern of plants re-growing after a fire.

Block, Mariah  
**Faculty mentor:** Julie Moreau

**Session I, 9:00am-11:00am, 90C**  
**Title: Disabilities in America: The Stigmatization of People with Invisible Disabilities**

Intersectionality is important within the world of feminism. Without an intersectional lens and framework we would be unable to cross issues such as disability and the queer community. Within this project we are going to focus on not only people with disabilities, but those who are disabled within the queer community. The main focus of disabilities will be on invisible disabilities and mental illness as these are stigmatized more so than obvious physical disabilities. The amount of people in the United States with invisible disabilities has been increasing over the past few years due to doctors being able to more easily diagnose patients. In this study I will be looking at how people struggle with their disabilities, as well as their identities within the queer community.

Boelter, Amanda  
**Faculty mentor:** Natalie Cawood

**Session II, 2:00pm-4:00pm, 81C**  
**Title: Planned Behavior: Dealing with Stress**

I choose how to change my behavior when I am under stress. I set a goal, assessed my capacity for change, and identified the steps I would take to make the change. I tracked my behavior over several weeks using a chart that I created and researched helpful ways in order to change this behavior.

Bogart, Joey  
**Faculty mentor:** Elizabeth Bechok, Nicholas Martel, Lupita Salazar

**Morning, 9:00am-9:25am, Skydome Roundtable R3**  
**Title: School Gardens: How to Teach in the Garden**

The School Gardens Action Research Team works in Kinsey and Killip Elementary Schools to provide garden education in their school gardens during the FACTs after school program. First Year Seminar students mentor elementary students in working in the garden and learning about diverse topics associated with gardening at high elevation. For this symposium, I will prepare a round table discussion which mimics a school garden lesson about seeding saving. Participants in the discussion will learn about locally adapted seeds and then have the opportunity to help sort, pack, and label seeds.

Bohannon, Briana  
**Faculty mentor:** Melissa Santana, Jessica MacKenzie, Matthew Tombaugh

**Session I, 9:00am-11:00am, 120C**
Title: Gender and the Public Restroom

Women or Men, that's the option one is given at most public restrooms. What may seem everyday for some is a constant battle. Whether it's gender identity to longer lines for women, there are a wide variety of issues of how our current state of public restrooms are not benefiting the greater good. 'Potty Parity' is the idea of equal rights for women and men in the public restroom. With this current state of divide, public restrooms portray how society views gender and gender ideology. Gender normative behavior is acted out in public restrooms and those who did not fit can feel ostracized and targeted. Male restrooms that do not have a changing station, with this mentality of men does not take care of children puts many single dads to use the restroom floor. Historically privileged places like the Senate chamber in the U.S. Capitol in Washington, D.C did not have female restrooms until the 1990s, which tells women that they do not belong in the Senate. Class and privilege can be seen by the state of the public restroom. A restroom in a Greyhound station is vastly different than one at an airport. Not having female restrooms or gender-neutral restrooms sends the message who belongs in a space and who does not. The solution would be to have an all-inclusive gender-neutral restroom. In all encompassing space for any gender identity; caretakers can come in to take care of their family member; parents can share the restroom with their child regardless of their age or gender. The goal of this project is to examine some current issues in public restrooms and see what changes can be made to improve the public restroom system and structure.

Bonar, Samantha
Connor Lane, Alyssa Prokow, Timothy Weimar
Faculty mentor: John Houser, Matthew Anderson

Session II, 2:00pm-4:00pm, 101B

Title: I Don't Care About Your Dead Dad: Trust and its Affect on Empathy

This research project explored the potential link between a person's experience with trust and their ability to empathize. Our hypothesis was that when a person trusts another, and that trust is exploited, the person will be less likely to be empathic. To test this hypothesis we presented one of three stories to participants in which the participant imagines they trusted a friend and their trust was either exploited, rewarded or not needed. The participants then were asked to complete a new empathy assessment to assess how well the person's empathy was impacted by their experience. We distributed our survey packet to several Psychology Research Methods classrooms. A factorial ANOVA will be used to analyze the data. We predict that the results will indicate that participants with the exploited trust experience will score lower on the empathy scale then the participants with the rewarded empathy scale or the neutral empathy scale.

Bosic, Stephanie
Kristen McFadzen, Dianna Johnson, Vannesa Banister
Faculty mentor: Nicole Bies-Hernandez, Matthew Anderson

Session I, 9:00am-11:00am, 96B

Title: Parenting Styles and Deviant Behavior

For this study, we looked at the relationship between parenting style and the amount of deviant behavior shown in the first year of college. We hypothesized that students who grew up with a more authoritarian parent would display more deviant behavior than those who grew up with a permissive parent, while those with an authoritative parent did not have a higher or lower amount of deviance. Participants were asked to fill out the Parental Authority Questionnaire and the Normative Deviance Scale.

Botsch, Brad
Faculty mentor: Becky Butcher

Session II, 2:00pm-4:00pm, 116A

Title: Modern Sustainable Living

While maintaining features of a modern-day house with all of its technologies, research will be conducted to see how easily homeowners can switch from grid electricity to sustainable electricity. Using data from average electricity uses from modern day homes and all of its appliances, is it realistic to use sustainable electric generating techniques? How
can this impact the environment? Can this save homeowners money? What other benefits and disadvantages accompany generating sustainable electricity?

**Bottiglieri, Salvatore**  
Michael Albanese, Drew McDaniel, Trent Cooper, Adam Thomas  
**Faculty mentor:** John Georgas, Okim Kang, David Johnson

**Session II, 2:00pm-4:00pm, 10D**

**Title: Automatic Syllabification**

Current speech recognition software can convert speech of the English language into text with high accuracy. However, when converting speech to text a lot of information about the speaker is lost. For example, is this person making a command, asking a question, or making a statement? Is there sarcasm, anger, or another emotion in the speaker's voice? Does this person have some sort of accent? Conventional speech to text cannot answer any of these questions. We designed a system that converts a speech file to timestamped syllables. The NAU Linguistics Department will be able to use our system to syllabify a speech file. With the syllabified speech file they would be able to create a system that analyzes the pitch, rhythm, and stress of the file's syllables. The analysis of these features can provide the answers to all the questions above. Our Automatic Syllabification software is the important first step needed to analyze the syllables. Our software provides the times the syllables occur so that the sound waves can be analyzed in each syllable for the features mentioned above. The timestamp feature of our software is something that other automatic syllabification programs, namely speech to text, doesn't support. Our Automatic Syllabification program uses different Machine Learning algorithms. Since there are so many possible combinations of sounds in speech of the English language, deterministically listing how every sound pattern should be split wouldn't be feasible. Machine Learning provides our program different ways of making its own informed guesses and assumptions when syllabifying, eliminating the need to list every syllabification rule. By using different Machine Learning approaches, we were able to achieve a high enough accuracy so that our software can be used in the further work of the NAU Linguistics Department.

**Boxberger, Kayla**  
Summer Anderson  
**Faculty mentor:** Sara Mushro
Session II, 2:00pm-4:00pm, 37D

*Title: Market Research for Lowell Observatory*

We are performing market research for Lowell Observatory. Our goal is to find out how to get them more visitors, increase membership sales, and find the best and most affective ways to advertise for Lowell Observatory.

**Boyd, Samantha**  
**Faculty mentor:** Christine Lemley

**Afternoon, 2:15pm-2:30pm, Skydome Stage E**

*Title: Feminist Movement*

The project primarily focuses on gender equality, and it portrays the definition of feminism as equal rights for both men and women. With the incorporation of interview footage, pieces of Youtube videos, and important quotes I will display and illustrate a side of feminism most may not see. The misconception that feminism is women empowerment is true in a sense, but most people do not understand its true definition.

**Boyd, Taylor**  
**Faculty mentor:** Becky Butcher

**Session I, 9:00am-11:00am, 116B**

*Title: Importance of Health and Nutrition in the Workplace*

I would like to do a project that intertwines nutrition in the work place. Nowadays, not as many companies truly care about the physical well-being of their employees. However, I feel like more stressed should be placed on this area. For that reason I am looking to do research about current health and nutrition structures of varying businesses. If any are not in place, I hope to find out ways to build them from the bottom up, while also learning from the one's that are already established.

**Bozigian, Sean**  
**Faculty mentor:** Ann Huffman

**Session II, 2:00pm-4:00pm, 37A**

*Title: Jack's Colors*

The NAU Jacks baseball team is a group of young men brought together by a bond formed through diversity. One of the most integral parts of the team is the cultural diversity demonstrated through the Jack's lineup. The team is constructed of players from diverse backgrounds and walks of life. Baseball is the communal bond we all share, despite the wide variety of cultures and backgrounds we come from.

**Bradley, McKayla**  
**Faculty mentor:** Natalie Cawood

**Session I, 9:00am-11:00am, 81D**

*Title: Planned Change: Going From Inactive to Active*

After of years of living an inactive lifestyle for different reasons, I came to realize I was out of shape and desperately wanted to change this behavior about myself. Therefore, I came up with a step by step plan to change my lifestyle of being inactive to active. I developed a measurement tool to track my progress and I will report my results. I will also apply this behavior change process to my future social work practice and how this experience will help me with clients.

**Braga, Shien**na  
**Faculty mentor:** William Cordeiro

**Afternoon, 1:15pm-1:35pm, Skydome Stage B**

*Title: Breaking Bad: Analysis of Season Posters*
The popular television show, Breaking Bad is known for its adrenaline-packed and emotional plot that gives viewers an inside view of the criminal world; more specifically, the world of the drug industry. Although the characters and action of the show are the main variables that grab the attention of new viewers and fans, other factors are just as important and play a significant part in the series, such as the posters portrayed by the show. Breaking Bad is an intense television show that, whether the viewer notices or not, is filled with an endless amount of symbolism and issues that can be interpreted differently by the show's audience. Just like the show has many hidden messages and symbolism, the cover posters of the show do as well; and each is unique and significant to the underlying message of each season.

Breuer, Madison  
Faculty mentor: Britton Shepardson  
Session II, 2:00pm-4:00pm, 64B  
Title: Archeology of Sexuality  
My project is going to be about the archeology of sexuality and how it has evolved over time. It will describe the history or sexuality and how it has changed all over the world over time. Different perceptions of it and how it has been viewed around the world.

Breuer, Marc  
Faculty mentor: Anthony Barnhart  
Session I, 9:00am-11:00am, 93D  
Title: The Theater of the Mind  
The practice of Theater and acting is an under-examined aspect of Psychology. Actors seem to have unique qualities about perspective taking and their Theory of Mind (ToM)- appreciating the mental states of others. Actors seem to be particularly adept at perspective taking, but there is some debate on the psychological source of this ability. Surprisingly, Goldstein, Wu, and Winner (2009) observed dissociation between empathy (experiencing the feelings of others) and Theory of Mind in a sample of actors. This experiment aims to look at the association between empathy, ToM, and an actor's perceived approach to acting; namely the 'method approach' compared to 'the system.' The Method aims for actors to recall previous emotional states and experiences to bring believability on stage, whereas The System calls for the actor to actually go through the same emotional state as the character in order to maximize believability. The Method was developed out of The System in the United States when actors had difficulties recreating difficult emotional states on stage consistently. Our hypothesis is that actors who are classified as system actors will be more empathically attuned than the Method actor counterparts. However, being the nature of actors, both should be skilled at Theory of Mind. To this end we will administer and online survey consisting of four parts; Quiet Ego Scale, Empathy Quotient, Reading the Mind in the Eyes Test, and The Stanislavsky Scale. The first three are validated measures while we created The Stanislavsky Scale to adequately assess an actor's approach. While research on actor's is scarce, it may be worthwhile to see what epiphetical or Theoretical approaches actors possess for Psychology as well as the art of acting.

Breuer, Savannah  
Faculty mentor: Natalie Cawood  
Session II, 2:00pm-4:00pm, 81D  
Title: Overcoming Stress: A Planned Change Project  
To overcome stress, I decided to incorporate a combination of vigorous physical exercise, yoga, and meditation to develop useful and effective skills to cope with stress. By changing my behavior and making these activities my go-to mechanisms for facing high amounts of stress, not only I am seeking to create more sustainable habits, I am also intending to overcome stress at a biological level!

Bright, Corinne  
Karolina Pieja  
Faculty mentor: Ted Martinez
Session II, 2:00pm-4:00pm, 111A

**Title: Nature and Mental Health**

This poster examines the effects of nature on mental health and compares the results to the effects of using biological methods such as medication. Certain medications come with the possibility of many negative side effects, whereas natural therapies such as nature or green therapy and natural home remedies have reported far less negative side effects. Medications are typically prescribed for a short amount of time, whereas natural therapies have to be adopted into one's every day life and continued for the long term. With these natural remedies, one can obtain an optimum happy and healthy lifestyle that will improve both mental and physical health.

**Brinson, Shameka**  
Tara Blank, Liliana Berzunza, Ross Thomas, Shameka Brinson  
*Faculty mentor*: Nicole Bies-Hernandez, Mathew Anderson

Session II, 2:00pm-4:00pm, 96B

**Title: Life Satisfaction and Pet Ownership**

The purpose of this research was to evaluate the relationship between pet ownership and life satisfaction. It was hypothesized that primary pet owners would score higher on the satisfaction with life scale than non-pet owners, and amongst all primary pet owners, dog owners would score the highest on the life satisfaction scale. Research methods in psychology students, from a medium-sized school in the Southwestern United States were the only participants in this study. To test this hypothesis, participants were asked to complete the satisfaction with life questionnaire as well as a demographic data sheet. The purpose of the demographics sheet was to establish whether participants were the primary caregiver to their pet. Researchers then grouped participants as non-pet owners, dog owners, and all other pet owners. The scores from each group were then averaged and compared using a differential t-test design. This study is important to society, as it gives evidence to if there is a correlation in the relationship between pet owners and life satisfaction.

**Brouws, Amanda**  
*Faculty mentor*: Becky Butcher

Session II, 2:00pm-4:00pm, 116C

**Title: Roles of Women in the United States Military**

Many of those in the general public tend to know about the United States military and how it has influenced American history, but there is a side to it that many don’t know. The public has been shown very little of women's contributions to the military over the years. Though not publicized it is a part of history and must be told. Starting from their participation in the United States Army during the War of 1812 and working towards modern day women in the United States Air Force this timeline will show the major strides women have made while fighting for their country as civilians and soldiers. It will also explore the culture of the military mainly focusing on why women were not allowed to be soldiers for many years.

**Brown, Jacqueline**  
*Faculty mentor*: Roger Nosker, Priscilla Sanderson

Session I, 9:00am-11:00am, 43D

**Title: American Indians, Renal Failure and The Plant Based Diet: Plants Are Friends...and Food**

Chronic Kidney Disease (CKD) is the result of long-term damage due to high blood pressure, diabetes, and other related causes. Signs and symptoms of CKD go undiagnosed until it has progressed. The consequence of these health complications can lead to long-term care like dialysis, which is the process of manually filtrating the blood. The limited resources available to these patients often list animal protein as a primary source of nutrition; the problem is that animal protein also contributes more waste products to the blood, making it harder for the already failing kidneys to function. On American Indian reservations following such diets presents a problem in itself. Often time's resources like money, food, and quality health care are limited making it difficult to adhere to such strict diets. One of the goals is to provide free resources on plant-based renal dialysis diets with the help of Center of American Indian Resilience (CAIR). Health literacy and/or lack of understanding of medical jargon can pose a problem to the patient and the caregiver, making miscommunication a common occurrence. This tends to result in exacerbated health issues resulting
in hospitalizations that could have initially been avoided. The information provided such as culturally appropriate brochures, coloring books, and presentations will help increase health literacy on the Arizona and New Mexico reservations.

Brown, Laura  
Faculty mentor: Anita Antoninka, Matthew Bowker  

Session I, 9:00am-11:00am, 20D  
Title: Do Mature Biocrusts Support More Diverse Microarthropod Communities?  
Biological soil crusts (also known as biocrusts) are mainly composed of various combinations of cyanobacteria, mosses, and lichens. These organisms create a living crust on top of mineral soil that stabilizes soil, fixes nitrogen and carbon, decreases erosion, and supports the soil food web. Microarthropods are an important, but understudied part of the biocrust food web, governing decomposition and nutrient cycling in the soil. In this study, we hypothesized that more mature and diverse biocrusts would support a higher abundance and diversity of microarthropods. We collected a total of thirty biocrust samples from Hill Air Force Base (Great Basin Desert, Utah) categorized to 5 different compositions (n=6): no crust, cyanobacteria only, cyanobacteria and lichen, cyanobacteria and moss, and cyanobacteria, lichen, and moss. We extracted mites (Acari) and collembola (Hexapoda) using Tullgren funnels over one week with a gradually increasing temperature gradient. Preliminary analysis suggests that more developed biocrusts support more diverse and abundant microarthropod communities. The abundance and diversity of microarthropods are limited by available food sources, therefore, the complexity, diversity, and abundance of the desert biocrust food web depends on the development of the biocrust. More diverse arthropod communities may lead to faster carbon cycling and nutrient mineralization. Our findings are important to understanding the flow of energy and matter through desert ecosystems.

Brown, Savannah  
Faculty mentor: Britton Shepardson  

Session I, 9:00am-11:00am, 64C  
Title: Why Farm?  
A simple question with a very complicated response and the shortest one is that no one really knows. Many anthropologists today struggle with the pursuit of the answer to this simple question. There are many hypotheses. The result of man's domestication of plants is clear: a written history, art, and painting. Pre-historic man was a species of hunter-gatherers until only about a few thousands of years ago. What changed to cause man to change his ways and start domesticating plants? Man went from a healthy hunter to a more inactive, more restless lifestyle filled with risk. As human population increased, the threat and reality of famine became more real. The only species on earth to farm is man. Man had to work more to feed himself and his family with farming. Many have been trying to explain the question 'Why Farm?' Ranging from increased population, a desire to own land, a desire to maintain ritual, climate change to just a random explanation that 'things just happened,' but without a true explanation, we are only left to wonder. Did man have a push to preserve history? To create a legacy? Almost all of the earth is now civilized. A few hunter-gatherer tribes remain but these isolated groups remain without a significant written history. The simplest answer may be some genetic change in man that caused him to want to own, to settle down and to preserve a legacy and the only way to do that was through the domestication of plants.

Buchanan, Siobhan  
Faculty mentor: Becky Butcher, Janet Hart, Jack Dodson  

Session I, 9:00am-11:00am, 116D  
Title: An Analysis of Events at a Coffee Shop.  
Different events including art contests, board games night, and poetry contests are analyzed from a statistical point of view as well as an overall customer satisfaction rating.

Buckingham, Ryan  
Faculty mentor: Gerard van Belle
Session II, 2:00pm-4:00pm, 20C

Title: Development of a Spectrophotometric Data Reduction Pipeline

Lowell Observatory's robotic 31' telescope has recently been upgraded with a transmission grating being added to its filter wheel that produces spectra of observed stars, in addition to the existing suite of narrow-band filters. The current photometric pipeline is suited for the filters but cannot process spectra from the grating. Development and evaluation of the quality of a fully spectrophotometric pipeline to process these spectra is the aim of this project. The pipeline development was done using Python in a Linux environment. The functioning spectrophotometric data reduction pipeline for the 31' telescope can now be used by astronomers at Lowell Observatory. Given the portable nature of the code, potentially other telescopes at Lowell and other institutions can be easily outfitted with this inexpensive grating, which would allow the processing of spectral data into calibrated data products to aid in astronomical investigations of stellar objects.

Burchfield, Ashleigh
Faculty mentor: Christine Lemley

Session II, 2:00pm-4:00pm, 50A

Title: Representation of Latino/a Culture at NAU

My project discusses how people who come from a Latino/a culture are treated at Northern Arizona University. It dives into the issues facing separation, discrimination, and stories from the students.

Burgess, Sidney
Faculty mentor: Marie Baker-Ohler

Session II, 2:00pm-4:00pm, 78A

Title: The True Face of Fear: Media Terrorism

The news media uses fear as a tactic to change the ways viewers think and act. This causes the news viewer to think the world is a more dangerous and fearful place than it actually is. Using Cultivation Theory, Agenda Setting Theory, and the idea of of Mean World syndrome, this project attempts to highlight the issue for all to see, and start a discussion on how best to handle the situation.

Burns, Krystal
Faculty mentor: Natalie Cawood

Session I, 9:00am-11:00am, 81B

Title: Can I Stop Procrastination?

For my project I have chosen to stop procrastinating to see if I am less stressed, get better grades, and have more free time. I have always been a procrastinator and wait until the last minute to write a paper or pay bills, etc. By changing my habits I believe I will be less stressed and have more free time. To do this I bought a planner to keep me on track. I have listed every school assignment to be due a week early and bills to be paid at the beginning of the month instead of the end. I am learning to space out my time as well as my priorities.

Burton, Shelby
Meliksah Demir, Nora Dunbar
Faculty mentor: Meliksah Demir, Nora Dunbar

Session II, 2:00pm-4:00pm, 59D

Title: Professor-Student Rapport, Perceived Autonomy Support, and Student Outcomes

Interest in promoting student success has been increasing at the national and state level. Past empirical research highlights two robust predictors of positive student outcomes: professor-student rapport and perceived autonomy support. Professor-student rapport is best described by two dimensions, perception of teacher and student engagement. Previous research suggests positive teacher perceptions, higher levels of student engagement, and strong support for autonomy predict higher self-motivation, perceived teacher effectiveness, and anticipated and actual course grades. However, research has not examined both rapport and autonomy simultaneously. Therefore, the current study evaluates...
both factors to see whether one variable has a greater impact on student outcomes than the other. The full study included survey responses (n = 412) from undergraduate students in various psychology classes and measured how much professors were perceived as promoting rapport and autonomy support in the classroom via the Professor-Student Rapport Scale and the Learning Climate Questionnaire. Autonomy support was the main predictor of actual course grades and explained 5% of the variance. Professor-student rapport was the main predictor of course evaluations, perceived amount learned, and missed classes (72%, 27%, & 4% of the variance, respectively). Follow-up analyses revealed that the student engagement component of professor-student rapport was the only predictor of course and student outcomes. In conclusion, professor-student rapport and perceived autonomy support are important for course outcomes but have different roles in different indices of student learning outcomes. The findings could be used to find ways to improve professor-student rapport in the classroom that could improve student learning.

**Butler, Jaze**
Dana Hughes, Antoinette Wilson

**Faculty mentor:** Jay Sutcliffe

**Session I, 9:00am-11:00am, 46B**

**Title: Summit High School Nutrition Program**

This project provided an opportunity to assess the current diet of the students enrolled in the nutrition course at Summit High School. The students taking this course are provided with general information on the study of nutrition, the value of foods, and the problems in food selection. It is difficult to translate the lessons learned in class into real life situations. The Summit High School Nutrition program implemented an intervention that demonstrated how to prepare well-balanced meals to achieve a proper, healthy diet.

**Butler, Shelby**

**Faculty mentor:** Melissa Santana, Jessica MacKenzie, Nancy Leo

**Session II, 2:00pm-4:00pm, 120D**

**Title: Church Design: Senior Interior Design Capstone Project**

Christian Church facilities are expanding, now more than ever. Creating a space that encompasses universal design, effectively educates, inspires, transcends, yet resembles the tradition and structure within the traditional church are some of the challenges of designing a church. Creating a space that is used for worship, education, love, and community inspires me to take elements of the historical religious structures and design for the modern day American Christian of all ages, and bringing back a sense of tradition. I hope to showcase a church design that resembles a church, but causes you to look for what you want to learn. Creating a place that is engaging, transforming, and transcending us into the future of design within educational facilities, religious facilities, and spiritual experiences.

**Byars, Rae**

**Faculty mentor:** Abe Springer, Sharon Masek-Lopez

**Session I, 9:00am-11:00am, 23C**

**Title: A Geologic Inquiry of Upper Lake Mary's Rising Turbidity Levels, and the Effects on the Reservoir's Water Quality.**

Quaternary faulting in Northern Arizona caused major movement of the underlying basement rocks. This fracturing of the region's geological skeleton created normal faults and volcanic events in the Lake Mary area near Flagstaff Arizona, providing a lowland basin that was successfully dammed by the City of Flagstaff in 1941. The reservoir that has resulted has played an important part in the city's history. Seepage loss and mitigating turbidity levels have been ongoing issues with the reservoir, yet it continues to be a viable water source contributing about 30% to the City's total water supply. Water samples show that most of the turbidity is caused by silty-clay sediments which were thought to have been carried into the lake by contributing streams, however; photos show the lake is far more turbid than the incoming flow. The sediments have a negative ionic charge, which cause the clay particles to remain suspended in solution rather than clumping together and settling out. Although it is costly to treat highly turbid water, the suspended solids ultimately aid in the coagulation and flocculation of the water during the treatment process and help achieve good water quality. My research on Upper Lake Mary may help others understand surface water processes, water
quality standards of surface water and will provide details on how the highly turbid water can affect the filtration process.

Caldwell, Keith  
Trevor LaBanz, Austin Rhodes, Josiah Sellstrom, Katherine DeFonce  
Faculty mentor: Elmer Grubbs, Douglas Holland, Niranjan Venkatraman, Julie Heynssens

Session II, 2:00pm-4:00pm, 9A

Title: NASA Radiation Absorption in Tissue Samples: Measurement of Radiation Flux

There is a need in both the biology and aerospace communities to gather data about how radiation affects various cell tissues. An imager system is ideal for measuring radiation flux in cellular tissue because an image sensor array can detect minute electromagnetic changes. The design incorporates one circuit board for the image sensor and one for the memory unit and control circuitry. An imager was selected with high enough definition to measure effects on a cellular level. The logic to capture and store the images was designed using the AHDL design tool and implemented in hardware with an Altera Flex-10K FPGA. The two boards are connected using a flex harness in order to protect the control board from harmful radiation effects. This improved device will show which cells in a sample absorb radiation or allow it to pass through, enabling NASA researchers to study radiation effects at the cellular level.

Caldwell, Keith  
Trevor LaBanz, Austin Rhodes, Josiah Sellstrom, Katherine DeFonce  
Faculty mentor: Elmer Grubbs, Douglas Holland, Dr. Niranjan Venkatraman, Mrs. Julie Heynssens

Morning, 8:55am-9:20am, duBois Southwest Room

Title: NASA Radiation Absorption in Tissue Samples: Measurement of Radiation Flux

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Campbell, Connor  
Tyler Eink  
**Faculty mentor:** Marcia Metcalf  

**Session II, 2:00pm-4:00pm, 40D**  

**Title: Gender Diversity within the Franke College of Business**  

The poster will be in-depth regarding gender diversity within the schools of business. Particularly comparing the male student population to the female student population. The research will then be compared to our very own business school the FCB to get a further understanding on gender diversity.

Canales, Gustavo  
Kellan B. Finney, Kinya Hotta, David T. Fox  
**Faculty mentor:** Andrew Koppisch

**Session II, 2:00pm-4:00pm, 25B**  

**Title: Influence of the role of dehydroshikimate dehydrogenase in production of Î²-carboxymuconic acid from D-glucose using an Escherichia coli heterologous h**

Production of chemicals of industrial value from renewable materials is an appealing means to reduce the organic, inorganic and greenhouse gas waste streams associated with the synthesis of many of these compounds from petroleum distillates. Î²-carboxy-cis,cis-muconic acid and 3-carboxymuconolactone represent two novel polymer precursors which are readily formed from D-glucose (via the shikimate pathway) through heterologous biosynthesis. The target triacid and lactone are both biosynthesized by an E. coli host containing a multi-monocistronic construct comprised of genes from siderophore biosynthesis (dehydroshikimate dehydratase) and aromatic compound catabolism (dihydroxybenzoate dioxygenase). In this work, we have studied the effects of temperature and pH on the productivity of a strain expressing this synthetic construct. We have also investigated the effect on productivity of replacement of the native dehydroshikimate dehydratase with a mutant enzyme which has been computationally designed for an increased thermal resistance.

Cardoso, Felipe Daniel  
Kylie Sage, Nathan Nieto  
**Faculty mentor:** Nathan Nieto, Aubrey Funke

**Session I, 9:00am-11:00am, 15C**  

**Title: Ultrastructural morphology of Borrelia burgdorferi under chemical stress**

Lyme disease is the most common tick-borne disease of the United States. It begins with erythema chronicum migrans (also known as a “bulls eye” rash), which can be followed by abnormalities in the cardiac and neurologic system and chronic arthritis in the joints. Its etiological agent is the spirochete Borrelia burgdorferi, a bacterium with twelve linear and nine circular plasmids. Few studies have been done showing the ultrastructural morphology of B. burgdorferi and morphological changes when antibiotics are applied. This study aims to evaluate the effects of ciprofloxacin against B. burgdorferi. Cultures growing in Barbour-Stoenner-Kelly (BSK) medium were stressed with different concentrations of the antibiotic. Then a sample was prepared and observed with transmission electron microscopy (TEM). Further studies will be made to evaluate the action of different antibiotics and changes in the gene expression as result of antibiotic stress.

Carlson, Annamarie  
**Faculty mentor:** Christina Gutierrez-Dennehy

**Afternoon, 3:00pm-3:20pm, Skydome CAL Floor**  

**Title: FAT-and that’s Okay**

This capstone project is an original performance piece exploring the artist's relationship with food and her body. Coming from a tradition of performance art as a means of giving testimony, the artist shares personal narratives from throughout her life and examines how they relate to body image and mental illness. The idea of fat as an identity, and the way it permeates and distorts all aspects of one's life is explored using personal experiences as a lens for greater...
understanding of the impact of fat shaming in the United States. While the text is the framework of this piece, it is the unceasing eating of the artist that pulls it forward. Food, which gives life, shame, and comfort, is at the center of this performance. Food is not only central in the discussion, but literally colors the set and the artist herself as the narrative continues, depicting the messy inescapability of a negative body image.

Carlson, Timothy  
**Faculty mentor:** Britton Shepardson  

**Session II, 2:00pm-4:00pm, 64C**  
**Title:** The Prehistory of Death and the Afterlife  
My presentation for the Undergraduate Symposium will be a look at the Prehistory of Death and the Afterlife. I will observe traditions throughout select prehistoric cultures in order to better understand how they treated their deceased, and what their belief systems said about the afterlife. I will be using several scholarly sources in order to conduct my research.

Carpentier, Kyle  
Josh DeBenedetto, Joey Annolino, Greg Dowske, Joseph Andaya, Wilson January  
**Faculty mentor:** John Tester, Sarah Oman  

**Session II, 2:00pm-4:00pm, 3B**  
**Title:** NASA Human Exploration Rover  
The National Aeronautics and Space Administration (NASA) has long been at the forefront of space exploration through the use of automated rover systems. Automated rover systems currently on Mars collect data to be sent back to Earth in the form of soil and air samples, and photographs that are invaluable to our understanding of the solar system. NASA has current plans for human exploration of moons, planets, asteroids and comets that requires a vehicle for transportation of people and cargo across the terrain of these bodies. Our team has designed and built a human powered exploration rover that is portable enough to be transported from Earth to another planetary body, and efficient enough to operate for years once on that planetary body. Steel construction of the rover provides strength, while an independent suspension allows for the ability to traverse difficult terrain experienced on planets, moons, asteroids, and comets. The rover can transport two people at a time, who also power the rover by pedaling independent drive systems, with room for their gear and any samples collected while exploring. The human powered rover we have designed will allow NASA to realize its current plans of human exploration of the moons, planets, asteroids, and comets of the solar system.

Carpentier, Kyle  
Josh DeBenedetto, Joey Annolino, Greg Dowske, Joseph Andaya, Wilson January  
**Faculty mentor:** John Tester, Sarah Oman  

**Morning, 9:45am-10:10am, duBois Fremont Room**  
**Title:** NASA Human Exploration Rover  
The National Aeronautics and Space Administration (NASA) has long been at the forefront of space exploration through the use of automated rover systems. Automated rover systems currently on Mars collect data to be sent back to Earth in the form of soil and air samples, and photographs that are invaluable to our understanding of the solar system. NASA has current plans for human exploration of moons, planets, asteroids and comets that requires a vehicle for transportation of people and cargo across the terrain of these bodies. Our team has designed and built a human powered exploration rover that is portable enough to be transported from Earth to another planetary body, and efficient enough to operate for years once on that planetary body. Steel construction of the rover provides strength, while an independent suspension allows for the ability to traverse difficult terrain experienced on planets, moons, asteroids, and comets. The rover can transport two people at a time, who also power the rover by pedaling independent drive systems, with room for their gear and any samples collected while exploring. The human powered rover we have designed will allow NASA to realize its current plans of human exploration of the moons, planets, asteroids, and comets of the solar system.

Carrasco, Eric
Fatemah Husain, Hamad Alajmi

**Faculty mentor:** Mark Lamer

**Session I, 9:00am-11:00am, 11D**

**Title: Channel Stabilization Design for Summit Homeowner**

An unstable open channel located in Flagstaff, Arizona along Pulliam Road is causing issues for three Summit homeowners. The homeowners are experiencing lack of privacy as their backyard fence is slowly slipping into the open channel, causing property damage as heavy rainfall has the potential to over bank the current design. The existing culverts in the channel have sedimentation building up near the outlet, which hinders storm water conveyance from the area. The purpose of this project is to reassess and redesign the existing open channel so it meets the client's necessities while abiding to the Standards and Regulations of the Summit Homeowner Association.

Analyzing the current conditions of the open channel was the first approach for this project. The student engineers have performed a survey of the open channel, geotechnical testing of the soil, and retrieved the engineering report of the area from the City of Flagstaff for hydrological references. The group's overall approach is to elevate the fence to a height that maintains privacy between homeowners, substitute the existing soil to prevent further slippage, and increase the slope of the channel.

**Carrasco, Eric**

Eric Carrasco, Hamad Alajmi, Fatemah Husain

**Faculty mentor:** Mark Lamer

**Afternoon, 2:55pm-3:20pm, duBois Agassiz Room**

**Title: Channel Stabilization Design for Summit Homeowner**

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**Carrillo, Juan**

**Faculty mentor:** Christine Lemley

**Session II, 2:00pm-4:00pm, 52C**

**Title: How to preserve Traditional Knowledge in indigenous communities by promoting language and their linkage to ecology?**

Indigenous communities are often not acknowledged for their knowledge which is slowly disappearing as they transition to modern culture. This problem is globally characterized and linked to intellectual property. Traditional knowledge can be connected to modern society for the benefit of both, so then tribes can be culturally more competent in terms of the preservation of unique languages and natural environments.

**Carter, Tyler**

John Tomazin

**Faculty mentor:** Jay Sutliffe

**Session I, 9:00am-11:00am, 46C**

**Title: Smoke Alarm Safety**
What we would like to do for this project is to initiate a smoke alarm campaign and installation service in the Parks and Bellemont communities. We will begin by going door-to-door, with the help of Ponderosa Fire Department and The Red Cross, asking about each resident about their smoke alarm systems and whether or not they would like more information about maintaining them. We plan to find many homes that require installation of smoke alarms in Parks and additional knowledge regarding these alarms then record the data on the services provided.

**Carvalho, DemiLynn**  
Chyna-Mae Sablan, Austin De Los Santos, Ellaina Logacho  
**Faculty mentor:** Nicole Bies-Hernandez, Matthew Anderson

**Session I, 9:00am-11:00am, 96C**  
**Title: Social Media Effects on Happiness**  
This study is analyzing the relationship between social media use and subjective happiness. Specifically, if the amount of daily social media use can affect the level of happiness for an individual. Participants in this study were given a survey to complete and a t-test was used for analysis.

**Casey, Kayla**  
**Faculty mentor:** Glenn Hansen

**Session I, 9:00am-11:00am, 107D**  
**Title: The Truth Behind the Fairy Tale**  
My project is a comparison of Disney's most famous films with the original story that they are adapted from. Many Disney movies are based off of much darker stories, written by the Brothers Grimm, Hans Christian Andersen, and Charles Perrault. I discuss the accuracy of Disney's Cinderella, Snow White, The Little Mermaid, Tangled, and Pocahontas.

**Casey, Sarah**  
**Faculty mentor:** Natalie Cawood

**Session I, 9:00am-11:00am, 82A**  
**Title: Behavior Change Project - Healthy Living**  
The project is a documented tracking of myself working toward a healthier lifestyle. These changes include better eating and sleeping habits, regular exercise, and reduction of fast food intake. My progress will be tracked on weight loss for a nine week period. The ending result will evaluate my total weight loss and overall attitude evolution through this activity.

**Cassidy, Maia**  
**Faculty mentor:** Paul Donnelly

**Session I, 9:00am-11:00am, 126B**  
**Title: Pilgrimage and Sacred Space in Film: Dogma**  
I will be discussing the movie Dogma and a number of characters embarking on a pilgrimage to a church. This movie in particular follows two fallen angels trying to take advantage of a loophole created by the Catholic Church.

**Castillo, Alexander**  
**Faculty mentor:** Julie Moreau

**Session II, 2:00pm-4:00pm, 90D**  
**Title: Machoism in the Chicano Culture: The Violence to Chicana Women**  
In many Western societies, women have been placed under subordination to men, which damages and violates their individuality, reputation, and identity. The Chicano culture depicts these characteristics and is enforced in Chicana women. Due to this nature, Chicana women lose their identity within the Chicano community which leaves long-lasting negative perceptions and expectations.
Celaya, Derian
Faculty mentor: Britton Shepardson

Session I, 9:00am-11:00am, 64D

Title: Archaic Music
What the purpose of my research would be to better inform the public on how music has evolved over the years, how it started out in the archaic times and soon transitioned into the more modern age of music. For my project I will be making a professional poster with five to seven different times and three places for each time period. I will also include which instruments were used during each time period and the significance of both the instruments used and the music played. The reason as to why this is my topic of interest is because I have always been very fond of every type of rhythm, beat, or sound pertaining to the connection of the culture and the history of the culture.

Cerra, Caitlin
Faculty mentor: Ryan Fitch

Session II, 2:00pm-4:00pm, 30B

Title: The Central Arizona Project
With a growing population, Arizona will also have growing water demands. Efficient use of water is especially important in Arizona, due to low precipitation, the current over-use of the Colorado River, and the growing population. Water transfers allow water rights to be efficiently allocated to the uses resulting in the highest utility, and are a solution to the current use it or lose it method of distributing water rights. This project seeks to outline how water transfers and the Central Arizona Project will help Arizona meet future water demands. For example, excess water can now be stored underground of times of low demand in order to be used in times of higher demand.

Cerra, Caitlin
Faculty mentor: Robert Neustadt

Afternoon, 3:40pm-4:00pm, Skydome Stage B

Title: Illegal Immigration: Economic Myths Debunked
There is much current debate surrounding immigration into the US, including sentiments that see undocumented migrants in particular as a drag on the economy. This is however not supported by economic theory, and so this project identifies major myths about both documented and undocumented migration and explains the related economic theory, which usually supports a conclusion other than migrants presenting negative economic benefit. Topics include they’re stealing our jobs, they’re living off of welfare, and they send too much money back home.

Chamberlain, Jessica
Trevor Wilson, Mary Koehler
Faculty mentor: Ted Martinez

Session II, 2:00pm-4:00pm, 111B

Title: The Effect of Nature on Human Happiness and Spirituality
This poster demonstrates the powerful, positive influence of nature on human happiness and spirituality through connecting humans with their surroundings. By furthering our understanding of how nature affects the way we feel, we will find a way to maintain a positive state of mind. A positive state of mind directly relates to the overall happiness of the individual, therefore, by maintaining the state of mind it is possible to maintain happiness.

Chambers, Kayli
Kyle Larsen, Leah Gavin
Faculty mentor: William Cordeiro

Morning, 9:00am-10:00am, Skydome Stage C

Title: The Canyon
This short documentary feature focuses on the struggle to find balance between traditional and Montessori education in our modern world. With a diverse and fascinating set of opinions on both sides of the gap, we explore the effect that this free-form educational style has had on the children of yesterday and today versus the impact of traditional, authoritarian schooling on our nation's youth. We will also explore the political maze that has formed in the administration of our educational systems to expose the underlying frustrations oft expressed behind closed doors. This expository piece will enlighten viewers to a growing trend and alternative to a political game played with the future of the next generation.

**Chancey, Kathryn**  
Dannette Allen  
**Faculty mentor:** Sara Jarvis  

**Session II, 2:00pm-4:00pm, 16C**  
**Title:** The metaboreflex is not enhanced during exposure to moderate altitude  

Because of the lower partial pressure of oxygen (PO2), chronic exposure to a hypoxic environment may decrease muscular strength and cause an earlier onset of muscular fatigue. This is due to the accumulation of metabolites which decreases one's ability to perform work. The purpose of this study was to examine the metaboreflex response and time to fatigue during two different O2 conditions. Fourteen healthy men (21±2 yrs) performed static handgrip (SHG) to fatigue in hypoxic (20.9% O2 at 595 mmHg) and hyperoxic (27% O2 to simulate sea level) conditions, with conditions randomly assigned. Heart rate (HR), blood pressure (BP), and muscle sympathetic nerve activity (MSNA) were measured during baseline (BL), at fatigue, post-exercise circulatory arrest (PECA), and recovery (REC). HR was higher during hypoxia compared to hyperoxia (main effect, p=0.014) and increased from BL to fatigue (66±9 and 62±7 to 98±20 and 96±20 beats/min for hypoxia and hyperoxia, respectively, both p<0.001). Systolic and diastolic BP were similar between O2 conditions and increased from BL to fatigue (SBP: 127±10 and 122±11 to 167±13 and 161±14 mmHg, both p<0.001; DBP: 64±5 and 60±7 to 90±16 and 85±9 mmHg, both p<0.001). MSNA indices were similar between hypoxia and hyperoxia and increased from BL to fatigue (burst frequency: 11±9 and 14±9 to 41±26 and 40±19 bursts/min, both p<0.001). The handgrip time to fatigue was not different (145±31 vs. 148±24 sec, p=NS) between conditions. Moderate altitude such as Flagstaff, Arizona does not enhance the metaboreflex and reduce the capacity to perform work.

**Chapman, Caitlin**  
**Faculty mentor:** Neil Cobb, Lindsie McCabe  

**Session I, 9:00am-11:00am, 18B**  
**Title:** The Importance of Biogeography in Determining Species Response to Climate Change  

All species will be affected by climate change, but we still know little about how responses to climate may vary among different species types. I examine whether species groups that have different biogeographic ranges differ in their predicted response via future suitable habitat. I examined wolf spider species (Pardosa spp.) inhabiting three regions/elevations: the American Southwest (low elevations), Colorado Plateau (mid-elevations), and Rocky Mountains (high elevations). I assessed present (2015) and future (2080) suitable habitat for two species in each group using BIOMOD2 in the R programming environment. Seasonal temperature was most important for Southwest species, while monsoon precipitation was most important for Rocky Mountain and Colorado Plateau species. The model predicted future habitat loss in the three species groups on the Colorado Plateau in the following order: Rocky Mountains (57%), Southwestern 76%, and Colorado Plateau (94%), thus supporting the notion that biogeography does mediate response to climate change.

**Chege, Faith**  
**Faculty mentor:** Frederick Lampe  

**Session I, 9:00am-11:00am, 62C**  
**Title:** Maendeleo : Modern developments in Africa  

Aside from all of the economic and political instability shown in the media, many African countries are making great developments. From growth in infrastructure, to advancements in medicine, African countries are thriving. Countries are slowly but surely overcoming the struggles they faced in the past. Although they are countries still involved in
internal conflict, a hand full of other countries, are thriving. The World Bank is predicting between 1 to 5% economic growth in some nations.

Christ, John  
Faculty mentor: Jeff Mielander

Session II, 2:00pm-4:00pm, 8C  
Title: Flagstaff EcoRanch Fall Internship 2014: Tangible, Local and Sustainable Solutions.

In the field of sustainability, there are myriad problems in finding local solutions to global conundrums. In Flagstaff, Arizona, the Flagstaff EcoRanch provides a perfect setting for experimentation with cold climate sustainability. The EcoRanch is a facility located outside of the city of Flagstaff that is dedicated to providing educational opportunities by means of hands-on experience. The ranch offers internships both during the spring, summer and fall semesters. The goals of the internship during the fall of 2014 were to increase the yield of chicken eggs throughout the cold winter months. To do this, many small projects were outlined, planned, and executed with the help and coordination of volunteers. Such projects included the insulation of the chicken coop and repairing various parts of the barn and the chicken run. Overall the experience at the EcoRanch allowed for a much better understanding of what it takes to live more within means in a cold climate environment, specifically pertaining to food and agriculture. The experiential nature of the project shed light onto the reality of ranch life in the high country, and the results provide tangible examples of how to become more sustainable in cold climate environments on a small to medium scale.

Christ, John  
Solan Watts, Sara Krznarich  
Faculty mentor: Robert Sanford

Session II, 2:00pm-4:00pm, 8D  
Title: Citizen Science: Feeder Watch, Studies in Migration Patterns

Citizen science is a community based science research program designed to help scientists and citizens to gain a better understanding of the national landscape and it's environments. The Feeder Watch Organization is an online based citizen science project through which the following research has been outlined. Feeder Watch encourages the national community to participate in a species count of birds by watching a bird feeder. This is beneficial to the scientific community for the ability to gain a better understanding of migratory bird patterns as well as determining a home range. This specific project contributes to Feeder Watch and was structured following the standard guidelines from the Feeder Watch website and Feeder Watch starter packet. A bird feeder was then placed in NAU's north quad area under a ponderosa pine. The bird feeder was watched 3 times a week for 30 minutes at a time. The time of day varied, with the goal of finding the best time of day. Species were only counted if they were at the bird feeder and near by birds were taken note of. Preliminary results have shown there to be little to no bird activity in the day time and minimal activity in the morning and evening. This is to be expected due to the student population that has proved to be disrupting the birds feeding habits. Much of the time birds are by the feeder but not at the feeder which could be due to the amount of students in the area. The current plan is to continue monitoring bird activity through the spring season of 2015.

Christ, John  
Faculty mentor: Jeff Mielander

Morning, 9:18am-9:30am, duBois Meadows Room  
Title: Flagstaff EcoRanch Fall Internship 2014: Tangible, Local and Sustainable Solutions.

In the field of sustainability, there are myriad problems in finding local solutions to global conundrums. In Flagstaff, Arizona, the Flagstaff EcoRanch provides a perfect setting for experimentation with cold climate sustainability. The EcoRanch is a facility located outside of the city of Flagstaff that is dedicated to providing educational opportunities by means of hands-on experience. The ranch offers internships both during the spring, summer and fall semesters. The goals of the internship during the fall of 2014 were to increase the yield of chicken eggs throughout the cold winter months. To do this, many small projects were outlined, planned, and executed with the help and coordination of volunteers. Such projects included the insulation of the chicken coop and repairing various parts of the barn and the chicken run. Overall the experience at the EcoRanch allowed for a much better understanding of what it takes to live
more within means in a cold climate environment, specifically pertaining to food and agriculture. The experiential nature of the project shed light onto the reality of ranch life in the high country, and the results provide tangible examples of how to become more sustainable in cold climate environments on a small to medium scale.

Clemens, Sarah  
Faculty mentor: Melissa Santana

Session I, 9:00am-11:00am, 121A

Title: Rabat Moroccan Restaurant - Converting a Dance Hall into a Restaurant

The research purpose is to come to a conclusion in developing a restaurant and bar from an existing space. In the research, needing to facilitate for the necessities of a restaurant and bar was very important. When researching and learning about building conversions, there are many things to consider as to ADA accessibility, code compliance, and creating a new layout while dealing with existing structural interior elements. The Rabat Moroccan Restaurant was originally an Indonesian Dance Hall that was transformed on the inside, while keeping elements of the exterior to blend in with the surrounding neighborhood and providing a welcoming feel. If certain required components of a restaurant and bar are not being met appropriately, they would need to be redesigned in the best way possible. The research of visiting converted buildings within the community gave me more of an understanding of what is necessary to successfully repurpose this building. The design was inspired from the community and surrounding cityscape, as well as the culture and design of Morocco. It helps to create a design for the space with three main components. The components were welcoming, blending with the community, and providing a new and fun experience. From there, bringing elements that create those things was important to complete the design. Welcoming was created by providing an exterior with some Moroccan elements and, when coming into the space, providing a comfy atmosphere where one would want to have fun on the dance floor or relax in the restaurant. The blending component was achieved by keeping some Indonesian elements, primarily on the exterior of the building. Finally, creating a new and fun experience was accomplished by including a variety of element seen in traditional Moroccan design while providing a stage and dance area for performances within the bar.

Cloud, Katie  
Faculty mentor: Abraham Henn, Nick Koressel

Morning, 10:42am-10:54am, duBois Room A

Title: Assessing Energy Usage at Northern Arizona University with Visual Interactive Technology

Energy usage on campus must be monitored and educated to students, faculty, and staff that are part of the Northern Arizona University community, and this was aimed to be done through the implementation of visual technology known as energy utility dashboards, which show real time energy usage data. In fall 2014, the number of students enrolled at Northern Arizona University's Flagstaff campus totaled over 20,000, and since this community will continue to increase as Northern Arizona University continues to expand and upgrade their campus there will be an increase in energy usage. Northern Arizona University is an institution that is committed to being a leader in sustainability and environmental stewardship, as noted in the university Climate Action Plan created in 2010. The process of implementing the technology included working with Green NAU Energy Initiative, NAU sustainability coordinators, various energy technology companies, and students to research and discuss the goals, visions, and ideas for bringing this educational technology to campus. Comparisons between various colleges' energy utility dashboards, testing of different adaptations to the interactive software, and gathering knowledge from the NAU community about what was recommended for this technology to successful and impactful on campus was essential for the research aspect of this project. The result of this research and discussion between all groups resulted in a clear vision and goals for the new energy dashboard as well as an agreement with an energy technology company to move forward with creating the technology. While this technology is still being created for Northern Arizona University's campus, discussions between students, sustainability coordinators, and other interested groups will continue to ensure the most educational, effective, and interesting visual technology for the NAU community.

Comprosky, Erin  
Faculty mentor: Michael Vasquez

Session II, 2:00pm-4:00pm, 56C
Title: NAFTA and its Impacts on the United States and Mexico

My poster will present a contextual and visual analysis of NAFTA policies and its effects on workers in both the United States and Mexico. It will also show how people are combating NAFTA policies and making change such as the Zapatista movement. NAFTA allows U.S. corporations to outsource jobs to countries such as Mexico in for cheap labor. It also aids in U.S. agriculture cornering the market with subsidized food causing the loss of agricultural jobs in Mexico. This loss of jobs causes a multitude of problems in both the United States and Mexico including crime, poverty, unemployment, loss of self-esteem, and degradation of land and resources. In the case of outsourcing of jobs to Mexico many factory workers in the U.S. lose employment and their pensions. In the case of Mexico many workers are exploited as cheap labor and much of their land is destroyed and corporations provide unsafe working conditions. The purposes of this poster is to shed light on how NAFTA policy benefits big corporation and agro-export from the U.S., as well as to show how people in both the United States and Mexico protest NAFTA policy and provide ways to deal with the social injustices.

Compton, Lindsey
Shea Shoemaker, Landon Wright
Faculty mentor: Katherine Mahosky, Matthew Wangeman

Session I, 9:00am-11:00am, 88C

Title: Reshaping Media's portrayal of Disability

Disability has been negatively portrayed within the the media since the first time motion picture was introduced into society. We will be raising awareness about media's depiction of people with disabilities that often result in negative stereotypes. We want to show how the media contributes to these misrepresentations of disability and how they oppress people with disabilities. Much of the attitudes that society learns come from the media that associates impairment with dependency. We would like to provide ways to reshape the media's image of disability so that viewers can see disability as a valued aspect that contributes to society's diversity.

Compton, Shelby
Desiree Hopkins, Samantha Dowhie
Faculty mentor: Robyn Martin

Morning, 9:00am-10:00am, Skydome Stage B

Title: Beyond The Burqa

Our three-part presentation explores the complex and contemporary (post 9/11) issues of various Middle Eastern Muslim women. We'll share research regarding Muslim women's identity and self-determination as it relates to science, LGBTQIA and/or minority culture, and comparisons to their American women counterparts and the 'savior' mentality. Typically we view Muslim women through our own ethnocentric and cultural biases, limiting these women to the role of submissive, helpless females. Our course HON394: Beyond the Burqa explores the myths of Muslim women's supposed subjugation via Islamic culture, traditions, and male privilege of various Muslim women groups in particular middle eastern countries. The course also illuminates Muslim women's challenges as they labor in their own countries and abroad to realize self-determination in their own ways. The presentation will share individual research projects that reveal the realities behind some of the myths about Muslim women and provide insight into the Muslim women's experience as best as we are able, from our western (American) perspective.

Condon, John
Alvaro Alvarez
Faculty mentor: Ted Martinez

Session II, 2:00pm-4:00pm, 111C

Title: The Physical Human and Nature

This poster seeks to inform the public of the contrasts of living a lifestyle with nature integrated in and one without dominant natural experiences. In addition, this presentation discusses the adaptations in society when involved in a natural lifestyles such as changes in sensory and immune system glands.
Copp, Brennan  
Richard Hofstetter  
**Faculty mentor:** Richard Hofstetter

**Session II, 2:00pm-4:00pm, 19B**

**Title: Can Acoustic Vibrations Affect the Growth of Fungi?**

Organisms create vibrations when moving, communicating or feeding. The mechanical energy from these vibrations has been shown to affect the growth and behavior of neighboring organisms. For instance, tree growth can be accelerated with low-intensity ultrasonic sound and plant pathogenic fungi growth can be reduced in the presence of 5kHz sound waves, in one study. The purpose of this study was to determine if combinations of two sound frequencies affect the growth pattern of a common fungal pathogen of fruit and trees called Botrytis cinerea. We tested the hypothesis that 'fungal growth is slowed by a particular combination of sound frequencies'. We tested fungal growth rates in the presence of these combinations of frequencies: 110Hz, 110Hz/116.54Hz, 110/146.83Hz, 110/155.56Hz, 110/164.81Hz, 523.25/554.365Hz, 523.25/659.255Hz, 523.25/698.456Hz, 523.25/783.99Hz, 1046.5/1108.73Hz, 1046.5/1318.51Hz, 1046.5/1396.91Hz, 1046.5/1567.98Hz, 2093/2217.46Hz, 2093/2637.02Hz, 2093/2793.83Hz, and 2093/3135.96Hz. We grew the fungus on a standard media in plastic petri dishes, and monitored their growth daily. We administered sound/vibrations using tactile transducers connected to computers. Fungal growth rate was significantly reduced by 110/164.81Hz, acoustic treatment and significantly increased by the 523.25/659.255Hz treatment relative to the no-sound treatments. Our results suggest that vibrations can have a positive or negative effect on fungal growth depending upon the acoustic pitch (i.e. frequency). Further studies are needed to test higher frequencies, which have been shown to be negatively affect microbial growth.

Cordell, Kristian  
Vanessa Stoyanof  
**Faculty mentor:** Frederick Lampe, Melissa Granat

**Session II, 2:00pm-4:00pm, 62C**

**Title: Environmental Anthropology, From Pigs to Policies**

To study and better understand the environment and how humans impact it and each other. Our presentation will compare and contrast ethnoecology (specifically Papua New Guinea), complex societies, climate change, populations, religion, biodiversity health, and consumer cultures all found in the book, Environmental Anthropology, From Pigs to Policies Second Edition by Patricia K. Townsend.

Cottingham, Larrea  
Catherine Gehring, Suzanne Owen  
**Faculty mentor:** Catherine Gehring, Suzanne Owen

**Session II, 2:00pm-4:00pm, 18B**

**Title: The Effect of a Stand Replacing Fire on Ectomycorrhizal Fungi Inoculum Potential**

Longer drought periods as a result of global climate change and increased fuel due to historical fire suppression increase the frequency and severity of forest fires. I investigated the effect of fire on the inoculum potential and species composition of ectomycorrhizal (EM) fungi in Pinus ponderosa after a stand replacing fire. EM fungi increase nutrient acquisition for their host trees and fire can burn both the roots and the associated fungi. I grew Pinus ponderosa seedlings in soil cores taken from three severely burned plots at different distances from the nearest non-burned Pinus ponderosa stand and measured EM fungi inoculum potential and species composition. EM fungi inoculum potential in two of the three stands declined significantly with distance from the intact forest. Reduced EM fungi inoculum in the soil may decrease the ability of Pinus ponderosa to regenerate in severely burned areas.

Couture, Sheridan  
**Faculty mentor:** Britton Shepardson

**Session II, 2:00pm-4:00pm, 64D**

**Title: Did the Cavemen Believe in God?**
Even before the presence of the written word, religion and spirituality have been part of the human existence. Archaeologists all over the world have been uncovering evidence that religion existed during prehistoric times. This project will demonstrate the evolution of religion and spirituality over space and time in human prehistory.

Cowin, Jake  
**Faculty mentor:** Kira Russo, Phil Basehart

**Afternoon, 1:30pm-1:42pm, duBois Meadows Room**

**Title: Earthship Biotecture: Sustainable From The Ground Up**

The intent of the internship at Earthship Biotecture was to find out how to construct sustainable housing, through the use of recycled materials and three key systems. When building a structure that is self sufficient and sustainable, one must learn about three key systems. The systems that make up an Earthship are, the energy producing system, the water collecting and organizing system, and finally the sewage system. Throughout the time spent at the internship hands on experiences and classroom time were crucial components in understanding the infrastructure and feasibility of the architecture. What differs Earthships from conventional housing is that they do not have to be hooked up to a power grid, public water, and can be made at a much lower cost. Earthship Biotecture provided the innovative information to show people how to build a home with fewer expenses, and in a way that is more environmentally friendly than almost any other building. Infrastructure of these buildings are ingenious and have been translated to help communities all over the globe. Most Earthships being comprised of 3,000 to 5,000 tires all packed tightly with soil and then eventually cemented over has made the differences in lives of people who live in communities affected by extreme storms such as hurricanes. Through the time spent at this internship one can find out how easy and practical these structures are to make, and also how beneficial they could be to the future preservation of our environment.

Crane, Catherine  
Kyle Weiss, Kathryn Meyers, Zach Kramer, Audrey Sumpter  
**Faculty mentor:** Cassandra Dakan

**Morning, 10:00am-11:00am, Skydome Stage D**

**Title: So You Think You Know Yourself: Understanding the Human Mind**

The journey to understand the self is the most mysterious, and most important. These panelists will take you on a journey into positive psychology, mindfulness, the problematic of compassion, the limits of the human mind, and the uses of psychoactive drugs to explore and expand the self.

Crane, Stephanie  
Samantha Roberts  
**Faculty mentor:** Sumner Sydeman, Samantha Roberts

**Session I, 9:00am-11:00am, 102C**

**Title: A systematic review of available evidence on the efficacy of Cognitive-Behavioral Based Therapy (CBT) for Perinatal, Prenatal, and Antenatal Females**

A systematic review of available evidence on the efficacy of Cognitive-Behavioral Based Therapy (CBT) for Perinatal, Prenatal, and Antenatal Females Diagnosed with DepressionPostnatal depression (PND) affects 10-15% of postnatal women worldwide, yet it is poorly recognized and managed (Leung et al., 2013). The feasibility and symptom outcomes of Cognitive Behavioral Therapy (CBT) on PND have been previously reported in a number of studies (O’mahen et al., 2013). The aim of the current project was to conduct a systematic review on the effectiveness of CBT for perinatal, prenatal, antenatal, and postnatal female participants diagnosed with, and suffering from, depression.. Our review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses standards (PRISMA: Liverati et al., 2009). Several randomized control trials, three non-randomized control trials and non-randomized control trials were located in the literature. Results generally support the efficacy of CBT and its use in the treatment of perinatal, prenatal, antenatal, and postnatal females suffering from depression. Strengths and limitations of the published clinical trials are discussed and suggestions for future research are provided in the poster.

Crawford, Kaitlyn  
**Faculty mentor:** Natalie Cawood
Session II, 2:00pm-4:00pm, 82A

**Title: Behavior Change: Daily Fitness**

I chose daily fitness as a behavior that I wanted to instill within myself. I set a goal, assessed my capacity for change, and identified the steps I would undergo to complete the change. I then developed a measurement tool to track my efforts to change my daily fitness practices over time. I will present results of this effort at changing my behavior and also discuss how this assignment will impact my future social work practice.

Creaser, Lara  
**Faculty mentor:** Anthony Barnhart

Session II, 2:00pm-4:00pm, 93D

**Title: Personality and Magic**

Previous research has been done on susceptibility to psychological forcing. However, this research does not look at the link between susceptibility and personality traits. The current research proposal examines the correlation between personality traits and susceptibility to psychological forcing in magic shows. The study hypothesizes that introverts are more likely to believe that they are not being influenced or biased by the magician through psychological forcing and that it is in fact true magic being performed. Results supporting the hypothesis will show a correlation between introverts and psychological forcing.

Cruz, Joshua  
**Faculty mentor:** Marie Baker-Ohler

Session I, 9:00am-11:00am, 78B

**Title: Social Exclusion & Isolation: The Need for Belonging and Acceptance**

Social isolation is the opposite of building relationships and the overall picture of communication. It prevents one's identity, emotional need, hinders social skills and avoids crucial conversations that form one's being into 'Being'. The topic that is taking place for the research is social isolation and how it can potentially damage one's health (whether emotionally or mentally) through relationships (or lack thereof). This research looks at the damage or extreme opposite end of the spectrum of having no human contact. It also expands on the possibility of the isolation being voluntary (the person's choice) or involuntary (not the person's choice).

Cuellar, Christopher  
**Faculty mentor:** Michael Alban

Session I, 9:00am-11:00am, 93B

**Title: Difficulty Estimates by Magicians versus Non-magicians**

People often use their own subjective experience when estimating the difficulty of a problem, even when asked to rate how difficult the task would be for other people to solve. When people are robbed of a chance to solve a problem themselves (e.g., when the problem’s solution is immediately given), they tend to under-estimate the problem’s difficulty. Magicians may be a group of people who are especially aware that their experiences differ strikingly from the experiences of others, because their profession affords many occasions to observe the mismatch between subjective experience and the experience of an audience. Such awareness could lead to extensive practice correcting for (“debiasing”) the sway of subjective experience. Using a task wherein participants estimated the difficulty of anagrams (words whose letters have been jumbled), we tested whether or not individual differences exist between magicians and non-magicians. We predicted that magicians would be accurate at predicting difficulty for other people, even when presentation of solution words spoils their ability to assess difficulty via reliance on subjective experience. In contrast, non-magicians should under-estimate difficulty in an “Anagrams with Solution” condition, supporting the idea that regular people (“Muggles”) inadequately discount their subjective experience as a basis for judgment.

Cuellar, Christopher  
Justin Jones, Matthew Valente  
**Faculty mentor:** Daniel Weidler
Session II, 2:00pm-4:00pm, 93B

Title: Inclusion of Romantic Partner in the Self, Emotional Dependency, and Relationship Satisfaction

A survey was conducted to explore associations among variables regarding romantic relationships, including inclusion of one's romantic partner in the self, emotional dependency, and relationship satisfaction. Aron and Aron (1986) developed the construct of inclusion of other in the self as a cognitive representation of self/other merging in relationships. Inclusion of other in the self has been associated with a variety of positive relationship outcomes including relationship satisfaction. The construct of emotional dependency was developed by Rathus and O'Leary (1997) in identifying the extent to which an individual over-relied on a romantic partner for self-esteem, identity, and general functioning. Greater emotional dependency has been associated with several negative relationship outcomes, including partner abuse. The aim of the current study was to determine whether varying levels of emotional dependency on a romantic partner and differing levels of inclusion of a partner in self would interact in predicting relationship satisfaction. Specifically, it was hypothesized that, replicating previous research, greater inclusion of a romantic partner in the self would predict greater relationship satisfaction. However, it was further hypothesized that this association would be moderated by emotional dependency such that only those who are low in emotional dependency will demonstrate the aforementioned positive association between inclusion of partner in the self and satisfaction. A self-report survey was administered to 185 students currently involved in a romantic relationship. A multiple regression analysis provided support for the study hypotheses. The results suggest that greater inclusion of a romantic partner in self is predictive of relationship satisfaction, however, this association is not apparent for those demonstrate over-reliance on their partner for emotional and identity needs. These results imply that greater inclusion of other in the self may not always lead to greater relationship quality. Future research might explore additional relationship processes that may moderate the effects of inclusion of other in the self on positive relationship outcomes.

Cuestas, Briana

Faculty mentor: Natalie Cawood

Session I, 9:00am-11:00am, 82B

Title: Behavior Change: Getting Active

I chose physical fitness as my behavior change goal. I set a weekly goal, set a realistic time frame and identified what I needed to do to hopefully be successful. I laid out my personal measurement tool to track my progress for adding physical fitness goals in my daily routine. I will present the results of this behavior change and how doing this assignment will change my future social work practice.

Cuje, Alexander

Faculty mentor: Becky Butcher

Session I, 9:00am-11:00am, 114B

Title: Communicating Visually Through Entertainment Stage Design

With music festivals, concerts, and events occurring more and more each year, the demand for stage designs have been a crucial part in making the experience more enjoyable for all attendees. With the rise of ticket prices each year, events have been charging more money for music listeners to attend these events with poorly designed stages that lack the necessary design principles and elements. The design principles these stages lack are: balance, contrast, emphasis, proportion, and patterns. The design elements many stages also lack are the size, shape, space, and color. With the majority of the event revenue being used to bring in the talented artists to perform, stage designs are pushed behind as a small priority and are built lacking the design principles and elements that make the stage unappealing to many viewers. My project presents a solution to poorly designed stages through analyzing the design elements and principles required to communicate visually through stage design.

Cusack, Danica

Haylee McElroy, Jennifer Girvin, Caitlynn Tompsett

Faculty mentor: Lyn Johnson

Session I, 9:00am-11:00am, 41B

Title: Global Interdisciplinary Project: Mainpat, India
When China invaded Tibet more than 50 years ago, Tibetans began fleeing their homeland by foot across the Himalayas, seeking refuge in near-by countries where they could be free to practice their cultural and religious traditions. The exodus continues today, populating Tibetan refugee settlements that are scattered throughout India. Of these, the camps at Mainpat, India, in the northeastern province of Chhattisgarh, one of India's poorest areas, is among the most impoverished and isolated settlements. For the past four years an interdisciplinary group of students and faculty from NAU has traveled to Mainpat to provide dental, dental hygiene, engineering, nursing, and public health services which are not otherwise available to the Tibetans living there. This year the group also included an acupuncturist and a veterinarian as well as a business consultant. The goals of the trip were three-fold: 1.) provide service to Tibetan refugees, 2.) provide a learning opportunity for students to develop intercultural awareness and competency, and an understanding of the obstacles to global health care, 3.) provide an interdisciplinary experience in both learning and service.

Cutler, Brett
Benjamin Luginbuhl
Faculty mentor: Cindy Browder, Constantin Ciocanel, Aubrey Funke

Session I, 9:00am-11:00am, 27A

Title: Investigation of Plant-Derived Carbon Aerogels for Use in Multifunctional EDLCs

Multifunctional electric double layer capacitors (EDLCs) are capacitor subtypes that use an electrolyte, or salt solution, to enhance electric potential and are made with materials that allow them to play a structural role. It has been established that the capacitance of EDLCs is directly related to the surface area of the electrodes. We hypothesized that high surface area carbon aerogels could be synthesized from the plant-derived polysaccharide agar and incorporated into structural EDLCs to increase their capacitance. Hydrogels of agar and water (2, 3, and 4 % wt/wt) were dried through lyophilization (forming a cryogel) and critical-point drying (forming an aerogel). The dried gels were pyrolyzed at 900 [degrees] C under inert atmosphere to form a carbon aerogel. Scanning electron microscopy (SEM) and multi-point BET surface area analysis were used to characterize the morphology of the gels. Carbonized gels were mechanically powdered, incorporated into the electrolyte of structural EDLCs, and characterized electrically with cyclic voltammetry. The mean surface area of the aerogels (230 m2/g) was six fold greater than the mean surface area of the cryogels (30 m2/g), however, the drying method did not influence the surface area of the gels post-carbonization. EDLCs with agar carbon aerogels showed increased capacitance compared to those without. In conclusion, agar carbon aerogels have high surface area and improve the capacitance of structural EDLCs.

Daley, Brett
Faculty mentor: Britton Shepardson

Session I, 9:00am-11:00am, 65A

Title: The Prehistory of Spirituality/Religion

Religion continues to be a main cause of conflict around the world, but this may not always have been the case. Let's explore how it evolved throughout time and space in human prehistory taking note of similarities and differences between five different places.

Dalsing, Ashton
Jasmine Castellanos, Raquel Daniels, Erikson Bighorse
Faculty mentor: John Houser, Matthew Anderson

Session I, 9:00am-11:00am, 101C

Title: Favorability of Adoption: How knowing someone adopted effects people's favorability of adoption

This study explored the effects of knowing someone who is adopted on favorability of adoption. The study investigated if knowing someone adopted effects people's views on adoption and whether or not it effects their favorability toward adoption. It was also investigating people's opinions of same-sex couples adopting and single parents adopting and if this effects people's favorability toward adoption. The sample was composed of undergraduate students taking a research methods class in a small university in the southwestern corner of the United States. A survey was passed out to the students during class in order to collect the data. Expected results are that people will be more favorable towards adoption if they know one or more people adopted. All results will be presented in the poster presentation.
Daniels, Kendall  
**Faculty mentor:** Melissa Santana, Roger Vitello

**Session II, 2:00pm-4:00pm, 121B**  
**Title: Adaptive Reuse: Repurposing the Historic Barrister Place Building**

As cities continue to age we are left with the dilemma of what to do with old buildings that have deteriorated or been abandoned. While the simple fix would be their destruction, many architects and designers are opting to instead renovate and repurpose these structures. Though this process provides numerous challenges, the restoration of historic buildings also allows for many rewards. Challenges include: working within an existing footprint, maintaining the integrity of the original facade, and incorporating design elements from another time period; however benefits include: economic assistance through tax breaks, conservation of culture, and sustainability. From this it becomes clear that it is our social responsibility to take these decrepit buildings and return them to their former glory in a way that can be useful to us now. The purpose of this project is to take the Barrister Place Building in Downtown Phoenix, which was once the Jefferson Hotel and is now vacant, and renovate it through the use of sustainable design into retail and housing space. The goal is to preserve the history of the building while repurposing it into something that will be useful to the public and will also incorporate responsible green design elements. Located in the heart of Downtown Phoenix, Barrister Place is a perfect example of an underutilized building with the potential to become a thriving part of the downtown cityscape.

Darnell, Daren  
Justin Sieczkowski, Mitch Pike, Rayan Alawi  
**Faculty mentor:** Sara Mushro

**Session II, 2:00pm-4:00pm, 38A**  
**Title: Marketing Research Design of Project: Lowell Observatory**

After conducting research in the field, we will be able to determine the links and correlation between why consumers visit Lowell Observatory. Observing the data analysis and using project methods such as complete questionnaire design, we will determine why consumers return to Lowell, and why some do not. With this study we can increase market share for Lowell and can research forecasting methods more precisely. Understanding consumer behavior will increase the amount of sales goals set upon by Lowell, and will in turn help them design a campaign to structure themselves around the consumers needs.

Darwish, Muhammad  
Chet Johnson, Min Hee Kim  
**Faculty mentor:** Sara Mushro

**Session II, 2:00pm-4:00pm, 38B**  
**Title: Who is coming to Lowell?**

To find who would visit Lowell Observatory, why they visit Lowell Observatory and how long they would visit Lowell. Hoping to find a way to increase Lowell Observatory traffic.

Davidson, Samantha  
Lily Styrmoe, Andrew Johnson, Crystal Rolinger  
**Faculty mentor:** Angela Moline

**Session I, 9:00am-11:00am, 8A**  
**Title: Sticking to the 200-mile radius; Local Eating in Flagstaff, AZ**

The objective of this project was to create a meaningful change in the Flagstaff community by educating students and faculty of Northern Arizona University on the importance of local, sustainably-sourced food. Our methods of achieving this began with in-depth research on the benefits that local food provides in relation to health/nutrition, the environment, and the economy. This was followed by an investigation of local businesses and restaurants in the Flagstaff community that provision local food. Using this information we created a fact sheet describing the benefits of
local food consumption and information on how the public can access local foods in Flagstaff. In addition we created a sticker to distribute with the fact sheet. The purpose of the sticker was to create a lasting impact that will remind people of the Flagstaff local food movement. We then reached out to NAU professors and presented this information to undergraduate students, with the intention that students are developing long-lasting eating habits which we can potentially influence by teaching them about local foods. We hoped that by educating the Northern Arizona University community about local food through class talks, fact sheets, and our stickers, this information will resonate with the students and encourage eating local.

Davidson, Samantha  
Faculty mentor: Rod Parnell  
Afternoon, 3:54pm-4:06pm, duBois Meadows Room  
Title: Sea Turtle Conservation & The Promise of New Life  
My internship with AVSO, an organization centered around conservation, aimed to explore the relationship between state government and local environmental efforts and to contribute to species conservation. National park lands in Costa Rica were awarded to AVSO in order to conduct conservation projects on endangered species. This specific project focused on Olive Ridley, Green, and Leatherback sea turtles. Methods for conservation included scanning beach shores to collect newly laid nests, relocating nests from the beach to the site's hatchery, consistently monitoring active nests, collecting data from baby sea turtles, and releasing turtles after data collection. The data collected included weight, height, length, species type, nesting duration, and number of turtles per nest. The data are used to track trends among sea turtle species and develop methods to encourage population growth. Our findings indicated that the Olive Ridley population was steadily increasing over time, while Leatherback turtle populations were growing at a much slower pace. All in all, the conservation efforts and support of the surrounding communities have helped the turtle populations increase by decreasing both human and natural threats, like poaching and predators, and increasing protection to sea turtle nests. Compared to the United States, Costa Rica has had more success in shorter time frames regarding sea turtle habitat and species conservation. This is partially due to the methods of conservation, but largely attributed to cooperation between non-governmental organizations, the communities, and governments.

Davis, Courtney  
Faculty mentor: Francis Smiley  
Session I, 9:00am-11:00am, 70D  
Title: The Ulithi of the Western Pacific: Material Culture and the Archaeological Record  
This poster presents the visual and textual information of the ethnographically known Ulithi society of the western Pacific. The information gained from examining the material record of the Ulithi can assist archaeologists with studying similar prehistoric societies only known archaeologically. The Ulithi are a sedentary tribal society residing in the Ulithi atoll of the Caroline Islands. The Ulithi rely on fishing, gathering, horticulture, and minor domestication of animals. The society is comprised of all people residing on the atoll, divided into smaller nucleated villages. The Ulithi build dwellings from regional lumber, coral, and thatch roofs out of leaves from the coconut tree. Material correlates include tools used for hunting, dwellings, burials surrounding the villages, and plant and animal matter from subsistence strategies. Although these are all materials the Ulithi actively use, I predict limited preservation of the material in the archaeological record. The purpose of my research is to predict the material culture items produced by the Ulithi present in the archaeological record. The model I produce can be applied to other sedentary tribal societies residing in similar tropical environmental zones.

Day, Emily  
Faculty mentor: Dianne McDonnell, Claudia Jurowski  
Session II, 2:00pm-4:00pm, 10A  
Title: BioEnergy and Wastewater Management  
The community of Brownsberg in Suriname operates an Ecotourism facility in need of a more efficient waste water treatment process. Consequently, this research focuses on innovative techniques for solving the problem. The research project is the result of the combined efforts of engineering and hospitality management students.
De La Torre, Jasmine  
Faculty mentor: Sumner Sydeman  

Session II, 2:00pm-4:00pm, 102C  

Title: How Effective is Psychoeducation in the Treatment of Adults with Bipolar Disorder? A Systematic Review of Empirical Research  

The current project reviews the efficacy of psychoeducation in the treatment of bipolar disorder. This systematic review complies with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) standards (Moher, Liberati, Tetzlaff & Altman, 2009). We are currently conducting the literature review. The results were generally supportive of psychoeducation as an effective treatment method for bipolar disorder. An analysis of the clinical trials is included in this project.

De La Torre, Jasmine  
Faculty mentor: Anthony Barnhart  

Session I, 9:00am-11:00am, 94A  

Title: Perspective Taking and Empathy  

This research proposal explores the topic of perspective/role taking and empathy. There were 80 participants in this proposed experiment, 40 men and 40 women. They were all psychology students from a midsized college in Southern California. The researchers wanted to investigate whether people who practice switching perspectives would perform better on a perspective taking test than people who have not practiced. All of the participants took an empathy test at the beginning of the experiment and after they were split into two groups: those who took two perspective taking practice tests and those who did not. The practice tests consisted of character sheets where the participants had to review them and then answer questions as to how the character would answer specific questions. They had to switch from one character sheet to another and answer these questions. It was found that those who had practice is perspective taking and switching perspectives performed noticeably better in the final switching perspectives test than those who did not.

DeBenedetto, Brianna  
Daniel Delgado, Danielle Treto, Ian Ross  
Faculty mentor: Phoebe Morgan  

Session II, 2:00pm-4:00pm, 57D  

Title: Working through Roommate Disagreements  

Our poster will depict the evolution of a senior capstone project completed by a team of criminology and criminal justice students enrolled in CCJ 480: Alternative Dispute Resolution (ADR). Everyday people experience numerous interpersonal conflict(s) that must be resolved. On a college campus, a major source of conflict is communication between roommates. Resident assistants (RAs), who are an available resource to residents for resolving conflicts, are not always trained in a professional method of conflict management. For this reason, our project is to present the Assistant Director of the RA training committee of Northern Arizona University (NAU) with a supplemental training video on ADR and a potential method on how to mediate roommate disagreements to be used in RA training sessions in the fall semesters. The method illustrated in this video will be 'Getting to Yes', which was written by Roger Fisher and William Ury in 1981. Furthermore, as our group will be unable to assess the effectiveness of our video, we plan to organize a preview of the video to a group of current RAs and ask for constructive feedback on its helpfulness. The goal of this project is to provide a service to the NAU campus by showing RAs and subsequently students how to handle their disputes. As a result, our poster will depict the outcome of this project, but currently, this project is still being executed. By Friday, April 24th however, the project will have been completed and the poster will describe its evolution and its results.

DeMonico, Emily  
Faculty mentor: Zsuzsanna Gulácsi
**Session II, 2:00pm-4:00pm, 126D**

**Title: Japanese Castle Architecture of the Momoyama Period**

Masterfully combining power and prestige, castles remain an important component of Japan’s late feudal history. Although they first began as simple wooden fortifications influenced by architecture from China and Korea, they evolved into truly unique architectural masterpieces built by warlords during the Momoyama period. Due to European influence and the introduction of guns, the longstanding Japanese style of samurai warfare changed dramatically, resulting in the implementation of new military strategies. Combined with the Japanese aesthetic, castle features were crafted with beauty and tactical expertise in mind. The purpose of this project was to understand the late feudal Japanese approach to military defense and security through examining the tactical features and structural elements of the most famous castles of Japan, such as Himeji and Matsumoto. The examined features mainly include: castle type, location, layout, bridges, gates, moats, and the characteristic stone foundations. As Japanese feudal culture was heavily influenced by warfare, the impact of its sudden evolution and absorption of European ideas during the Momoyama period changed Japanese culture permanently, however, its roots continued to survive as well as many original castles.

Demakovsky, Joshua  
Shelby Burton  
**Faculty mentor:** Sumner Sydeman

**Session I, 9:00am-11:00am, 102D**

**Title: How Does That Make You Feel? A Systematic Review of the Efficacy of CBT in Treating Depressed Adolescents**

The aim of this project is to conduct a literature review of cognitive behavioral therapy (CBT) for adolescents diagnosed with depression or depressive symptoms. According to Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) standards, the literature review located eleven randomized control trials (RCTs). Results generally indicate that CBT is effective, but there are discrepancies regarding how large the effect size is and its long-term effects. These discrepancies are discussed along with the strengths and limitations of the clinical trials included in this project.

Deng, Ting Ting  
**Faculty mentor:** Melissa Santana, Sara Maier

**Session I, 9:00am-11:00am, 121C**

**Title: Aging in Place - Home Safety for Senior**

With quality of life improved, the older population increasing year by year. Rather than going to assisted living, older would rather be aging in place. Aging in place is a term used to describe a person living in the residence of their choice, for their ability and age. This is getting assistance or services to maintain and support their safety and quality life in the residence. Aging in place is important is because it will fix the problems that old have in their lives. The most effectively design for aging in place is Universal Design (UD), which can provide safety and quality life for everyone. The principle of Universal Design is designing for people of all ages and abilities. The benefit of Universal Design concept for aging includes: (1) flexibility in use, (2) simple and intuitive use, and (3) low physical effort. That means, Universal Design can provide and enhance older a security, safety, privacy and comfortable environment in design. In brief, aging in place is necessary because it can reduce risk of falling for senior and help them independence in their life. And Universal Design is a useful product that can provide senior safety, security and relax interiors and exteriors, and reduce physical issues and pressure to achieve quality of their life.

Denham, Verity  
Lundon Hatcher, Jennifer Girvin, Hope Spreadbury, Amber Jacobs  
**Faculty mentor:** Tricia Moore, Ivan Pacheco,

**Session I, 9:00am-11:00am, 41C**

**Title: Clinical and Self-Perceived Oral Health of Older Adult Patients**

Dental disease is more prevalent in older adult populations, and access to affordable care for the uninsured and underserved is limited. The purpose of this study was to compare self-reported oral disease status to actual clinical
screenings of older adults in a small, rural community in northern Arizona. The sample knew their decay statistics more than they knew their periodontal disease status. Oral disease in this population was much higher than national surveys and Healthy People 2020 goals.

Deniger, Daniel  
Kyle Maddux, Kyle Spaulding, Luis Montano  
Faculty mentor: Bryan Cooperrider, Rob Bruner, Timothy Becker, Robert Morgan

Afternoon, 1:30pm-1:55pm, duBois Southwest Room  
Title: ScreedAll

As a result of a semester-long needs finding process, the ScreedAll is an all-purpose wet concrete leveling tool. Its lightweight, modular assembly approaches many of the common issues associated with fixed-length aluminum screeds. The ScreedAll is adjustable for irregularly shaped concrete pour areas, reduces the bulk of bringing numerous fixed-length screeds to the job site, all while retaining the simplicity and function of the traditional 2'x4'. The ScreedAll features a very simple pin attachment between segments and an easy to clean material. The ScreedAll targets smaller construction operations, namely contractors and small business owners. Its construction of inexpensive Rigid PVC ensures durability, including abrasion resistance and impact absorption. The ScreedAll is a unique product, with no direct competitors that offer modular attachments. This simple solution ensures the existence of screeds to fit the consumer's needs.

DePaola, Taran  
Victoria Warnock  
Faculty mentor: Sumner Sydeman

Session I, 9:00am-11:00am, 104C  
Title: A Systematic Review of Cognitive Behavioral Therapy (CBT) and Adult Attention-Deficit Hyperactivity Disorder (ADHD)

The purpose of our study was to conduct a systematic review of the efficacy of psychotherapeutic clinical trials of Cognitive Behavioral Therapy (CBT) for adult male and female patients diagnosed with Attention-Deficit Hyperactivity Disorder (ADHD). Eligibility of participants screened for this systematic review consisted of both male and female adults (18 years of age or older), and the studies analyzed include review articles, randomized controlled trials (RCTs), and a meta-analysis. The literature search was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses standards and regulations (PRISMA: Liberati et al., 2009). Results generally indicated that CBT is an efficacious therapy intervention for adults with ADHD. The strengths and limitations of published clinical trials are evaluated and discussed as well as suggestions for future research.

DePaola, Taran  
Dylan Barbera  
Faculty mentor: Chad Woodruff

Session II, 2:00pm-4:00pm, 104C  
Title: Event-Related Desynchronization and Correlates of Self-Other Differences

Research on cognitive processes and empathy has been an area of interest since the discovery of specialized neurons in the brains of macaque monkeys, deemed 'mirror' neurons (MN). The MNs are postulated to be involved in the visual and semantic processing of motor movements, but also recently hypothesized to correlate with empathic processing as well. Less known, however, is the degree to which empathic processes are correlated with MN activity. One method to investigate this question has been to look at mu-suppression, which is the suppression of the mu rhythm (a band range of electrical activity in the brain between 8-13 Hz), that is observable via electroencephalography (EEG) and correlate that data with perspective-taking measures. This study utilized EEG and event-related desynchronization (ERD) to analyze data correlating empathy and mu-suppression. Participants were video-recorded making emotional faces (happy, angry, sad, and neutral) and then were fitted with the EEG cap and monitored while viewing stimuli of themselves making emotional faces (self-group) and others making emotional faces (other-group). After the experiment the participants were asked to fill out questionnaires that pertain to measuring their empathic and perspective-taking ability. Statistical analysis using ANOVAs and paired-samples T-tests yields significant results by
condition for electrodes F3, Fz, F4 (p = .004, .001, & .003, respectively) when comparing the self vs. other conditions. Furthermore, electrodes C4 and Cp4 were significant (p = .012, p = .014, respectively). These results suggest that the brain can discriminate between the self and the other during processing of emotional information.

DePinte, Daniel  
**Faculty mentor:** Matthew Bowker

**Session I, 9:00am-11:00am, 19A**  
**Title:** Effects of ponderosa pine biochar in Arizona's agricultural soil: water retention, drought resistance, and crop yields  
Arizona supports a $12.4 billion agriculture industry, which is the primary consumer of water in the state using 1.632 trillion gallons annually. Current climate change models predict an increase in temperatures of 2-6º Celsius by 2050, which will exacerbate the need for maximizing water use efficiency in these agricultural systems. By increasing the water holding capacity of the soil, agricultural systems could increase drought tolerance, crop yields, and maximize water use efficiency. We hypothesize that amending soil with ponderosa pine biochar might be one possible ameliorant. We assessed the moisture retention rates of three soil categories: control soil, and soil with 4%, and 8% biochar. We monitored variations of stomatal conductance of the crops and compared the three categories for leaf water potential. Additionally, crops were monitored during a drought simulation for signs of wilting and days until permanent wilting points were reached. Lastly, the crops were compared for yield mass between the three categories. No significant difference in water retention rates were detected in soil amended with biochar compared to the control. There were no trends that indicated that leaf water potential was increased by amending the soil with biochar, no difference in drought tolerance was observed, nor in crop yields.

Desabrais, Erika  
Victor Iniguez  
**Faculty mentor:** Dennis Foster

**Session II, 2:00pm-4:00pm, 34B**  
**Title:** The Public Choice Aspect of the Mountain Line Bus System  
Currently the mountain line is a government run transportation system that runs throughout Flagstaff. It is supported through grants, tax payer dollars, and NAU student fees. The bus system is not a public good so therefore it does not seem fair to make all tax payers support the bus line. The system that is currently in use is inefficient and wasteful. With the large bus sizes they are seldom full. The are scheduled to pick up every fifteen minutes to every hour depending on the stop. The goal is to privatize this system in hope that is would result in a more cost efficient and better run system catered to the needs of the customers. Private markets are motivated by profit which correlates with customer satisfaction. The private market would work to find more efficient solutions, such as smaller bus sizes that run more frequently. Because the private market is ran by competition the rates would need to compete with other transportation competitors, creating a fair price for consumers. Moving away from a government run system to a private one, the bus system throughout Flagstaff will be more efficient and cost effective.

DeVita, Sarah  
Beth Pickens, Kelsey Hecker  
**Faculty mentor:** Gerald Wood

**Session II, 2:00pm-4:00pm, 51A**  
**Title:** The Arts and Academics  
This project is centered around the affect of music and arts on student's brain development, academic performance, and social interaction. Through our research, we have discovered that Arizona lacks proper funding for fine arts programs in schools. This can lead to decreased performance in the core curricular classes. Statistics have repeatedly shown lowered graduation rates in schools lacking these programs. Our goal is to educate about the benefits of the arts in schools.

Didier, Darian  
Sophia Horn, Kathryn Keegan
**Faculty mentor:** Brant Short

**Session II, 2:00pm-4:00pm, 79D**

**Title: A Rhetorical Criticism of Tea Party Leaders Advocacy Against Obamacare**

This paper is a rhetorical analysis looking at the anti-obamacare campaign. Through research focusing on major leaders in the tea party's advocacy against Obama Care we will address the strategies and effectiveness of their movement. In order to best explain their rhetorical approach we have applied the rhetorical methods of metaphors and ideographs looking at how these methods are utilized as a persuasive strategy.

**Dishong, Bradley**  
Catherine Mallory, Forrest Colavecchia, Alexandra Tyra, Johnna Martorana  
**Faculty mentor:** Matthew Anderson, Nicole Bies-Hernandez

**Session I, 9:00am-11:00am, 93C**

**Title: Effect of Music Preference while Studying on G.P.A. and Need for Cognition**

The purpose of this research was to evaluate if studying while listening to a specific type of music correlated with an undergraduate students' need for cognition and grade point average. It was hypothesized that students who preferred to listen to soothing music while studying would have an increased need for cognition, and a higher grade point average. To assess this hypothesis, the research team used two one-way ANOVA tests. One hundred PSY 302W students were administered the accompanying surveys during a data collection week. Students were asked a variety of questions in regards to their music preference while studying, as well as were administered a previously established Need for Cognition survey. Results of this study will be available on the associated poster.

**D'Luzansky, Gabriel**  
**Faculty mentor:** Moran Henn

**Afternoon, 2:42pm-2:54pm, duBois Room A**

**Title: Raising Community-Based Interactions through Social Events and Educational Seminars**

Friends of Flagstaff's Future is a non-profit organization that was created to make sure that people were involved in our political actions in Flagstaff. I chose Friends of Flagstaff's Future (F3) as my internship because I wanted to do something that benefited the community. In addition to this I wanted to make sure I was learning the skills necessary to apply similar values and goals to a potential future community I might live in. I was drawn to the idea of having a broad base of goals and actions instead of one specific one. My internship duties for Friends of Flagstaff's Future consisted mainly of helping put on the Speak Up event, which aimed to connect local people to local politics through informational meetings. We created a relaxed environment as opposed to the actual city hall, which can be intimidating for people who have not involved themselves in local politics. I also helped out with several other aspects of the organization, like the Full Circle Stuff the Truck program, Zero Waste Program, and helping setting up outreach tables at film festivals and other public events that F3 was a part of. I learned from my experience that it takes a lot of time and effort to promote ideas within a community. A recommendation for F3 in future internships is to encourage the interns to spearhead a specific goal or interest that might spark an idea.

**Doan, Kyler**  
Quinn Tanner  
**Faculty mentor:** Dennis Foster

**Session II, 2:00pm-4:00pm, 36B**

**Title: The Privatization of the Flagstaff Airport**

Tanner and I are looking to investigate the idea of privatizing the Flagstaff Airport. We have seen the money that is being poured into the airport that could be divided and placed in other more important needs. We believe that the dynamic forces of the private market could solve this issue. The private sector has much greater efficiency than that of the government and also tends to not over provide. We want to show the city the potential of tax money that could be saved and allocated elsewhere by taking this step and privatizing the airport.
Doan, Kyler
Faculty mentor: Ryan Finch

Session II, 2:00pm-4:00pm, FCB EASEL
Title: San Diego Desalination Plant
I would like to cover the desalination movement in San Diego, and run a cost and benefit analysis as to how it helps San Diego. I would like to focus on the nation’s largest ocean desalination plant. I want to address how this process works and what it will cost for the city of San Diego and the benefits the city will receive. Being from San Diego I will actually be heading up to the plant to see if I can get any information or insight on the project. This project really interests me seeing that its my home town and I know the struggles of drought and water shortages that we face.

Dobiecki, Michael
Faculty mentor: Britton Shepardson

Session II, 2:00pm-4:00pm, 65A
Title: The Archaeology of Weapons and Warfare
Recent archaeology has shown the incredible evolution of weapons and warfare. Throughout time, man, and his archaic ancestors have needed both weapons and warfare to survive and flourish in this unforgiving world. I have created a presentation detailing 5 specific periods in prehistory, and the weapons and warfare associated with those times. Each period of time also has been separated into different regions, being Europe, Asia, and the New World. The goal of this project is to show the foundation of weapons and warfare that has lead to modern technology and tactics. This perspective gained from learning about prehistoric weapons and warfare will lead to a greater understanding of the need and use of weapons over time.

Donnelly, Kaitlin
Faculty mentor: Frederick Lampe

Session I, 9:00am-11:00am, 62A
Title: The History and Impacts of Tourism
This poster will be based on the book Native Tours by Erve Chambers. The book focuses on the anthropology of tourism and travel. This poster will show the history of tourism and how it has evolved through time. It will show that tourism has not only an impact on the tourists, but also has had a significant impact on the indigenous people they visit. The indigenous people of various countries have to adjust to the Western world invading their land. The tourists affect these indigenous people by changing their customs, artifacts, and rituals. The indigenous people's culture becomes more of a show for the tourists in order to make a profit.

Dosdall, Christopher
Faculty mentor: Ryan Fitch

Session II, 2:00pm-4:00pm, 30C
Title: An Economic Analysis of Colorado Water Issues
The Colorado River starts in the Rocky Mountains and flows down through the east side of Colorado. This river supplies water to most of the state which means it has very high demand. Denver is the biggest city in Colorado and it is located to the west of the Rocky Mountains which makes getting water from the Colorado River very costly. The eastern half of the state uses large amounts of water on agriculture which leads to major tension from both halves of the state over who should get to use the water.

Dotterman, Savannah
Faculty mentor: Savannah Dotterman

Session I, 9:00am-11:00am, 107A
Title: Disney is Everywhere
Disney is everywhere will be a poster comparing statistics concerning the success of Disney's teaching English Abroad Program with competing teaching English Abroad programs in China. Through this project I will be showing the effects of using Disney as a method of teaching and describing the Disney Teach program in detail by showing it's growth and systematic teaching approach as well as analyzing some of the songs and stories they have implemented into the program, all of which use Disney characters.

Doud, Carter  
**Faculty mentor:** Regan Emmons

**Morning, 8:54am-9:06am, duBois Meadows Room**

**Title: Environmental Education at The Arboretum of Flagstaff**

During this internship, my goal was to acquire skills to help me better communicate the importance of conserving communities specific to the Southwest to people of all ages. I sought to learn abilities necessary to educate young people about the importance of plant, soil, and environmental preservation. As an Environmental Studies major, nature's preservation is very important to me. The potential environmental problems that rest on future generations will have to be dealt very soon. It imperative to educate the youth about the importance of appreciating the environment so that further harm is reduced, or slowly eliminated. During this internship I aimed to accomplish this, as well as educate myself further about Southwest ecosystems and the problems facing its continued existence. While shadowing, helping with, and ultimately guiding a fieldtrip, I discovered and identified processes which are effective in increasing understanding among people regarding the environment in which we live. Active involvement of the students and hands on experiences were used to engage them and encourage higher retention rates. The use of the five senses was promoted to further aid in active experience and cultivating a consciousness to the natural surroundings. Through a set curriculum and interactive learning, I was able to convey the importance of promoting healthy biotic interactions that help to uphold healthy, functioning ecosystems to children and adults alike.

Drehobl, Emma  
**Faculty mentor:** William Culbertson

**Session I, 9:00am-11:00am, 43C**

**Title: Articulation Progress in Children with Combined Repaired Maxillofacial Abnormalities.**

In the field of maxillofacial abnormalities, researchers believe that there are four cited areas of communication that commonly affect children with maxillofacial abnormalities. The four areas that include resonance, articulation, voice, and expressive language. The area I would like to research further is the most frequent articulation errors that occur after the maxillofacial abnormality is repaired. The children chosen for the study will be between the ages of five and ten with a repaired maxillofacial abnormality. The purpose of the project is to gain understanding of articulation progress in two different children with maxillofacial abnormalities. A student clinician will perform an oral mechanism examination to assess the child's physical condition and function of the mouth and its related structures. The student clinician will ask the child to complete a verbal articulation test, which consists of ten sentences. The verbal articulation test will be recorded on a digital audio recorder and only will be heard by the lead investigator, Emma Drehobl and the faculty supporter, Dr. William Culbertson. Next the child will engage in a conversation lab with the Lead Investigator, Emma Drehobl and the graduate student. The conversation lab will be recorded and a group of five graduate students chosen at random will transcribe the digital audio recording and give their results directly to the Lead Investigator, Emma Drehobl. This session will only occur once and will not exceed 60 minutes. The participant will be provided with frequent breaks to allow for optimal performance and the decrease the onset of fatigue.

Dunn, Paul  
**Faculty mentor:** Becky Butcher

**Session II, 2:00pm-4:00pm, 115A**

**Title: Facing Parkinson's Disease: An interdisciplinary approach to returning quality of life to those effected and their care-givers**

Parkinson's disease is a chronic degenerating disease which is prevalent among the elderly. It causes a decline in quality of life for those diagnosed along with their caregivers and family. While Parkinson's is an incurable disease, it is imperative to preserve quality for life for those affected by this disease. Parkinson's has many symptoms which
cannot be addressed with a singular approach or treatment option. Therefore, an interdisciplinary approach regarding what the best comprehensive treatment approaches is needed. Physical symptoms are at the heart of the disease but psychological effects such as depression are also an important aspect of the disease. In a health care system often managed by specialists it can be observed that not one specialist can return quality of life to the affected as well as a combined and comprehensive treatment approach. It will prove beneficial to patients and their caregivers to have an interdisciplinary approach to treatments which takes into account all aspects of the disease and how to best restore the quality of life which they are entitled.

Dunning, Kourtney  
**Faculty mentor:** Julie Moreau, Sanjam Ahluwalia

Session II, 2:00pm-4:00pm, 91B  
**Title:** Discovering Trans*Erasure in the Historiography of Stonewall  
Discovering Transgender erasure within the historiography of Stonewall. Using a queer studies framework to be critical of the agnotology and presentism of language in queer identifiers throughout history.

Dutchover, Alyssa  
Sydney Olson  
**Faculty mentor:** Phoebe Morgan

Session I, 9:00am-11:00am, 85C  
**Title:** Introducing Flagstaff Justice Court Staff to Alternative Dispute Resolution (ADR)  
This poster will be created by two CCJ majors in order to illustrate the fulfillment of a senior capstone project for CCJ 480: Alternative Dispute Resolution. The project involved interviewing court personnel from the Flagstaff Justice Court to determine their knowledge on Alternative Dispute Resolution (ADR). Despite the increased use of ADR within the courts people still have little to no knowledge of it. This includes those working within the courts themselves. After conducting informational interviews with court personnel of the Flagstaff Justice Court it was discovered that they possessed very little knowledge about what ADR is and what kind of options their court offered. Using the information gathered from interviewing the Court Administration Alternative Dispute Resolution Coordinator of Coconino County a needs assessment will be conducted to determine what information is needed to bring the court staff up to speed on what is going on and to provide them with knowledge about ADR in general as well within the Flagstaff Justice Court. A PowerPoint presentation will be created and given to the court staff and those who are in attendance will be given COJET (Committee on Judicial Education and Training) hours, employees are required to have sixteen hours of training per year of employment. Educating the court staff about ADR gives them more knowledge of the subject so that if a person were to ask them about ADR then they have an understanding of it and what is offered so they may better serve the public with said knowledge.

DuVal, Hiba  
Ann Futterman Collier  
**Faculty mentor:** Ann Futterman Collier

Session I, 9:00am-11:00am, 101A  
**Title:** Theater Well-Being  
The main purpose of this study is to explore if regular involvement in community or professional theater, i.e. three to seven days a week, is associated with overall life satisfaction and well-being. The researchers would also like to determine if theater involvement influences depression and positive mood repair. The sample includes people living in Arizona and surrounding states that were associated with community and professional theaters. Participants completed an online questionnaire that asked about depression, well-being, life satisfaction, flow, mood repair, among other measures. Data will be analyzed with both SPSS and Nvivo 10 for qualitative analysis.

Dyer, Annie  
Tad Theimer  
**Faculty mentor:** Tad Theimer
Session II, 2:00pm-4:00pm, 13C

Title: Is there anything a skunk won't eat?: Potential for Rabies Transfer via Scavenging of Dead Bats

In the United States, vaccination programs have essentially eliminated rabies in domestic animals, but rabies remains abundant in wildlife. The rabies virus is typically transferred via a bite from an infected animal. Laboratory studies have demonstrated the potential for rabies transfer via consumption of a dead, infected animal, but no field studies have shown the ecological potential for this route of transfer. In Flagstaff, Arizona, a rabies virus variant (RABVV) associated with bats has appeared in skunks, foxes and domestic cats on three separate occasions (2001, 2005 and 2009) with each case an independent transmission from bats to mesocarnivores (medium-sized carnivores). Our experiment was designed to determine the potential for wild animals to scavenge dead bats, and thereby the ecological potential for this route of rabies transmission. Our hypothesis was that there was ecological potential for rabies transmission via consumption of bat carrion but that it likely varied among different scavengers. We placed one rabies-free mouse carcass and one rabies-free bat carcass at 20 locations in and around Flagstaff and monitored for 5 days using trail cameras. Skunks took bats 36 times out of 38 approaches, while grey fox took bats once out of 12 approaches. Results supported our hypothesis that there is ecological potential for rabies transmission via consumption of bat carrion but this potential is much greater in striped skunks than foxes. Efforts to limit skunk and bats access to shared den sites through home and outbuilding modification could reduce the potential for rabies transmission via this route.

Dyer, Chelsea

Faculty mentor: Natalie Cawood

Session II, 2:00pm-4:00pm, 82B

Title: Planned Behavior Change: Cutting back on fast food meals

I chose eating fast food multiple times a week as a behavior that I would like to change within myself. I set my goal, decided that I was capable of this goal if I really tried and worked hard for it, and identified some steps and I would take to make the change that I desire. I then developed a measurement tool to track my efforts to change how often I eat fast food over time. I will present the results of this effort at changing my behavior and I will discuss how this assignment will impact my future social work practice.

Eder, Tyler

Faculty mentor: Christine Lemley

Morning, 9:45am-10:00am, Skydome Stage E

Title: The Shifting Navajo Nation

I'm interested in learning how Navajo culture is shifting or morphing with the influx of technologies like social media and the internet. I will be interviewing Navajo students who are being raised in this tech era and compare their experiences to known cultural phenomenons documented by research on Navajo culture comprised in the 20th century. I plan to then comprise my research into a Prezi presentation for the Symposium.

Elrod, Jessica

Kellie Jones

Faculty mentor: Walter Vannette

Session I, 9:00am-11:00am, 72C

Title: The Role of NAGPRA in Applied Archaeology

This poster will summarize the creation of the Native American Grave Protection and Repatriation Act (NAGPRA) and the role it plays in archaeology, especially Cultural Resource Management. It was also detail the process of NAGPRA, who is affected and the how it effects archaeologists. We will also look at the short-comings of NAGPRA and look at ways that it can be improved.

Ensley, Nathan


Faculty mentor: Bryan Cooperrider, Dianne McDonnell, Robin Tuchscherer
Session II, 2:00pm-4:00pm, 11A

Title: Preventing Cattle Disease: A Lesoit, Tanzania Project

Cattle are among the most prized possessions to the Maasai people of Lesoit, Tanzania. Rapid deforestation and lack of access to current treatment practices have made the cattles' health worse in recent years. The main source of cattle disease has been caused by disease carrying vectors. The current standard in rural Tanzania is to herd the cattle to a neighboring village where the cattle are then passed through what is known as a cattle dipping vat, which is a chemical bath that coats cattle with chemicals that target the tick. During summer 2015 representatives from Northern Arizona University will travel to Lesoit to conduct an assessment trip to assess the soil parameters and water quality in Lesoit. These representatives will determine if the village should construct a cattle dip or if an alternative solution would be more beneficial.

Ensley, Nathan


Faculty mentor: Bryan Cooperrider, Dianne McDonnell, Dr. Robin Tuchscherer

Morning, 10:45am-11:10am, duBois Southwest Room

Title: Preventing Cattle Disease: A Lesoit, Tanzania Project

Cattle are among the most prized possessions to the Maasai people of Lesoit, Tanzania. Rapid deforestation and lack of access to current treatment practices have made the cattles' health worse in recent years. The main source of cattle disease has been caused by disease carrying vectors. The current standard in rural Tanzania is to herd the cattle to a neighboring village where the cattle are then passed through what is known as a cattle dipping vat, which is a chemical bath that coats cattle with chemicals that target the tick. During summer 2015 representatives from Northern Arizona University will travel to Lesoit to conduct an assessment trip to assess the soil parameters and water quality in Lesoit. These representatives will determine if the village should construct a cattle dip or if an alternative solution would be more beneficial.

Erickson, Garrett

Faculty mentor: Abe Springer

Session II, 2:00pm-4:00pm, 23D

Title: Flow Relations of the Hoxworth Springs

Groundwater in the Lake Mary Watershed is the primary source of drinking water for the town of Flagstaff. Many streams in this watershed are ephemeral, and often fail to terminate in a body of standing water, such as Lake Mary. The nature of infiltration of these ephemeral streams over highly faulted rocks is not well documented. The Hoxworth Springs are perennial springs with an ephemeral reach within the Lake Mary watershed. Analysis of extensive precipitation, surface flow, and ground water level data in the Hoxworth Springs watershed has shed light on the nature of how ephemeral flows contribute to the groundwater supply. This project also creates a baseline of how precipitation and surface flow impact ground water levels. Future studies can use this baseline to analyze the hydrologic effects of forest restoration that is to take place in the Hoxworth Springs region over the next two decades.

Etzkorn, James

Faculty mentor: Emily Howard

Afternoon, 3:20pm-3:40pm, Skydome Stage A

Title: Gray Wolf Conservation

This research is meant to further understand the biopolitics of wolf conservation in the United States and how the management of this species is effected by the various uses of public and private lands. My intentions are to explain the the positive and negative associations between wolf conservation efforts and the expansion of public and private lands in and around designated recovery areas.

Evenson, Shelby

Faculty mentor: Marie Baker-Ohler
Session II, 2:00pm-4:00pm, 78B

Title: *Being For and Being With: Acknowledgment Expectancies of Grieving*

Everyone experiences death at one point in their life and therefore must grieve. There are many ways in which people grieve. Some people like to grieve independently and others wish to grieve with a group of people, i.e. friends and/or family. There are certain expectations that are made in the process of grieving: Being With, acknowledging, and providing a space for the Other. However, some people do not like to grieve with people and prefer to be alone. When a person chooses this path a grieving, there can be turmoil with the family. The family can place guilt on the other if they chose not to be with them. Here is where the argument comes in: you do not have to be With to be For. For example, people can grieve independently but still have the acknowledgement that the other is also going through grief. We can be For the other by acknowledging their time and space. Most people do not understand this concept and in turn, delivers my problem. The communicative approach comes from Levinas and Heidegger’s view on Being With and Being For. There is a difference between the two metaphors and the two philosophers have made it known that one is better than the other. The goal is to prove that Being With and Being For can be brought together for the benefit of the other in times of grief.

Fader, Zachary  
Michael Isbell, Kiisa Nishikawa, Cinnamon Pace  
*Faculty mentor:* Kiisa Nishikawa, Cinnamon Pace

Session II, 2:00pm-4:00pm, 112D

Title: *Joint angles and jump variation between wildtype and mutant mouse mdm genotypes*

Jumping is a locomotor behavior used by many organisms, including mice that can help us elucidate how muscles work. Animals performing vertical jumps are thought to utilize the elastic components of titin to store and recover strain energy and increase jump height. Mice with muscular dystrophy myositis (MDM) have a deletion in the N2A region of their titin protein and exhibit different active and passive in vitro muscle properties when compared to wildtype mice. MDM mice have also been shown to have lower jumping performance than wildtype (WT) mice, but the limb kinematics of jumping are unknown. It is also unknown how jump kinematics in MDM and WT mice vary with increased jump performance. Jump performance can be measured by arial distance traveled which can then be scaled to a percentage of total body length for comparison to other individual jumps. Jumping kinematics can be summarized by the extension velocity of the lower limb joints which is calculated from the range in joint angle per second of extension. Therefore, The goal of this project is to determine whether MDM genotypes differ in their joint angles from WT mice over a range of jump heights. MDM and WT mice were filmed performing voluntary jumps using a high-speed digital imaging system. Locations of the mouse hind limb were digitized and metatarsal, ankle, and knee joint angles were calculated. For both genotypes the ankle had the largest excursion. For WT, the metatarsal joint usually had a larger excursion than the knee; whereas, the mutant showed the opposite pattern. Additionally, WT mice exhibited a greater range of movement in both the metatarsal and knee joints. These kinematic differences may exist due to the deletion of titin in the N2A region in MDM mice. If so, the decrease in jump performance is evidence of the winding filament hypothesis (Nishikawa et al., 2011). By combining different kinds of whole animal locomotion studies, such as jumping, with our muscle lever studies, we will broaden our understanding on how titin contributes to muscle function and movement.

Farley, Amber  
*Faculty mentor:* Chris Lantermann

Session I, 9:00am-11:00am, 51B

Title: *How Loneliness Impacts the Lives of Individuals with an Intellectual Disability*

Have you ever wondered how loneliness affects the lives of individuals with an intellectual disability? Have you ever wondered what stigmatizes these individuals as they try to move forward in life? The obtainable research in How Loneliness Impacts the Lives of Individuals with an Intellectual Disability takes an in-depth look into the trials and challenges of what loneliness is, and what it does to individuals with an Intellectual disability. Two interviews with two woman are present within the research. The first interview takes place with a woman named Carrie. Carrie is a thirty-year old woman who has an intellectual disability. Carrie wants a job so that she can support herself financially. In the research paper, Carrie recalls how life was like for her in school, and how she felt when she was learning to understand the emotions of others as well as her own emotions. In reference to Carrie's story, Caroline is forty-seven...
years old and she wants to see changes along with having her life improved by the limits that exists in the factory she worked at for individuals with disabilities. All of Caroline's co-workers have disabilities that varies; Caroline copes with the reality that individuals that resembles her have little to no leadership roles within her workplace. Other useful topics that are accessible in the research paper includes, how loneliness effects an individual's social identity, how school relates to one's own experiences of being lonely, the impacts of loneliness on one's health, and a conclusion that ties the whole research together along with the two interviews use to bring life into the research paper. The research in the paper is supported with valid and reliable scholarly essay's that creates a foundation of what loneliness is, and how it pertains to individuals with an intellectual disability. In the articles I used for my research paper, I discovered that a student who goes to a school where communication plays an important role inside and outside of the classroom will have a higher chance of not being lonely in comparison to a student who is offered little to no chance of communicating within a classroom or social setting. In addition, I found that individuals with an intellectual disability compare themselves unfavorably to others. This causes them to feel emotionally distressed. In the Beart article, the author suggests that some individuals with an intellectual disability face health issues that stems from a lack of interaction between themselves and others.

Farron, John  
**Faculty mentor:** Michael Vasquez  

**Session I, 9:00am-11:00am, 73C**  
**Title: Military Identity in Kurdistan**  
This poster aims to examine how the various military groups of Kurdistan have shaped the nation's identity. Groups like the YPG and the YPJ are an integral part of Kurdish life, and have come to represent the struggle of reaching national recognition.

Faus, Robb  
**Faculty mentor:** Thomas Paradis  

**Session II, 2:00pm-4:00pm, 89B**  
**Title: Economic and Environmental Impacts of the Slide Fire, 2014**  
Wildfire in Northern Arizona is an integral component of forest ecology. Recently, wildfires have become increasingly devastating to the environment in the southwest, burn hotter and consume more acreage than ever before. This change in volatility has presented land managers with new challenges in suppression, mitigation and rehabilitation. Factors including climate change and aggressive fire suppression techniques have led to current fuel load conditions that are susceptible for large, catastrophic fires that are extremely destructive to the environment and economically affect the surrounding communities. Fuel treatment techniques are being employed to slow the rate of spread and create defensible space around municipalities that are in the path of potentially high-intensity wildfires. This wildland urban interface is gradually being buffered by fuel reduction projects that include thinning, timber sales and prescribed burns. However, challenges still exist, as can be seen in Oak Creek Canyon and the Slide Fire of 2014. Associated costs of wildfires include the destruction of natural resources, diminished recreational opportunities and economic loss to businesses. This study will examine the various environmental and economic impacts caused by the Slide Fire of 2014 and the current mitigation strategies designed to protect communities from wildfire events with the goal of reinforcing the necessity for optimal land management stewardship.

Fawcett, Rebecca  
**Faculty mentor:** Chris Lanterman  

**Session II, 2:00pm-4:00pm, 51C**  
**Title: Is all transition planning successful?**  
Individual Transition Plans are meant to help people who have disabilities. Transition planning is a process that brings together a student and those individuals directly involved in helping the student prepare to enter a post-school environment. They help people transition from high school to which ever life scenario they choose. The question is, how successful will the person be once the plan is no longer implemented? If the person is not successful or independent, what does that do to their quality of life? By interviewing people who have disabilities, we can figure out if a change needs to happen to their Individual Transition Plan. This way we can further assist in improving their
quality of life. For this research quality of life is defined by looking at adaptive behavior skills. Adaptive Behavior is 
the age-appropriate behaviors necessary for people to live independently and to function safely and appropriately in 
daily life. Adaptive behaviors include real life skills such as grooming, dressing, safety, safe food handling, school 
rules, ability to work, money management, cleaning, making friends, social skills, and personal responsibility. Quality 
of life will also be defined by asking the individual if they are happy with their current living situation, relationships 
with others and their own overall happiness.

**Felton, Joseph**  
Emily Haworth, Scott Judge  
**Faculty mentor:** Ted Martinez

**Session II, 2:00pm-4:00pm, 111D**  
**Title: Reconciling with Nature**  
This poster will present and expand on the benefits that reconciliation ecology, in conjunction with other forms of 
conservation, brings to natural landscapes and human communities. While preservation of designated protected 
landscapes offer conservation, reconciliation ecology allows for conservation regardless of location. Not only that, but 
it offers an engaging and cohesive relationship between nature and humans because of the focus on interaction between 
the two. The poster will also outline the possible negative implications, for both humans and nature, which may result 
from this form of ecology being ignored. Reconciliation ecology and restoration promotes biodiversity within an 
ecosystem and the welfare of nature itself.

**Ferguson, Sierra**  
Nadine Barlow  
**Faculty mentor:** Nadine Barlow

**Session II, 2:00pm-4:00pm, 21B**  
**Title: Search for Central Pit Craters on Saturn's Icy Moons**  
Central pit craters are craters with central depressions that are thought to form either by the melting and draining of 
subsurface ice during the crater formation process or by the collapse of a weak subsurface layer or central peak. 
Finding these craters on the Moon and Mercury have brought into question the role that water plays in central pit 
formation. This project looks at the smallest bodies on three of Saturn's icy moons where central pit craters are found to 
constrain the role of gravity in pit formation. We identified 12 pit craters on Rhea and Dione and 13 on Tethys. We 
find that pit diameter increases with the diameter of the main crater. We see a higher pit to crater diameter ratio on 
these three bodies than on Mars and Rhea and Dione have a value above that of Ganymede. We also find that there are 
fewer central pits on these low gravity bodies. The sizes of bodies that can have central pit craters are relatively small 
and they all have a high concentration of subsurface water ice. These results are consistent with the melt drainage 
model of central pit formation in that a larger water content and low surface gravity is conducive to central pit 
formation.

**Finden, Alexander**  
Michael Minicozzi, Alice Gibb  
**Faculty mentor:** Michael Minicozzi, Alice Gibb

**Session I, 9:00am-11:00am, 15B**  
**Title: Does the morphology of the vertebral elements influence escape response timing and displacement in bony 
fishes?**  
Many teleosts respond to a negative stimuli using an escape mechanism called a C-start. During this behavior, they curl 
the entire body laterally into a C-shape (stage 1) then, using stored elastic energy and muscular contractions, swing the 
tail across the midline and accelerate away from the stimulus (stage 2). In some individuals, the time it takes to 
complete the C-start is shorter and the resulting net displacement is greater, which will increase the likelihood of 
escaping potential predators. We predicted that the following aspects of vertebral column morphology influence C-start 
performance: (1) longer vertebral (neural and hemal) spines store more elastic energy when bent and (2) decreased 
vertebral spine angle (the angle between a given spine and the vertebral column) will increase the effective spine 
length, which will also enhance elastic energy storage. We hypothesized that longer spines and shallower spine angles
are associated with improved timing of the C-start behavior (i.e., shorter stage 1 & 2 durations) and greater net displacement. To test this hypothesis, we analyzed the C-starts of multiple individuals of Gambusia affinis using high-speed cinematography, then cleared and double-stained each individual and measured vertebral spine lengths and angles with ImageJ. Our preliminary analysis suggests that there are no significant correlations between vertebral element morphology and C-start performance. In fact, several spines actually show a weak positive association between spine length and stage durations, which is the opposite of our initial prediction. Future studies analyzing additional G. affinis individuals and sister species will determine if a larger amount of variation in vertebral morphology is associated with observed variation in escape response performance.

Fisher, Melissa  
Faculty mentor: Mindy Bell

Morning, 10:06am-10:18am, duBois Meadows Room

Title: Developing BioScience Education Enrichment Kits for Educators in Flagstaff, AZ

This report describes and presents my internship experience with STEM City Central located in Flagstaff, Arizona. The objective was to implement several programs that assist local educators in applying environmental science and biology concepts into their curriculum. Tasks included assembling and organizing the proper materials and instructions for several BioScience Education Enrichment Kits (BioSEEK), environmental science soil testing kits, and water quality testing kits. A marketing system was developed through various sources of social media and newsletters. Afterwards, they were to be made available to teachers in the community that requested them. These tasks were accomplished and furthered with an online scheduling system put in place, constant maintenance of returned kits, and the development of a teacher and student feedback system. In the future, the continued development of this project would require raising additional awareness of the availability of the different kits. Scheduling can interfere with the rate at which kits were used and the quality of the experience teachers and students received. Proceeding to alter the scheduling system may result in a more quality experience. In the future, this internship project could be furthered and continued with another intern.

Fisher, Nicholas  
Faculty mentor: Elizabeth Hulen

Session I, 9:00am-11:00am, 62B

Title: Inhospitality: Do the Homeless Need Rescuing from Missions?

According to the CDC, health begins at home (2009); however, 527 individuals in Flagstaff reported contending with homelessness in 2014 (Flagstaff Shelter Services 2015). Perhaps unsurprisingly, the National Health Care for the Homeless Council reports that homeless individuals experience illnesses such as chronic bronchitis, diabetes, hypertension, and stroke at significantly higher rates than other populations (2011). Homelessness is one of many social determinants of health that we observe and work to address as Health Partners, and it is one that we consider to be primarily significant. Unfortunately, this barrier to health is not easily surmounted as Section 8 subsidized housing requires an unrealistic waiting period (City of Flagstaff 2015) and transitional housing is sparse. The most accessible resource available is temporary housing in the form of homeless shelters; however, in our capacity as health advocates, we have heard complaints concerning theft of personal possessions, deteriorating health and exacerbation of pre-existing conditions, and even abusive staff within these shelters. The purpose of this poster is to outline a proposed research project into the conditions of Flagstaff shelters, and to discuss the role that poor temporary housing environments can have as barriers to health. The research method that we will propose is the Rapid Assessment, Response and Evaluation (RARE).

Fisher, Nicholas  
Faculty mentor: Walter Vannette

Session II, 2:00pm-4:00pm, 62B

Title: The Neo-colonial Menu: The Colonization of your Grocery List

Corporate colonialism, according to Francis Thicke of the University of Iowa’s Public Policy Center, is the paradigm of exploitation employed by corporations in order to exploit the resources, labor, and/or capital of other peoples or
territories in a manner characterized by negative reciprocity (Thicke 2003). Turned inwards, internal corporate colonialism is the same exploitation of peoples who reside outside of the locality of the corporation, as exemplified by corporate chains. Structural violence, as defined by Paul Farmer, 'is one way of describing social arrangements that put individuals and populations in harm's way; (Farmer 2006)' these factors operate at a macro, or structural, level to affect the micro, or personal, agent. There are many factors that influence health in a negative capacity in the United States in general and Northern Arizona in specific; I am particularly interested in health inequities that arise from and are maintained by institutional structures. In this poster, I will define the agricultural and fast food industries as colonial institutions and discuss their structurally violent roles in Northern Arizona.

Fitzgerald, Kaitlin
Richmond Barkemeyer, Michelle Chavez, Zachary Klinefelter, Angela Milkie
Faculty mentor: Ann Huffman

Session II, 2:00pm-4:00pm, 92D
Title: An Examination of the Transferability of Military Experience to Civilian Job Success
In recent years, the popular press has touted the benefits of hiring veterans stating that veterans gain many skills and abilities that are desired by future employees. Even sources beyond the popular press have taken notice of these benefits. A recent report by the Institute for Veterans and Military Families at Syracuse University (2012) provided ten research informed propositions concerning characteristics that veterans can bring to the workplace. Some of these characteristics included entrepreneurship, advanced technical training, resiliency, and team building. A review of the literature revealed no empirical studies that examined whether the skills and abilities gained from the military translate directly to job performance in the civilian sector. The purpose of the proposed research is to empirically examine the link between military service and civilian job performance. Providing evidence of the benefits of military experience would further assist veterans’ success in the civilian job market.

Fleming, Sara
Faculty mentor: Britton Shepardson

Session I, 9:00am-11:00am, 65B
Title: The Prehistory of Death and the Afterlife
The project will be a professional poster including information on the beliefs of prehistoric populations. The specific focus of the project is going to be their beliefs on death and the afterlife, how different populations' beliefs were similar or different, and also what factors played into their reasoning when it came to their beliefs.

Flores, Carolina
Faculty mentor: Natalie Cawood

Session II, 2:00pm-4:00pm, 82C
Title: Behavior change: shopping/ spending
I chose shopping/ spending as a behavior that I want to change. I set a few goals for my self for my behavior to change. The first thing I did was to identify the steps I would take to make the change. The second thing I did was to develop a measurement tool to track how I was doing in changing my shopping/ spending over time. I will also be talking about the struggles to overcome my bad habit and what worked and what did not. I will present the results of my effort at changing my behavior and I will discuss how this assignment will impact my future in my social work practice.

Flores, Jenny
Faculty mentor: Marie Baker-Ohler

Session I, 9:00am-11:00am, 78C
Title: Being Superwoman: Negotiating Identities and the Good Life in the Post Modern Era
In this post modern world there has been a shift with women taking on multiple roles and giving up the 'simple life.' With juggling everything from their careers, school, family, relationships among other tasks, women have found it
difficult to balance everything in their lives, find their identity, and what makes them happy. This research will provide a perspective as to what makes the good life in this western post modern world for women.

Ford, Elizabeth
Faculty mentor: Frederick Lampe
Session II, 2:00pm-4:00pm, 63D
Title: Environmental Anthropology
We will be looking different environmental issues that are faced by different people, including those in Papua New Guinea. These issues include such as climate change and the population issues. There are many issues associated with this such as agriculture practices and adaptation. These issues are studied through an approach that help to contribute to the global environmental problems.

Fowler, Emily
Faculty mentor: Michael Vasquez
Session II, 2:00pm-4:00pm, 73C
Title: Traditional Maya Medical Practices, Ethnobotany, and Western Medicine
This poster explores, through visual and textual representations, traditional Mayan medical practices and how they may be incorporated with Western methods to create a holistic practice. The research used to create this presentation comes from the ethnographic tale of Sastun by Rosita Arvigo and interviews with experts in the fields of ethnobotany and Maya medicine. Rainforest plants are a vital portion of Mayan traditions and my research seeks to find how this may be useful in all medical practices. Julian Steward's theory of Cultural Ecology is used to explain the development of Mayan medical practices and the dependence on rainforest flora. The purpose of this poster is to shed light on a broader approach to medicine and hopefully inspire a desire to learn more about natural healing.

Fox, Amanda
Faculty mentor: Frederick Lampe
Session I, 2:00pm-4:00pm, 79A
Title: Behavior Change, can we stop the addiction to technology
For my behavioral change project I will be to tracking how many times a day me and 7 friends check our phone, and then ask each participant to see if they can cut back on their own phone use. The desired outcome will be for not only me but also the participants to see how much we use our phone on the daily basics and see if we can cut back on unnecessary phone use.

Fox, Tim
Faculty mentor: Erika Nowak, William Parker, Cathy Lash
Session I, 9:00am-11:00am, 14A
Title: Reconstruction of a Caiman Skeleton
Animal anatomy and physiology are commonly studied topics in biology throughout the world. A useful method of learning vertebrate anatomy is observing articulated skeletons of animals. These skeletons provide a useful way of educating students that charts and diagrams cannot recreate. Kinesthetic education techniques can help integrate more
opportunities for learning into a classroom, museum, or other educational environment. However, many skeletons of exotic animals are hard to obtain, and even if they are available, they require cleaning and a mounting structure so that students and the public can enjoy them. The Northern Arizona University Herpetology Collections acquired a deceased caiman (Caiman sp.) through a donation from the Phoenix Herpetological Society, and we are preparing this individual's skeleton for use in university biology classes. Building on initial preparation completed by members of the 2013 Herpetology class, we have finalized cleaned and bleached the bones, and are finalizing mounting the skeleton for display. We worked with paleontologists at the Petrified National Forest National Park who were knowledgeable with the anatomy of crocodilians to identify disarticulated bones. The mounting process will be completed with the use of wiring and glue, and a mounting board to give the skeleton support and create a life-like posture. Our project has provided valuable insight into how skeleton cleaning and preparation is conducted, with the aim of helping future educators provide skeletal material to use as a teaching aid.

Franklin, James  
Ryan Hogans  
**Faculty mentor:** Nathan Nieto

**Session II, 2:00pm-4:00pm, 15C**

**Title:** Ectoparasitism and vector-borne pathogens in Northern Arizona predator-prey cycles: epizootiological risk to reintroduced black-footed ferrets

The black-footed ferret (Mustela nigripes) exists in a small focal population in the Aubrey Valley region of Northern Arizona and is a classic example of an endangered species brought to near extinction by epizootic events. The ecology of the reintroduced ferret population provides numerous opportunities for understanding the emergence of vector-borne diseases in sylvatic cycles. The black-footed ferret shares habitat and close contact with the black-tailed prairie dog (Cynomys ludovicianus) and other small mammals that are hosts to zoonotic pathogens. Our study utilized molecular genetic techniques for the detection and analysis of pathogens within arthropod vectors (ticks, Ixodidae) found on the black-footed ferret. We worked in collaboration with the Arizona Game and Fish Department to collect a total of 279 ectoparasites from the 39 individual ferrets. We identified the ectoparasites and found two different species of tick (Ixodes kingi and I. sculptus) and three flea species (Diamanus montanus, Echidnophaga gallinacea, and Hoplopsyllus affinis). We detected a tick-borne relapsing fever spirochete in 12 of the ticks and subsequently confirmed using genetic sequencing that the ticks were infected with the pathogenic spirochete *Borrelia miyamotoi*. The presence of *Borrelia miyamotoi* at endemic levels in the Aubrey Valley is a concern for the endangered black-footed ferret population due to the generalist nature of the spirochete. *Borrelia miyamotoi* is an addition to the list of other zoonotic pathogens endemic to Northern Arizona.

Friedmann, Jill  
Lauri Budzinski  
**Faculty mentor:** Cynthia Childrey

**Session II, 2:00pm-4:00pm, 1B**

**Title:** Refill at Cline Library: Water Bottle Fill Stations and Reducing Waste

In response to student appeals Cline Library requested funding in the amount of $38,508.66 to install ten combination water bottle fill station-water fountains from the NAU Green Fund. The project, which became a partnership with the Green Fund and Facility Services will include installation of new bottle fill stations throughout the library; behavior change promotion to increase the use of reusable water bottles; ongoing statistical analysis to determine the effectiveness of the bottle fill stations; and significant environmental cost savings to users and the university. Each bottle fill station has the potential to eliminate up to 20,000 single use water bottles from landfills per water filter annually. We anticipate that number to be higher depending on the number of water bottles filled at each station. Last year the library logged over 500,000 people through its doors. In addition, we expect the fill station next to the assembly hall will see the most use, as 2,000 students a week pass by this location. If half of those individuals visiting the library, 250,000+ fill their water bottles at the new fill stations then we will be replacing filters in the fill stations more frequently and off-setting 200,000+ single use water bottles annually. As a result of student demand, the NAU President's energy initiatives, and the library's current efforts to achieve LEED certification as an existing building, this project will continue to advance efforts to promote environmental awareness, energy efficiency, and behavior change on campus.
Froyum, Joshua  
**Faculty mentor:** Jani Ingram, Andee Lister

**Session I, 9:00am-11:00am, 26C**

**Title: Statistical Analysis of Uranium Exposure of Sheep Near Abandoned Mines**

For Navajo, sheep are a crucial part of a larger societal system because sheep are deeply intertwined in tradition, culture, and staple food item during ceremonies. The purpose of this study is to quantitate uranium exposure and accumulation in sheep grazing near abandon uranium mines on the Navajo Nation and to illustrate the statistical reproducibility of the uranium content in sheep meat and soft tissues. Due to the absence of a regulated level of uranium in sheep, exposed sheep to uranium near the mine sites will be compared to a control group that grazes in areas that were not mined. Five sheep organs, specifically the heart were collected from Cameron, AZ and Leupp, AZ, totaling 10 samples. The samples were sliced thinly, dried, powdered, and digested with acids to determine the amount of uranium. Trace metal analysis was conducted with an inductively coupled plasma mass spectrometer (ICP-MS). A preliminary study was conducted by our research group, examining one sheep and one lamb from the Cameron, and one sheep from the Leupp. The preliminary study illustrated that the sheep from Cameron had significantly higher levels of uranium than the sheep from Leupp. The current study will expand on the preliminary study to fulfill a request made from the community members of Cameron to study the sheep for uranium.

Fujikado, Lane  
Mark Thompson, Sarah Kehoe, Mohammad Al-Otaibi  
**Faculty mentor:** Eckard Doerry, Mandy Hansen, Lilliane Palm

**Session I, 9:00am-11:00am, 10D**

**Title: Planifi: Itinerary Creation Web Application**

Planifi is a sophisticated web application to streamline scheduling of event itineraries, ranging from one-day events involving just a few participants to multi-day events involving dozens of coordinated contributors. Examples include conferences, delegation visits to a campus or company, or even large weddings. An itinerary normally spans multiple days and is made of many discrete but coordinated events, each of which may include multiple participants or presenters. The application helps coordinate scheduling and coordinating these events by sending out invitations to users and receiving input as to what their most convenient time to attend an event is. The application is a solution to the woes of manually planning an itinerary: calling people, emailing, manually editing and making changes as well as sending reminders. The application is dynamic and makes edits in real time so users can always be up-to-date on the most recent itinerary.

Fujikado, Lane  
Mark Thompson, Sarah Kehoe, Mohammad Al-Otaibi  
**Faculty mentor:** Eckard Doerry, Mandy Hansen, Lilliane Palm

**Afternoon, 2:55pm-3:20pm, duBois Festival Room**

**Title: Planifi: Itinerary Creation Web Application**

Planifi is a sophisticated web application to streamline scheduling of event itineraries, ranging from one-day events involving just a few participants to multi-day events involving dozens of coordinated contributors. Examples include conferences, delegation visits to a campus or company, or even large weddings. An itinerary normally spans multiple days and is made of many discrete but coordinated events, each of which may include multiple participants or presenters. The application helps coordinate scheduling and coordinating these events by sending out invitations to users and receiving input as to what their most convenient time to attend an event is. The application is a solution to the woes of manually planning an itinerary: calling people, emailing, manually editing and making changes as well as sending reminders. The application is dynamic and makes edits in real time so users can always be up-to-date on the most recent itinerary.

Fuller, Ellie  
Gabe Hernandez, Chris Studey, Jordan Althouse  
**Faculty mentor:** Cassandra Dakan
Afternoon, 1:15pm-2:00pm, Skydome Stage D

Title: Self Portrait of America: Preserving Opportunity

In the long history of social movements in the United States, people have not only fought to right wrongs, but to preserve things of value. Panelists will present the fight for women's rights as expressed through art and language, the ongoing fight for music education, and the fight to protect natural beauty. Activists in these causes preserve opportunity and access for all.

Gagnon, Jályn

Faculty mentor: Michael Vasquez

Session I, 9:00am-11:00am, 73D

Title: What is the impact of globalization on the environment?

Globalization has been studied and much debated in recent years to determine its advantages and disadvantages. Some argue that globalization helps create new opportunities, ideas, and markets. Others say that globalization is damaging or weakening local communities, small economies, and the environment. After researching and discussing the topic, I can see merit on both sides. From a financial perspective or economic standpoint, globalization has changed the world for the better, for some. Globalization has increased free trade, and is helping create new opportunities, ideas, and markets. These positive features have resulted in the growth of export-oriented companies, and new markets and lines of communication. On the other side, globalization has made it easier for large companies to grow even larger and get richer. This has resulted in monopolies dominated by large companies focused only on maximizing their own profits, disregarding cultural, environmental, and societal effects. Human needs of individual countries and local populations are not taken into consideration. Profits are generated and markets expanded at the cost of natural resources. I plan to address the negative outcomes globalization has had on the environment. I will present growing research that provides evidence that, while it has lead to new innovations in science and technology, corporate globalization is causing the destruction and depletion of valuable natural resources and cultures.
Galbreath, Kristina
Robert Kellar, Aaron Tabor
Faculty mentor: Robert Kellar, Aaron Tabor

Session II, 2:00pm-4:00pm, 16D

Title: Development of an In Vitro (Bench-top) Assay to Evaluate the Effects of Reactive Oxygen Species on Fibroblast Cultures

Reactive oxygen species (ROS) are normally produced in cellular metabolism. High levels of ROS can be detrimental to cellular functions and thus, it is necessary for ROS scavengers to neutralize the harmful environment. Today, these ROS scavengers have gained attention in the form of antioxidants found in common foods consumed in the average diet to help lower the effects of free radicals in the body. In this study, an in vitro assay was developed to demonstrate the effects of harmful ROS on fibroblasts. A 0.5mM hydrogen peroxide treatment acted as a ROS agent and was introduced to a fourth passage human neo-natal dermal fibroblasts (hDFn) cellular line. The hDFn cells were also treated with a proline derivative, Prolisel, to analyze its possible ROS scavenging effects. Prolisel may have future clinical implications acting as a ROS therapy.

Garcia, Alexandra
Faculty mentor: John Grahame

Afternoon, 3:42pm-3:54pm, duBois Room A

Title: Rerouting the Rio de Flag: Effects on the Flagstaff Community

Friends of Rio de Flag (FoRio) is a non-profit organization located in Flagstaff, Arizona. Their mission is to promote the Rio de Flag's natural stream system as a unique and valuable natural resource, an asset, and amenity to the City of Flagstaff and the surrounding community. FoRio sponsors monthly membership meetings that are open to the public, usually featuring a speaker on a topic of interest to members such as water quality, watershed health, or springs restoration. FoRio was interested in knowing how to get the word out to the community about its events and increasing meeting attendance. I examined attendance, pre-event publicity, and targeted emails and found that attendance at these events varied, even with relatively constant outreach efforts. In order to refine and develop FoRio's outreach strategy, I conducted a survey a large public event held in conjunction with another larger non-profit. The survey determined that targeted emails and community calendar listings in the Arizona Daily Sun newspaper were the most effective in attracting people to their events. It also determined 60+ was the main age demographic of the people in attendance. This information was provided to FoRio and recommendations were offered as to how to use it to improve their outreach efforts. Increased attendance at monthly meetings and community events would give this small but mighty group more clout and an opportunity to create a lasting difference on the Flagstaff community.

Garcia, Alexandra
Matthew Belus, Heather Aaron, Megan Starostecki
Faculty mentor: Angie Moline, Nick Koressel

Morning, 9:30am-9:55am, Skydome Roundtable R1

Title: NAU Green Office Certification: Collective Efforts for Waste Reduction

In 2007, under President John Haeger, NAU joined the ranks of over 600 other universities that have made the pledge to the American College and University Presidents' Climate Commitment. This pledge initiated the Sustainability Action plan, which outlines strategies for NAU to become carbon neutral by 2020. The current action plan outlines different avenues for achieving a more sustainable campus through the concerted effort by students, faculty, and staff. Specifically, the recycling and waste minimization section aims to reduce campus waste and consumption. Here, we show that the Green Office Certification (GOC) program effectively promotes efficient, sustainable, and collective efforts for offices to contribute to carbon neutrality. The GOC initiative is currently practiced in 75% of NAU's offices and departments. Office sustainability is guided by an Energy Mentor to facilitate a reduction in environmental impact. In order for all NAU offices to achieve certification a user-friendly checklist of criteria and supervision from an Energy Mentor is imperative. The GOC is a widespread program that spans many different institutions across America. We reviewed the criteria, checklist format, and implementation process of programs at other universities. We found commonalities in these programs that fulfill NAU's commitment to environmental stewardship. We determined the best interface for offices to catalog their concerted actions is through an Excel spreadsheet that can then be submitted to the
Office of Sustainability. We also completed a dry run of the program with a few offices on campus and recorded their problems and recommendations. These improvements to the Green Office Certification program will ensure the transferability of this program to all offices at NAU.

Garcia, Jocelyn  
Alison Adams  
**Faculty mentor:** Alison Adams

**Session I, 9:00am-11:00am, 16B**

**Title: A comparison of student performance and experiences in a traditional versus 'flipped' classroom (BIO 240)**

Two sections of Genetics and Evolution (BIO240) were taught by one instructor, one through a 'flipped' approach, and the other through a traditional lecture format. Students in the two sections were randomly assigned. Both sections were provided with identical lecture materials, in-class problem sets, in-class assessments, and extra-credit opportunities; the main difference was in the way the lecture material was delivered - online for the flipped section and in-person for the traditional section - and in the amount of time therefore spent in the classroom on problem sets. Analysis of final grades and other objective measures revealed that there was no difference between the success of students in the two sections. An anonymous end-of-semester survey showed no significant difference between the two sections in perceived usefulness of the various class resources, amount of time spent on these resources, or interest in the subject matter. There was, however, a significant difference between the two sections in student preferences for the flipped versus traditional format: 89% of students in the traditional section said they preferred traditional in-class lectures, whereas only 42% of students in the flipped section (who had therefore had experience with the flipped format) said they preferred the traditional approach.

Garcia, Jocelyn  
Liza Holeski  
**Faculty mentor:** Liza Holeski

**Session II, 2:00pm-4:00pm, 16B**

**Title: Effects of Mimulus guttatus physical and chemical defense traits on a generalist and specialist herbivore**

Plant and herbivore interactions are regarded by many as the world's dominant species interaction. The importance of herbivory can be attributed to the fact that it is the channel of energy transfer from autotrophic plants through the rest of the food chain. The purpose of this study is to see how constitutive defense traits affect insect herbivores in a model plant species (Mimulus guttatus). The two herbivores used in this experiment are the generalist caterpillar, Spodoptera exigua and the specialist caterpillar, Junonia coenia. The experiment consists of feeding trails and analysis of caterpillar fitness in relation to plant defenses. We will assess physical defenses (trichomes and leaf toughness) and chemical defenses (phenylpropanoid glycosides). Caterpillar fitness will be determined by weighing its dry mass. We expect to see a decline in fitness of the insects with increasing levels of plant defenses. For example, we expect to see the generalist herbivores to be more affected by chemical defenses due to the specificity of a certain chemical to a plant species. On the other hand, the specialist herbivores should be more affected by physical traits due to a lack of variation in its natural diet and lower incidences of exposure to these defenses. Studying the effects of plant defenses on herbivores is useful in understanding the evolution of plants and insects. Keeping the natural balance of plant and herbivores interaction is crucial to the ensuring the balance of the universal food chain.

Garcia, Nicholas  
Mary Begay, Brett Booen, Calvin Boothe, James Ellis  
**Faculty mentor:** Srinivas Kosaraju

**Session I, 9:00am-11:00am, 2C**

**Title: Horizontal Test Stand Rotation Mechanism**

Orbital ATK has a Launch Vehicle Design and Manufacturing facility, located in Chandler, AZ, which is responsible for conducting tests on the payload fairing to ensure the designs will tolerate the dynamic loads experienced during launch. Loading simulation is conducted on the company's test stand in a horizontal rather than a vertical position. This requires the two halves of the clamshell fairing to be mounted one at a time, rotating the test stand to a stable position once each half is loaded. Mounting of the two pieces is a time-consuming and delicate process due to the use
of an overhead crane which doubles as a brake to prevent the mounting ring from freely rotating. This system puts the technicians and engineers around at risk in the event the crane fails. Orbital ATK has asked our capstone team to design, build, and integrate a system to automate the test stand reducing set-up time and increasing the safety of its employees. The team came up with a design in the form of two wheels driven by electric motors mounted to the interior of the test stand. These wheels work in tandem to rotate the test ring at no more than 1 rpm in unloaded, partially loaded, and fully loaded regimes. The prototype is fabricated out of aluminum at NAU machine shop. It will be installed on the test stand at Orbital's facility for final testing before being put into operation.

Garcia, Nicholas
Mary Begay, Brett Booen, Calvin Boothe, James Ellis
Faculty mentor: Srinivas Kosaraju

Afternoon, 3:20pm-3:45pm, duBois Fremont Room
Title: Horizontal Test Stand Rotation Mechanism
Orbital ATK has a Launch Vehicle Design and Manufacturing facility, located in Chandler, AZ, which is responsible for conducting tests on the payload fairing to ensure the designs will tolerate the dynamic loads experienced during launch. Loading simulation is conducted on the company's test stand in a horizontal rather than a vertical position. This requires the two halves of the clamshell fairing to be mounted one at a time, rotating the test stand to a stable position once each half is loaded. Mounting of the two pieces is a time-consuming and delicate process due to the use of an overhead crane which doubles as a brake to prevent the mounting ring from freely rotating. This system puts the technicians and engineers around at risk in the event the crane fails. Orbital ATK has asked our capstone team to design, build, and integrate a system to automate the test stand reducing set-up time and increasing the safety of its employees. The team came up with a design in the form of two wheels driven by electric motors mounted to the interior of the test stand. These wheels work in tandem to rotate the test ring at no more than 1 rpm in unloaded, partially loaded, and fully loaded regimes. The prototype is fabricated out of aluminum at NAU machine shop. It will be installed on the test stand at Orbital's facility for final testing before being put into operation.

Gardner, Chelsey
Kylie Suter
Faculty mentor: Trina Spencer

Session II, 2:00pm-4:00pm, 88D
Title: Explicit Vocabulary Instruction Embedded in Narrative Language Intervention
A major challenge facing US educators is the high percentage of students with reading difficulties. Reading comprehension is the product of both decoding and language comprehension. Two of the strongest components of language comprehension are vocabulary and narrative skills. Given that reading comprehension is related to both vocabulary and narrative skills, it is reasonable that preventative reading comprehension intervention includes narratives as well as vocabulary. The purpose of this study was two fold. The first purpose was to examine the effect of vocabulary instruction on multiple sets of vocabulary targets. The second purpose was to examine participants’ improvements on the narrative and inferential word learning measures. A mixed-method design was used to investigate the effect of explicit vocabulary instruction embedded in narrative intervention, including a repeated acquisition design with the 11 students receiving the treatment and a small-scale randomized control group design with 22 students in treatment and control groups. Participants were first grade students with limited language skills. The students in the control group received typical instruction from their teachers and students in the treatment group received a small group narrative intervention with explicit focus on less common vocabulary words four days a week for 30-minutes across 12 weeks. Results of the repeated acquisition design indicate that the intervention was responsible for weekly improvements in defining vocabulary words. Statistically significant differences between the treatment and control groups were observed at post-test on both narrative retelling \[t(20) = 3.62, p > .001, d = 1.54\] and inferential word learning measures \[t(20) = 2.77, p = .01, d = 1.18\].

Garner, Martha
Teresa Martza, Cassandra Bizon
Faculty mentor: Gregory Busath, Matthew Anderson

Session I, 9:00am-11:00am, 98B
**Title: Interpersonal Attraction and Gender Identity**

Feelings of attraction are universal within the human experience. Prior research shows both similarities and differences between ratings of attraction between men and women; however, research that includes non-binary identified genders appears to be a gap in the literature of this field. Thus, the purpose of this project was to compare the interpersonal attraction ratings across all gender identities. Researchers used an online questionnaire to have participants rate the importance of various personality and physical traits in their preferred partner gender. Participants were undergraduate students at the university. The three hypotheses were that there would be differences between all groups, that men rate physical traits as the most important, and that women rate personality traits as the most important. Researchers used two Factorial ANOVAs to compare means between all groups in the importance of both physical and personality traits. Results are reported on our poster.

**Garver, Nicholas**  
Nicole Lavigne, Kyle Brandt, Gilbert Hays  
**Faculty mentor:** Nicole Bies-Hernandez, Matthew Anderson

**Session II, 2:00pm-4:00pm, 96C**

**Title: Qualities in Short-term and Long-term Relationships**

As humans, we strive to find long-lasting and meaningful relationships. As increasing numbers of people attend college, short-term relationships have become a necessary and prevalent action. This research is exploring differences in the preferences of qualities in short-term and long-term relationships. Five qualities were given to rank for the participants: intelligence, loyalty, looks, health, and self-esteem. Two vignettes were provided as well in order to acquire data for the insight of differences.

**Gastreich, Annaliese**  
Jadwa Alsulami, November Alvarado, Revan Dawood  
**Faculty mentor:** Tricia Moore, Ivan Pacheco

**Session I, 9:00am-11:00am, 41D**

**Title: The Public's Perception of the Dental Team's Preparations and Responsibilities**

The goal of the research was to understand the public's knowledge and attitudes pertaining to the education, licensing requirements, and responsibilities for various members of the dental team. Questionnaires were distributed to 100 adults in downtown Flagstaff, AZ. The questionnaire consisted of 11 closed-ended questions related to preferences, and knowledge about duties and work requirements pertaining to the dentist, dental hygienist and dental assistant. The results show that the general public has a lack of knowledge pertaining to the requirements to practice and the legal responsibilities of some dental team members. Most knew the requirements and responsibilities of the dentist. The tendency was for participants to underestimate the dental hygienists' scope of practice, required education and certification while overestimating the education required to work as a dental assistant.

**Geier, Ryan**  
**Faculty mentor:** Robert Kellar, Robert Diller

**Session I, 9:00am-11:00am, 16D**

**Title: Mechanical Characterization of Freshly Excised and Decellularized Murine Integument**

Medical products that are developed for end clinical use first must pass rigorous in vitro (bench top) and in vivo (pre-clinical) testing before human clinical trials can be conducted. Therefore, the desire exists to more appropriately develop in vitro test methods and conditions that can help screen prototypes or provide indications on how prototypes may function in living systems. In the case of developing novel biomaterial scaffolds as skin replacements (for wound healing applications), determining the mechanical properties of the skin can provide design inputs for the bioengineering of a suitable architectural replacement. In the current study, the mechanical properties of mouse skin were evaluated and characterized using a newly designed and built uniaxial tense test measuring device. Freshly excised and decellularized murine dermis was tested and the tensile strength, peak strain, and elastic modulus values were determined. These data will allow for mechanical design inputs to be established for the development of replacement (bioengineered) skin scaffolds that match the mechanical characteristics of native skin. The ability for 'mechanical
matching' of targeted diseased or damaged tissues affords scientists the opportunity to more appropriately design replacement bioengineered substitutes such as skin replacements for wound healing applications.

Gentile, Vincent  
Faculty mentor: Francis Smiley

Session I, 9:00am-11:00am, 70B  
**Title: The Mediterranean Hal-Farrug: A Maltese Agricultural Society and the Archaeological Record**

The poster represents a visual and textual examination of the material record of the ethnographically known Farrugin society of Malta in the Mediterranean Sea. Archaeologists can learn a great deal about ancient agricultural villages and societies by closely examining the material records of living societies. The people of Farrug, Malta are a state level society that is still very much agricultural. However, the traditional lifestyles of rural Maltese villages, such as Farrug, are being threatened by a desire to gain prestige through occupations more profitable than agriculture, such as industrial jobs in the city. The people of Farrug have permanent buildings made of limestone, strong kinship ties, and are strongly associated with Catholicism. While many of the material correlates of Farrugin society are perishable, I predict that the archaeological record will be full of examples of Farrugin and Maltese society. The purpose of the presentation is to set out a model of the kinds of material cultural items produced by Farrugin and Maltese society given the social, organizational, and cultural factors involved. The poster also presents examples of archaeological research on similar societies to compare the archaeological record with the ethnographic record.

Gentile, Vincent  
Faculty mentor: Walter Vannette

Session II, 2:00pm-4:00pm, 70B  
**Title: Archaeological Preservation: The Importance of Protecting the Archaeological Record in Danger Prone Areas**

The poster represents a visual and textual examination of several important archaeological sites in danger of disrepair or destruction. Archaeologists and future generations can learn a great deal about ancient societies through remains of settlements, and as technology advances there may yet be more to learn from the sites in danger. It is important to not forget where we come from, and many of the world's sites which are in danger represent the things we hold dear today, such as the alphabet, democracy, literature, and architecture. However, it is not simply a matter of throwing money at programs to block off areas in order to prevent further damage. The communities and societies living near ancient sites as well as those involved in preservation programs, need to both be involved. Convincing people to be involved in their history to prevent further destruction of sites is an important step in ensuring these aspects of humanities history survive for future generations. Other areas are in danger due to political conflicts, such as those belonging to the Mesopotamian cultures in the Middle East, and they present problems of their own. The purpose of the presentation is to set out a model for preventing important archaeological sites from further damage. The poster also presents information as to why the sites being used as examples are important to the archaeological record.

Genung, Jennifer  
Faculty mentor: Glenn Hansen

Session I, 9:00am-11:00am, 108A  
**Title: Psychology of Color in Disney Films**

The poster will be looking at how different colors effect emotions. Different scenes from Disney features will be used as examples.

Gergus, Kristina  
Faculty mentor: Marie Baker-Ohler

Session II, 2:00pm-4:00pm, 78C  
**Title: Transcending Marginalization: Granting Hope through Acknowledgement**
Cultivation theory provides a framework for the effects created when one watches television shows. The more one watches television, the more likely their viewpoints will change to mirror those of the program which is being observed. Media has played a key role in marginalizing groups of people by portraying them in a manner that is not realistic, which creates the illusion that one must be as portrayed. The transgender community is one population that has experienced marginalization through the manner in which they have been depicted by the media. Marginalization creates the feeling of despair, isolation, and low self-worth, decreasing one’s quality of life. This despair leads one to feel as if there is no place for him or her in the surrounding world, which leads to social death. This research argues, with the use of positive acknowledgment, marginalization can be overcome, creating hope in those who were previously hopeless. It is the desire of every human to be acknowledged in a positive manner, to be granted a sense of belonging, and to matter. A sense of worth provides the hope needed for an everyday existence, overcoming isolation and reinforcing the importance of belonging and acceptance.

Geroulis, Tony  
**Faculty mentor:** Britton Shepardson

**Session II, 2:00pm-4:00pm, 65B**

**Title: The Archaeology of Music**

Music has emerged as one of the most common forms of art in contemporary society. Just about everyone uses music in some way, whether it be listening to it, writing it, or performing it. In order to understand a greater appreciation for music, it is important to examine the roots of music and study its archaeology. Music is believed to have originated from ancient cultures such as Israel, Mexico, and China. By tracing the roots of music from different places, it allows the understanding of different techniques that are still seen in modified forms today.

Gersbach, Alyssa  
**Faculty mentor:** Christine Lemley

**Session I, 9:00am-11:00am, 50B**

**Title: LGBTQ Coming Out**

My project involves COH. I am going to be interviewing two people in the LGBTQ community about their coming out stories. I want to hear how their relationships with their friends and family are and how their friends and family support them.

Gibson, Arthur  
**Faculty mentor:** Glenn Hansen

**Session I, 9:00am-11:00am, 108B**

**Title: Disney's Game of Monopoly**

This project would expand on how the Walt Disney Corporation controls different companies and entertainment and whether the Disney Corporation could be considered a monopoly or part of an oligarchy.

Gillooly, Stephanie  
Giovanna Picarella, Ashley Baker  
**Faculty mentor:** Jay Sutcliffe

**Session I, 9:00am-11:00am, 46D**

**Title: Flagstaff Fun Fitness at the Boys & Girls Club**

This project focused on implementing an intervention with children ages 8-17 at the Boys and Girls Club of Flagstaff. The purpose was to improve their physical fitness on a daily basis and educate them on healthy eating habits in an effort to improve their overall health and quality of life in the future. Program activities focused on fun ways to get the children active through interactive physical games, and were also able to provide them with the opportunity to get hands-on cooking experience making healthy snacks. In this project, the Health Belief Model was implemented to address what boundaries the children faced when it came to eating healthy. Discussions with the members were centered on why they were eating unhealthy, if they perceived their foods as being unhealthy, and how they could
change their eating habits in the future. Meetings at the Boys and Girls club were held every Thursday during a four week period in October and November of 2014 from 3:30 - 5:30pm and included a general meeting with the members, followed by a physical activity and then the snack in the community kitchen.

Gilmore, Alex  
**Faculty mentor:** Zheka Belooussov  
**Afternoon, 2:54pm-3:06pm, duBois Room A**  
**Title: SkyHi!, an All Natural Microgreen Producer**  
The objective for this internship was to learn natural growing practices and the workings of a small business growing and selling micro greens. This was achieved by working with Sky Hi!, a small company based out of Sedona, Az. Sky Hi! is run out of a 2400sq. ft. green house with a 600 sq.ft outdoor space for composting. The work was done under the supervision of Zheka Belooussov who is the founder and owner of Sky Hi! The goals when starting this internship were to gain knowledge about natural growing practices, business operations, and health benefits of micro greens. This included composting techniques, air/water quality, operating a greenhouse, seed quality, sales, distribution, nutrient content, and overall health benefits of the plants. Duties working for Sky Hi! included, planting, watering, composting, harvesting, distribution, planning for future orders and documenting sales information. After completing this internship, all of these goals were achieved by learning natural growing practices and the logistics side of running a small business. During the time spent working with Zheka at Sky Hi!, most of the effort was put in to improving the functionality of the growing process and the operations of the company as a whole. Recommendations for SkyHi! would be to become better organized in all aspects of the business and to put more effort into advertisement.

Giraldo, Angelica  
**Faculty mentor:** Natalie Cawood  
**Session I, 9:00am-11:00am, 84D**  
**Title: Behavior Change: Lower Stress Levels**  
I chose stress reduction as a behavior that I wanted to change. I set a goal, assessed my capacity for change, and identified the steps I would take to make the change. I then developed a measurement tool to track my efforts to change my stress levels over time. I will present the results of this effort at changing my behavior and I will discuss how this assignment will impact my future social work practice.

Girard, Cailey  
**Faculty mentor:** Britton Shepardson  
**Session I, 9:00am-11:00am, 65C**  
**Title: The Archaeological Evolution of Music**  
Music has become a basis for emotional expression and ritual performance. This research is meant to show how music and musical instruments have evolved from their first appearance in history to present times. This research is also meant to show how music has come to mean to humans what it currently does today and what it supposedly meant to archeaic humans, so in a sense we can get a better understanding of one of the biggest influences in human history.

Girard, Mikaela  
**Faculty mentor:** Francis Smiley  
**Session II, 2:00pm-4:00pm, 70C**  
**Title: The Maasai of East Africa: The Material Culture and Archaeological Correlates of a Herding Society**  
The poster presents a visual examination of material culture in the Maasai society focusing on subsistence strategies and gender roles in comparison with similar archaeological societies. The Maasai live in the savannah of East Africa in communities known as kraals. The Maasai do not hunt or participate in agriculture but instead live off of the milk of the cattle in their herds. Cattle herding is the Maasai’s main source of wealth and sustenance. Archaeologists can glean a great amount of information from examining the material correlates of small scale herding societies. Although the Maasai produce items such a spears and swords as well as beadwork, I predict that not many items will survive in the
archaeological record. The purpose of the presentation is to give a model of the kinds of material culture herding societies produce and give information on other cultural factors that govern the operation of that type of society.

Glessing, Melanie
Elizabeth Olson, Emmett Tsosie
Faculty mentor: Robert Sanford

Session I, 9:00am-11:00am, 8C
Title: Feeding the Birds: A Feeder Watch Project

Northern Arizona University's population has significantly grown over the past few years. The changes due to this rise in population are easily identifiable across the campus, from new infrastructure to increased traffic on streets and sidewalks. Our group sought to find ways that this might have affected the wildlife nearby. Over the past semester we have worked to record the number of birds sighted at a specific location on campus in order to learn about the bird species and numbers depending on the time of day and weather. We achieved this by joining Project FeederWatch - The Cornell Lab of Ornithology, a national citizen science project seeking to record bird populations across the United States. Our group received permission to put a feeder at the Students for Sustainable Living and Urban Gardening (SSLUG) Garden on south campus and each of us picked a day of the week to monitor the feeder independently in order to increase the likelihood of seeing different birds. After several weeks of monitoring, we compared our data with information from other Feeder Watch participants in Arizona during 2005 and 2010. Preliminary research indicates that the same bird species frequently visit the same locations as in previous years. These species include the pygmy nuthatch, American crow, dark-eyed junco, steller's jay, and red-tailed hawk. Based on our results thus far our group has seen significantly less dark-eyed juncos than in previous years. However, this project is ongoing, and further research is still needed.

Glynn, Trevor
Faculty mentor: Christopher Calvo, Matthew Johnson

Morning, 10:06am-10:18am, duBois Room A
Title: Southwest Riparian Habitat and Tamarisk Leaf Beetle Introduction

The tamarisk leaf beetle was recently introduced to the American Southwest as a bio-control for the tamarisk, or saltcedar. The focus of this study was to establish a baseline of the insect community present on the tamarisk trees across the Colorado Plateau, particularly in areas host to endangered species, the Southwestern Willow Flycatcher for example. This baseline builds understanding of the function of an ecosystem that faces rapid and immediate change from a newly introduced species, in conjunction with this, collected data was shared with the Tamarisk Coalition to map the spread of tamarisk leaf beetles. Data was collected using manual sweeps for insects along transects, GPS points, and through the use of pheromone traps. The results of this study show that tamarisk leaf beetles are not yet uniformly dispersed through the Colorado Plateau. Results from this study and others show that there is a observable difference in habitat structure between areas where the beetle has colonized, and those it has yet to reach. Future studies could focus on areas where the tamarisk leaf beetle is beginning to colonize as they are eligible for restoration efforts both to return the riparian zone to native habitat, and to provide temporally continuous habitat for sensitive species that utilize the area.

Godoy, Juliana
Faculty mentor: Becky Butcher, Lizeth Zepeda

Session I, 9:00am-11:00am, 118D
Title: The Preservation of Historical Archives, Manuscripts and Special Collections

As a society it is important that we educate ourselves about our historical past. In order for our society to become accepting of other cultures, we have to be able to learn about their historical past including their customs and traditions. History is typically passed down from generation to generation. In some cultures, stories are passed down orally from one family member to the next, but many of these stories are lost because they are not recorded and saved. In order to retain our history, we have to be able to collect and preserve significant historical archives as educational tools. If there are no institutions preserving our historical past, then as a society we run the risk of losing our ability to understand and accept other cultures. Preserving our history is important because it needs to be made available to
future generations. This project seeks to determine the complexities and processes of archival preservation and answer the following question: How will the preservation and dissemination of historical archives contribute to future generations in the Southwestern United States? The information collected will primarily focus on the Latino community; it will look into how Latino culture is being preserved and how their stories are being communicated to the public. This project will provide details on how historical archives are preserved, in other words, how they are taken care of, stored, and how they are presented to the public at large.

**Goetzke-Rux, Kaylen**  
**Faculty mentor:** Britton Shepardson

**Session II, 2:00pm-4:00pm, 65C**  
**Title: The Prehistory of Animal Domestication**

The prehistory of animal domestication will be categorized and placed in chronological order based on evidence found in archaeological sites, the location of the sites, the species of animal, and how domestication changed the course of life for humans. The culture of those who occupied the sites discussed will be included, demonstrating the change in lifestyle from hunting and gathering to taking care of and breeding animals for specific purposes, whether it is for food, tools, or clothes.

**Goff, Justin**  
Justin Johnson, Tobias Martinez, Nikolas Rabyada  
**Faculty mentor:** Eric Yordy

**Session II, 2:00pm-4:00pm, 28A**  
**Title: Wendy’s v. DavCo**

This project addresses a current legal suit in which a franchisor and franchisee disagree as per the restaurant refurbishment and point-of-sale system implementation obligations. These original obligations are claimed to have been overwitten by subsequent development agreements. This project examines the Common Law issues of Statute of Frauds, Whose Meaning Prevails, and the Parol Evidence Rule which will almost certainly arise as this case progresses.

**Goldfarb, Robin**  
**Faculty mentor:** Natalie Cawood

**Session I, 9:00am-11:00am, 82D**  
**Title: Overcoming the Imbalance of my World**

A few behaviors I have recently wanted to work on are organization, time to ponder my thoughts, and my overall balance of life. I have set intentions to begin this journey in order to grasp the intentions I wish to execute. I have developed methods and tools to be able to track my progress. These areas I have set out to work on may seem like goals that are far-fetched, but I feel that now is the best time to begin. Achievements such as these are efforts I always plan to work on because there is always more room to grow and new obstacles to overcome. I will present the results of my efforts at changing my behavior and discuss how this could impact my future in social work practices.

**Goldman, Maeghan**  
**Faculty mentor:** Frederick Lampe

**Session I, 9:00am-11:00am, 63A**  
**Title: The Correlation of Religion and Witchcraft in Africa**

African Aboriginal traditions remain steadfast in various tribes all across the African nation. During the colonization of different states, missionaries rooted themselves into the lives of families, embedding in them the faith of Christianity. Although the newly found belief in God altered many families perception of living, it is the ancestral traditions that take hold when an unbalance becomes present within a community, and with that, the superstitions of witches and witchcraft. The growth of Christianity in Africa can be seen as a result of people seeking refugee from the prevalent fears of witchcraft. It can be argued whether witchcraft is a religion or a superstition; nonetheless, people hold strong
beliefs in the practice of witchcraft and the power it is alleged to have over the success or misfortune of an individual. The action of bewitching is believed to bring about harm or hardship in someone's life. There is a balance that upholds communities; this is altered when something or someone has been troubled, sick or misfortuned. When this occurs people seek out a reason or cause to this misfortune. The assumption usually involves witchcraft and people seek out a diviner or a prophet to solve the problem that has come about. The Aboriginal belief and practice of witchcraft has widespread implications for it is commonly used for personal, financial, and political gain. There is an evident difference between the various actions and behaviors witchcraft and religion bring about. The belief in either witchcraft, religion or possibly both will never cease to exist for they are major influences bringing about good and bad fortune and most importantly instilling faith in the people.

Golightly, Sean
Faculty mentor: Francis Smiley

Session II, 2:00pm-4:00pm, 70D
Title: Simple Subsistence: Material Correlates of the Washo Lifestyle
The poster presents a visual and textual examination of material culture that correlates to the subsistence strategies of the ethnographically known Washo people of California and Nevada. Archaeologists can learn much about prehistoric societies by examining the material culture of living societies. The Washo in particular, because of their simple technology, make excellent analogs for the study of prehistoric peoples of the Great Basin. Centered around the Lake Tahoe area, the Washo traverse mountain and basin environments, where they extract numerous floral and faunal resources with minimal technology. Fishing, hunting, and gathering, is all achieved with tools handmade from organic resources. The Washo have no metallurgy, ceramics, and minimal preservation. They rely on heavily on naturally existing shelter and make small, temporary shelters. For these reasons, their lifestyle may closely reflect much older peoples. The purpose of this poster will be to provide an example, based on the Washo, of the types of materials and sites one might look for if intending to research other hunter gatherers, or peoples of similar societal organization, in basin or mountain environments of the North American West.

Gonzalez, Alejandro
Johnelle Hoskie, Stephenie Nechvatal, Taylor Brown
Faculty mentor: Linda Paul

Session I, 9:00am-11:00am, 48B
Title: Reducing sleep disturbances in the hospital setting to promote healing
Sleep is a condition where the body and mind are relatively inactive for several hours. Little is known about why we sleep, but we do know it's essential for a healthy state of mind and body. Hospitals are settings known to provide patients with care and improve well-being. We aim to explore how hospital settings can affect the sleep patterns of patients and their health. Environmental stimuli such as noises, lighting, and frequent care from the nurses all have been shown to interfere with patients' sleep. Research has shown that when sleep is disturbed and poor sleep patterns continue, patients are at greater risk for infection, complications, and death. We are interested in sleep care guidelines for noise and light reduction to improve patients' sleep during their hospital stay. Using a number of studies, it is shown that reducing the volume from monitors, rearranging medical treatment and nursing care to be delivered before 11pm, as well as modifying other sources of noise have improved patients' sleep patterns. By identifying the causes for disturbed sleep in the hospital environment, we hope to improve patients' sleep and promote patient care education in the future.

Gonzalez, Joseangel
Faculty mentor: William Cordeiro

Session I, 9:00am-11:00am, 105C
Title: Breaking Racism: Analysis of Portrayal of Minorities in Breaking Bad
This project will address the portrayal of minority characters, specifically Latino characters in the television series, Breaking Bad. These characters tend to be depicted as either lesser and insignificant background characters or malignant entities bent on the downfall of certain protagonists. My analysis will delve into the implications of such portrayal and possibly its effects on certain audience demographics.
Gonzalez-Gomez, Ana  
Faculty mentor: Erika Hess

Afternoon, 2:00pm-2:12pm, Skydome Stage A

Title: Immigration, identity, and inequality for Maghrébins in France

This project researchers the role of immigrants from North Africa, or 'le Maghréb', who are now living in France. Pulling from research on the history of North Africa, I begin with a brief survey of the history of Morocco, Tunisia, and Algeria during the period when they were French colonies or protectorates. I provide analysis on how this history relates to the current politics of these countries, as well as France's policies concerning them. This provides a background from which to discuss the current perspectives of North Africans, or 'immigres Maghrébins', in France. My research from then on consists of a mix of scholarly articles, books, newspaper articles, and world news videos from which I will examine the perspectives and opinions not only of French citizens but also of the immigrants themselves; especially as concerns their status in France and how they identify themselves ethnically and culturally. Within these perspectives, I will discuss the issues that are created for the Maghrébins in France, as well as efforts that have been made to either weaken or strengthen the xenophobia and islamophobia currently present in French society. Special focus will be given to the role of women in the discussion of the different perspectives of North African immigrants in France since their struggle concerning discrimination and identity is unique. By discussing the inequality existing for Maghrébins in France, I hope to be able to provoke thought about how these issues have created an environment of xenophobia in many parts of the world, including the U.S., that leads to great inequality for immigrants.

Goodwin, Andrea  
Faculty mentor: Becky Butcher

Session I, 9:00am-11:00am, 11B

Title: Preventing wrong-way car accidents in Arizona

For my topic I have chosen to focus on wrong way car accidents in Arizona. In my recent internship of heavy highway construction I have seen how this issue has affected people all over our state and feel something has to be done to fix this problem, people should not have to lose their lives because someone carelessly drove in the wrong direction. In my proposal I will show statistics and some precautions that have been enforced to help minimize this problem, then finally I will share my opinion as to what should be done to prevent wrong way car accidents.

Goodyke, Siara  
Faculty mentor: Britton Shepardson

Session I, 9:00am-11:00am, 65D

Title: archaeology of weapons and warfare

This project will show the different tools people used for hunting, and fighting. I will be explaining the evolution of the materials, how they were used, and there effectiveness.

Grafstrom, Rebecca  
Ann Futterman Collier  
Faculty mentor: Ann Collier

Session I, 9:00am-11:00am, 99B

Title: Emotion Inducing Event Recollection and its Effect on Human Compassion

The present study examined how human compassion is impacted by the recollection of moments of anger and awe. Compassion can be identified as 'the emotional response when perceiving suffering and involves an authentic desire to help' (Seppala, 2013). Awe is an emotion that is evoked by a rare and commonly life changing experience such as a breathtaking view from the top of a mountain, giving birth to a child, or the devastation caused by a tragic event (Keltner & Haidt, 2003). The participants were undergraduate students at Northern Arizona University from Psychology classes. Participants were assigned to one of two conditions (awe recall or anger recall) and after completing an online survey in which they wrote about a time in which they experienced awe or anger. They were then
asked about a situation regarding a student in need and how they would respond to that situation. We predicted that participants in the awe recall condition would show greater compassion by assisting the student in need due to their awe emotion and that those in the anger condition will show the least amount of compassion due to the recollection of a negative event. The qualitative data will be analyzed using SPSS.

Granchelli, Kyle  
Duke Ayers, Ryan Dooley, Kristopher Bullins, Jarrin Oishi  
**Faculty mentor:** Patricia Kopf, Omar Badreldin, Ron Jones

**Session I, 9:00am-11:00am, 1C**

**Title: Flexible Maintenance Calendar**

Scheduling of clinical staff and patients in the Imaging Department at Flagstaff Medical Centre is a complex and time consuming task. Currently, a staff member is tasked with managing the schedule of staff members and is responsible for coordinating patient flow and staff shift assignments. Even a small change to the schedule requires significant work in coordinating and approving the change, as the process is paper-based and involves maintaining consistency across an array of documents. As a result, clinician time is consumed in administrative tasks, leaving less time for patient care. More importantly, the department is unable to generate periodic reports on scheduling concerns regarding individual employees. Our project was developed in close collaboration with the Imaging Department and is aimed at developing an automated scheduling management solution. The system facilitates the creation and management of shifts, including change notifications and approvals. The system enables all staff members to see current schedule information, and enables the team to be proactive in the face of patient flow fluctuation. For example, the system enables two staff members to swap shifts, without introducing any overhead to the Department Head. In addition, the system enables the department head to manage vacation requests, and to easily generate reports.

Granchelli, Kyle  
Duke Ayers, Ryan Dooley, Kristopher Bullins, Jarrin Oishi  
**Faculty mentor:** Patricia Kopf, Omar Badreldin, Ron Jones

**Afternoon, 1:30pm-1:55pm, duBois Festival Room**

**Title: Flexible Maintenance Calendar**

Scheduling of clinical staff and patients in the Imaging Department at Flagstaff Medical Centre is a complex and time consuming task. Currently, a staff member is tasked with managing the schedule of staff members and is responsible for coordinating patient flow and staff shift assignments. Even a small change to the schedule requires significant work in coordinating and approving the change, as the process is paper-based and involves maintaining consistency across an array of documents. As a result, clinician time is consumed in administrative tasks, leaving less time for patient care. More importantly, the department is unable to generate periodic reports on scheduling concerns regarding individual employees. Our project was developed in close collaboration with the Imaging Department and is aimed at developing an automated scheduling management solution. The system facilitates the creation and management of shifts, including change notifications and approvals. The system enables all staff members to see current schedule information, and enables the team to be proactive in the face of patient flow fluctuation. For example, the system enables two staff members to swap shifts, without introducing any overhead to the Department Head. In addition, the system enables the department head to manage vacation requests, and to easily generate reports.

Gray, Elena  
**Faculty mentor:** Britton Shepardson

**Session II, 2:00pm-4:00pm, 65D**

**Title: Archeology of music**

My project will be professional poster that demonstrates how that particular topic evolved over time and space in human prehistory. I will illustrate both similarities and differences over time and across space. My project will identify at least 5 different times & places.

Gray, Kaylynne  
Andrew Walters
Faculty mentor: Andrew Walters

Session I, 9:00am-11:00am, 103C

**Title: Developing a Positive Transgender Identity: A Qualitative Study of Identity Development**

Although in recent years there has been an increase in the study of sexuality as it relates to individuals who identify as a sexual minority, gender identity still remains underexplored, except as it relates to pathology and risk. Regarding individuals who identify as non-binary (including but not limited to transgender, genderqueer, and trans*), literature focuses mainly on transgender attitudes toward medical or mental health treatment. The present study seeks to better understand and represent the perspectives of non-binary gender identity through the sharing of self-identified individuals’ stories. Participants were interviewed about their gender identity throughout development and their experiences throughout establishing their identity.

Greene, Shauna
Zane Holditch

Faculty mentor: Stephen Shuster, Kayla Ochoa,

Session II, 2:00pm-4:00pm, 14D

**Title: Revisting Sperm Limitation in Parasitic Wasps**

Living animals reproduce in an extraordinary number of different ways. A species of parasitic wasp, Nasonia vitripennis, reproduces in a way that sons are produced without sperm whereas daughters require fertilization of eggs to be produced. Previous research on reproduction in N. vitripennis has only examined populations of wasps that can freely interact and mate with one another. In our study, we investigated this species in terms of several monogamous pairings, where wasps mate with a single partner for a controlled period of time. At this level, we were able to develop a controlled system where sperm availability, mate choice, and the time a female spends with a host were examined. These variables were investigated for their effect on the ratio of male and female offspring. Our results show that, over time, sperm is a limiting factor for offspring sex ratios. This contradicts traditional views that predict an equal number of male and female offspring. Our future research will continue to look at sperm as the primary factor that influences offspring sex ratio.

Gregg, Alison

Faculty mentor: Britton Shepardson

Session I, 9:00am-11:00am, 66A

**Title: The Prehistory of Food and Nutrition**

My project will be all about the prehistory of food and nutrition. It will describe the different food sources of different humans around the globe. It will also be about the way people developed nutrition habits and styles and how they developed different agricultural styles to produce their food. I will compare and contrast the styles of agriculture and nutrition from a lot of locations and sites occupied by the different humans living there.

Griffin, Jill

Faculty mentor: Anthony Barnhart

Session II, 2:00pm-4:00pm, 94A

**Title: Narcissism; a review in pathology of self-deception, deception and manipulation**

This paper will attempt to distinguish the differences between narcissism, self-deception, deception and manipulation. Then we will also take a look at psychopathy and the cluster B personality disorders and how narcissism, self-deception and manipulation all interplay with each other. There are still areas of narcissism, self-deception and manipulation that needs to be studied however there are a lot of correlations between the psychopathy but the question is does one cause the other or are they part of the personality disorder itself. The hypothesis for this paper is that narcissism, self-deception and manipulation are part of the narcissistic personality disorder and not the causation. The tests that will be looked at are the Self-deception and Mystification Inventory (IAM 40), the BIDR's scale (Paulhus1984, 2002) for impression management and self-deception and the Narcissistic Personality inventory )NPI to examine narcissism.
Gronwald, Alayna  
**Faculty mentor:** Melissa Santana, Sara Maier

**Session II, 2:00pm-4:00pm, 121D**

**Title: Progress and Main Street Revival**

The purpose of the research done in this symposium is to create a space that is aesthetically pleasing to all involved, while also understanding all the details to build the space. In an existing building, it is interesting to know the history. In this particular structure, the history is pasted on the brick walls in the form of an advertisement from the early 1900s. The research taken from this incredibly preserved advertisement for 'Henry George's Five-Cent Cigars', is the basis for the concept of this design. Bringing life into downtown Main Street McAlester, Oklahoma, is the historic building that is 312 E. Choctaw Ave. Research helps to create a beautiful coffee shop in the ground floor of the structure, while also supplying living space to the owners of the building on the second floor of the structure. Through research done on optimizing space, building codes, lighting design and implementation, way finding, and many other things, this building will reach its full potential through interior design. By reviving the life of this building, the life of Main Street McAlester will also flourish.

Grunwald, Jonathan  
Stephan Ramos  
**Faculty mentor:** Catherine Propper

**Session I, 9:00am-11:00am, 14C**

**Title: Exposure to environmentally relevant arsenic levels affects estrogen sensitive tissues in an adult vertebrate**

Inorganic arsenic (As) is a common environmental metalloid that can be found in many ground and surface water resources around the world. Exposure to high concentrations of As negatively impacts cardiovascular health and can lead to cancers in humans. Recent evidence shows exposure to low concentrations of As can impact endocrine physiology. In this study, we tested the hypothesis that low dose exposure to arsenic affects the reproductive system. Sixty adult female Xenopus tropicalis were exposed to 0.0, 0.1, or 1.0 uM As for two weeks. Tissues were collected and analyzed for effects on morphology and gene expression. Animals exposed to As showed significant reductions in oviduct and ovary weight along with oocyte diameter. There were no signs of overt toxicity in other organs. These results suggest that arsenic, at concentrations below current US EPA drinking water limits (10 ppm), may inhibit estrogen signaling processes.

Guerrero, Cristina  
**Faculty mentor:** Britton Shepardson

**Session II, 2:00pm-4:00pm, 66A**

**Title: Death and Afterlife in Prehistory**

Many people do not know about the values and traditions of the prehistoric humans. As anthropologists unearth prehistoric civilizations and settlements, they stumble across various burials. Burials can be as simple as someone laying there, but they can be as elaborate as bodies covered in red ochre laying in certain positions next to another body. Artifacts that are found in burials can easily be assumed that these ancient peoples believed the dead would take the artifacts with them. We find evidence of afterlife in the paintings we find in the caves; paintings that imply some sort of life beyond this one. This project is to provide knowledge about death and afterlife within ancient civilizations. Hopefully this will create a sense of interest in the audience. The research of this project will hopefully create a sense of appreciation for the ancient peoples of this world.

Guild, Morgan  
**Faculty mentor:** Christine Lemley

**Session I, 9:00am-11:00am, 52D**

**Title: Native American Students and Public School System Curriculum**
My research project was done in hopes to expose a common issue in the public school systems, cultures being left out. I chose specifically to use the Native American student culture and how students felt when they were asked about their experiences in school both academically and emotionally.

Guy, Brian  
**Faculty mentor:** Britton Shepardson

**Session I, 9:00am-11:00am, 66B**
**Title:** Archaeology of Weapons and Warfare
I will be explaining the archaeology of weapons and warfare.

Hack, Christina  
**Faculty mentor:** John Leung

**Morning, 10:00am-10:20am, Skydome Stage A**
**Title:** American Anti-Japanese Propaganda in the Era of the Second World War
This paper examines and analyzes the connection between the American government's anti-Japanese propaganda and the racism and prejudice against Japanese-Americans before and during World War II. Not only did the U.S. propaganda machine use a variety of tools and media, such as posters and film, it appealed to a widespread section of the American population, from children to adults. The propaganda targeted Japanese Americans specifically, due to deep-rooted fears and racism within the United States, and permeated every aspect of the media, creating a more united front against the Japanese, and to counteract the perceived threat of espionage by Japanese-Americans.

Haden, Thomas  
Samantha Kruse, Loren Reichfeld  
**Faculty mentor:** Stephanie Hurst

**Session I, 9:00am-11:00am, 26A**
**Title:** A sea urchin's insight into science: Synthesis of naphthoquinone natural products
This project focuses on the synthesis of analogues of the natural product Mirabiquinone, which is synthesized by the sand dollar sea urchin (Scaphechinus mirabilis). This product and other similar structures are called binaphthoquinones and may have potential medicinal properties. These different compounds may be distinguished by their different substituents and these molecules will be characterized by Nuclear Magnetic Resonance (NMR) using 1- and 2-dimensional techniques. These new compounds will also be characterized by X-Ray diffraction, which requires high quality crystals to be grown. This data will allow us to compare the structure-property relationships between the binaphthoquinones. This information will further the understanding of the potential role of these compounds in the prevention of oxidative and free radical damage (reperfusion therapy).

Hagan, Michelle  
**Faculty mentor:** Ryan Fitch

**Session II, 2:00pm-4:00pm, 30D**
**Title:** Economic Analysis of Superfund Sites
The United States has over 1,400 designated Superfund sites. These sites are those which have been designated as hazardous and/or contamination zones that threaten human and environmental health. In this paper, I will be doing an economic analysis of Superfund sites as well as a comparison between the efficiency of the Government versus private corporations.

Haines, Kortney  
**Faculty mentor:** Britton Shepardson

**Session II, 2:00pm-4:00pm, 66B**
**Title:** Archaeology of Weapons and Warfare
The topic I picked for my project is the archaeology of weapons and warfare. Through my project, I am going to describe how weapons and warfare have changed over the years. I will be identifying different times and places of the topic. I will also illustrate similarities and differences over time and across space.

Handady, Karthik
Ian Humphrey, Cate Holcomb, Ryan Buckingham, Crystal Hepp
Faculty mentor: Crystal Hepp, Wolf-Dieter Otte

Session II, 2:00pm-4:00pm, 9D

Title: Increasing Taxonomic Resolution of Microbial Communities

The comparison of microbial communities within healthy and diseased individuals is a rapidly growing field of research. By sampling microbial communities, researchers can search for the presence of a highly conserved gene, called the 16S rRNA, to confirm the presence of prokaryotic organisms and to begin determining which microorganisms are associated with disease states. However, one limitation to the 16S rRNA approach is a loss of resolution at lower levels of the taxonomic scale: we are able to identify what family the microorganism belongs to but not the species. This is due to the high level of conservation of the 16S rRNA among microorganisms, preventing species differentiation. Without taxonomic discrimination, researchers are unable to link the wealth of knowledge surrounding virulence and host specificity of particular microbial taxa to human disease. In an attempt to remedy this issue, we have developed an intuitive pipeline which incorporates a program that identifies variability in genetic regions of a user-defined length. The Mutual Information metric has been incorporated to determine differentially segregating sites within a given region, allowing for maximization of user-defined species or strains. Researchers can then use the highest scoring region(s) when performing amplicon sequencing to determine, with greater resolution, what species and even strains compose a microbial community. The increase of resolution afforded by the aforementioned pipeline will greatly aid research efforts where the goal is to characterize microbial communities within clinical, environmental, and other biological samples.

Handady, Karthik
Ian Humphrey, Cate Holcomb, Ryan Buckingham, Crystal Hepp
Faculty mentor: Crystal Hepp, Wolf-Dieter Otte

Morning, 10:20am-10:45am, duBois Festival Room

Title: Increasing Taxonomic Resolution of Microbial Communities

The comparison of microbial communities within healthy and diseased individuals is a rapidly growing field of research. By sampling microbial communities, researchers can search for the presence of a highly conserved gene, called the 16S rRNA, to confirm the presence of prokaryotic organisms and to begin determining which microorganisms are associated with disease states. However, one limitation to the 16S rRNA approach is a loss of resolution at lower levels of the taxonomic scale: we are able to identify what family the microorganism belongs to but not the species. This is due to the high level of conservation of the 16S rRNA among microorganisms, preventing species differentiation. Without taxonomic discrimination, researchers are unable to link the wealth of knowledge surrounding virulence and host specificity of particular microbial taxa to human disease. In an attempt to remedy this issue, we have developed an intuitive pipeline which incorporates a program that identifies variability in genetic regions of a user-defined length. The Mutual Information metric has been incorporated to determine differentially segregating sites within a given region, allowing for maximization of user-defined species or strains. Researchers can then use the highest scoring region(s) when performing amplicon sequencing to determine, with greater resolution, what species and even strains compose a microbial community. The increase of resolution afforded by the aforementioned pipeline will greatly aid research efforts where the goal is to characterize microbial communities within clinical, environmental, and other biological samples.

Hanson, Sarah
Marissa Brzozowy, Justin Mully, Nabeal Sunna
Faculty mentor: Bryan Cooperrider, Tim Becker, John Sharber

Session II, 2:00pm-4:00pm, 1D

Title: Developing an Alternative Powered Mobility Device for Disabled Children
A person's sense of mobility, learned at a young age, continues to develop as they grow older. However, birth defects and other disorders can cause intellectual, orthopedic, visual, and/or speech and language impairments. These disabilities limit cognitive and motor abilities at a young age and inhibit the development of the sense of mobility as the child matures. Many of these children develop a sense of learned helplessness, in which they become reliant on parents or caregivers for movement, and never learn to move on their own. Commercially available powered pediatric wheelchairs are a viable option for some of these children, but they are too expensive and difficult to transport to cater to a large audience. This team sought to design a reproducible, low-cost powered mobility device for children ages eight and up to provide them with an opportunity for self-motivated, independent mobility. The ultimate goal of this project was to write a build manual to disseminate to families in Chino Valley to instruct them on how to construct the device. We focused mainly on designing a device with off-the-shelf components and strived to maintain low costs, simple construction, and safety. We were able to design two different devices: a modified ride-on car and a universal electric scooter attachment for a wheelchair. These devices cater to different children's needs depending on their needed level of support, age and weight, and their caregivers' abilities to build one of our devices.

Hanson, Sarah
Marissa Brzozowy, Justin Mully, Nabeal Sunna
Faculty mentor: Bryan Cooperrider, Tim Becker, John Sharber

Morning, 10:20am-10:45am, duBois Southwest Room
Title: Developing an Alternative Powered Mobility Device for Disabled Children
A person's sense of mobility, learned at a young age, continues to develop as they grow older. However, birth defects and other disorders can cause intellectual, orthopedic, visual, and/or speech and language impairments. These disabilities limit cognitive and motor abilities at a young age and inhibit the development of the sense of mobility as the child matures. Many of these children develop a sense of learned helplessness, in which they become reliant on parents or caregivers for movement, and never learn to move on their own. Commercially available powered pediatric wheelchairs are a viable option for some of these children, but they are too expensive and difficult to transport to cater to a large audience. This team sought to design a reproducible, low-cost powered mobility device for children ages eight and up to provide them with an opportunity for self-motivated, independent mobility. The ultimate goal of this project was to write a build manual to disseminate to families in Chino Valley to instruct them on how to construct the device. We focused mainly on designing a device with off-the-shelf components and strived to maintain low costs, simple construction, and safety. We were able to design two different devices: a modified ride-on car and a universal electric scooter attachment for a wheelchair. These devices cater to different children's needs depending on their needed level of support, age and weight, and their caregivers' abilities to build one of our devices.

Hardi, Jessica
Jessica Hardi, Matthew Langenbach, Kacy Aoki, Evan Kaichi, Dohna Bicoy, Steven Goettl, Darren Frankenburger
Faculty mentor: Claudia Jurowski, Dianne McDonnell

Session II, 2:00pm-4:00pm, 40A
Title: Brownsberg EcoTourism Facility Design
A team of students worked researched the needs of the Brownsberg EcoTourism Facility to identify potential innovations to make the facility more sustainable and more effective in achieving its mission. The analysis of the research and discussions with consultants from Suriname led to a new design for the facility.

Harper, Zachary
Faculty mentor: Anthony Barnhart

Session I, 9:00am-11:00am, 94B
Title: Effects of Contextual Framing of a Magic Trick on Magical Thinking in Children
Children's strengths in their beliefs and convictions can range from being easily influenced to being stubborn and steadfast. In the realm of magical thinking, it has yet to be discovered whether the effects of priming have a significant influence on the way children view magic and the supernatural. This study will aim to investigate this query by assigning 150 young participants, from ages four- to six-years-old, into one of three experimental conditions: the supernatural contextual framing condition (primed to believe magician has real, supernatural powers), the deception
contextual framing condition (primed to believe magician uses deception and trickery), or the control condition (no priming). The first of three hypotheses suggests that the contextual framing of a magic trick as a simple act of deception will not yield a significant difference in magical thinking in children, whereas the second hypothesis promotes that the contextual framing of a magic trick as a genuine demonstration of real magic will significantly increase magical thinking in children. Lastly, the third hypothesis suggests that the overall creativity of the children's rationalizations of the trick will decrease if they are primed to believe that the trick and the magician do not demonstrate real magic. I predict that children's preexisting magical thinking and paranormal beliefs will persist, and possibly even expand, despite the attempts of priming and that the overall creativity of the children's explanations of the magic demonstration will be severely limited if it is not fed the fuel it needs.

Harrison, Amanda
Amanda Harrison, Matthew Rodgers, Michael Robinson, Dustin Morris, Andrew Atkinson, Eric Rich-Plotkin,
Faculty mentor: Dianne McDonnell, Claudia Jurowski

Session II, 2:00pm-4:00pm, 11C
Title: EcoPod Development for Copper Canyon Mexico
Engineering and hospitality management students collaborated with consultants and conducted research on the potential for Ecopod concepts to create sustainable lodging for tourists to the Copper Canyon region in Mexico. Several design concepts were considered including solar powered Eco tents and a semi-mobile yurt based village.

Hart, Jonathan
Faculty mentor: Paul Donnelly

Session I, 9:00am-11:00am, 126C
Title: Modern Influence on Pilgrimage and Sacred Spaces
The Kumbh Mela is a Hindu pilgrimage that has become a source of revival for the Hindu religion and culture, not only within India but also abroad. This pilgrimage attracts many different kinds of adherents to the Hindu faith from the sadhus (hardcore ascetics), to the lay practitioner, to the foreign practitioner on their first trip out of country, or the seasoned traveler looking for a new experience. All of these people come to the Kumbh with different expectations from the different forms of Hinduism they have or have not experienced. The aim here is not to elevate any of these experiences above any of the others as more correct or authentic, rather it is to highlight the varieties of experiences that people go through at this massive gathering. The primary sources of observation for these experiences will be A Mystical Journey, a Smithsonian documentary that follows Dominic West and Dr. James Mallinson, also Sacred Journey, a documentary that follows a group of American Hindus. Dr. Mallinson's journey will be looked at as a practitioner that while living outside of India is still quite immeshed in Hindu religion and culture within the country. This account also gives a very good idea of what this pilgrimage experience is like for Hindus living within India, sadhus and lay practitioners alike. The accounts of the American Hindus will be examined as practitioners that are highlighting a more Westernized view of Hinduism and what affect, if any, that has on their pilgrimage experience.

Hartzell, Kaleigh
Christopher Placker
Faculty mentor: Sumner Sydeman

Session II, 2:00pm-4:00pm, 101A
Title: The Couple's Path to an Alcohol Free Life: A systematic review of Behavioral Couples Therapy for Treating Alcoholism
The goal in our current project was to explore previously conducted research and review clinical trials for Behavioral Couples Therapy (BCT) for treating alcoholism. This therapy includes not only treatment of the alcoholic, but his or her partner with the goal that the partner's presence and support is more conducive to long term sobriety. In accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standards we conducted a systematic literature review. We will explore the strengths and limitations of a number of previously conducted studies, and compile information based on results of these trials and literature reviews.

Harvey, Christy
Loren LeSueur  
**Faculty mentor:** Loren LeSueur

**Morning, 8:54am--9:06am, duBois Room A**

**Title: The Pathway to Owls in the Coconino National Forest**

Mexican Spotted owls are a threatened species because of habitat destruction and they are a source of prey for Great Horned owls. The goal of this internship was to locate the nesting trees for Spotted owls working with the wildlife crew to ensure the nest gets the protection it needs in the Coconino National Forest in Flagstaff, Arizona. The method for finding the owls at night was to hike to areas where their habitat was and to call for them using a four-note call. When a Spotted owl answered us, a compass pinpoints the direction the call came from. Within 48 hours, we returned to the previous location where the owl had responded with mice. We tried to find the owl again and if we did, we let the mouse lose. The owl would capture the mouse and take it back to its nest. We had to run through the forest to follow the owl when it flew back to its nest. One nesting tree out of a total of two was located after returning to the area where the owls had responded to the call the previous night before. Once the nesting tree was located, it becomes a recommended protected area to ensure the young owls have a chance to survive to adulthood. The other nesting tree requires future wildlife surveys to take place to determine its location to protect the young owls. Protecting nesting trees helps to prevent owls from becoming an endangered species.

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Haskie, Kaitlyn

**Faculty mentor:** Michael Lerma

**Session II, 2:00pm-4:00pm, 75B**

**Title: Tribes and Historic Preservation: American Indian Religious Freedom Act**

Native American tribes have always had a unique relationship with the federal government. These dealings have led to the enactment of several acts and policies including the American Religious Freedom Act. The American Religious Freedom Act or the AIRFA, has had many critiques since it's inception in 1978. Including the inability to provide rights without conditions. My project is to work though the act and present it's flaws as well as suggest new ways to approach the problems using Indigenous knowledge.

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Hathaway, Amanda

**Faculty mentor:** Melissa Santana

**Session I, 9:00am-11:00am, 119A**

**Title: From Silo to Prepper’s Retreat**

Television shows and movies like The Walking Dead, Blast from the Past, and Red Dawn portray events that alter the lives of individuals and force them to find, use, and defend resources. These examples in media allow people to consider how they would handle and prepare for these situations. In the real world people prep for a number of reasons including natural disasters, attack on the home front, nuclear crisis, epidemic, EMP's, etc. This project takes that preparedness mindset and incorporates it into the built environment. The project consists of renovating an underground Atlas F missile silo into a place where a community of people can live and survive. In order for this space to be converted, research was conducted to understand the psychological, architectural, and design needs, as well as, the prepper lifestyle. This research will be used to guide the design of the silo and create a unique, comfortable, and sustainable space. The silo will contain a number of rooms that people would utilize for an extended stay. These spaces include a fitness center, garden, medical clinic, library, classroom, and dining hall. Some of the challenges that this project will address are creating a connection with the outdoors in an underground environment, bringing in a sense of light, and creating a comfortable and homey atmosphere.

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Haynes, Andrew

Antonietta Bartley, Delaney Page, Wolfgang Nelson

**Faculty mentor:** Nicole Bies-Hernandez, Matthew Anderson

**Session I, 9:00am-11:00am, 96D**

**Title: Effects of Religiosity on Preferences for Mate Selection**
The current study focused on the effects of religiosity on preferences for mate selection. A demographics form gathered information from Psychology 302W students pertaining to religious affiliation and level of religiosity. A scenario questionnaire measured the importance of physical attractiveness and career ambition in a potential mate. It was hypothesized that the importance of physical attractiveness and career ambition in a potential mate correlated with the participant's level of religiosity. We ran analyses to test for significant differences in mate preferences as a function of participants' level of religiosity. The implications of our findings as they apply to the general study of relationships and religion are discussed.

Haynes, Andrew  
Faculty mentor: Meliksah Demir  

Session II, 2:00pm-4:00pm, 96D  
Title: Is Volunteer Bias a Source of Concern in Friendship Research?  
A critical, yet understudied phenomenon within friendship literature, is the issue of volunteer bias (VB). VB has been documented in past research (e.g., sexual behaviors) but remains to be investigated in research on friendship. Considering that college students are often relied upon as participants in this research domain, it is essential to examine what (if anything) sets those who are interested in study participation apart from those who are uninterested. Within Study 1 (n=823), participants with a same-sex best friend (SSBF) were asked whether they would be interested in volunteering to participate in a study on SSBF (Yes vs. No). Participants, without knowing about the content matter, completed well-established measures tapping into various friendship variables: McGill Friendship Questionnaire - Friend's Functions; Mattering to Others Questionnaire; the Friendship Autonomy Support Questionnaire; and the Positive and Negative Affect Schedule. Volunteers, compared to non-volunteers, reported higher levels of relationship quality, mattering, and autonomy support in their friendships. The two groups did not differ from each other on happiness. However, the correlations between friendship variables and happiness were significantly stronger for non-volunteers when compared to volunteers across men and women. In study 2 (N=1,068), we sought to examine how many identified non-volunteers, who were previously shown to have less positive friendships compared to volunteers, actually participated in friendship research during the semester. Results revealed that of the 178 non-volunteers, 72% (n=128) participated in 1 of 4 available friendship studies during the semester. As for volunteers, 99% participated in an available friendship study. The findings suggest that VB is a source of concern within friendship research. The results of our follow-up study provide some degree of relief though, suggesting that our analyses are more inclusive of the larger spectrum of friendship experiences. It is appropriate to note however, that participants were taking a psychology course that required participation in a research study. It is probable that student time and research availability likely constricted students' choices, which could result in participation that they wouldn't have otherwise volunteered for. In light of this, future researchers should be mindful of the context in which research is being conducted.

Heiser, Christopher  
Eduardo Iniguez, Jordan Harris  
Faculty mentor: Omar Badreldin, Ricardo Castillo  

Session I, 9:00am-11:00am, 10C  
Title: Clinical Pathways Management and Simulation  
Clinical activities in hospitals are complex, unpredictable, and are human intensive activities. In this project, we are deploying cutting edge technologies to model, monitor, and simulate key clinical activities in hospitals. In specific, we are using Business Process Modeling and Simulation tools to develop a process automation solution for the Acute Coronary Syndrome (ACS) in the Heart Unit at Flagstaff Medical Centre. Bonita BPM tool is used to create advanced models of the key activities involved in the treatment of ACS patients, starting from admission, diagnosis, treatment, follow-up and discharge. Our approach provides interfaces for clinicians to admit and manage patients flow from the moment they arrive in the hospital, and until they are discharged. Our solution incorporates key elements to ensure compliance to medical guidelines. For example, the tool can report in real-time how long each patient has been in the hospital at any moment of time. The tool also facilitates decision-making by providing multi-step and multi-person approvals for key clinical decisions. We have also developed a simulation model of the same clinical process using BP Simulator. Our simulation model can help the hospital predict how long it will take a patient to go through the entire
clinical process. It can also help the hospital analyze their existing processes by simulating various scenarios and assess impact of proposed changes. For example, our model can tell the hospital how long patients will wait if the number of treating clinicians changes.

**Heiser, Christopher**  
Eduardo Iniguez, Jordan Harris  
**Faculty mentor:** Omar Badreldin, Ricardo Castillo

**Afternoon, 2:20pm-2:45pm, duBois Festival Room**

**Title: Clinical Pathways Management and Simulation**

Clinical activities in hospitals are complex, unpredictable, and are human intensive activities. In this project, we are deploying cutting edge technologies to model, monitor, and simulate key clinical activities in hospitals. In specific, we are using Business Process Modeling and Simulation tools to develop a process automation solution for the Acute Coronary Syndrome (ACS) in the Heart Unit at Flagstaff Medical Centre. Bonita BPM tool is used to create advanced models of the key activities involved in the treatment of ACS patients, starting from admission, diagnosis, treatment, follow-up and discharge. Our approach provides interfaces for clinicians to admit and manage patients flow from the moment they arrive in the hospital, and until they are discharged. Our solution incorporates key elements to ensure compliance to medical guidelines. For example, the tool can report in real-time how long each patient has been in the hospital at any moment of time. The tool also facilitates decision-making by providing multi-step and multi-person approvals for key clinical decisions. We have also developed a simulation model of the same clinical process using BP Simulator. Our simulation model can help the hospital predict how long it will take a patient to go through the entire clinical process. It can also help the hospital analyze their existing processes by simulating various scenarios and assess impact of proposed changes. For example, our model can tell the hospital how long patients will wait if the number of treating clinicians changes.

**Hellings, Connor**  
**Faculty mentor:** Christine Lemley

**Morning, 10:00am-10:15am, Skydome Stage E**

**Title: The Revitalization of Yup’ik culture**

I will be discussing the various ways Yup’ik community members are preventing culture loss and ways we could improve or work on Yup’ik outreach programs for the future.

**Henderson, Krista**  
Anna Birch, Tyler Rogers, Maraina Frabbiele  
**Faculty mentor:** Nicole Bies-Hernandez, Matthew Anderson

**Session I, 9:00am-11:00am, 97D**

**Title: Coloring Personality**

Color is a large influence in societies and cultures around the globe. Multiple researchers in the past have questioned if a relationship exists between preference of colors and personality dynamics. In this study, students collected data in a pool of PSY 302W students to determine if such a relationship does exist. Participants were questioned about their preference between warm and cool color groups and then were asked to complete the Eysenck Personality Inventory to determine their degree of extroversion. The student researchers hypothesized that extroverts would prefer warmer colors and introverts would prefer cooler colors.

**Henry, Miranda**  
Tatum Bardsley, Katelyn Jezowski, Lee Sayles, Elise Fraher  
**Faculty mentor:** Cassandra Dakan

**Afternoon, 3:00pm-4:00pm, Skydome Stage D**

**Title: Empathy: Hinders or Helps?**
How is empathy defined, and how is it present in everyday life, even where one might not expect it? Does this response benefit or hinder human relations? Panelists will discuss empathy as expressed in music, the search for self awareness, gender relations, and in politics and war.

Hernandez, Alaine  
Faculty mentor: William Cordeiro

Session I, 9:00am-11:00am, 105D

Title: Christianity in the Amoral Breaking Bad

Christian beliefs, such as those in free will, salvation, redemption, and moral absolutism, are looked at through the lens of this seemingly amoral television show that has swept the nation.

Hernandez, Danelle  
Faculty mentor: Melissa Santana, Roger Vitello, Elizabeth Pidgeon

Session I, 9:00am-11:00am, 122A

Title: Urban Renewal: Designing Family Friendly Homes for a Low Income Community

The purpose of the research is to establish a children friendly community for lower income families. These homes are to support mental and physical growth while providing community support. Urban renewal allows for these home to develop in an up incoming neighborhood. Providing community growth and economic stability. These homes are to be located in the downtown area of Detroit, Michigan. The building to be restored will be the Farwell Building. Built in 1915, the Farwell Building once functioned in the heart of downtown as mixed offices. The exterior showcased the era's style of First Chicago School of Architecture with sleek ionic pilasters and large expanses of windows. The interior, bright and airy was rich in detail of Tiffany glass fixtures, Grecian marble, custom metal details, and a unique light well that connects the seven rising floors. The Farwell Building will provide an affordable housing option for families within the area. The building will provide a space of low tension, safety, and support. It is important to develop these lofts to be homes. One key element to achieve this is to allow for personalization. Residents will be encouraged to bring life and color to their homes with pre-selected color pallets. The community's amenities will span far beyond the apartment. Classrooms will be included to promote education. Classes such as resume building and parenting programs are a few examples. Community areas and public kitchens will be gathering spaces for residents to come together and grow as a community.

Hernandez, Karen  
Faculty mentor: Jinhee Yi, Joseph Busch, Erik Settles, Paul Keim

Session II, 2:00pm-4:00pm, 17A

Title: Characterization of antibody distribution in an asymptomatic, chronic case of human melioidosis

Burkholderia pseudomallei is a gram-negative bacterium endemic to northern Australia and southeast Asia that causes the lethal disease Melioidosis. In some cases, B. pseudomallei causes a chronic infection that persists for months or years. Understanding the humoral immune response in chronic melioidosis may explain how long-term disease develops and help identify common immunogenic targets for potential diagnostic and vaccine development. This study characterized the immune response in an asymptomatic long-term case of melioidosis (P314) through immunological and proteomic assays. Serum was collected from P314 over a period of 13 years. B. pseudomallei strain MSHR1435 was used as a reference strain since it was predicted to be the original strain that infected P314. Approximately 20 proteins persistently elicited an IgG antibody response for 10 years. Some of these proteins included NADH dehydrogenase, Alkyl hydroperoxide reductase, Elongation factor Tu, and GroEL, which were also identified in many acute melioidosis cases. IgG responses to these proteins were initially weak, then spiked after 3 years where the antibody response remained relatively consistent thereafter. The consistent immunogenicity of these proteins between acute and chronic cases suggests that these antigenic proteins can be used to more adequately diagnose a wider range of patients. These antigens can also be targeted as potential vaccine candidates. Future experiments will be performed to quantify the IgG response to these proteins and compared against acute cases. In addition, these identified proteins will contribute to our understanding of how chronic melioidosis cases develop.

Hernandez, Orianna
**Faculty mentor:** Glenn Hansen

**Session I, 9:00am-11:00am, 108C**

**Title: Disney Corporation in a Post 9/11 World**

Disney has been entangled in politics since it began. This grew after the 9/11 attacks. Disney, like most Americans, was afraid of future attacks; however, they used this fear to push their own political agenda.

**Herrera, Caroline**

**Faculty mentor:** Scot Raab

**Session I, 9:00am-11:00am, 48D**

**Title: Objectively Assessing the Efficacy of Kinesio Tape to Reduce Swelling in Anterior Talofibular Sprains**

The Anterior Talofibular (ATF) Ligament is a commonly injured ankle ligament. This study assesses Kinesio Therapy (KT) Tapes ability to reduce swelling associated with ATF sprains, when compared to swelling reduction of an ace wrap. There is a paucity of research supporting KT Tape as an adjunct to ankle therapy. This study has potential to expand current literature related to KT Tape. It was hypothesized that KT Tape will reduce the subjects swelling as efficiently as Ace Wraps in individuals who suffer isolated, non-complicated, ATF sprains were included. Participants were randomly assigned to either the experimental KT Tape group or the control Ace Wrap group. All participants underwent conservative rehabilitation in regards to therapeutic modalities, non-weight bearing gait, and therapeutic exercises for a total of nine sessions. Volumetric measurements to assess swelling were completed for a total of eight days beginning one day post injury. The measurements were collected prior to each rehabilitation session. The results were conclusive in respect to both KT Tape and Ace Wraps. The outcome of this study was swelling reduction was close to equal from both groups, which therefore implies that the KT Tape is as effective as the Ace Wrap. Further research is necessary to have more subjects included, thus resulting in more data collection.

**Heydorn, Rachel**

**Faculty mentor:** Amanda Acheson

**Morning, 10:30am-10:42am, duBois Meadows Room**

**Title: Sustainability in Coconino County: An Inside Perspective**

Rachel completed her internship with the Coconino County Sustainable Building Program, which is located within the Coconino County Community Development Department. The program seeks to educate, support, encourage and help develop sustainable building practices for the citizens of Coconino County. Rachel was responsible for multiple areas within the program including assisting with the Sustainable Building Program as well as a sustainability effort directed towards county employees that promotes recycling and wise water and energy use. Her internship duties included: creating event fliers, helping host workshops, helping host the Sustainable Building tour, conducting site visits and evaluations for the Sustainable Building Program as well as project management. She also helped write the monthly Coconino County Sustainable Building Program newsletter and created an outreach program for the Coconino Plateau Water Advisory Council, which focused on water awareness on the Coconino Plateau. Rachel learned valuable lessons about communicating in a professional environment by working with many different organizations during her time with Coconino County. She developed excellent time management skills as a portion of her work schedule depended on unsupervised assignments. Rachel learned about local building codes and zoning ordinances and how sustainable building is a key asset for future growth in the County. Finally, Rachel learned the importance of sustainability within a governmental organization and skills for outreach involving sustainability and the public.

**Higdon, Duane**

Andrew Nielsen, Sam Slager, Adam DeSerio, Davis Boyer

**Faculty mentor:** Ann Huffman

**Session II, 2:00pm-4:00pm, 36D**

**Title: Emotions**

The purpose of this project is to understand the diversity of the employees in the work place. I am examining the emotional intelligence of various employees to assess the prevalence within the how employees deal with their
emotions. In our poster we will discuss the importance of why it is important to have a diverse organization. Our poster will also propose some ideas on how working employees can be more diversified and/or maintain their diversity.

Higdon, Duane

Faculty mentor: Michael Lerma

Session I, 9:00am-11:00am, 75C

Title: Problems on the Navajo Nation

There are many issues that are occurring on the Navajo Nation. There are issues in my local community, Many Farms, but each individual community are dealing with the same problem one way or another. An issue that I want to shed light on is the trash that is accumulating all over the reservation, every place I drive through there is trash on the side of the road. Nobody is doing anything about it (not that I’m aware of) but it should be addressed soon. People throw their waste on the side of the road are the ones who are deteriorating the beauty of the Navajo Nation. It is their own hometown they are making look filthy and everytime people drive through the communities they focus their attention on how dirty the town is instead of the communities rich history. Another issue that is occurring on the Navajo Nation everywhere is unemployment. This issue should be the first to get addressed but at the moment elections are on the main agenda. In order to stabilize the economy on the Navajo Nation employment needs to boost everywhere so people can make a living.

Hill, Anaheed

Thomas Salerno

Faculty mentor: Gerald Wood

Morning, 9:30am-9:55am, Skydome Roundtable R2

Title: Creating Democratic Spaces in the College Of Education

Democracy aids in establishing rules for communities and groups to function in a healthy way by putting democratic principles to practice. Through researching John Dewey and working close with my peers, others and myself have been able to allow for more democratic spaces within the college. In articulating a theory of democracy, Dewey believed in developing the collective intelligence of people through working together to identify problems and solutions (Dewey, 1916). This past year in the College of Education there has been a strong group of students who have strived to make the spaces around them democratic, to allow all voices to be heard. Students were able to put together, with the help of faculty, a Welcome Day at the beginning of the year. This allowed all of the student organizations to come together, share with each other and students what their organization was about, and foster equal representation of all clubs. Students were able to work alongside faculty and staff to put on a conference at the College of Education where all clubs were able to participate in volunteering and community organization was put into practice. We have been able to dive into the relationships between students, faculty, and staff and how they work together and the set of challenges within that. Creating democratic spaces can be challenging, but well worth your effort. This research is relatable to anyone interested in community organizing or reforming, as the goal is to foster proactive and meaningful changes within various settings.

Hitzeman, Courtney

Faculty mentor: Britton Shepardson

Session I, 9:00am-11:00am, 66C

Title: The Archeology of Music

My project will show the different archaeology of music throughout the human history and prehistory of different sites. I will go in depth of different genres of music different instruments and every aspect of music throughout sites of history.

Hodgkiss, Jenna

Faculty mentor: Melissa Santana

Session II, 2:00pm-4:00pm, 122B

Title: Boutique Fitness Facility: Creating a Community and Alleviating Stress
Boutique gyms are a popular fitness trend that is occurring in many larger cities around the United States. Boutique fitness is more personal, sleek and scaled down specialized fitness clubs. Clients will not get 'lost' in the masses, and the class size is under control. By use of a fitness trainer, clients are able to achieve faster results in a smaller amount of time. Not only do boutique gyms offer ways to achieve fitness goals they also offer a sense of accomplishment, camaraderie, encouragement, and personal approach unlike 'typical' gyms. Larger cities have problems with establishing a community atmosphere, and creating social interactions between people. Many people residing in New York City do not have the opportunities or the accessibility to branch out and meet new people because of the size of the city. Along with no sense of community, people living in large metropolitan cities have significantly high stress and anxiety levels. This project focuses on creating a community based, stress free boutique gym which gives the clients a sense of community and a stress and anxiety free environment. There is a positive association with personal and social factors to involvement in a fitness center. Exercise reduces stress, increases energy, and decreases symptoms of depression. By incorporating social opportunities and stress free elements from related research and design techniques, this boutique gym grows a sense of community and alleviates stress and anxiety in the clients.

Holmes-DiGiovine, Isabella
Faculty mentor: Britton Shepardson

Session II, 2:00pm-4:00pm, 66C
Title: The Archaeology of Music
My project will consist of the ancient history of music. It will include where music is derived from and how it became a form of art, entertainment, etc. today.

Horne, Rene
Temuulen Sankey
Faculty mentor: Temuulen Sankey

Session I, 9:00am-11:00am, 7D
Title: Remote sensing analysis of an invasive plant in the Glen Canyon
The tamarisk tree has been known for its invasive nature across the southwestern riparian habitats. A bio-control, known as the tamarisk beetle, was introduced in Southern Utah in 2005 to control tamarisk. The tamarisk beetle was then found within Glen Canyon, Arizona in 2009. Using ENVI image analysis software, high spectral images from Glen Canyon in 2009 and 2013 were analyzed to determine the impact of the tamarisk beetle along the Colorado River. We estimate a 50% decline in green tamarisk over the 2009-2013 study period. The results indicate strong impacts of the beetle in the Glen Canyon ecosystem, which could have many positive as well as negative implications for that region. Our future work will determine if airborne, 3-dimensional lidar data further improves tamarisk defoliation detection.

Hougland, Ryan
Brett Schwartz, Matt Branscome, Josiah Huggins
Faculty mentor: Phoebe Morgan

Session I, 9:00am-11:00am, 86A
Title: Institutional Alternative Dispute Resolution between Students and Northern Arizona University
Conflict management between students and Northern Arizona University will be examined. Participants were predominantly Caucasian freshman females, of traditional college age. Preliminary findings suggest a strong link between conflict management styles of students and the dispute with the University. The researchers chose this topic because of the reoccurring nature of disputes between students and the University. Students will be given a link to our survey, via Survey Monkey, and they will first complete a conflict management styles quiz. Then the students will complete a survey on their student dispute resolution experiences while they attend the university. The group will then analyze the data from Survey Monkey through correlation analysis using the SPSS program. Our conclusion is that there is a high correlation between conflict management style and institutional disputes with the University and the students. Future research may focus on a causational link between conflict management styles and institutional disputes.
Howell, Blake  
Nicholas Butler, Zia Helgeson-Budrys, Brett Anderson  
**Faculty mentor:** Nora Dunbar, Matthew Anderson

**Session I, 9:00am-11:00am, 100A**

**Title: The Effects of Caffeine and Stress on Academic Performance**

Caffeine and stress are common factors in every undergraduate's life. From this research we looked into the connection between caffeine in a student's life and their perceived level of stress, in relation to their overall academic performance. The relationships were then explored in a gendered perspective; identifying the differences between men and women.

Howland, Olivia  
Kayla Ziolko  
**Faculty mentor:** Sumner Sydeman

**Session II, 2:00pm-4:00pm, 102D**

**Title: Family-Focused Therapy: Childhood and Adolescent Bipolar Disorder**

The purpose of this project was to conduct a systematic literature review of family-focused therapy trials for pediatric or adolescent patients diagnosed with bipolar disorder I, II, or NOS. A systematic literature search was conducted according to Preferred Reporting Items for Systematic Reviews and Meta-Analyses standards (PRISMA: Liberati et al., 2009). Six trials studying children ranging from 9 to 18 practiced family-focused therapy. The general results concluded that family-focused therapy was beneficial for depressive episodes more than the manic episodes. Each study discussed strengths and limitations that could be useful to conduct future studies.
Hudak, Aryn  
Taylor Chesley, Jenna Wright  
**Faculty mentor:** Gretchen McAllister, Bjorn KrondorferProfessor Martin KaldProfessor Patricia Murphy

**Afternoon, 3:10pm-3:20pm, Skydome Stage C**

**Title: Through the Eyes of Youth: Life and Death in the Bedzin Ghetto**

Holocaust victims and survivors' voices matter and it is necessary to hear their stories before they are not around anymore to tell them. The more the Holocaust is studied the less likely a chance there is for such an important event to be forgotten. The disparity of the implications of the intolerance of people during this time is to be learned from as to avoid any such instance occurring again. The purpose of this presentation is to highlight the educational component of the Bedzin exhibit. This exhibit personalizes the teaching of the Holocaust through the voices of six individuals. The education team (education majors) is developing teacher resources for grades 6th-12th that can be used with an online exhibit, as well as the traveling exhibit. The resources are aligned with Common Core and are available to use in inclusive classrooms so students with disabilities can engage with the content with their grade level peers. The resources include several primary resources to help students understand that the people who were victimized were average, everyday people with lives and families. The Holocaust is imperative to study and teach today to remember the voices of the past and to understand that through involvement and personalization, students' lives can be touched and lives can be remembered from the past and changed in the present and future.

Hudak, Jennifer  
**Faculty mentor:** Natalie Cawood

**Session II, 2:00pm-4:00pm, 82D**

**Title: Planned Behavior Change: Over Analyzing Personal Conversations and Interactions**

I chose over analyzing personal conversations and interactions with others as a behavior that I wanted to change. I set a goal for myself, assessed my capacity for change, and identified the steps I would take to make the change. I then developed a measurement tool to track my efforts to change over analyzing personal conversations and interactions with others over time. I will present the results of this effort at changing my behavior and I will discuss how this assignment will impact my future social work practice.

Hudak, Jennifer  
Laura Harbert, Emma Coleman, Hayley Steele, Mitchell Newman  
**Faculty mentor:** Phoebe Morgan

**Session I, 9:00am-11:00am, 85D**

**Title: Common Workplace Disputes and Resolutions**

We have prepared this presentation to fulfill the capstone requirements for CCJ 480C- Alternative Dispute Resolution. We are going to host an informative workshop to showcase how to effectively use alternative dispute resolution to resolve existing and future conflicts between student workers at an NAU student worker environment. At the end of the seminar, we will be distributing a pamphlet summarizing key alternative dispute resolutions steps to be used for future reference. This pamphlet will be created and designed by the group using scholarly research and articles. At the end of the seminar, we will be passing around a quick survey to receive constructive criticism. The broader interest is to bring attention to how effective alternative dispute resolutions can be in resolving workplace conflicts. The use of alternative dispute resolutions in the workplace can increase a company’s productivity, relations, and overall positive environment.

Hudson Jr, Ronnie  
Hamed Alharbi, Alex Rutledge  
**Faculty mentor:** John Markham, Niranjan Venkatraman

**Afternoon, 3:45pm-4:10pm, duBois Agassiz Room**

**Title: Cobham WiFi Project**
First responders, work teams and military units using this Wi-Fi communication and tracking system could be more efficient, productive and even save many lives. The system developed connects the users to a wireless network, collects each user's global positioning satellite (GPS) information, and displays the users' locations on a computerized map. It allows users or subgroups of users to communicate with one another by using local Wi-Fi links or wireless network switches. Android programming software was used to create and test our application on a smart phone. The system has a communication device and GPS tracking working simultaneously. Subgroup communication can also be assigned to limit the chances for miscommunication. As a result, this innovative communication management system has the potential to save lives in a crisis and make user groups more effective and productive.

**Huggins, Josiah**  
Faculty mentor: Nora Dunbar

**Session II, 2:00pm-4:00pm, 100A**

**Title: Academic Dishonesty as Moderated by Anonymity**

Academic dishonesty has remained a concerning topic among universities and first generation college students are faced with challenging life circumstances including anonymity and developing a commitment to an ethnic identity. The relationship between academic dishonesty and ethnic identity commitment and academic dishonesty and stereotype threat, as moderated by levels of anonymity was examined. The College Persistence Questionnaire assessed students’ level of anonymity at the university (Davidson, Beck & Milligan, 2009). The Multigroup Ethnic Identity Measure-Revised (MEIM-R) assessed ethnic identity commitment (Phinney & Ong, 2007). The Theory of Planned Behavior (TBD), a predictive measure, assessed academic dishonesty intentions and behaviors (Stone, Jawahar & Kisamore, 2010). Finally, stereotype threat was measured using the Social Identities and Attitudes Scale (Brown & Picho, 2011). Participants (N= 378) were predominantly Caucasian (68.3%), freshman females (84.7%), between ages 18-22 (M = 18, SD = 2.4) and 54% were first generation college students. Hierarchical multiple regressions were used to test the following hypotheses: 1. Without accounting for the moderator, the relationship between ethnic identity commitment and academic dishonesty and stereotype threat and academic dishonesty is weak. 2. The relationship between ethnic identity commitment and academic dishonesty and stereotype threat and academic dishonesty is dependent upon levels of anonymity. 3. The negative relationship between ethnic identity commitment and academic dishonesty will be stronger under conditions of high anonymity. 4. The positive relationship between stereotype threat and academic dishonesty will be stronger under conditions of high anonymity. Results may allow NAU to determine appropriate avenues for intervention.

**Hughes, Phoebe**  
Faculty mentor: Julie Brown

**Afternoon, 3:00pm-3:20pm, Skydome Stage B**

**Title: Black Topaz and Its Role in Joan Tower's Compositional Development**

During the mid to late 1980s, Joan Tower (b. 1938) fundamentally transformed her compositional style. Heavily involved in the serialist movement in New York City, Tower found herself moving away from the strict compositional guidelines imposed by the style. Tower's first breakaway work was Black Topaz (1976), which she described as being freely written and more representative of her own voice. This work also referenced tonality and more readily showcased a melodic line, aspects that increased the accessibility of her music. Two important influences helped prompt Joan Tower's shift in compositional style. First, her childhood in La Paz, Bolivia and other South American countries, where Tower was able to learn and perform in native music festivals in Bolivia, gave her strong fundamental understand of percussion instruments and Latin American rhythms. Works like Black Topaz helped refocus Tower's compositional voice, creating accessible, audience-friendly materials. Beethoven represents a second influence on Tower's change in style. As a composer who is known for dramatic and emotional music, Beethoven's compositional style encouraged Tower to substitute her own subjective musical experience for the structuralized sounds of serialism. In Black Topaz, one sees how Tower explored connective threads in her music with Beethoven's influence, and allowed her compositional voice to fully express her background. Exploring Tower's shift in compositional style that occurred during and after the composition of Black Topaz allows one to understand her works as a whole.

**Hutchison, Hannah**
Faculty mentor: Ryan Fitch

Session II, 2:00pm-4:00pm, 31A

Title: Issues in the Mono and Grant Lakes

I will be researching the market and non-market impacts of the Grant Lake Dam. There have been both positive and negative repercussions not only for Los Angeles Department of Water and Power, since they draw from this lake, but also for Mono Lake, the surrounding area, and the tourism and fishing this lake makes possible.

Hyatt, Nicole
Faculty mentor: Chris Lanterman

Morning, 9:00am-9:15am, Skydome Stage E

Title: Traveling Rwanda

Last year, as a Senior at Harborside Academy in Kenosha, Wisconsin, I was offered a once-in-a-lifetime chance to visit Rwamagana Lutheran School in Rwanda, Africa to conduct research for my final senior project. Together with Melissa, their Development Manager, we traveled to Rwanda for thirteen days where I had the opportunity to teach and share my experiences as a student at Harborside, an Expeditionary Learning School. This type of school uses hands-on, interactive learning as their primary method for teaching, and became the catalyst for my desire and passion to one day become a teacher myself. I was able to have an in-service with the teachers, teach several classes on developing writing skills, and provided grammar and writing tutoring groups. Throughout my trip, I met amazing people, experienced the beauty of their culture, and fell in love with Rwanda. This trip reinforced my career path and brought in the new idea of teaching abroad after I earn my degree. I feel called to work internationally, because I want to be able to experience the world and meet people from a variety of backgrounds and hear their perspectives. My trip to Rwanda encouraged me to share the importance of global education and traveling. Through the movie I made showing my time in Rwanda, I want to exhibit that, so people can get more of an image of what it entailed and hopefully be inspired through it.

Incremona, Marisa
Faculty mentor: Nancy Barron

Session II, 2:00pm-4:00pm, 128D

Title: Interdisciplinary Student-to-Student Writing Survey

I have been an intern with the Interdisciplinary Writing Program (IWP) since Fall 2013. My major project has been a student-to-student survey. In order to learn more about students' attitudes toward writing, I helped create a survey that asked students about their writing mechanics, motivations, and knowledge of on-campus writing resources. We decided to conduct the survey in an interview-style method because we hoped that we would get more honest answers from students compared to online surveys that students simply fill out in order to be placed into a drawing for a prize. When we asked students their biggest motivators for writing, the majority of students answered 'getting good grades'. We also asked students when they would start a paper that was due in two weeks, and the majority answered '3 days before'. Due to our impressionistic findings, we concluded that students have an external sense of motivation when it comes to writing, as most students were motivated by grades to improve their writing. However, this sense of motivation is not helpful to students because the students are not working towards improving their writing skills, but simply getting a passing grade. Instead, students should have an internal sense of motivation and want to improve their writing because they realize that it will be important to their future lives and careers. Because of the survey, the IWP is focusing on creating a writing culture on campus that will help students realize the relevance of writing, no matter what the discipline.

Iniguez, Victor
Faculty mentor: Ryan Fitch

Session II, 2:00pm-4:00pm, 31B

Title: Water Issues in Lake Mead- An Economic Perspective
This project takes an economics and econometric look into the problems facing Lake Mead. On top of that there are several legal issues that I will be touching on, including the newer creation of Lake Powell to the West. Lake Mead supplies water to ten states across the U.S. and parts of Mexico. That is why I believe that it is important to take action and figure out a way to preserve this water supply.

Inzunza, Ricardo  
Ahmad Alnattar, Zane Cross, Kyle Egan, Nick Garry, Neil Gehr, Trevor Hochhaus, Brandon Janca, Matthew Legg, Ryan Worden  
Faculty mentor: Srinivas Kosaraju, John Tester

**Session I, 9:00am-11:00am, 6D**

**Title: SAE Mini Baja**

The SAE Baja competition is an international competition in which student teams from many universities compete in a series of events designed to test the Baja vehicle to its limits. Student teams must design and build a single seat off-road vehicle. It must be able to traverse rugged terrain, rough roads, or steep hills, while offering the utmost level of safety for the occupant. A group of 10 students from Northern Arizona University is participating in this competition in Portland, Oregon in late May. Two three-person teams have designed the frame and drivetrain, and a four-person team has designed the suspension. The frame is made to be rigid and strong enough to ensure the safety of the driver during a collision. It is also light in weight, while providing enough space for suspension and drivetrain components. The drivetrain meets the expectations of the acceleration, endurance, and hill climb events, while being as light as possible. Our final design employs a fully-functional sequential transmission and a limited-slip differential. It can provide high torques and fast acceleration, while also maintaining durability. The steering is designed around the dimensions of the suspension to achieve the correct Ackerman angles and turning radius. The suspension is designed to absorb all obstacles while maintaining an optimal ride height. The suspension is also designed to have positive caster and negative camber for more stability and increased turning angles. A completed prototype will be tested on a rugged terrain that simulates the competition parameters.

Inzunza, Ricardo  
Ahmad Alnattar, Zane Cross, Kyle Egan, Nick Garry, Neil Gehr, Trevor Hochhaus, Brandon Janca, Matthew Legg, Ryan Worden  
Faculty mentor: Srinivas Kosaraju, John Tester

**Afternoon, 1:55pm-2:45pm, duBois Fremont Room**

**Title: SAE Mini Baja**

The SAE Baja competition is an international competition in which student teams from many universities compete in a series of events designed to test the Baja vehicle to its limits. Student teams must design and build a single seat off-road vehicle. It must be able to traverse rugged terrain, rough roads, or steep hills, while offering the utmost level of safety for the occupant. A group of 10 students from Northern Arizona University is participating in this competition in Portland, Oregon in late May. Two three-person teams have designed the frame and drivetrain, and a four-person team has designed the suspension. The frame is made to be rigid and strong enough to ensure the safety of the driver during a collision. It is also light in weight, while providing enough space for suspension and drivetrain components. The drivetrain meets the expectations of the acceleration, endurance, and hill climb events, while being as light as possible. Our final design employs a fully-functional sequential transmission and a limited-slip differential. It can provide high torques and fast acceleration, while also maintaining durability. The steering is designed around the dimensions of the suspension to achieve the correct Ackerman angles and turning radius. The suspension is designed to absorb all obstacles while maintaining an optimal ride height. The suspension is also designed to have positive caster and negative camber for more stability and increased turning angles. A completed prototype will be tested on a rugged terrain that simulates the competition parameters.

Ireland, Brett  
Trevor Glynn, Melissa Fisher  
Faculty mentor: Robert Sanford

**Session II, 2:00pm-4:00pm, 6A**
**Title: Tracking winter bird population movement via feeder observation**

This report describes and presents a citizen science project associated with The Cornell Lab of Ornithology and Project FeederWatch. The objective is to participate in Project FeederWatch to measure changes in the winter ranges and abundances of bird species over time. In order to collect data to determine species abundance over time, a bird feeder was set up near an open field in Flagstaff, Arizona. For two consecutive days every week birds were counted and identified using The Sibley Guide to Birds. Temperature, precipitation, wind speed, and direction were recorded along with bird count data. The preliminary results of our time viewing the feeder have been that three species of birds have been sighted. The majority of birds sighted were Dark-eyed Juncos, House sparrows, and House finches as well as a eurasian collared dove. These results are similar to the regional data from the 2013-2014 season of most common bird sightings. The species seen also fall within the top five common feeder species of the southwest U.S. The sample size of these preliminary results is not large enough for statistical analysis and further data collection is necessary. At the conclusion of the bird-watching season our data will be combined into the national database where it will be analyzed. From this data long term and short term population trends can be assessed and monitored.

**Ireland, Brett**

**Faculty mentor:** Cory Rade, Shanti Rade

**Morning, 8:42am-8:54am, duBois Meadows Room**

**Title: Whipstone Farm- The business, the science, the passion**

With farming being a vital aspect to life as we know it for food production, farming techniques and knowledge are crucial to continuing our civilization. The objective of my internship was to learn the entire process of operating and maintaining a medium sized locally supported agriculture farm. Through immersion in the farming life I would learn how to grow high quality natural produce, how to manage employees, how to manage resources, and how to gain clientele and grow a business. The internship performed took place at Whipstone Farm in Paulden, AZ, under the supervision of farm owners Cory and Shanti Rade. It was completed over the course of six months, working 50 hour weeks throughout the summer growing season. The tasks as an intern were to work in the field to learn all aspects of growing crops. This included prepping soils, seeding, transplanting, weeding, harvesting, and everything in-between. Other tasks required of the interns included working markets where produce was sold, working with clientele through restaurants and CSA’s to deliver produce, and learning all other aspects of running a business. Through this internship I successfully learned how to operate a locally supported agriculture farm and gained knowledge that can be used throughout my life. Recommendations that can be used to better the farm would be to decrease the use of non-renewable plastics as well as overall energy usage at the farm. Also, an increase of government subsidies to small farms would benefit the business drastically.

**Irons, Leigh**

**Faculty mentor:** John Houser, Matthew Anderson,

**Session II, 2:00pm-4:00pm, 101C**

**Title: How well do you know yourself: A Study on Attraction**

The purpose of this research was to measure if seeing isolated physical features versus the entire face affect which races facial features are found as most attractive. We expect to find that Caucasian eyes, nose, lips, and overall face would be rated as most attractive when compared to African American, Asian American, Hispanic, and Native American stimuli. In research methods in psychology classes, we presented visual stimuli in two conditions, one showing photos of the overall faces of each race, and other showing photos of the isolated features from the overall faces for each race. Participants were then asked to pick which feature they found most attractive. When we run four Chi-Square analyses, we expect to find a significant difference in attraction ratings between the two conditions.

**Irvine, Catherine**

**Faculty mentor:** Robin Tuchscherer

**Afternoon, 1:55pm-2:20pm, duBois Agassiz Room**

**Title: Prestressed Concrete Beam Design**
Prestressed concrete beams are designed to overcome concrete's natural weakness in tension. Typically, a concrete's tensile strength is between 8 and 14 percent of its compressive strength. Due to this low tensile capacity, cracks due to flexure develop early in the life cycle of concrete structures. Prestressed concrete extends the life of the concrete before it cracks under normal service loads. The Prestressed/Precast Concrete Institute (PCI) holds a yearly contest for undergraduate and graduate students to provide them with an opportunity to gain more knowledge about the industry. Students will design a beam under the given constraints of a minimum cracking load and a range for ultimate load at beam failure. Predictions for these loads are performed and then the designed beam is tested to check accuracy of these predictions and feasibility of the design. The final test results and report will be sent to PCI for review against other competing students.

Irving, Louis  
Gavin Parsons, Melissa Birkett, Ann Huffman  
Faculty mentor: Melissa Birkett, Ann Huffman

Session I, 9:00am-11:00am, 58A

Title: The Dualistic Model of Passion: Professor Outcomes and Student Evaluations

Passion, as a strong affective inclination towards a particular activity, has emerged as a useful predictor of employee performance, burnout, and satisfaction. However, additional research utilizing the dualistic model of passion (Vallerand & Houlfort, 2003) has found evidence that many of these outcomes are differentially related to passion that is manifested harmoniously (i.e. in an autonomous and adaptive manner) or obsessively (i.e. in an overwhelming and maladaptive manner). This study examined the extent to which these two types of passion were related to student perceptions of university professor performance (via ratings on ratemyprofessors.com) as well as professor self-reports of various personal and organizational outcomes. Professors (N = 151) were selected from ratemyprofessors.com using a novel, pseudo-random sampling method and were asked to complete a battery of surveys on a variety of work-related constructs. Although general passion for teaching (e.g. liking, spending a lot of time, and valuing teaching) predicted student ratings of professor clarity and helpfulness, whether or not this passion was harmonious or obsessive made no significant difference. However, differentiating between harmonious and obsessive passion was significant across all personal and organizational measures. Harmonious passion predicted increased work engagement, organizational citizenship behaviors, and resilience, as well as decreased burnout. Obsessive passion was not significantly related to work engagement, organizational citizenship behaviors, resilience, or burnout. These findings support the predictive power of harmonious passion on positive personal and organizational outcomes in university professors.

Jackson, Prudence  
Faculty mentor: Natalie Cawood

Session I, 9:00am-11:00am, 83A

Title: Behavior Change: Family/School Priority balance

I chose Family/School priority balance as a behavior that I wanted to change. I set a goal, assessed my capacity for change, and identified the steps I would take to make the change. I then developed a measurement tool to track my efforts to change priority over time. I will present the results of this effort at changing my behavior and I will discuss how this assignment will impact my future social work practice.

Jacobs, Rachel  
Bradley Van Deinse, Lauren Glick, Emily Lewandowski  
Faculty mentor: Eric Yordy

Session II, 2:00pm-4:00pm, 28B

Title: Brain Injuries in Professional Sports

Concussions suffered in high-contact sports have been linked to long-term health effects and brain injuries. As a result, there have been many lawsuits brought up by former athletes, suing for neglect and fraudulent actions of the professional sports leagues. The project focuses various cases and the legal results of those cases.
Nicole Bies-Hernandez  
**Faculty mentor:** Nicole Bies-Hernandez

**Session II, 2:00pm-4:00pm, 97A**

**Title: Students' Perceptions of Effective Study Strategies**

Upon analyzing the current situation of students' study habits and their perceptions of effective study strategies, the current study was conducted. The current study analyzed students' beliefs about effective study strategies and whether a student would report an increased likelihood to use the study habit of practice testing if given information about its effectiveness from a reliable source. The hypotheses were that the majority of the participants would not believe practice testing to be an effective study strategy compared to restudying, and students would be more likely to engage in practice testing if suggested by a reliable source. To test these hypotheses, participants completed a survey assessing their study habits and beliefs about the effectiveness of various study strategies. Participants also read about a reliable source of information stating that practice testing is more effective than restudying. These reliable sources included a trusted friend, teacher, an expert in the field and a study supporting that statement. To measure this, a four-way ANOVA was used. Results received from this experiment were analyzed to support whether more students believed restudying to be more effective than other study strategies and these results. In addition, other variables that could have altered the data are reported in this poster. By analyzing students' perceptions of effective study strategies, people may be able to work more effectively to improve students study habits and therefore, help them succeed academically and in life.

Jacquez, Alejandro  
**Faculty mentor:** Ryan Fitch

**Session II, 2:00pm-4:00pm, 31C**

**Title: Water Issues in the West: Desalination**

A look into the history of desalination in California, the effects and how to properly allocate the water gained from this source.

Jagiello, Bryan  
**Faculty mentor:** Angie Moline

**Morning, 9:30am-9:42am, duBois Meadows Room**

**Title: Is Conventional Landscaping More Efficient Than Low Impact Landscaping?**

I chose this internship to gain knowledge of landscaping and cement work. Level Development, a landscape company based out of Michigan, works with brick pavers, retaining walls, concrete pours, and gardening. My main purpose was to understand the difference between conventional landscaping and low impact landscaping. In addition, I wanted to understand the impact landscaping has on the environment. I wanted to research some of the ecosystems that can be affected, during construction in that area. The disruptive process to make a home look pretty can decimate the natural ecosystem. I learned how to operate heavy machinery such as a backhoe, cement mixer and commercial dump truck, all of which pollute the ozone. Life back in the day must have been much more difficult but better for the environment. The learning objective I plan to obtain is the process of negative and positive emissions. The company will cut down trees for a new development or remove brush. The company also will be laying decorative stone walkways, which will take away from the barren earth that was once there. This is the negative side of the business. The positive side is the planting the new trees, grass, bushes, and flowers that will work in the opposite direction. I recommend weakening community laws on residential exteriors and stricter laws on the clear-cutting before construction. The two laws could drastically change environmental practices and keep a natural look to subdivisions.

Jarnagin, Corrine  
**Faculty mentor:** Christine Lemley

**Morning, 9:00am-11:00am, Skydome COE Table**

**Title: Why We Left**
My hopes for this project is to showcase different stories of different people who have or are wanting to move from Mexico to Arizona. I want to interview people in Mexico and Arizona on their life experiences they had in Mexico and Arizona. Life in certain parts of Mexico is hard. I want to show how strong these people are and why they need our help rather than rejection.

Javier, Jessica  
**Faculty mentor:** Britton Shepardson  
**Session I, 9:00am-11:00am, 66D**  
**Title:** Written Systems Through the Years  
Today, the idea of writing is simple. When anything needs to be recorded, one takes a pen or pencil and jots down that idea. People utilized writing skills everyday, but many have no idea what the actual history behind these skills are. Ancient hominids developed their own form of writing, using script, images, characters, alphabets, and so. This project researched the history of writing systems, going back hundreds of thousands of years and spanning to recent times. The research involved looking through the findings and conclusions from archaeological sites, creating a relative timeline, and deciphering how our writing system today compares to those of ancient times. By mapping out the history of writing, one can get an understanding of how our own writing system has evolved and developed into what we know it as today. Comparisons can also be made with other writing systems that exist around the world, and conclusions can be drawn as to which civilizations came into contact with each other by looking at similarities between their writing.

Jay, Hannah  
**Faculty mentor:** Francis Smiley  
**Session I, 9:00am-11:00am, 71A**  
**Title:** The Owens Valley Paiute of the Great Basin Paiute: Material Culture and the Archaeological Record  
The poster presents an examination of the material record of the ethnographically known Owens Valley Paiute of the Great Basin Paiute and the possible archaeological correlates associated with this group. Archaeologists can determine what may be located from the archaeological record by examining the material record of living societies. The Owens Valley Paiute are a hunting and gathering society of the Owens Valley in California. They are part of the larger group of Great Basin Paiute. The Owens Valley Paiute live by exploiting their local environment in a skilled manner that allows for survival. Due to the limited and organic material lifestyle they live, I predict that the archaeological record will be limited. The purpose of the presentation is to identify the material culture produced by a society, and then predict what will survive if the society got up and left everything behind. Examples of archaeological research conducted within the area will be used to compare with the ethnographically known society.

Jimenez, Yordano  
Alice Gibb, Ian MacDonald  
**Faculty mentor:** Alice Gibb  
**Session I, 9:00am-11:00am, 16A**  
**Title:** When is a C-start not a C-start? Escape behavior in the English Sole (Parophrys vetulus)  
Like other teleosts, young flatfishes produce escape responses by imparting momentum to the water using the lateral aspect of the body. After metamorphosis, however, older flatfishes dwell on the seafloor and must produce the escape movement while their lateral aspect is in contact with the substrate. How do benthic and midwater escape movements compare? We used high-speed video of Parophrys vetulus performing escape responses from the benthos and compared these behaviors to midwater escape behaviors in other fish. Benthic escapes begin with an upward head movement, while the tail remains against the substrate. Fish then peel the anterior body off of the substrate, accelerating the body vertically. Finally, the fish leaves the substrate and moves into the water column. The fish then forms a whole-body bend toward the substrate and glides to the bottom. The differences between midwater and benthic escapes are as follows. (1) Phase 1 of a midwater escape is characterized by a C-shaped bend away from the negative stimulus; phase 1 of a benthic escape is characterized by a J-shaped bend toward the negative stimulus. (2) Phase 2 of a midwater escape is characterized by a wave of bending along the ipsilateral posterior body, which creates a tail-beat; phase 2 of a benthic escape is characterized by the fish bending toward the substrate. The unusual features of the
benthic escape response suggest that benthic-based escapes may be driven by a modified motor pattern produced by the Mauthner neurons, or perhaps a different motor pattern.

Johnson, Alicia
Faculty mentor: Britton Shepardson

Session II, 2:00pm-4:00pm, 66D

Title: Prehistoric Food and Nutrition

For my project in the Undergraduate Symposium I have chosen to research the food and nutrition of prehistoric times. The topic of food and nutrition now is very simple. To know what is good for you in times now is very simple because of food labels and the internet. Before modern technology when the hunter-gatherer lifestyle was common people had no idea about what they were eating. Along with the nutrition of what was in their food it was a large task to even acquire enough to maintain their body weight. Today we can simply take a trip to the grocery store and purchase a substantial amount of food. If we can understand and learn about the ways in which people from prehistoric times survived in terms of food then we can infer so much more about their lives. A simple understanding of what people eat can give a lot of insight into their entire lives.

Johnson, Andrew
Clinton Moran, Alice Gibb, Kathy Dickson
Faculty mentor: Clinton Moran, Alice Gibb

Session I, 9:00am-11:00am, 8B

Title: Locomotor behaviors exhibited by California grunion (Leuresthes tenuis) during spawning runs on California beaches vary with environmental conditions

Fish on land are forced to overcome challenges related to movement. The California grunion (Leuresthes tenuis) emerge on land to spawn and lay eggs. Grunion display different forms of terrestrial locomotion when subjected to different environmental conditions. These conditions include wave action, fish density and substrate particle size. We analyzed video sequences of grunion behavior during spawning runs. Fish movements were quantified by recording common behaviors. Data were collected from twenty second increments during which fish movement was observed. The data were analyzed to display the frequency of behavior on different substrates, the average distance and velocity, and the repetition of a behavior. Behaviors observed were a tail flip jump, skimming motion, and inching movement. Jumping was primarily observed in high density conditions and when variable particle size was present. Skimming was exclusively seen when water was present. Inching was observed when there was a low density of fish present, little to no wave action and a constant small particle size. Inching and jumping were used to move faster while skimming was reserved for use in wave action. Grunion have evolved to fill a niche that is foreign to most fishes. Their small elongate body aids in invading land by allowing grunion to wait in the shallows and emerge with the high tide. Spawning on land offers favorable temperatures, low predation, and relative safety increasing chances for offspring survival. Grunion have evolved a tail flip jump, skimming, and inching movements that allow them succeed when faced with variable terrestrial conditions.

Johnson, Andrew
Clinton Moran, Alice Gibb, Kathy Dickson
Faculty mentor: Clinton Moran, Alice Gibb

Afternoon, 2:42pm-2:54pm, duBois Meadows Room

Title: Locomotor behaviors exhibited by California grunion (Leuresthes tenuis) during spawning runs on California beaches vary with environmental conditions

Fish on land are forced to overcome challenges related to movement. The California grunion (Leuresthes tenuis) emerge on land to spawn and lay eggs. Grunion display different forms of terrestrial locomotion when subjected to different environmental conditions. These conditions include wave action, fish density and substrate particle size. We analyzed video sequences of grunion behavior during spawning runs. Fish movements were quantified by recording common behaviors. Data were collected from twenty second increments during which fish movement was observed. The data were analyzed to display the frequency of behavior on different substrates, the average distance and velocity, and the repetition of a behavior. Behaviors observed were a tail flip jump, skimming motion, and inching movement.
Jumping was primarily observed in high density conditions and when variable particle size was present. Skimming was exclusively seen when water was present. Inchng was observed when there was a low density of fish present, little to no wave action and a constant small particle size. Inching and jumping were used to move faster while skimming was reserved for use in wave action. Grunion have evolved to fill a niche that is foreign to most fishes. Their small elongate body aids in invading land by allowing grunion to wait in the shallows and emerge with the high tide. Spawning on land offers favorable temperatures, low predation, and relative safety increasing chances for offspring survival. Grunion have evolved a tail flip jump, skimming, and inching movements that allow them succeed when faced with variable terrestrial conditions.

**Johnson, Emily**  
Connor Lane  
**Faculty mentor:** Sumner Sydeman

**Session I, 9:00am-11:00am, 103A**

**Title:** Let's Go To Work: The Effects of Supported Employment Treatment on Schizophrenia

This project is a comprehensive report of the effectiveness of Supported Employment for the treatment of individuals diagnosed with schizophrenia. A literature search produced multiple randomized control trials, as well as meta-analyses on this topic. The search was conducted according to PRISMA standards and included trials from 2000 to the present. The results found indicate that Supported Employment is effective as a treatment for schizophrenia. In the future, research should continue to focus on this type of treatment, in combination with other research supported treatments.

**Johnson, Patrick**  
**Faculty mentor:** Anthony Barnhart

**Session II, 2:00pm-4:00pm, 94B**

**Title:** Choice Blindness & Morality: Testing Long Lasting Influence

As a human being, the concept of choice is important to us. We make a variety of decisions every day from large to small based on both facts and opinions that we believe in. Unlike most blindness studies which involve visual perception, choice blindness involves failing to notice a switch in our given answer or choice (Johansson, 2014). Not only this, but we are likely to even defend this wrong or mismatched answer as if it were our own. The effect of choice blindness has been recreated in multiple studies (Hall et al., 2010; Johansson et al., 2006, 2008, 2014), even with questions that involve beliefs as deep as morality (Hall, 2012). However the long lasting effects of choice blindness have not been properly tested. The proposed study first attempts to induce choice blindness regarding questions of morality and then over a three month span, test to see if choice blindness has lasting effects. Fifty participants from ages 18-65 will fill out a ten question morality questionnaire and after the answers are manipulated, asked to defend their answers. Then one month and 3 months after the first visit, the participants return and take the same questionnaire again. Then as before, defend their answers without manipulation to test if they will answer the manipulated answer of their own accord. Although choice blindness has been shown to have some lasting effect (Johansson, 2014), with such a long time span it is hypothesized that the participants will revert to their original answer.

**Jones, Blythe**  
Elena Bras  
**Faculty mentor:** Walter Vannette

**Session II, 2:00pm-4:00pm, 80C**

**Title:** Museums and the Community

For centuries, public museums were established to educate the public on historical, natural, scientific, artistic, and cultural topics and events such as ancient ancestry, heroes of the past, revolutionary events, animal life in the past and present, and many others pertaining to our natural world and human experience. This poster will focus on historical and cultural museums and their relationship and collaboration with anthropologists. We will also examine the positive impacts and benefits museums contribute to the community, aspects of critique, and suggestions for improvement based on our anthropological perspective.
Jones, Chandler  
**Faculty mentor:** Chris Lanterman

**Afternoon, 2:00pm-2:25pm, Skydome Roundtable R3**

**Title: Restraint in the Classroom**

Children's Gates in the Classroom  
Restraint for special needs students is something that is very controversial. In schools today many classrooms use different types of physical and environmental procedures to reduce and manage behaviors of students in the classroom. In schools today, I have seen the use of a child's gate to keep the student's in the classroom with the intent that they are not able to run out of the room, which could be seen as a tool to help safety but is it allowing for the student to be in their least restrictive environment. This is an issue in today's schools because it is restraining the child in the classroom. The Council for Exceptional Children believes 'that the least restrictive positive educational strategies should be always used to respect the child's or youth's dignity and that this especially pertains to the use of physical restraint and seclusion.' According to ed.gov the federal law states that children can only be restrained if they are at risk of endangering themselves or another student and never with mechanical restraints. With the use of a gate, the law is not being met because the students should be able to leave the classroom as long as they are not in danger of harming themselves or others. The teacher of the classroom may see using the gate as a means of protection for the student but using this type of gate in the classroom does not allow for students to be in their least restrictive environment because they are being barricaded in the classroom. In order for students to be safe in the classroom it is the job of the teacher and the other trained professionals to teach the students that leaving the classroom is not a safe decision instead of just locking them in. It is important to give the staff that is working with these children the proper training so that they are not restricting the child that is in any way unlawful. My other concern is for the other students in the classroom, is this hindering their ability to be in an environment best suited for them if there is a gate on the door. What do teacher see that make the use of the gate an appropriate tool for managing students behavior in the classroom and how to teacher feel about the use of a gate on classroom doors at their school?

Jones, Corey  
Meagan Morrison, Sydney Kemper, Tyler Furuya, Troy Ballard  
**Faculty mentor:** Robert Witkoff, Sarah Oman

**Session II, 2:00pm-4:00pm, 5C**

**Title: AquaScooter**

The AquaScooter is a gas-powered, recreational swim assist product that propels a person through the water in a swimming position. The current model of the AquaScooter does not meet EPA Standards and therefore cannot be sold in the United States. The goal of our Capstone Project is to engineer/modify a motor that meets EPA Standards in addition to completely renovating the AquaScooter's design. Our team has constructed a non-functioning prototype to represent the newly designed body and steering system. A commercial motor that meets EPA standards has been selected to model the new motor for the AquaScooter. By creating a newly designed version of the AquaScooter that meets EPA Standards, we aim to make our client's product marketable and appealing to consumers.

Jones, Corey  
Meagan Morrison, Sydney Kemper, Tyler Furuya, Troy Ballard  
**Faculty mentor:** Robert Witkoff, Sarah Oman

**Morning, 8:55am-9:20am, duBois Fremont Room**

**Title: AquaScooter**

The AquaScooter is a gas-powered, recreational swim assist product that propels a person through the water in a swimming position. The current model of the AquaScooter does not meet EPA Standards and therefore cannot be sold in the United States. The goal of our Capstone Project is to engineer/modify a motor that meets EPA Standards in addition to completely renovating the AquaScooter's design. Our team has constructed a non-functioning prototype to represent the newly designed body and steering system. A commercial motor that meets EPA standards has been selected to model the new motor for the AquaScooter. By creating a newly designed version of the AquaScooter that meets EPA Standards, we aim to make our client's product marketable and appealing to consumers.
Ryan Massey, Chris Binning  
**Faculty mentor:** Paul Helford

**Afternoon, 3:40pm-4:00pm, Skydome Stage A**

**Title:** Act Your Age

Former child star Darrin Handler has had a rough time ever since he lost his job on the children's show Princess Patti's Playhouse when it was cancelled fifteen years ago. When the show comes back on the air after Patti’s release from rehab, Darrin thinks he's a shoo-in for the role he played before, but he fails to convince the show's auditioners that he can still play a child. Desperate to get back to his glory days, Darrin decides to try method acting to learn to be a child again and get back the role he was born to play in this short film comedy. Act Your Age is the result of the combined efforts of more than seventy NAU students. It was produced by UTV Films, NAU’s student run film production studio that aims to provide students interested in pursuing careers in filmmaking with professional film set experience. Electronic Media and Film students helped with the creation of the project by fulfilling production roles including writing, directing, producing, and editing. In order to finance the film, students ran a crowdfunding campaign on Kickstarter and raised almost $5,000, in addition to receiving a grant from ASNAU. The film has been submitted for consideration in the Rocky Mountain Student Emmys.

**Juarez, Manuel**

Jordan Juarez, Dominic Petrini, Joe Gorski, Leroy Guenther, Alex Holmes  
**Faculty mentor:** Phoebe Morgan

**Session II, 2:00pm-4:00pm, 86B**

**Title:** Conflict Management Workshop For High Stress Environments

The Air Force ROTC and football programs at NAU are intense and stressful environments highly reliant on teamwork for success. The assumption at the onset of this project was that A. specific personality types are attracted to this type of environment (traits such as dominance, aggression, dedication, need for challenge) or that B. members of these groups develop these traits in order to succeed in them. To test our theory we used a 'Personality Inventory' to determine dispute resolution styles. We then presented a brief PowerPoint presentation about alternative dispute resolution and restorative justice tailored to the ROTC and football programs, and targeting their specific needs. Afterwards, participants were asked to provide solutions to scenarios designed around realistic and common situations for them. Lastly, they evaluated the workshop as a whole and indicated if it was helpful or not. The point of this project was to present alternative dispute resolution styles catered to the unique environments and needs of NAU's Air Force ROTC program and the football team. (The poster will depict the evolution of a senior capstone project completed by CCJ majors enrolled in CCJ 480:Alternative Dispute Resolution.)

**Jurowski, Claudia**

Matthew Shaw, Peter Baroldy, Jordan Calka, Timothy Patridge  
**Faculty mentor:** Claudia Jurowski

**Session II, 2:00pm-4:00pm, 40B**

**Title:** Experiential Ecotourism in Copper Canyon Mexico

This project involved researching experiential tourism, consulting with experts from Copper Canyon Mexico, an analysis of the strengths and weaknesses of Copper Canyon as a tourism destination and a proposed design of a sustainable experiential ecotourism experience.

**Jurowski, Claudia**  
Connor Nelson, Zane Grenner-Oyer, Kailey Fuller, Vanessa Pacheco, Adam Stalzer  
**Faculty mentor:** Claudia Jurowski

**Session II, 2:00pm-4:00pm, 40C**

**Title:** Ecotourism Facility in Copper Canyon Mexico

Research on sustainable tourism and on Copper Canyon in Mexico resulted in the design of a sustainable ecotourism lodging facility that meets the economic and social needs of the local people while preserving the natural environment.
Justus, Lauren  
Darriel Banks, Sydney Berner, Shalyn Maltos, Karina Herrera  
**Faculty mentor:** Jay Sutliffe

**Session I, 9:00am-11:00am, 47A**  
**Title: Healthy Mom, Healthy Baby**
Healthy Mom, Healthy Baby was an intervention implemented with the Teenage Parent Program, also known as TAPP, located at Summit High School. The TAPP program helps teenager mothers finish their high school education. In this project we focused on teenage mothers ranging from the ages of fifteen to twenty-one year olds and provided them with education about better nutrition for both themselves and their baby. The intervention was a four week program that was conducted twice a week. It taught them how to not only cook healthy meals, but to buy cheap meals that were more affordable. This intervention taught these new young mothers not only the nutrient dense foods that is better for them, but it taught them how to live an overall healthier lifestyle for themselves and their baby.

Kanzler, Justin  
Jose Martinez  
**Faculty mentor:** Nancy Barron

**Session II, 2:00pm-4:00pm, 128A**  
**Title: iWriting Workshops**
Exigence, the inconsistent attendance and poor results of group essay workshops. Students in attendance of one-on-one workshops are able to successfully address their questions, but do not have access to the same materials that are presented in formal group workshops. Materials available on the internet vary in credibility and content, so student works suffers if they apply content that is not credible or only seems credible. Viable resources are hard to find, often do not address the basic questions students have, and does not change its content based on user input. The most effective workshop format the iWriting team has applied is a 30-minute one-on-one session in which we address any writing questions or concerns students have. As the sessions are largely directed by the questions students have about the mechanics and strategies of their writing rather than the subject matter, the workshops are able to cater to any discipline. At the symposium, we will present an analysis of our process in creating a workshop format which can suit any discipline, as well as the online format in which we are making materials available to students which would have only had access to such materials presented in formal group workshops or scoured from the internet from sources of variable credibility.

Kaus, Hailey  
**Faculty mentor:** Scot Raab

**Session I, 9:00am-11:00am, 44B**  
**Title: Injury History Versus Current Fitness Baseline in Female Club Gymnasts**
Establishing a potential relationship between coaching philosophy and young gymnasts' fitness levels, as related to injury prevalence, can help club level gymnastics coaches improve injury prevention protocols. The purpose of this research study is to determine if baseline fitness and training, as well as coaching expertise, can predict injury rates in female, club gymnasts. 71 female gymnasts, levels four through ten volunteered to participate. Each participant's demographics were evaluated with a history form, which asked for their level, hours of practice per week, and if they had been injured within the year. If the gymnast had been injured, the participant was asked a few more, injury specific, questions. The baseline test consisted of five assessments: a vertical jump, right and left splits, a shoulder flexibility test and pushups. For gymnasts practicing 11-15 hours a week there was a 16 percent chance of injury, 16-20 hours had a 93 percent chance, and 21-25 hours had a 117 percent chance. The significance of this data is supported by the P-value of 0.01. The individual test results had some insignificant and some significant P-values: pushups at 0.04, vertical jump at 0.01, right splits at 0.16, left splits at 0.73, and shoulder flexibility at 0.33. As a gymnast's practice time increases, which corresponds to the level, there is an increase in the chance of injury. The reason for the increase in injury rate cannot be determined based on the baseline tests in this study.

Keener, Mitchell
Mukoma Simpanya, Jinhee Yi, Mark Mayo, Joseph Busch, Erik Settles, Bart Currie, Richard Bowen, Paul Keim  
**Faculty mentor:** Mukoma Simpanya

**Session II, 2:00pm-4:00pm, 13B**  
**Title:** Immune Antibody Response in a Melioidosis Goat Model to Targeted Set of Burkholderia pseudomallei Protein Antigens

Burkholderia pseudomallei is a pathogenic soil bacterium that causes the disease melioidosis in humans and other mammals. This organism is of public health concern in many regions of southeastern Asia and northern Australia due to its high mortality rate (20%) and because of its potential to spread to non-endemic regions. No vaccine is available and an accurate diagnosis is difficult; confirmation cannot be made until a patient develops antibodies or a culture is grown from patient specimens, which could take two days after the sample is collected. Current antibody tests can detect less than 90% of B. pseudomallei infections and many false positives can occur. Therefore, a need exists for better serodiagnostic tools to facilitate the early and accurate detection of an infection. A list of 53 proteins has been identified using human sera from melioidosis patients that includes potential protein targets for diagnostic assay development. Following purification of the target proteins, Enzyme Linked Immunosorbent Assays (ELISAs) were performed using serum from goats experimentally challenged with B. pseudomallei. The ELISA is used to determine the relative humoral (antibody-mediated) response to each protein raised during B. pseudomallei infection. Currently, 13 proteins have been purified and 5 proteins have been used in ELISA assays. Antibodies were detected in all B. pseudomallei infected goats 14 days after infection, which suggests a higher detection level than current tests. Future steps will be performed to confirm that these proteins are primarily serodiagnostic of B. pseudomallei and not other bacterial pathogens. Further testing will be performed to confirm the rapid and accurate diagnosis of melioidosis in a clinical setting compared to current diagnostic assays. Finally, all of these protein candidates can be used for future vaccine development.

Keller, Paeton  
**Faculty mentor:** Britton Shepardson

**Session I, 9:00am-11:00am, 67A**  
**Title:** The Prehistory of the Bow and Arrow

This research project uncovers the origination of the bow and arrow as used by prehistoric peoples and cultures.

Kelley, Charles  
**Faculty mentor:** Ryan Fitch

**Session II, 2:00pm-4:00pm, 31D**  
**Title:** Reducing Water Use with Better Irrigation

Water is a scarce resource in Arizona and the rest of the western United States. The largest use of water is for irrigation of agriculture. Subsurface drip irrigation is the most efficient method of irrigation and may provide the potential to reduce water use and lessen the strain on water in Arizona.

Keltz, Ehren  
**Faculty mentor:** Frederick Lampe

**Session I, 9:00am-11:00am, 62D**  
**Title:** Languages' Role on Gender

Most people should already know about the diversity of genders across all of the cultures around the world and even within our own (American) cultures, but one thing I think many of us take for granted is how our languages play a part in identifying and portraying genders. Languages have an enormous impact on how we, as humans, perceive the world around us and one of the factors we rarely consider is gender diversity. Many genders in the U.S. and around the world are ridiculed, oppressed and 'othered' for being 'outside of the norm,' and in some cultures they are respected and somewhat revered; a large part of this is how we verbally address such genders. In my research I am going to break down a few select genders within a few select cultures and attempt to discover how it is that the languages of these cultures portray certain genders. Some of the gender communities I will be advocating are the Hijras of India,
Transsexuals of the United States of America, and the 'Two-Spirited' people of particular Native American cultures such as the Lakota and the Navajo. Hopefully I can help spread a consciousness about how one might speak of other genders aside from the ones they are familiar with.

Keltz, Ehren  
**Faculty mentor:** Michael Vasquez

**Session II, 2:00pm-4:00pm, 62D**

**Title: Georgia's Indigenous Relations: Past and Present**

The state of Georgia, in the Southeastern United States, has had a rough and atrocious history with not only African Americans but also with Native Americans. Georgia pushed out all of the indigenous cultures from it's borders back in 1830 with the 'Indian Removal Act' and before that enslaved many indigenous peoples. It wasn't until 1980 that laws limiting the rights of the Muskogee-Creek people, east of the Mississippi, were officially removed. With this disgraceful history, I want to dive into the present day relationships between the state of Georgia and the Native American tribes and Nations that currently reside within it's borders. I have the potential, and honor, to do an interview with an old family friend who is the son of a Chief of the Muscogee (Creek) Nation in Georgia; his name is Mico Bowles. Given his last name, his family has quite a history amongst the Muscogee people going back to General William Augustus Bowles who married the Muscogee Chief's daughter back in the late 1700's. As with many states in the U.S., I'm sure there is some political animosity between the tribes and the state; I want to understand the current relationship and maybe hypothesize some potential resolutions, if any.

Khan, Kamran  
Shane Klotzman, Abdullah Ashkanani  
**Faculty mentor:** Bridget Bero

**Morning, 10:45am-11:10am, duBois Agassiz Room**

**Title: Informal Recreational Shooting Ranges and Lead Contamination**

Informal shooting ranges provide a space for the public to recreationally target shoot. However, prolonged use of a given area can pose a risk to the public. The following project's aim is to characterize 15 informal recreational shooting ranges with regards to heavy metal contamination. Sites of interest are located in the Sonoran Desert National Monument (SDNM), which is located south west of the Phoenix Metropolitan area, and is managed by the Bureau of Land Management. A human and ecological risk assessment was performed based on soil samples collected under BLM guidance. The culmination of the project is a Preliminary Assessment & Site Inspection document, which will inform the BLM as to the extent of contamination at the sites in question.

Khatoun, Yasmin  
**Faculty mentor:** Chris Lanterman

**Session I, 9:00am-11:00am, 51D**

**Title: Implementation of Universal Design in the Classroom**

The individual principles of universal design for learning have been researched and are suggested to be effective in making the academic world accessible for all. However, these principles are not fully implemented in education. The laws that protect individuals with disabilities require for reasonable accommodations which can be met through universal design for learning. The question becomes this, if the principles of universal design for learning have been suggested to be helpful to all learners, while simultaneously helping educators to obey the law for those students protected by it, then why have these principles not been fully implemented in education? This can be found out by surveying educators about their knowledge of Universal Design for Learning and their level of implementation of Universal Design for Learning. The reality may be that the vast majority of educators are simply unaware of such design principles because they are unaffected by inaccessibility, or that they do not understand the benefits of accessibility for themselves, and for others who may have disabilities or accessibility needs. The relationship between the lack of implementation of universal design for learning is one that can be combated through the education of all individuals of the benefits of universal design for learning to education.

Kie, Geoffrey
Faculty mentor: Micheal Lerma

Session II, 2:00pm-4:00pm, 75D

Title: 1680 - The Fight for Decolonization Continues

1680, at this point there was no Indian law case but a European justification of the Doctrine of Discovery which led to the decimation of people across the world. Their reports of savage beings from new lands meant it was their duty to civilize Indigenous peoples. Ultimately dismantling systems of Economy, Health, Governance which were already in place but never recognized as so. The Pueblo Revolt of 1680 was a result of human rights violations, before the United States of America was even a concept. This era can be described as the earliest seeds of this intimidation as Spanish explorers often had the upper hand with forged tools and weapons, disrupting cycles that were already maintaining human life. Large populations of Indigenous peoples were wiped out but the Pueblo people, from what is now New Mexico, led the first successful uprising against a colonial power which resulted from religious imposition and destruction of various resources. This single event has led to the continuation of language, culture, knowledge and existence of many Pueblo societies. Although the Pueblo Revolt was important to resilience, the ways of life had ultimately been skewed since then.

Kilgore, Dorothy
Faculty mentor: Michael Vasquez

Session II, 2:00pm-4:00pm, 73D

Title: Extermination of the California Indians during the Gold Rush (1850-1860)

This poster represents the history and early trends of California Indian–White relationships during the Gold Rush. Many California Indians were either used as slaves or were exterminated by white settlers during this time. The purpose of this poster is to present the history and prejudice that Native American tribes were facing during the California Gold Rush. The time period most focused on within this poster is the 1850's to the 1860's, the beginning of the Gold Rush in Central California.

Kimball, Daniel
Faculty mentor: Mike Lopez

Morning, 10:30am-10:42am, duBois Room A

Title: Electrofishing: Protecting the Endangered

The Apache Trout (Oncorhynchus apache), Arizona's state fish, was listed on the endangered species list in 1969. The Arizona Game and Fish Department (AZGFD) hired me for their Apache Trout Recovery Project. My internship's purpose was to help the Apache Trout recover by counting the population and removing competing invasive species (Rainbow, Brook, Cutthroat, and Brown Trout) from the White Mountain region of Arizona. My crew did this using backpack electrofishing, which allows biologists to stun and net fish either for measuring purposes or removal. The data we collected over the summer are analyzed and evaluated by the Arizona Game and Fish employees over the winter when data collection isn't occurring. My crew was also tasked with repairing fish habitat, limnological monitoring, angler creel survey, and pond construction. Limnological monitoring refers to taking lake water samples and testing them in a lab (pH, oxygen content, available nutrients) to decide if the lake is able to sustain additional fish stocked by AZGFD. During angler creel surveys a single intern would go to several lakes within the Pinetop-Lakeside and Show Low region to ask anglers various questions about their experience including, how many fish they have caught, and how many times they have been fishing in the last calendar year. We were also tasked over the course of the summer to aid in pond construction outside the AZGFD Region 1 office. During the internship I developed a greater understanding of how data are collected in the field and used. I now have a greater understanding of how the AZGFD works as a department. I would recommend that the department be more involved with their interns because my crew rarely had a supervisor with us, which was sometimes frustrating.

King, Clayton
Mackenna Tally, Jonathan Shimek, Emily Zamora
Faculty mentor: Eric Yordy

Session II, 2:00pm-4:00pm, 28C
**Title: Antitrust Law in Professional Sports**

Project focused on the ethical and economic impacts of antitrust violations in various professional sports (ie. NFL and MLB). We focused on various issues found in broadcasting, relocation, and trademark licensing. Further, applicable cases were identified and analyzed.

**King, Jacob**  
Ricardo Peterson, David Keene, Serena Sauceda, Brandon Shipman  
**Faculty mentor:** Douglas Holland, Elmer Grubbs

**Session I, 9:00am-11:00am, 9B**

**Title: Space Radiation Detection Imaging System**

In space, astronauts can be easily exposed to unique and harmful forms of radiation including Van Allen belts, cosmic rays, and solar particle events. The danger significantly increases outside the Earth's protective magnetosphere and consequently presents the most risks towards deep space travelers. To decrease any potential adverse effects, scientists first must undergo research on the biological reactions instigated by all types of space radiation. Our project focused on the design of a CMOS Sensor Array System that will accurately capture images of the absorbed radiation at the resolution of a biological cell. The final device will be used by researchers at other institutions, such as Texas A&M University, to provide a better understanding of how detrimental each class of radiation is. Ultimately, it will prove to be an important tool in furthering cancer research and improving radiation shielding for space travelers.

**King, Jacob**  
Ricardo Peterson, David Keene, Serena Sauceda, Brandon Shipman  
**Faculty mentor:** Douglas Holland, Elmer Grubbs

**Afternoon, 3:20pm-3:45pm, duBois Agassiz Room**

**Title: Space Radiation Detection Imaging System**

In space, astronauts can be easily exposed to unique and harmful forms of radiation including Van Allen belts, cosmic rays, and solar particle events. The danger significantly increases outside the Earth's protective magnetosphere and consequently presents the most risks towards deep space travelers. To decrease any potential adverse effects, scientists first must undergo research on the biological reactions instigated by all types of space radiation. Our project focused on the design of a CMOS Sensor Array System that will accurately capture images of the absorbed radiation at the resolution of a biological cell. The final device will be used by researchers at other institutions, such as Texas A&M University, to provide a better understanding of how detrimental each class of radiation is. Ultimately, it will prove to be an important tool in furthering cancer research and improving radiation shielding for space travelers.

**King, Karleen**  
Cameron Butler, Taylor Garrett, Luke Bruggeman, Alexandra Naidenovich, Chanelle Flori  
**Faculty mentor:** William Cordeiro

**Morning, 10:00am-10:40am, Skydome Stage C**

**Title: A short film detailing Anarchy: a fictional account of Slab City**

This short fictional film explores themes of Anarchy as it follows two characters and their conflicting journey to Slab City. The film begins by describing the main characters as two college friends who have very different personalities and opinions. As one character hits a road block in school he yearns for change and must work to convince his best friend to drop everything and make a spur of the moment trip to California. As his attitude about bureaucratic society shifts so does his relationship with his friend. Over the course of the trip the two pick up a third character who introduces more conflict and creates tension between the main characters. She is journalist who is on the way to create a story on an anarchist community in California called Slab City. She is able to change the direction of the trip and all three end up in the remote desserts of South Eastern California. While there one of the main characters takes special romantic interests in the hitchhiker which creates and even deeper divide between the two best friends who intended to use the trip as a way to escape society and bond over a fun weekend getaway. The anarchist ideals also begin to appeal to the other main character as he realizes that the current society he lives in is constricting. This film ends as the two friend's part ways and realize that their perceptions about anarchy have changed.
King, MacKenzie  
**Faculty mentor:** Britton Shepardson

**Session I, 9:00am-11:00am, 72D**

**Title: Archeology of Sexuality**

I will be looking at five examples of sexuality throughout time by researching material remains from known archaeological sites. I will be comparing and contrasting the different artifacts found at the sites to find how sexuality has changed or remained the same throughout time. One example that I will be looking at are artifacts found at Mal’ta-Buret’. At this site, they found figurines of women with exaggerated feminine features. I will be looking at other sites that give similar examples through their artifacts.

King, Shayna  
Derek Curtis, Nia Harris  
**Faculty mentor:** Cassandra Dakan

**Morning, 11:00am-11:30am, Skydome Roundtable R3**

**Title: CopyCat: The Future of Social Technology**

Technological advances are rapidly changing the ways humans relate to and communicate with one another, and perceive reality. What are the pros and cons of these changes? Discussants will examine the future of storytelling, the rise of social and caretaking robots, and the use of augmented reality.

Kirkeeng, Brianna  
**Faculty mentor:** Melissa Santana

**Session I, 9:00am-11:00am, 122C**

**Title: Behavioral Health Design**

Research supports that the built environment can have a positive impact on overall human well-being. Unfortunately, most behavioral health care buildings of the past century do more harm than good. Thus, there has been a recent movement in designing these facilities to be uplifting, welcoming spaces utilizing certain interior/exterior design elements to promote overall patient satisfaction, recovery, and reintroduction into community. The goal of the project is to design a new facility located in North Carolina that will create a new image for behavioral health services. The design behind Hickory Ridge Healing Haven is to create an environment that deviates negative stigma associated with earlier models of behavioral health care facilities. The concept for Hickory Ridge Healing Haven is to create a safe and secure environment that is welcoming for patients, visitors and staff. The design aesthetic will aim at being less institutional and providing a more comfortable, homelike atmosphere that integrates elements that resemble, replicate, or are symbolic of elements found in nature. The new facility is a nurturing environment that provides behavioral health services to a diverse population that customizes a discharge plan targeted at meeting individual health needs of every patient. It offers new opportunities and integrates 'real-world' activities into recovery and treatment plans that allow therapist a new set of grounds to observe and patients to grow. Hickory Ridge Healing Haven encompasses a variety of healing and recovery services and techniques in a therapeutic environment that foster patient's needs.

Kitz, Molly  
Molly Kitz, Kyle Renning, Kelsey Varner, Ryan Hawkins, Jacob Julian  
**Faculty mentor:** Linda Robyn

**Morning, 9:00am-11:00am, Skydome SBS Table**

**Title: Gangs Through the Ages**

Our project is a comparison of gangs through the ages. For example, gangs in the depression era versus gangs today. We will be discussing the similarities, differences, racial differences, as well as different cases and trials throughout the ages.
Klein, Rebecca  
**Faculty mentor:** Britton Shepardson  

**Session II, 2:00pm-4:00pm, 67A**  
**Title: The PreHistory of the domestication of animals**  
I am going to explain how animals went from being hunted down to being taken control of by people and being kept in a facility where they could not run away.

Kmetz, Ben  
**Faculty mentor:** Scot Raab  

**Session I, 9:00am-11:00am, 49A**  
**Title: S-100B Used as a Tool for Concussion Diagnosis: A Review of Literature**  
A review of literature to determine if, S100B protein can be used as a biomarker to diagnosis a concussion on the sidelines, in all ages of athletes. Methods: A literature of Medline and CINAHL Complete, using these terms:-Concussions - S100B with exercise-Biomarkers- S100B physiology-S100B protein- S100B with contact-Blood brain physiology - Ways to receive S100B levels. Discussion: The review of literature shows that S100B levels have a significant increase after a diagnosed concussion. It was shown in several studies to decrease back to baseline levels within 24 hours post-injury. It was also noted that S100B levels increase after exercise but these levels differ than concussive levels. Research showed that while S100B levels can determine a concussive hit, it took an unreasonable amount of time for an athletic trainer to use this protocol.Conclusion: From the evidence provided it can be said that at this time S100B protein cannot be used as a sideline concussion test. It is also concluded that based on levels decreasing 24 hours post-injury that S100B should not be used as a concussion management tool. Before considering S-100B as an objective test to diagnose a concussion, further testing needs to be done to receive blood results in a quicker fashion.

Koogle, Sloane  
**Faculty mentor:** Glenn Hansen  

**Session I, 9:00am-11:00am, 108D**  
**Title: Love and Gender by Disney**  
A look at love and gender represented by Disney in their films, company, and products. Focusing on the traditional masculine and feminine binaries in conjunction with the development of American culture.

Koritzke, Alanna  
Andee Lister, Jani Ingram  
**Faculty mentor:** Jani Ingram, Andee Lister  

**Session II, 2:00pm-4:00pm, 26D**  
**Title: Quantification of uranium in soil collected near an abandoned uranium mining site in Leupp, AZ on the Navajo Reservation.**  
The Navajo Nation has been deeply affected by the uranium mining that occurred in the 1950's. As a result, there is a legacy of abandoned mines on Navajo Lands. The water, soil, livestock, and plants surrounding the abandoned mines have been contaminated with uranium. Leupp, AZ is southeast of Cameron, where many of the mines are situated, and are connected by the Little Colorado River, roughly 40 miles apart. The purpose of this research was to determine the amount of uranium in the soil in the control site in Leupp. In future work, these results will be compared to the uranium in soil from a mining area near Cameron, AZ. Seven samples were gathered from the topsoil around various locations in Leupp. Each sample was sifted, crushed, and divided into five subsamples for five repetitions of analysis. These sets were placed in a high temperature furnace for 24 hours, acidified with nitric and hydrofluoric acids, and neutralized with boric acid to prepare for analysis. The concentration of uranium (in parts per million) was determined utilizing an inductively coupled plasma mass spectrometer (ICP-MS). The results of this analysis will be further discussed. Uranium exposure has the potential to affect human health, especially when the exposure is long-term. Possible notable effects include liver damage, cancer risk, internal irradiation, and chemical toxicity. We acknowledge...
the Partnership for Native American Cancer Prevention funded by the National Cancer Institute for supporting this work.

**Kosters, Teoni**  
**Faculty mentor:** Glenn Hansen

**Session I, 9:00am-11:00am, 109A**

**Title: The Disney Effect**

Disney's effect over the younger audiences scheme of body image. Does Disney really affect kids psychologically or is Disney really innocent?

**Kruse, Samantha**  
Thomas Haden, Loren Reichsfeld  
**Faculty mentor:** Stephanie Hurst

**Session II, 2:00pm-4:00pm, 26B**

**Title: Pharmaceutical Phosphines for Faster Formulation: Palladium-Phosphonium Complexes and their Medical Impacts**

Palladium catalysts are still undergoing significant research into their applications for important organic reactions. Palladium is a catalyst that has been employed in the creation of multiple pharmaceuticals, a few of which are standard anti-inflammatory drugs, such as Aleve® and Relpax®. Phosphine ligands have been shown to increase the efficacy of these palladium catalysts. Research has not yet been done on many bidentate phosphine ligands, which is what I have been working on. I have researched bidentate phosphine ligands that have one cycloheptatriene ring on each phosphorous group through synthesis reactions. These compounds have interesting chelating abilities with different metals such as palladium. I have characterized the compounds using 1D and 2D nuclear magnetic resonance (NMR) as well as crystallography. I am also working on similar research on the single sided derivative of these compounds. These new compounds would contain a single cycloheptatriene ring, which will change the compound's structural and catalytic properties. These will be characterized under similar means, and the structure-property relationships will be studied.

**Krznarich, Sara**  
Anita Antoninka, Bo Stevens, Nancy Johnson  
**Faculty mentor:** Nancy Johnson

**Morning, 9:18am--9:30am, duBois Room A**

**Title: Patterns of Arbuscular Mycorrhizal Fungal Communities in the Serengeti National Park**

Arbuscular mycorrhizal fungi (AMF) have a symbiotic relationship with plant roots. AMF transfer nutrients and water to their host plants and in return plants provide carbon to AMF. Mycorrhizal symbioses are vital to a plant's life, the grassland community structure, and ecosystem processes. The abundance and diversity of AMF and how they are impacted by environmental factors in natural grasslands is not well understood. We studied the influence of soil properties, climate, and grazing on the structure of AMF communities from 42 experimental plots at seven sites located across environmental gradients in the Serengeti National Park in Tanzania. Half of the plots excluded grazing with fences that prevented disturbance by large mammals. Samples were analyzed for their soil properties and spore communities of AMF. We discovered a very high diversity and density of AMF spores (47 spore types and 326 to 1757 spores per gram dry soil). Also, there was a significant impact of precipitation and soil properties on the species composition of AMF communities. Our discovery of strong patterns of AMF across precipitation and soil gradients contributes to the ecological knowledge about AMF and provides better understanding of the factors structuring grassland ecosystems.

**Kuhn, Sarah**  
Niya Davis  
**Faculty mentor:** Sumner Sydeman

**Session I, 9:00am-11:00am, 58B**
**Title: Is Group Cognitive Behavioral Therapy Effective for Children and Adolescents with Social Phobia? A Systematic Review of Available Evidence**

The current project was focused on conducting a systematic literature review of the effectiveness of group cognitive behavioral therapy (GCBT) for children and adolescents with social phobia. The literature search was performed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses standards (PRISMA: Liberati et al., 2009). Numerous randomized control trials were found and they will be reviewed in the poster. The limitations in this systematic review included no case studies or series. Strengths of the published articles will be discussed at length. Results demonstrate that GCBT is an efficacious type of therapy for children and adolescents with social phobia. In addition, the current researchers discussed the limitations of the clinical trials and provide suggestions for future research on this topic.

**Kulpinski, Maisie**  
**Faculty mentor:** Francis Smiley

**Session II, 2:00pm-4:00pm, 71A**

**Title: The Inuit of the Northern Arctic: Material Culture and the Archaeological Record**

The poster presents a visual and textual examination of the material record of the ethnographically known Inuit society of Alaska, Greenland, and Northern Canada, in comparison with similar archaeological societies. Archaeologists can learn a great deal about surviving in the northern arctic by examining the material correlates of the ethnographically known Inuit society. The Inuit are a hunting and gathering society of Alaska, Greenland, and Northern Canada. The Inuit whale, fish, and manufacture goods throughout self-governed groups. The surrounding societies trade and assist among the Inuit communities with other goods. Despite the harsh weather of the northern arctic, I believe the archaeological records will be abundant. Because the Inuit produce a range of products, and build temporary dwellings out of bone and stone, I predict that the archaeological record will be abundant. The purpose of this presentation is to set out a model of the kinds of material cultural items produced by a society given the social organization and other cultural factors that govern the operation of that society. The poster also presents examples of archaeological research on similar societies to compare archaeological reality with the ethnographically derived model.

**Kumorek, Megan**  
**Faculty mentor:** Francis Smiley

**Session I, 9:00am-11:00am, 71B**

**Title: The Yuqui of Bolivia: Archaeological Correlates of a Hunter-Gatherer Society**

The poster presents a visual and textual examination of the material record of the ethnographically known Yuqui society of Bolivia in comparison to similarly known archaeological societies. Archaeologists can learn a great deal about indigenous people having to adapt to a changing world by closely examining the material record of the Yuqui. The Yuqui are a hunter-gatherer group that reside in the Amazonian rain forest of Bolivia. A headman, called a Papa, which is also the name a wife uses to address her husband, leads the Yuqui. The Yuqui people build homes for their dead, possess slaves, and divorce when they do not feel satisfied. The Yuqui make eight-foot bows, which they sell to neighboring communities so that they may purchase guns for hunting. Though the Yuqui develop homes for their dead, bows, and arrows, and possess guns, I predict that the attendant archaeological record will be limited due to the climate of the Amazon rain forest. The purpose of this presentation is to set out a model of the kinds of material cultural items possessed by a society given the pressures they face from the outside world. The poster also presents examples of archaeological research in similar Amazonian societies to compare archaeological reality with the ethnographically derived model.

**Kuyper, Madison**  
Lexie Sutcliffe, Ashley Mutchek  
**Faculty mentor:** Cassandra Dakan

Morning, 11:00am-11:30am, Skydome Roundtable R2

**Title: The Future of Human and Animal Synergy**
Nature has spent billions of years perfecting symbiotic processes that re-use wastes and keep the Earth in healthy balance. Join a discussion on the future potential of Biomimicry, plant based medicine, and solutions to pressing environmental and engineering challenges that can help cure what ails the Earth and humans.

LaBrusciano, Angela  
**Faculty mentor:** Anthony Barnhart

**Session I, 9:00am-11:00am, 96A**  
**Title: Attitudes, Smells, and Choice Blindness**

The purpose of this research was to determine if attitudes change after preference is manipulated would choice blindness occur. This has been discovered by manipulating the independent variable and is defined by the two different scents: apple and pear. The two scents are manipulated by having duplicates of the two scents, totaling four bottles. Each participant was deceived to believe that they smelled their preferred scent when in actuality they smelled their un-favorite scent. The dependent variable was measured and is identified as participants' favorite scent before and after exposure. Upon examination participant's preference out of the two scents was measured. The research findings suggest that choice blindness does influence perception and that preference does not play a major role in likability. This was measured by having participants say their favorite scent out of the two and then specify which scent was preferred after exposure again. Lastly, the findings demonstrate that participants are in fact influenced by choice blindness. This research is important because it helps determine that choice blindness is in fact a phenomenon and can occur in many situations.

Lackey, Danielle  
Dakota King, Chelsea Seifert  
**Faculty mentor:** Brant Short

**Session I, 9:00am-11:00am, 80A**  
**Title: ‘Lactivism’ in the Media: Persuasive Messages Created by Public Breast Feeding Supporters**

The purpose of this study is to examine several case studies regarding breastfeeding in public and understand the ways in which those involved addressed the issue. The main case study that is examined is the one involving Ashley Clawson and Victoria Secret that took place earlier this year. This study also takes a look at other organizations, such as the La Leche League and the World Alliance for Breast-feeding Action, and social media campaigns, such as #Brelfie, that serve as activists of breastfeeding in public. The Expectancy Violation theory and Dramatism is then used to critique these case studies and campaigns and provide a better understanding as to how these organizations communicate about the lactivism movement.

Laird, Caleb  
**Faculty mentor:** Becky Butcher

**Session II, 2:00pm-4:00pm, 117A**  
**Title: Social Construction of Race: An Historical Overview**

This project is a research project of the history of African Americans in the United States. I will examine how race is a social construct. Through looking through the effects that this construct, as well as discriminatory laws and practices African Americans faced during the history of the United States, I will show how this has historically affected the ability for African Americans to achieve equal access to resource shares (jobs, education, finances), as well as to examine how it affects African Americans today.

Lancaster, Chris  
Joshua Carmen  
**Faculty mentor:** Stephen Schuster, Becky Beresic-Perrins

**Session I, 9:00am-11:00am, 14D**  
**Title: Microbial Floras between species of leeches in Montezuma Well**
Many animals are known to have dermal bacterial microflora. However, the degree to which microfloral communities differ among species is poorly known. To address our hypothesis that microflora are distinct at the species level, we will compare the dermal microflora of two apparent species of leeches found at Montezuma Well. We will collect three individuals of each leech species and maintain them in vacuum-filtered Well water for 24 hrs. We will then inoculate culture plates with unfiltered Well water, filtered Well water, distilled water, and the water in which leeches were maintained. From the three of the most morphologically distinct colonies in each culture, we will compare the morphology, staining properties and if possible, DNA sequences of the sampled bacteria. Differences among bacterial cultures between the apparent leech species will suggest that these two leeches are not only distinct from one another but also may occupy different niches within the Well. No differences in microflora between the leeches could suggest that the species are not distinct. Overall our results will provide the first investigation of microfloral characteristics in leeches.

Landy, Taylor
Alex Gilmore, Rebecca Baracco
**Faculty mentor:** Ashley DeBoard

**Session I, 9:00am-11:00am, 7B**

**Title: Environmental Education: Reaching Youth in Elementary Schools**

To help bring further environmental education programs to elementary level students, we have created an in class project to help students and teachers. Incorporating a story based learning program we are able to connect with students and have them individually thinking about Earths problems and solutions. By leaving the teacher with further instructions to continue the learning in future years to come. Our hope is to create a program where environmental education becomes just as important as science math and english is.

Lane, Morgan
Rayele Sherlock, Kimberlyn Carovillano, Morgan Nells, Monika Fennell
**Faculty mentor:** Linda Robyn

**Morning, 9:00am-11:00am, Skydome SBS Table**

**Title: Gangs**

In this magazine there will be a variety of subtopics within our main topic of gangs. From the history to the local gangs of Flagstaff, our project will further educate the public of the danger, location, and the creation of gangs in our society and inside prison.

Lang, Audrey
Nicolas Boon, Nicole Stanczak
**Faculty mentor:** Bridget Bero

**Session I, 9:00am-11:00am, 11A**

**Title: Vulture Mine Tailings**

Risk Assessment is a crucial component in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process, and must be completed before any remidal action may begin on a hazardous waste site. Risk Assessment is an important component in the CERCLA process for hazardous waste site clean-up, because it provides details on the extent of harm a hazardous waste site poses to human health and ecological health. This project will help the Bureau of Land Management examine and assess the risks that accompany the migration of mine tailings. To do this, Gold Member Inc. screened 104 soil samples with an X-Ray Fluorescence handheld device and correlated the data with analytical data after the soil samples were tested in the Environmental Analysis Laboratory. A risk assessment was done for one animal and one plant to show potential hazards for species inhabiting the area. The results concluded that the contaminants of concern, primarily lead, exceeded both residential and non-residential soil remediation limits. This concludes that the Bureau of Land Management will need to take further action with this site and pursue a responsive party.

Lang, Audrey
Nicolas Boon, Nicole Stanczak
Faculty mentor: Bridget Bero

Afternoon, 1:30pm-1:55pm, duBois Agassiz Room

Title: Vulture Mine Tailings

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Langdon, Daniel
Connor Matthews, Diego Mondragon
Faculty mentor: Phoebe Morgan

Session I, 9:00am-11:00am, 86C

Title: The Resolution Guidebook to Freshmen Living

Because we have been focused on alternative dispute resolution, we thought it would be a good idea to apply this concept to freshman living in dorms. After talking to Richard Payne (head of student living at NAU) we have come up with several problems most freshman have to deal with, especially concerning roommates that did not know each other before moving in with one another. These problems include: cleanliness, privacy, lack of communication, and disputes that revolve around who is and is not allowed in the room. By incorporating what we have learned about alternative dispute resolution, we are making a guidebook that is aimed at solving the typical disputes mentioned above as well as others that freshman living on campus have to deal with. Ultimately, we hope to talk to various RA’s that live in freshman dorms and ask them if they find the guidebook helpful and if they will refer to this guidebook in the future, and if they have any suggestions for editing the book so that we can make it more accurate. We hope that this book can be used to solve disputes so that there is mutual benefit between freshman and as a reference for RA’s mediating these problems. This poster depicts the evolution of a senior capstone project created by a team of CCJ major enrolled in CCJ 480: Alternative Dispute Resolution.

Lanza, Alex
Austin Sanders, Leah Kalush, Justin Liddicoat
Faculty mentor: James Palmer, Trent Hare

Session II, 2:00pm-4:00pm, 10B

Title: SciViewer

The United States Geological Survey is a global leader in planetary cartography and astronomic imagery. Current software solutions used to view these large images are slow due to their sheer scale and the high level of detail. The massive size of this data severely limits the ability to view the data. In this work we explore methods that reduce the number of interpolation calculation required to view very large images. This allows us to render images without the large preprocessing step associated with current gigapixel image rendering techniques. Our solution, SciViewer, improves upon the interpolation process by using an image sampling technique called stochastic sampling. In stochastic rendering, samples are selected randomly and averaged together to produce a representative sample. By using this method, our lightweight, large image viewer will be a valuable asset to researchers by reducing the time it takes to view these massive images.

Lanza, Alex
Austin Sanders, Leah Kalush, Justin Liddicoat
Faculty mentor: James Palmer, Trent Hare
Morning, 9:45am-10:10am, duBois Festival Room

Title: SciViewer

The United States Geological Survey is a global leader in planetary cartography and astronomic imagery. Current software solutions used to view these large images are slow due to their sheer scale and the high level of detail. The massive size of this data severely limits the ability to view the data. In this work we explore methods that reduce the number of interpolation calculation required to view very large images. This allows us to render images without the large preprocessing step associated with current gigapixel image rendering techniques. Our solution, SciViewer, improves upon the interpolation process by using an image sampling technique called stochastic sampling. In stochastic rendering, samples are selected randomly and averaged together to produce a representative sample. By using this method, our lightweight, large image viewer will be a valuable asset to researchers by reducing the time it takes to view these massive images.

LaRosa, Alex
  Brian Williams, Taylor Tracy
  Faculty mentor: Ann Huffman

Session II, 2:00pm-4:00pm, 37B

Title: An Analysis of Ethnic Diversity within the W. A. Franke College of Business

This poster will include an analysis of diversity within the W. A. Franke College of Business with regards to ethnicity. There will be observations on how this group affects and associates with NAU. Comparisons will be made to other NAU colleges as well as other business colleges outside of NAU. A management plan will be included that will help support ethnic diversity within the college. This poster is being used in an organizational behavior classroom using information learned through research and class lectures by putting that information into a real life situation with the W. A. Franke College of Business.
Larrick, Tate  
**Faculty mentor:** Walter Vannette

**Session II, 2:00pm-4:00pm, 72C**  
**Title: The People's Production Co.**

I came into the Anthropology program with the intention to tell stories. After chewing through tough theory, I came to the realization that I do not have the power to tell someone else's story. The People's Production Co. is an attempt to create a program that gives anyone the resources to tell their own stories through documentary film making. The ultimate goal is to create an application process that filters into a workshop for those who are accepted. Each film crew will be given equipment and training, then left to tell the story their way. Finally, the film will be edited, categorized, and published for anyone to access.

Larson, Jenna  
**Faculty mentor:** Monica Lane, Laureen Simpson

**Afternoon, 2:00pm-4:00pm, Skydome UC Table**  
**Title: Working Animals**

This project worked through the different types of working animals throughout the world from service animals to emotional support animals to animals in the military and media and so many more places that animals aren't expected to be but are. The research paper was accompanied by the raising and training of a Guide Dog for the Blind puppy who will go on to be a working Service Dog for a blind person.

Lau, Fiona  
**Faculty mentor:** Britton Shepardson

**Session I, 9:00am-11:00am, 67B**  
**Title: Archeology of Music**

My project will reveal the discovery of music from different cultures and how the love for music has transcended throughout time and is still essential in society's lives today.

Lauing, Kyrstie  
**Faculty mentor:** Inez Nez, Evangeline Parsons-Yazzie

**Session I, 9:00am-11:00am, 130A**  
**Title: Type 2 Diabetes mellitus described in the Navajo Language**

Based off a paper written entirely in the Navajo language describing the disease mechanisms and etiologies of Non-insulin dependent Type 2 Diabetes mellitus among the Navajo people. Provides the details of disease pathologies as well as the history of disease prevalence among the Navajo people. Describes current treatment options and why they are recommended. Provides information about various disease management programs provided by the Navajo Nation Special Diabetes Program as well as those offered by the Indian Health Service. Written to describe the disease to non-English speaking elders in order to provide better understanding and therapy outcomes among the Navajo people in an effort to reduce disease prevalence.

Lawhead, Emily  
**Faculty mentor:** Paul Donnelly

**Session I, 9:00am-11:00am, 127A**  
**Title: Pilgrimage and Contested Space in Religious and Secular Works of Art**

Mount Fuji is known around the world both for being a religious site and a national icon of Japan. From its historical roots as a Shinto deity into its mixed identity as a Buddhist site, Mount Fuji symbolizes more than one particular element of religious worship. The site itself could even be interpreted as contested, between different religious groups and secular communities who wish to see the mountain as a representation of national identity. The mountain itself, though often debated throughout society, has remained a centerpiece to many different worshippers and adventurers on
the Japanese islands for centuries. From Fuji worship to modern day hiking enthusiasts, this natural wonder has been appreciated as a powerful element of the greater Japanese landscape, and these pilgrimages have actively contributed to the global perception of the mountain today. These perceptions have manifested in world consciousness through religious mandorlas, Ukiyo-e prints, and western propaganda throughout World War II and beyond. The overarching identity of Mount Fuji has been created through the actions of religious worshippers and pilgrims, but its place within Japanese culture has been solidified through the use of two-dimensional religious and secular works of art.

Lawhead, Emily  
Faculty mentor: Zsuzsanna Gulácsi

Session II, 2:00pm-4:00pm, 127B  
Title: Ai Weiwei's Zodiac Heads

We do not change the subject, we only change the interpretation' Ai Weiwei. This 2011 project by Ai Weiwei features twelve bronze heads that are replicas of an original set designed by Jesuit missionaries for Emperor Qianlong in the Qing Dynasty. They originally surrounded a water fountain and served as a water feature clock at the European style palace garden at Yuanming Yuan. In 1860, this palace complex was ransacked by British and French troops and the heads were severely damaged. Ai Weiwei reinterprets these heads on an oversize scale to make a statement about looting and repatriation of Chinese history, contributing to his conception of 'fake' and copies in relation to originals. Numerous of the original zodiac heads now placed in museums. Many of the pieces were sold at auction and spread around the world, and these heads have become a symbol of Chinese heritage that the population wants returned.

Laws, Terry  
Sarah Brown  
Faculty mentor: Sumner Sydeman

Session II, 2:00pm-4:00pm, 103A  
Title: An Exploration of the Efficacy of Cognitive-Behavioral Therapy for Juvenile Obsessive-compulsive Disorder

Juvenile obsessive-compulsive disorder, also known as OCD, is a psychological condition consisting of unrelenting and distress provoking recurrent irrational thoughts or impulses. Individual based cognitive behavioral therapy, either alone, or in conjunction with certain medications, appears to be an effective treatment for this disorder. The primary rational behind this review is to compare cognitive-behavioral therapy (CBT) with some of the other available evidence based treatments for this disorder. The authors expect to demonstrate that individual CBT, either alone or with the addition of medication, is the most effective means of treating this disorder.

Layne, Katherine  
Sarah Hewitt, Katarina Torres  
Faculty mentor: Brant Short

Session II, 2:00pm-4:00pm, 80A  
Title: Women's Rights in the Workplace

Our project focuses on gender inequality issues in the workplace. We begin by discussing the gender issues that exist in this environment. Our research discusses the double standard of being a woman in a male-dominated business world. From the research, we discover the problems and come up with possible solutions to these issues. We try to analyze how the solutions we have found can persuade women to achieve success. Also, we plan to help bring awareness to this issue. Our project begins by discussing the following issues: unequal pay, sexual harassment, less women in managerial and CEO positions, and less women in politics. Then we go on to discuss the positives of being a woman in the workplace. These positives include the following: communication abilities, approachability, the ability to read between the lines, experience being opportunity experts, networking skills, and being natural givers. We aim to raise awareness and implement in the workplace environment. Both genders need to be aware of these issues and not act on the stereotypes that exist. Every positive step we take towards equality will lead to progress.

Layser, Brianna  
Faculty mentor: Anthony Barnhart
Session II, 2:00pm-4:00pm, 94C

Title: The Effect of Saccade-Induced Retrieval Enhancement on False Memory

Previous research on suggestion and misinformation demonstrates how the integration of information into an individual's memory can be manipulated in order to construct a 'memory' that was never truly experienced. In saccade-induced retrieval enhancement (SIRE), engagement in saccadic eye-movements has been suggested to improve memory retrieval and even reduce susceptibility to misinformation. The study attempted to explore whether susceptibility to suggestion and the consequent false memory it produces can be influenced by engagement in bilateral, saccadic eye-movements. Based on recent theories of suggestion and false memory incorporation, it was reasoned that if misinformation was presented during an event, then an individual would be more likely to merge the misinformation with his or her true memory. This study aimed to discover whether engagement in saccadic eye movements can discredit misinformation and enhance accurate memory recall.

Ledesma, Alicia

Faculty mentor: Melissa Santana, Sara Maier, Jessica Bartolomeo, Linda Young

Session II, 2:00pm-4:00pm, 122D

Title: POISE Salon and Spa Design

Salons and Spas are places in which one may escape to get away, as well as beautified. This reflects a goal for the cosmetology industry. Salons and Spas are of constant demand for all and have the ability to reinforce positivity, giving confidence the ability to shine through. They are places devoted to enhancing the overall well-being through a variety of educated professionals, offering services that encourage the renewal of the mind, body and spirit. Whether it'd be a day of pampering or just relaxing, the design gives clients a place to unwind and stray away from the world in one moment as you step through the doors of a Salon and Spa. In doing so, multiple specialties are presented, such as hair, nail, makeup, massage, and skin care services.The goal of this project is to design POISE Salon and Spa in Gilbert, Arizona that is appealing to all ages, as well as caters to each one of their needs and also gives each one of them a sense of place in the midst of chaos. The concept of this design is to highlight the importance of convenience, balance, and the overall impact of lighting in this space. There will also be historical elements brought into the space, as well as a modern touch to create a comfortable aesthetic. Another intent of this space is to be designed as an appealing environment in which provides clients with an enjoyable experience that they look forward to returning before they have even left. By creating a mood that stimulates our senses, I hope to leave positive responses on the body and mind by bringing people's confidence to the next level after a visit and to positively affect their appearance and lifestyle.

Lehman, Derick

Faculty mentor: Scot Raab

Session I, 9:00am-11:00am, 44C

Title: The Best Care for Cystic Fibrosis in Athletics

Cystic Fibrosis is a life threatening genetic disorder that affects the patient's respiratory and digestive systems. There are estimated 30,000 children and adults in the United States with Cystic Fibrosis and another 1,000 new cases diagnosed yearly. Cystic Fibrosis is caused by a defective gene that results in unusually thick, sticky mucus production in the respiratory airways and digestive tracks. Secondary to this mucus production, there is a greater risk for infection in the respiratory airways. Recent research focuses on the effects of aerobic and anaerobic exercise upon Cystic Fibrosis patients along with the participation of sports. The affects of aerobic and anaerobic exercise on the lungs is clear however it has yet been researched on how this exercise affects those who have this disorder.Objective: To present a detailed background on Cystic Fibrosis, the prevalence of athletes with Cystic Fibrosis, immediate treatment for signs and symptoms, and the benefits of exercise on Cystic Fibrosis. Methods: Review of medical literature with a focus on the 1990's to currents research on Cystic Fibrosis and the effects of exercise. The medical literature is found through medical notes, treatment notes, exercise plans, patient interviews and observations. Review of current literature using EBSCOhost, CINAHL Plus, Cochrane, PubMed, and Medline.Results: It is hypothesized that aerobic and anaerobic exercise could enhance the quality of life of Cystic Fibrosis patients which would allow the treatment to be a part of the participation. In conclusion exercise is a treatment regimen that can be used to enhance the quality of life.

Lenhardt, Carly
Faculty mentor: Natalie Cawood

Session II, 2:00pm-4:00pm, 83A

**Title: Morning Preparedness**

Mornings had been routinely difficult and stressful in my life. I was waking up late, getting to class late, skipping breakfast and lunch, and never looked 'put-together'. For as long as I can remember, mornings have been struggles for me. For as long as I can remember, I have tried to get better about waking up and not having stressful mornings. From putting my phone far away from my bed to making people call me to make sure I am awake, all of my efforts to create a habit of early morning preparedness have been in vain. This semester, my Social Work in Biology class challenged me to pick a behavior that I want to change and document the process of defeating what bad habits I wanted removed from my life. With research, I have learned that each individual person has specific needs in sleep and rest. I have also discovered that there are certain strategies and acts that can make becoming a morning person entirely plausible. This project experiments with these strategies and individual study to discover the solution for my morning dilemma - how do I convince myself to wake up in time to make breakfast, have a thirty minute quiet time to read my Bible, and still make it to my engagements on time? The hope of this project is to have useful tools and strategies that I can offer to other people that worked for me, a subconsciously stubborn sleeper.

Leon, Antonio  
Faculty mentor: Natalie Cawood

Session I, 9:00am-11:00am, 83B

**Title: Behavior Change: Physical Improvement**

My behavior change for this semester was to improve my physical fitness and weight. Not necessarily expecting a dramatic change in my physical appearance but to improve my stamina and endurance during certain physical activities such as running.

Leone, Cassandra  
Kelsey Hackett, Alana Weber, Ariana Tyler  
Faculty mentor: Green Fund

Session I, 9:00am-11:00am, 2A

**Title: Student Attendance and Experiences at 2014 Association for the Advancement of Sustainability in Higher Education**

In October 2014, four students received a grant to go to the AASHE conference in Portland, Oregon. These students have a variety of interests in sustainability. This poster will detail their experiences at the conference.

Lerager, Alyssse  
Faculty mentor: Moran Henn

Morning, 10:42am-10:54am, duBois Meadows Room

**Title: Planting the Seed for a Sustainable Future in Flagstaff, AZ**

Friends of Flagstaff's Future (F3) is a non-profit organization that promotes a livable community through advocacy and activism to enhance the quality of life for Flagstaff residents. The objective of my internship was to gain specific training relating to communication and community outreach within an environmentally conscious organization. The internship focused on four main areas: leadership and communication, advocacy, Northern Arizona University (NAU) connections and non-profit administration. As an intern I was responsible for coordinating and implementing the 'Sounds of Flight' project under the Kids Art Recycling and Eating for Sustainability program and engaging in community outreach through voter registration. I also assisted with informing NAU students about the importance of connecting with the Flagstaff community as well as fundraising and event planning for F3. This internship provided insight on how a successful non-profit organization operates and enhanced both my interpersonal communication and public speaking skills. Before the internship, I did not appreciate the amount of work it takes to create a successful program nor did I recognize the importance of internal communication. Through my time with F3, I developed the knowledge to implement meaningful environmental programs and learned how to communicate effectively with both my internship
coordinator and members of the Flagstaff community. Most importantly, I gained the talents necessary to adjust to different speaking styles and find creative ways to present contentious issues. This internship provided a broad scope of interests from hands on experiences to advocacy and policy.

Lerager, Alysse
Christy Harvey, Rachel Heydorn, Bryan Jagiello
Faculty mentor: Angie Moline

Afternoon, 3:00pm-3:25pm, Skydome Roundtable R2
Title: Wolves Know No Boundaries
The Mexican Gray Wolf is one of the most endangered mammals in the United States. Reintroduction efforts have been successful, but still face major setbacks because the Mexican Gray Wolf naturally roams much farther than the designated reintroduction area where they are protected. Wolves do not understand or comply with imaginary boundaries that have been imposed on them and when they cross into unprotected areas, they are often killed or trapped and returned to the reintroduction area. For reintroduction to be fully successful the Mexican Gray Wolf needs a larger corridor in which to migrate. We support the reintroduction of the Mexican Gray Wolf through the expansion of their territory. This includes the proposed Grand Canyon region, which will serve as a corridor for the wolf to migrate safely without pressures of hunting and trapping on the population. We feel that increasing public awareness of this issue is the best way to help change legislation to increase the wolves' current range to include the Grand Canyon region. We have created a stop motion animation Public Service Announcement that is tangible for a large age range of people who are not aware of the struggle of the Mexican Gray Wolf or why expansion of their territory is desperately needed.

Lerma, Leslie
Faculty mentor: Glenn Hansen

Session I, 9:00am-11:00am, 109B
Title: The Sound of Disney
I would like to creatively display how Disney, incorporated different stereotypes into their songs. Through my project, I want to showcase the affect these stereotypes may have on their audience, especially kids.

Levy, Samuel
Faculty mentor: Ryan Porter

Session I, 9:00am-11:00am, 24C
Title: Mantle Flow Beneath Central Alaska
The recent installation of new seismic stations in Alaska allows for more detailed investigations into the structure and dynamics of the Earth beneath the region. Determining the mantle flow beneath central Alaska is important for understanding the region's plate tectonics. The North American-Pacific Ocean plate boundary in Alaska is primarily flat slab subduction with some strike slip movement, the resulting effects on mantle flow in central Alaska are not well constrained. Using SKS wave splitting, we are able to calculate the anisotropic fast axis and the delay time of shear wave splits, which allows us to quantify mantle flow beneath the region. Preliminary results show a generally uniform NE-SW movement. This mantle flow corresponds with the motion of the North American Plate and shows unsubstantial effects due to the flat slab subduction. A comparison is currently being performed using receiver functions to further constrain mantle anisotropy.

Lewis, Alycia
Faculty mentor: Julie Moreau

Session I, 9:00am-11:00am, 91C
Title: Marriage Equality and Immigration Status
In October of 2014, marriage equality was officially legalized in the state of Arizona. The moment was hailed as a monumental victory for the LBGTQiA community in particular and for human rights in general. However, it was also
a moment sharply criticized by radical queer circles as an appropriation of queer identity into a heteronormative institution that reinforces the commodification of bodies and remains inaccessible to people of color and the working class. Given the historical connection that marriage has developed with citizenship and nationality, it is surprising that relatively little attention has been paid to the consequences that marriage equality will have on immigrant communities in the United States, especially for queer undocumented persons of color. However, laws that directly tie citizenship to marriage may make undocumented persons some of the most directly affected by marriage equality. This presentation seeks to utilize personal stories from queer undocumented immigrants and transnational, queer, and feminist theory to explore the consequences of marriage equality for undocumented communities. Specifically, it seeks to understand how marriage equality can be both empowering and disempowering for queer undocumented immigrants. How does marriage equality make citizenship more or less accessible? How has marriage historically operated as a system of patriarchal "naturalization" and abuse for immigrant women and how does marriage equality reproduce these relationships within the queer immigrant community? How do the intersecting institutions of marriage and citizenship operate as a coercive force? Does marriage sanction the abuse of immigrant women and/or queer persons? Can marriage be a site of empowerment for queer immigrants? This project does not seek a decisive answer on all these questions but hopes to open a dialogue about the complicated relationship between gender, race, sexuality, and citizenship.

Lewis, Eloisa  
Faculty mentor: Jeff Downard

Session I, 9:00am-11:00am, 130D

Title: C.S. Peirce, Artificial Intelligence, and Systems of Representation

This project presents (1) research relevant to the history and nature of analog and digital computing, (2) the logical, semiotic, and cognitive theory of Charles Sanders Peirce as it relates to theory of mind, and (3) develops an argument for a hypothesis based on the conclusions drawn from a primary focus on abstract and applied mathematics as they relate to cognitive systems of representation, as constraints on the possibility of artificial intelligence.

Libero, Sedona  
Faculty mentor: Julie Brown

Afternoon, 3:00pm-3:20pm, Skydome Stage A

Title: Ethel Smyth: The Liberation of Music and Gender

In the 19th century, women's music making was considered delicate, amateur, and insubstantial. Women were expected to employ amateur musical skills for nothing beyond domestic performance. If women did compose music, they wrote only small piano pieces, songs, and chamber music. British composer Ethel Smyth (1858-1944) broke those prejudices. Acknowledging her talent for composing early on, she resolved at age nine to pursue a career as a professional composer. Ten years later, she left Britain to study at the Leipzig Conservatory. In Leipzig she gained encouragement and training from prominent musicians such as Brahms and Clara Schumann. Though Smyth began her compositional education by writing short songs and chamber pieces, she quickly progressed to writing larger, public works. Such compositions infiltrated areas of composition reserved singularly for men: large orchestral works and opera. Smyth called opera her 'first love'. She wrote six operas in her lifetime and saw them all publically performed, an incredible feat for a woman composer. She also cultivated an identity as an artist through her public sexuality. She blurred the lines between the sexes through her open lesbian relationships, which she admitted to inspiring many of her compositions. Smyth also engaged in male activities, such as sports and hunting. Her involvement with the Women's Suffrage Movement demonstrated her concern for validating women politically as professional artists. Smyth championed an example for future women composers to have the freedom to be artists and to have their art taken seriously.

Licher, Sophia  
Randy Brierley, Mara Georgeff, Courtney Gage, Anthony Porter, Mackenzie Staires, Samantha Schommer,  
Faculty mentor: William Cordeiro

Afternoon, 2:00pm-3:00pm, Skydome Stage C

Title: Writing like a Beast: Hybrid Forms
Students in the class of HON 291, Writing Like a Beast: Hybrid Forms will present performances of their short creative work in such genres as prose poems, flash fiction, and lyric essays.

Liewer, Rachel  
**Faculty mentor:** Natalie Cawood  
**Session II, 2:00pm-4:00pm, 83B**  
**Title: Behavior Change: Study Habits**  
I chose my study habits as a behavior that I wanted to change. I made a plan, set small goals and assessed my level of motivation as it was dependent upon other behaviors, such as my diet and my sleeping schedule. I developed a way to measure my progress and I will present my findings, as well as discuss how this behavior change can impact my life as a social worker.

Lillie, Hannah  
**Faculty mentor:** William Cordiero  
**Session I, 9:00am-11:00am, 106D**  
**Title: The Role of Misogyny in Breaking Bad**  
This presentation explores the role of societal misogyny and how it is demonstrated in the acclaimed television series Breaking Bad, particularly in the character Skyler White. It focuses on the vehement fan hatred of Skyler's character and the irony of this when comparing her actions to her husband Walt's. By synthesizing a number of online fan pages and blogs along with analysis of the show itself, the overwhelming influence of misogyny and sexism in Breaking Bad is evident.

Lim, Evan  
Taylor Boyer, Seth Kollman, Brody Johnson, Paul Hurd  
**Faculty mentor:** Linda Robyn  
**Afternoon, 2:00pm-4:00pm, Skydome SBS Table**  
**Title: Investigating Difference**  
Many of us do not understand the differences in our society. What is difference? One of many definitions of difference defined by Merriam-Webster is, 'the quality that makes one person or thing unlike another' (Difference, n.d.). While the definitions of the word difference vary, one thing is for certain. The United States (U.S.) has always been known as a society of different cultures, different ethnicities and a diverse population. That legacy has continued at the start as a nation and one of 'difference' from the rest of the world. According to the U.S. Census Bureau (2000), the United States has, 'a racially and ethnically diverse population' (Population Profile of the United States). In order for us to understand difference in our society, we need to understand what others expect of us in our society. Our magazine investigates the many facets of difference in the U.S.

Lim, Laura  
Anthony Troftgruben, Casey Jahn, Ekaterina Melkozernova  
**Faculty mentor:** Jay Sutliffe  
**Session I, 9:00am-11:00am, 47B**  
**Title: Anytime Fitness**  
Program purpose is to implement proper form of various gym-facility equipment and increase self-efficacy of participants at Anytime Fitness. We are targeting participants of the H.I.I.T. (High Intensity Interval Training) class on Tuesdays. Over the course of 3 weeks, we will teach them proper form for a few different exercises and then take them through a correlated H.I.I.T. class each meeting. Teams will be formed and incentives provided for winning team. We will measure their self-efficacy and exercise knowledge in the beginning and end of the program by using a pre- and post-evaluation.
Sarah Carpenter, Michael Woody  
**Faculty mentor:** Patricia Murphey, Bjorn Kronodrfer, Martin Kalb, Gretchen McAllister

**Afternoon, 3:20pm-3:30pm, Skydome Stage C**

**Title: Through the Eyes of Youth: Life and Death in the Bedzin Ghetto**

Our role in the project was to design a website meant to supplement the Through the Eyes of Youth physical exhibit. The project challenged us to investigate making a website that was user-friendly, accessible to the public, and maintained a look and feel of the physical exhibit while exploring new aesthetic choices to better fit our purpose. As part of the panel we will present how we accomplished these tasks through specific design processes and choices. We will explain how we made the website by describing the design process of creating multiple drafts and our specific design choices. Design decisions that we made include colors, themes, texture, moods and interactivity. We will talk about how these choices affected the final outcome of the website. Our process of working on an interdisciplinary team will be addressed as well as the personal impact it had on us. We will give our perspective of working on an interdisciplinary team. We will discuss the challenges of communicating design to non-designers; how we transferred aspects of the physical exhibit and new content into a visual website; and how it was interesting to see different perspectives. To conclude, we will address why we chose to work on the project and why we decided to continue with the project.

**Loeffler, Megan**  
**Faculty mentor:** Britton Sheppardson

**Session II, 2:00pm-4:00pm, 77D**

**Title: The Prehistory of Monumental Architecture**

My project is on the prehistory of monumental architecture. I will show how the architecture evolved from time to time. It will also show the differences in cultures from time to time. It will provide five examples of prehistoric monumental architecture.

**Lopez, Toby**  
**Faculty mentor:** Britton Sheppardson

**Session II, 2:00pm-4:00pm, 67B**

**Title: Lifestyles/Diet of Modern Humans**

I will be presenting a project about the vegetation of the modern humans. I will be talking about the specifics of what they would eat at that time.

**Lopez-Garay, Griselda**  
**Faculty mentor:** Melissa Santana

**Session I, 9:00am-11:00am, 123A**

**Title: Creating a Home Away from Home: A Temporary/Transitional Shelter for Families**

Homelessness is an issue that has grown over the years and keeps on growing every year. In researching, it is found that homeless families comprise about a 1/3 of the total homeless population. Family homelessness is caused by multiple of things from poverty, unaffordable housing, hardships of being a single parent, and even domestic violence. In researching and learning about the causes and effects of homelessness, it was necessary to create a place that facilitated the needs of the families. The goal was to create a shelter that keeps a family together while accommodating multiple types of families. It was found that in designing a shelter, it was important not to just keep the aesthetics in mind, but to also follow code compliances, Universal Design, and most important the needs of the families. Things that were found to be combated within the design that shelters sometimes lack was to decrease violence, increase better health, and combat mental health. The spaces were designed to have flow throughout that were to create a place that was safe, gave privacy, inspired hope, and most importantly unified family. It was important to include the elements and principles of design to figure out what materials were appropriate to bring into the space. By doing so, cost consideration was taken into place when thinking about implementing safety within shared spaces, sleeping areas,
within the community, and between one another. As soon as we understand homelessness, there is nothing that can stop us from combating it.

**Lough, Wilson**  
**Faculty mentor:** Jeff Rushall  
**Session I, 9:00am-11:00am, 22C**  
**Title: The Unimodular Determinant Spectrum Problem**  
Computing all possible determinant values of n-by-n matrices with entries restricted to \{+1,-1\} is known as the determinant spectrum problem. For n < 8, the spectra consist of sets of consecutive integers in arithmetic progressions, but gaps appear in the spectra for n > 7. In this talk, we will present new results classifying the spectra of n-by-n matrices with entries restricted \{+1,-1,+i,-i\} for small n.

**Lovett, Taryn**  
Brittany Kirby, Shawntell Atkins, Jessica Gowens  
**Faculty mentor:** Nicole Bies-Hernandez, Matthew Anderson  
**Session I, 9:00am-11:00am, 97B**  
**Title: Victimization Levels in College Students**  
The purpose of this research project was to explore the levels of victimization associated with fraternity or sorority members vs. students who are not affiliated. Our hypothesis states that there will be a difference of victimization of self-reported crime between fraternity and sorority life students and students who are not affiliated. An online survey was administered to a variety of randomly selected fraternities and sororities students as well as students who were enrolled in PSY302W. To evaluate the difference between self-reported incidents within fraternity and sorority life and non-affiliates, we used an independent-samples two-tailed t test with an alpha level of .05. The results are presented in the accompanying poster.

**Lu, Na**  
**Faculty mentor:** Melissa Santana, Roger Vitello, Alan Francis  
**Session II, 2:00pm-4:00pm, 123B**  
**Title: International Airport Terminal**  
Increasingly, airports are being designed and expanded to function as self-contained urban centers. Airports around the world are reinventing themselves as relaxing destinations rather than the awful place where travelers wait to board a plane. Many airports are in pursuit of achieving double benefits- providing good service to travelers and making economic profit. Sometimes various services are provided to travelers that may be considered useless to some people, thus creating controversy. This project will focus on these two arguments: Design a way to reap economic benefit or accommodate for travelers' convenience? The mission will be to find an 'equilibrium point' between both arguments in order to give travelers an immediate sense of place. This will be achieved by combining the local culture with the natural environment to provide an efficient, assisted environment as well as a healthy lifestyle for travelers. To connect the airport with its environment, the design will be inspired by nature and renewable resources.

**Lummis, Madeline**  
Carina Hall, Joseph Busch, Jason Sahl, Theodore Spilker, John LiPuma, Mark Mayo, Bart J. Currie, Paul Keim, David M. Wagner  
**Faculty mentor:** David Wagner, Carina Hall, Joseph Busch  
**Session II, 2:00pm-4:00pm, 12B**  
**Title: From the soil to cystic fibrosis patients: Antibiotic resistance in Burkholderia vietnamiensis**  
The soil dwelling bacteria in the Burkholderia cepacia-complex include many species responsible for infections in cystic fibrosis patients. Due to the harsh environment in the soil many bacteria, such as the members of Burkholderia, must develop survival mechanisms like antibiotic resistance, which can result in many strains also possessing this resistance when involved in infections. Much research has been conducted on B. cepacia to determine the antibiotics to
which it is most susceptible. Unfortunately, the same has not been done for B. vietnamiensis even though it is the third leading cause of infections. A total of 79 strains of B. vietnamiensis were whole genome sequenced with subsequent phylogenetic analysis revealing two distinct clades. One group consisted entirely of samples collected from soil in Florida/Louisiana and the other of both clinical and environmental samples found throughout the world. Based upon the importance of this soil bacterium in cystic fibrosis patients we decided to look for differences in antibiotic resistance between these two groups. To accomplish this we used epilometer tests, which are commonly used for antibiotic resistance screenings. We screened four antibiotics for resistance, including: minocycline, ciprofloxacin, trimethoprim/sulfamethoxazole, and amoxicillin/clavulanic acid. We found varying resistance across all strains including high resistance in multiple environmental and clinical strains. As antibiotic resistance was not observed among all strains, the resistance mechanism may come at a cost to the bacteria explaining why all strains do not possess it. Most importantly, this experiment provided us with new insights into antibiotic resistance in B. vietnamiensis.

Luque, Andrea
Faculty mentor: Cornelia Bogaard, Todd Evan Sullivan

Session I, 9:00am-11:00am, 130C
Title: Naamu Xunuta School of Music
Naamu Xunuta is a school of music that will be different from any other in Sonora because it will provide a space and education that includes diverse music ensembles and not only private lessons. These ensembles include traditional Mexican music that has been left behind in other institutions. It is going to be established in Ciudad Obregón, Sonora, Mexico in behalf of regional needs. The only formal music institution in the state is located in the north part of the state, but unfortunately its level of education has been decreasing in the past years. Besides this institution, the next formal school of music is three states apart, and after that, good music education gets even further. An art like music, taught in an appropriate way, can be a good tool to enrich human values, but Naamu Xunuta also wants to promote music for what it is and not only for the extra abilities it develops. Its programs will be varied; trying to fit different needs and age ranges. Its purpose is not only to get people to enjoy more concerts, but also to wake up their curiosity and encourage them to try something new. The requirements to teach here will be higher than in any other institution of the state. Therefore, the vision of Naamu Xunuta involves international agreements that will provide students the opportunity to take their music education further. This social commitment will keep it active in the music industry, making Ciudad Obregón a new platform for music.

Ly, Rang
Faculty mentor: Sumner Sydeman

Session I, 9:00am-11:00am, 103B
Title: A systematic review of available evidence of Relaxation Therapy for Insomnia in Adults
The purpose of the current project was to conduct a systematic review of psychotherapy clinical trials of relaxation therapy for adults diagnosed with Insomnia. A systematic literature search was conducted according to Preferred Reporting Items for Systematic Reviews and Meta-Analyses standards (PRIMSA: Liberati et al. 2009). One of the more effective therapies supported by research for Insomnia is relaxation therapy (Morin et al. 2006). Progressive muscle relaxation has generated more evidence than any other treatment for insomnia (Taylor and Roane, 2010) and yoga, which aims to calm the muscles, has also been shown to be effective (Khalsa, 2004). Due to the greater efficacy of these kinds of techniques, this review shall focus primarily on treatments involving relaxation therapy.

Lytikainen, Sarah
Faculty mentor: Natalie Cawood

Session I, 9:00am-11:00am, 83C
Title: Behavior Change: Establishing a Regular Sleeping Schedule
I chose to establish a regular sleeping pattern as a behavior to change. I set a goal, assessed my capacity for change, and identified the steps I would take to make the change. I then developed a measurement tool to track my efforts to
change my irregular sleeping pattern over time. I will present the results of this effort at changing my behavior and I will discuss how this assignment will impact my future social work practice.

Lytton, Briana
Faculty mentor: Natalie Cawood

Session II, 2:00pm-4:00pm, 83C

Title: Eat your greens to fit in your jeans!

I chose Nutrition as a behavior that I wanted to change. In the beginning of this Spring semester I set a goal to be more committed to eating healthy and working out, in hopes to lose thirty pounds by summer 2015. I assessed my capacity for change as well identified the steps it would take to make those changes. I will present the results of this effort at changing my behavior and I will discuss how this assignment will impact my future social work practice.

Mackin, Tressa
Faculty mentor: Christopher Mann

Session II, 2:00pm-4:00pm, 20B

Title: Real-Time Surface Profiling of Industrial Materials Using Digital Holography

The purpose of this project is to investigate in-situ properties of industrial materials. Multiple wavelength digital holography has been used to observe real-time compression and expansion of a magnetic shape memory alloy (MSMA), specifically Ni2MnGa, allowing for measurement and characterization of properties such as elasticity, microstructure evolution, and phase transformation. Multiple wavelength digital holography uses a synthetic wavelength created by the interference of two light sources with different wavelengths to achieve resolution on the scale of one to two nanometers. This imaging technique extracts phase shift information from a single image such that the relative heights of surface features are determined, permitting three dimensional reconstruction. This implies the ability to observe time dependent processes in three dimensions. Real-time non-invasive observations could reveal the formation of cracks and/or other weaknesses of material surfaces, providing insight to the limitations and potential applications of MSMA and other materials.

Malatesta, Stefany
Faculty mentor: Natalie Cawood

Session I, 9:00am-11:00am, 83D

Title: Planned Change: Working Towards A Better Me

My project is all about working towards a better me. I have had issues with my weight since high school and I never really had that much self-confidence. My poster will be all about how I took the steps to bettering myself and gaining more self-confidence. For example I have started weight watchers to help me eat healthier, and I have also done some confidence boosters that I have found online. I have been tracking my weight loss and how many times I have worked out on a chart. I have also been tracking the days I do things that are supposed to help boost my confidence to see how those days go, compared to days I do not do things to boost my confidence.

Malone, Jonathan
Alex Lacy, Joshua Gutman
Faculty mentor: Cassie Dakan

Morning, 11:00am-11:30am, Skydome Roundtable R1

Title: Pursuit of the Future Perfect

How might the future be populated by better beings, including enhanced humans? Join in a discussion of the ethics, probability, and plausibility of sentient androids, human brain implants, and widespread genetic modification.

Mancha, KarenAnn
Kristen Harris, Chantelle Chandler, Madeleine Krull, Rachel Casey
Faculty mentor: Jody Marie Bartz
Session I, 9:00am-11:00am, 50D

Title: Maintaining the Momentum: TASH@NAU

The TASH Student Chapter has been active at Northern Arizona University in Flagstaff, Arizona for over 10 years. As the only formal student chapter in the country, this past academic year, advocates came together and brought an exciting and renewed student-led energy to the chapter. This dynamic poster session will highlight the history of TASH@NAU, discuss ways to maintain a student chapter, and present future directions for TASH@NAU.
Mancha, KarenAnn  
Kristen Harris, Chantelle Chandler, Madeleine Krull, Rachel Casey  
Faculty mentor: Jody Marie Bartz

**Afternoon, 3:45pm-4:00pm, Skydome Stage E**

**Title:** Ask Us About Inclusion!

Panel presenters will share (a) personal experiences and connections with persons with disabilities, (b) their reasoning for joining and being involved with TASH@NAU, (c) their own paradigm shift regarding inclusive practices for persons with significant support needs, and (d) the future directions for TASH@NAU. Time will be given for audience to ask questions.

Manzana, Ana  
Faculty mentor: Elizabeth Bechok, Nic Beckett

**Session I, 9:00am-11:00am, 113C**

**Title:** HEALTH Action Research Team: Cook Book for Local Foods

The Health Education About Lifestyles and Therapies (H.E.A.L.T.H.) Action Research Team (ART) is committed to making Northern Arizona University (NAU) a healthier and more sustainable campus within the Flagstaff community. Our current work has resulted in a NAU Green Fund grant that will go towards the creation of an online and printed cookbook intended to educate students, living in the residence halls or campus apartments, on how to prepare nutritious, sustainable meals with limited resources. The cookbook will include recipes provided by local businesses, students, and campus organizations that utilize sustainability in their day-to-day activities, as well as local farmers that provide our community farmers markets and Community Supported Agriculture (CSA) program. The idea is to promote healthy, more sustainable eating habits by connecting the students with their local food suppliers, as well as encourage the students to be more mindful of what they eat, especially when purchasing produce. Part of the Green Fund funding will also go towards a Food Forum, in which students and community members will be invited to discuss pressing food issues around NAU campus and the Flagstaff community. The undergraduate symposium will be a great opportunity for our students to share their finalized cookbook, as well as present any information gained through the Food Forum.

Mapes, Abigail  
Abigail Mapes, Vanessa Karina Flores, Chelsea Schoech  
Faculty mentor: Gerald Wood

**Session I, 9:00am-11:00am, 54D**

**Title:** What's Engagement Got to Do with it? : Going Beyond Classroom Management

We will compare different classroom management styles being used today and identify key aspects of engagement to develop meaningful learning. Our presentation will address the history of classroom management and how we can improve them for our students. This project will be demonstrated by implementing effective learning styles and teaching techniques.

Marbach, Megan  
Faculty mentor: Scot Raab, Monica Lininger, Deborah Craig, Glen Edgerton

**Session I, 9:00am-11:00am, 44D**

**Title:** The Effects of Scoliosis on Young Athletes

Scoliosis is and has become an increasingly more prevalent condition, between 2 and 24 percent, amongst the young athlete population, especially with athletes in today's society starting out training at an early age. With this increasing condition of idiopathic scoliosis amongst athletes, comes a need to increase the knowledge of how to treat and prevent this condition in order for it to not become or cause an increased difficulty for participation in sports for an athlete in the future. The purpose of this research is to examine the effects of idiopathic scoliosis on the motion of the body and to examine how exercise is affected by this condition. It is to examine the different interventions and treatment methods that could be used in order to help decrease the disability of the athlete in order for them to have increased
functionality and decreased pain with performance. Methods of research will be to review current findings using PubMed, CINAHL Plus and EBSCOhost. Many different variables can be examined about this condition such as the effects of muscle strengthening and if prevention is possible. Current research will examine different variables in order to see if there is any effective ways to treat an athlete with scoliosis and help them have increased functionality and ability to perform movements required by their sport. There are a number of different interventions and methodologies to help decrease the disability of scoliosis amongst athletes. Bracing, rehabilitation, and surgical intervention were interventions of focus. These interventions have reportedly been shown to have the greatest effect on improving the effects of idiopathic scoliosis. This report goes over some of the ways to identify, treat, and prevent the effects of scoliosis that can be used by medical professionals in order to help prevent the long lasting effects on young athletes.

Marsh, Bradley
Joshua Ellsworth
Faculty mentor: Cindy Browder

Session I, 9:00am-11:00am, 27C
Title: Oxime Preparation for the Production of Isoxazoline Derived Bacterial Growth Inhibitors
The rational drug design process in medicinal chemistry involves the identification of a specific drug target and then designing compounds that are biologically active against it. Due to the increasing antibiotic resistance of bacteria, targets of interest include enzymes necessary for bacterial metabolism. By preventing bacteria from producing its own amino acids via inhibition of a metabolically important enzyme in the biosynthetic pathway, bacterial growth will be reduced significantly or stop. The target of interest for this project is the active site of indole-3-glycerol phosphate synthase (IGPS). IGPS is involved in the fourth step of the five step conversion of chorismic acid to tryptophan, and it has been found to be a rigorously conserved active site among most bacterial species. Our lab has developed libraries of potential lead compounds for preventing IGPS from converting 1-(o-carboxyphenylamino)-1-deoxyribulose-5-phosphate (CdRP) into indole-3-glycerol phosphate (IGP), and we are continuing to optimize the chemical structures and synthetic strategies for the isoxazoline leads. Isoxazolines mimic a portion of the sugar chain of CdRP, and they are formed from relatively easily synthesized oximes. Our current efforts have been toward obtaining a consistent yield of pure oximes in order to increase our yield of isoxazolines. Conditions regarding the order and rate at which reagents are added, temperature upon adding reagents and during the reaction, reaction time, solvent volumes, and the overall scale of the reaction have been considered for the oximation process.

Martinez, Marissa
Nathaniel Douglas
Faculty mentor: James Reed

Session II, 2:00pm-4:00pm, 84D
Title: Gender Tropes In Video Games: A Sociological Examination
How do gender tropes within video game affect reality? Using previous research, we will discuss prevalent gender tropes within the realm of video games and how these tropes can influence player choices in terms of character creation. The prevalent tropes we examine fall into three categories: physical, gender presentation, and racial. By using these three categories of tropes, we can examine previous and current video games as well as what marks they have left on society. We will present our research to individuals, and then offer them to participate in research, studying their own personal choices when given a selection of possible video games protagonists to play as.

Mathew, Gabrielle
Faculty mentor: Zsuzsanna Gulacsi

Session II, 2:00pm-4:00pm, 125D
Title: Contemporary Industrial Design and Traditional Symbolism of a Chinese Super Yacht
This research examines the functionality and artistry of the Chinese super yacht “Tomorrow”. The yacht industry is quickly gaining popularity in China and due to the growing economy its citizens are able to afford such extravagant purchases. “Tomorrow” uses specific colors and symbolism to incorporate Chinese tradition into a futuristic ship designed for the modern elite Chinese consumer.
Mathiasz, Jessica
Gabriella Nunnally, Corbin Jountti, Kaiah Eaton, Tylor Brown, Tiffany Onyenagubo, Manuel Apodaca
Faculty mentor: Frederick Gooding

Session I, 9:00am-11:00am, 91A

Title: The Genius Behind Hip Hop

When held under the microscope of society, generally, Hip Hop is associated with negativity. One may ask society to describe their first thoughts when hearing the word hip hop and an array of mental images may flood based on stereotypes such as gangster rappers, violence, and misogyny. However beyond the microscope, it is evident that Hip Hop performs an important social function in our culture. The six elements of hip hop effectively screen out biases and stereotypes subtly conveyed against Hip Hop within the various media outlets; giving the craft a deeper respect and appreciation.

Matthews-Penrod, Candice Marissa
Kourtney Guzman, Danica Cusack, Mira Angle
Faculty mentor: Tricia Moore, Ivan Pacheco

Session I, 9:00am-11:00am, 42A

Title: Continuing education Course for Nurse Practitioners on the Application of Fluoride in Their Practice to Prevent Early Childhood Caries.

The high prevalence of early childhood caries (ECC) is a considerable problem. Untreated tooth decay among children in Arizona exceeds the national average and falls short of the Healthy People 2020 goals. Realizing this problem, AHCCCS, Arizona's health care equivalent of Medicaid, has begun reimbursing primary health care providers who apply fluoride varnish during well baby visits. (Lewis, 2005). The purpose of this project was for dental hygiene students to provide an educational course to nurse practitioners about the importance of preventing ECC, the benefits of fluoride varnish and how to apply it. Scores from pre- and post-questionnaires were compared to determine how much the nurse practitioners learned and if they were persuaded to incorporate the use of fluoride varnish within their practice. NPs gained a considerable amount of knowledge and expressed intention to begin placing fluoride varnish.

Maxwell, Christina
Imani Barnett, Hannah Palazzi, Heather Coleman, Alexia Coppell, Nicholas Hodge, Ethan Hoover, Ella Joseph, Kaleb Lightfoot, Grace Novak, Eduardo Pinson, Jordan Reinhardt, Sonja Usher, Keenan Ward, Logan White, Audrey Young
Faculty mentor: Kathleen McGeever

Afternoon, 2:00pm-4:00pm, Skydome Floor

Title: PLAYING AROUND: Physical Approaches to Building Character using Commedia dell' Arte and other Physical Techniques

We began our journey exploring physical, outward approaches to building character, including Commedia Characters in true Commedia dell' Arte style, as well as adapting the characterization to varying degrees of stylized performance. In preparation, we utilized original adaptations of Commedia games and techniques in the rehearsal hall, as well as traditional methods of study and training. The traditions of Laban, and Tai Chi, coupled with the animal work, and varied physical theatre approaches were used in a playful and experiential setting culminating performance.

May, Chrishay
Faculty mentor: Becky Butcher

Session I, 9:00am-11:00am, 117B

Title: Stereotypes in Athletics

Stereotyping is done in everyday life. People may not know that they are doing it but it happens. Athletes go through this everyday depending on their race. People expect them to perform a certain way depending on the color of their skin or just by how they look.
Mazzacane, Courtney  
Faculty mentor: Britton Shepardson  

Session I, 9:00am-11:00am, 67C  
Title: The prehistory of food/nutrition  
My project focuses on the prehistory of food/nutrition and how it not only changed over time, but how it impacts us today.

McAnally-Trejo, Erin  
Amanda Sagriolo, Natana Caren De Castro, Lucas Ramos  
Faculty mentor: Rand Decker, Paul Gremillion  

Session II, 2:00pm-4:00pm, 11B  
Title: Moringa Seed Project  
Mining is an unavoidable activity that can and has contaminate the water and soil in Arizona. When copper wastewater is discharged into natural water courses and arroyos, it is a violation of Environmental Protection Agency (EPA) and Arizona discharge water quality standards. This investigation focuses on whether or not Moringa Oleifera seeds can be used to lower the copper concentration in mine wastewater sufficiently to meet these standards. Research points towards these seeds as an organic material with a capacity for biosorption of copper ions. The objective of this research is to test the efficiency of the Moringa Oleifera seeds in the adsorption of copper(II). A wastewater surrogate was synthesized using copper chloride (CuCl2) in solution of known concentration. The concentration of copper(II) in the laboratory wastewater was set to values published by (www.azsos.gov) the Arizona Department of Environmental quality (ADEQ), and the EPA copper concentration standards. The CuCl2 concentration was fixed and other parameters (Moringa Oleifera particle sizes) were changed to verify what aspects will influence the adsorption of copper(II). Testing was done using magnetically agitated batch reactions and then the wastewater copper concentration is analyzed with atomic adsorption to determine if the moringa seeds reduced the copper concentration. The best results of the first test will be chosen for a second round of investigation, where the efficiency of the moringa seeds to remove copper from wastewater will be analyzed. This will be done by systematically varying the time of contact with the moringa seed during batch mixing with magnetic agitation.

McAuliffe, Riley  
Faculty mentor: Britton Shepardson  

Session II, 2:00pm-4:00pm, 67C  
Title: The Evolution of Sex- As Told By Rubbish and Rarities  
This project will delve into the evolution of sexuality, and the way it has shaped politics, social structure, culture, identity, and the overall influence it has had on human history. This project will work to define sexuality, and the archaeological role it plays in uncovering the cultures that time has long since claimed, as well as explaining its modern-day impact. Detailed within this project will be key artifacts, sites, and hypotheses pertaining to sexuality in an ancient and modern context.

McBride, Tami  
Kaylee Smith  
Faculty mentor: Sumner Sydeman  

Session II, 2:00pm-4:00pm, 103B  
Title: An Examination of Empirical Research Regarding Applied Behavioral Analysis on Children with Autism Spectrum Disorder  
The purpose of the current project is to systematically review clinical trial data related to the use of applied behavioral analysis (ABA) for children diagnosed with Autism Spectrum Disorder (ASD). A systematic search of available literature is being conducted using the Preferred Reporting Items for Systematic Reviews (and Meta-Analyses) guidelines (PRISMA: Liberati et al., 2009). Studies conducted between the years 2000-2015 are being considered for this review. We are currently in the process of gathering randomized control trials (RCTs), and all of the reviewed
trials thus far support ABA as an efficacious therapeutic intervention for children suffering from ASD. Strengths and limitations of the current available data will be discussed and suggestions for future research will be included.

McCarthy, Courtney
Anwyn Tompkins, Alicia Martin, Sarah Guinea
Faculty mentor: Nora Dunbar, Matt Anderson

Session I, 9:00am-11:00am, 100B
Title: Birds of a Feather: Skin Tone, Attraction, and Stereotyping
The psychological theory of Birds of a Feather Flock Together posits that individuals with a more similar phenotype will be attracted to one another (Mackinnon, Jordan, & Wilson, 2011). While this tends to be the norm in the United States, recently the idea of interracial relationships has become more acceptable. Eighty-five percent of the population reports a positive attitude toward interracial dating and marriages (Mendelsohn, 2014). However, only 2% of marriages in 2012 were between black and white individuals. The purpose of the current study is to learn how the younger generation of people approach interracial dating, through surveying college aged students. The focus of the study is to observe if there was a correlation between cultural background and interracial attraction and dating. It is predicted that despite reported positive attitudes toward interracial dating, in practice individuals will tend to remain in relationships with those of similar skin tone. Results in support of this hypothesis would suggest that although there have been advances in social acceptance of interracial couples, individuals still rely on skin tone when selecting romantic partners.

McComb, Kimberly
Faculty mentor: Glenn Hansen

Session I, 9:00am-11:00am, HONORS EASEL
Title: The Portrayal of Psychotropic Drugs in Walt Disney Animated Classics Canon
Humanity’s use of psychotropic drugs is not a modern movement; indeed, humans have used drugs for thousands of years for reasons varying from medicine to religion to recreation. Given the media’s tendency to reflect the era of its origin, one can trace shifts in societal attitude towards substance use by viewing films. This study expanded upon and utilized data from the research of Thompson and Yokota, published in Pediatrics 107.6 (2001). Content analysis was implemented to examine 54 Walt Disney Animated Classics for the use and depiction of alcohol and tobacco over time. Factors recorded and/or generally noted include: movie year, setting, presence of substance, if character used the substance, user’s ethical proclivity, presence of physical effect (if yes, negative or positive), type of substance, and duration that the substance was present on screen. The data from this study, when chronologically graphed and superimposed over American tobacco and alcohol consumption trends, suggest Walt Disney films align themselves with popular opinion, even if said opinion is damaging. The portrayal of injurious behavior such as smoking and drinking in children’s media (rated G) should either be removed or depicted as having harmful consequences. Unfortunately, the Disney film canon is continuously introduced to impressionable newfangled generations, thus, the negative behaviors depicted in older films are perpetually assimilated. Further research into the correction of the misconceptions created by viewing media should be conducted so that negative behavior on screen can be seen without behavioral integration.

McDonnal, Jenn
Faculty mentor: Glenn Hansen

Session I, 9:00am-11:00am, 109C
Title: Heroes, villains, and Disney
From evil stepmothers to dashing princes, Disney is obsessed with the idea of good vs. evil. This project examines stereotypes of Disney heroes.

McElroy, Haylee
Haylee McElroy, Jason Leininger, Amber Clark, Angie Salazar
Faculty mentor: Tricia Moore, Ivan Pacheco
Session I, 9:00am-11:00am, 42B

**Title: Interprofessional Medical Care**

Many oral health related cases present to the hospital for treatment. Hospital personnel are often not prepared to treat oral cases. Objective: The purpose of this study was to conduct qualitative interviews of hospital personnel to learn more about the types of oral-related cases that present to the hospital and the preparedness of the hospital to manage these. Methods: Medical providers (nurses and doctors) working in different departments within the hospital (Step down unit, emergency room, labor and delivery, and orthoneurotrauma) are interviewed. Open-ended questions were asked to determine what they knew about connections between oral and general health, what oral care protocols are currently implemented within their facility, the nature of oral related cases they see and how prepared the facility was to manage these cases. Results: All eight interviewed worked directly with patients and had some knowledge of the relationship between general and oral health including cardiovascular disease as it relates to oral health. Six of eight interviewees knew of a relationship between oral health and diabetes, stroke, and pneumonia. Three of the eight were aware of a possible relationship between oral health and adverse pregnancy effects. Two of the eight participants stated their department had an oral protocol. The common theme throughout all interviews was that having an oral health professional on site would increase quality of patient care, limit the need for referral and improve treatment completion for oral cases. The majority of participants stated that while it would be beneficial, they doubted the budget of the hospital could accommodate the addition of an oral health care provider.

McIntosh, Bailey

Lauren Herd, Cori Schreiber

**Faculty mentor:** John Houser, Matthew Anderson

Session I, 9:00am-11:00am, 101D

**Title: The Effect of Music Mood Type on Problem Solving Ability**

The purpose of this experiment was to test whether or not the type of mood music affects problem solving ability. We had four different levels of the IV (Elevating, Sombre, Neutral, and no music). Participants in a psychology research methods class listened to either elevating, sombre, neutral, or no music while completing a maze. In order to check for the manipulation of mood, a survey was given before and after the cognitive test. An Analysis of Variance (ANOVA) test with an alpha level of .05 will be used to measure the difference in scores on the maze. Our expected results are that (1) elevating mood music will increase cognitive performance, and (2) sombre mood music will decrease cognitive performance.

McKinney, Veronica

**Faculty mentor:** Elizabeth Bechok, Kaitlin Brakke

Session II, 2:00pm-4:00pm, 113D

**Title: Community Gardens Action Research Team: Living the Good Life**

This semester our Action Research Team worked to create and implement an installation about happiness at Museum of Northern Arizona. Our course focused on how people can have a better quality of life, and activities such as gardening can make us happier overall. I am presenting a poster about the installation of our work and impacts on the First Year Seminar students.

McMinimy, Kyle

Robert Diller, Robert Kellar

**Faculty mentor:** Robert Diller, Robert Kellar

Session II, 2:00pm-4:00pm, 17D

**Title: Using Digital Histopathology to Determine Biocompatibility of Tropoelastin and Collagen Implants**

Biomaterial implants are used throughout the body to treat or replace damaged tissues or organs. These implants must undergo extensive biocompatibility testing prior to their clinical use in humans to avoid complications. Electrospun tropoelastin and collagen scaffold implants are promising biomaterials for wound healing research because they can be manufactured/generated to mimic the extra cellular matrix (ECM). Before implantation, however, these protein scaffolds must be cross-linked in order to prevent early degradation of the materials’ mechanical properties, which may
have a direct effect on the scaffolds' biocompatibility in living tissues. Native protein biomaterials (non-cross-linked) are known to degrade quickly under physiologic conditions, thus demanding the necessity for cross-linking. In the current study, various biomaterials including tropoelastin and collagen were surgically implanted, subcutaneously, into a murine model for two weeks. Post-explant, the resulting tissue surrounding the implanted materials was evaluated using digital histopathology with quantitative morphometry to determine the effects of gluteraldehyde cross-linking and to elucidate scaffold biocompatibility differences.

McVeigh, Emma  
Faculty mentor: William Cordeiro, Anne Scott

Morning, 10:40am-11:00am, Skydome Stage C

Title: Marriage: A Queer Institution

Marriage is an institution that has been treasured and left unquestioned for centuries. It is the way we as a society legitimize love, have lifelong partnerships, and raise children. Recently, LGBTQ+ movements have been gaining national and worldwide attention for their fight to be included in this process. But what is it about marriage that makes us want to join in so badly? Is it the ceremony? The affirmation of commitment and love before our friends, family, and religion? Or is it the legalities- the legitimacy, benefits, protection, and other privileges- that have us running to the altar? Through an analysis of popular queer theories, this question of privilege will be addressed. Specifically, this presentation will explore and compare the assimilationist and radical queer views on the institution of marriage, and the benefits and downfalls that are associated with it. By using examples from not just LGBTQ+ folks, but also other social minorities, this presentation will explore the ways in which marriage helps and hinders us, and will encourage ourselves, and our leaders, to open our minds to marriage and domestic partnership, and provide alternatives to our current understandings.

Melton, Rachel  
Alex Garcia, Kyle Collingwood, Elizabeth Lozano, Derick Souza
Faculty mentor: Phoebe Morgan

Session II, 2:00pm-4:00pm, 86D

Title: Getting to Yes

For this capstone project, our group focuses on Alternative Dispute Resolution and Getting to Yes among college aged students. To do this, once our plan is finalized, we will put on a workshop focusing on roommate problems regarding visitation of significant others or friends at an off-campus apartment complex. The poster will reflect on the process of Getting to Yes and what happened during the workshop.

Meucci, Brittany  
Faculty mentor: Nancy Riggs, Marian Holness

Session II, 2:00pm-4:00pm, 23B

Title: A Comprehensive Study of Two Columnar Jointing Locations to Determine Differences in Rate of Cooling

Columnar jointing is a result of lava interacting with water or other wet, cool materials. Rapid cooling causes contraction and thermal heat loss within each joint. However, the cool, wet material cannot be too cold otherwise the lava would shatter rather than create joints. Columnar jointing and what factors control the width, length, shape, and spacing between each column is not fully understood. Unfortunately, the process that forms columnar joints is not easily recreated in a lab or the field. Analysis of Devil's Postpile in California and Grand Falls in Arizona showed drastic differences in the four factors considered. Both locations are of mafic composition and show similar mineral fabrics with olivine crystals and a dense groundmass of primarily plagioclase laths. The sites differ in flow thickness, with Devil's Postpile at 120-180 meters and Grand Falls at approximately 50 meters. Measurements of width and number of sides were collected and thin section samples were made to study mineral composition. Thin sections of Devil's Postpile show distinct Plagioclase phenocrysts up to 4.5 mm. Other work on Plagioclase grains has given timelines of cooling in sills. On-going work examining the shape and size of plagioclase phenocrysts and plagioclase laths in the flows will potentially provide an estimated length of time for cooling of joints. Observations show wide, 5-8 sided joints in Devil's Postpile and narrow, 3-6 sided joints in Grand Falls. The interpretation is that Grand Falls cooled much quicker than Devil's Postpile, which is conclusive with thickness of the lava flows.
Meyer, Kendall
Sultan Alshahrani, Ryan Baloo, Mohammad Molani
Faculty mentor: Srinivas Kosaraju

Session I, 9:00am-11:00am, 5B
Title: Mechanical Paper Shredder

Conventional paper shredders are electric powered, often consuming more power that required, while running idle. Our design team was tasked to retrofit a commercially available electric paper shredder to be operated manually by a hand crank system. The mechanical system had to be operated efficiently enough to compete with the electric system. Retrofitted the paper shredder should not cost more than $100 (including the cost of commercial paper shredder) and is able to shred paper as well as disc media such as CDs and DVDs. The team studied a commercial paper shredder and came up with a simple hand crank design. It is added directly to the shredder mechanism by replacing the electric motor. The hand-crank mechanism is designed to be manufactured very easily using commercially available components that can be replaced in the event of wear-out or failure. The retrofitted system will be made available for regular use in the engineering administration office and its usage will be assessed for future modifications and commercialization.

Meyer, Rachel
Carina Hall, Heather Centner, Jason Sahl, Rebecca Coleman, Amy Vogler, Jeannine Petersen, Paul Keim, David Wagner
Faculty mentor: David Wagner, Carina Hall

Session I, 9:00am-11:00am, 12C
Title: Understanding the persistence of plague in a highly active focus in New Mexico

The causative agent of plague, Yersinia pestis, was first introduced into North America at San Francisco in the late 1800s. From there it spread through native rodent populations to become ecologically established throughout much of the western United States. One area in northern New Mexico, Eldorado (near Santa Fe), reports plague activity in rodents almost every year, as well as sporadic human cases. By studying the change of Y. pestis over time in Eldorado, we can gain greater insight into how Y. pestis exists and evolves over time within a specific region. The entire genomes of eight Y. pestis samples from Eldorado allowed us to identify genetic differences, specifically single nucleotide polymorphisms (SNPs), between those samples. After identifying 18 SNPs, we then screened for them in other Y. pestis DNA samples from Eldorado that were collected over a ten year time period. We found multiple lineages of Y. pestis present in the Eldorado region, which suggests there have been multiple introductions of plague into this area. However, since the same lineages of Y. pestis collected in Eldorado were observed during multiple plague seasons, we know that Y. pestis is maintained through time in this environment.
Michl, Sidney
Faculty mentor: Andrew Sanchez-Meador, Mike Stoddard

Afternoon, 2:30pm-2:42pm, duBois Meadows Room

Title: The influence of microclimatic factors on the establishment of ponderosa pine germinants

Today, southwest ponderosa pine (Pinus ponderosa) forests face significant increase in tree mortality as larger and more severe wildfires erupt in frequent fire-adapted ecosystems. Contributing factors of these uncharacteristic fires include the suppression of low-severity, frequent surface fires, livestock grazing, and logging. These practices date back to Euro-American settlement in the mid-late 1800s and have since altered natural forest processes and composition. This study examines the influence of microclimatic factors and preexisting forest structure on the emergence and establishment of ponderosa pine germinants in the Fort Valley Experimental Forest in Flagstaff, Arizona. Fort Valley is comprised of four experimental blocks separated by treated and control plots. Six plots from each treatment were randomly selected and transects were laid out along the south and west lines of each plot where litter and duff depth, canopy cover, percentage of substrate cover, and the number of germinants per quadrat were measured. By examining the same factors across various treatments, it was determined that treated blocks, specifically Fort Valley's 2:4 tree replacement treatment, produced more germinants than the control block. Germinant count and percent bare soil cover averaged highest in this particular treatment block, while the remaining substrates including canopy cover, litter and duff depth values, and 1,000 hour fuels cover averaged highest in the control block. In the future, management implications of ponderosa pine forests should include various restorative treatments to create a more natural and self-sustaining ecosystem where conditions for germinant regeneration are favorable.

Mierzwa, Danielle
Faculty mentor: Bruce Aiken, Franklin Willis

Afternoon, 2:00pm-4:00pm, Skydome CAL floor

Title: A Moment in Time

These paintings portray a glimpse into the world beyond humans and into the wilderness. Through oils on canvas I create an environment as well as the animals living within them. I am interested in the animals around us and their well-being, through these paintings I express what a privilege it is to see these animals in person and how important it is to protect them and the place they call home.

Mierzwa, Danielle
Faculty mentor: Bruce Aiken, Franklin Willis

Morning, 9:00am-11:00am, Skydome CAL floor

Title: A Moment in Time

These paintings portray a glimpse into the world beyond humans and into the wilderness. Through oils on canvas I create an environment as well as the animals living within them. I am interested in the animals around us and their well-being, through these paintings I express what a privilege it is to see these animals in person and how important it is to protect them and the place they call home.

Miller, Pamela
Faculty mentor: Francis Smiley

Session II, 2:00pm-4:00pm, 71B

Title: The Huron of the Great Lakes Region: The Archaeological Correlates of a Tribal Society

The poster presents a visual and textual examination of the material record of the ethnographically known Huron society of the Great Lakes region of North America in comparison to similar archaeologically known societies. Archaeologists can obtain analogous data about prehistoric societies by examining the material record of historically known societies such as the Huron. The Huron were an agriculturally based tribal society who lived in the Great Lakes region and were part of the larger 'umbrella' tribe of the Iroquois. The Huron inhabited villages comprised of wooden longhouses. Although the Huron created a range of material goods and built permanent dwellings, I predict that the archaeological record would be limited due to the prevalence of organic materials used for manufacturing. The
purpose of the presentation is to show a model of the kind of material cultural items produced by a society with a particular social organization and other cultural factors. The poster also presents examples of archaeological research done on similar societies to compare archaeological reality with the model derived from the ethnography.

Mills, Dylan  
Faculty mentor: David Elliott

Session II, 2:00pm-4:00pm, 24B

Title: A new large armored fish from the Devonian (380 Ma) Martin Formation of Mt. Elden

Placoderms are a group of early jawed fish characterized by bony dermal plates covering the head and trunk of the animal. They lived from the Late Silurian period to the end of the Devonian period (417-380 Ma). Locally, fossils of six placoderm species have been found in the Upper Devonian Martin Formation on Mt. Elden. These species include: three arthrodire placoderms, Eldenosteus arizonensis, Holonema sp. and an unidentifed arthrodire; a ptyctodont placoderm, Denisonodus plutonensis; and an antiarch placoderm, Bothriolepis sp. In addition to these five species there is material of a large arthrodire whose identity has been unclear for several decades. This material was generally classified within arthrodires as either a dinichthyid or as a coccosteomorph. Through collection and preparation of this material, and examining housed specimens at the Museum of Northern Arizona it has been determined that neither of these descriptions are sufficient and that the material represents a new genus and species of arthrodire placoderm based on its size, ornamentation of the dermal plates, and the position of the lateral line sensory canals. This new large arthrodire is thought to be closely related to the genus Plourdosteus. Identifying this animal increases the diversity of the fish fauna from the Martin Formation, now totaling nine species of fish ranging from fresh water to marine forms. This fish fauna is one of the most diverse Devonian faunas in the western United States and can be used to help correlate other Devonian localities across the country.

Minette, Philip  
Faculty mentor: Neil Cobb, Lindsie McCabe

Afternoon, 1:42pm-1:54pm, duBois Meadows Room

Title: Plant-pollinator associations of the San Francisco Peaks: A study of pollination ecology over an elevation gradient

The Colorado Plateau Museum of Arthropod Biodiversity is the arthropod museum at Northern Arizona University. It's collection of over 250,000 specimens is used to support research, education, and public outreach. I was given an internship under Neil Cobb to study pollination ecology over an elevation gradient. Within the internship was included 150 hours of work on an independent research project as well as a literature review on pollination ecology over elevation gradients. The study took place on the slopes of Arizona Snowbowl where bees and flies were collected as well as the flowers they visited. Specimens were collected at the elevation brackets; mixed conifer (2500m - 2900m) and spruce fir (2900m - 3200m). Host flowers collected were later pressed and identified. Insects captured were moved to a jar with ethyl acetate which kills and preserves them. They were later identified and pinned to a display with labels for date, elevation, location, and host flower. Higher prevalence of pollinating flies compared to bees was noted in the higher spruce fir altitude. Experienced was gained in employing common entomological techniques, taxonomic identification, and performing research in the natural sciences. Experience in scientific research writing was gained in creating the literature review paper as well as knowledge of pollination ecology of elevation gradients.

Misiak, Danielle  
Ashley Stanley, Marissa Hall  
Faculty mentor: John Houser, Matthew Anderson

Session II, 2:00pm-4:00pm, 101D

Title: Moody Munching: How Emotions Affect Eating

This project evaluated how emotion affects people's food choices. We recruited participants from research methods in psychology students. Participants were shown video clips that either evoked emotions of sadness, stress, happiness, or neutrality. The participants were allowed to choose a snack that was either unhealthy or healthy. The healthy snacks were bags of apples and grapes, and the unhealthy snacks were bags of chocolate candy and chips. We hypothesized
that the participants that watched the sad and stressful clips would be more likely to choose the unhealthy snacks. We used Chi Squared as our statistical analysis.

**Misiuk, Jori**
Mary Lauderdale, Violet Hays, Courtney Mazzacane, Erica Grove, Katie Cuppy  
**Faculty mentor:** Gerald Wood

**Session II, 2:00pm-4:00pm, 54C**

**Title: Disability Studies**
The general public has a lack of knowledge in regards to interactions with people who have disabilities. This is a problem because not only are individuals with disabilities a part of our society but they deserve to be treated as such without fear of rejection or ridicule. This is an issue because it further creates a societal gap and can be offensive to the individual who has a disability and place further limitations upon the individual and create an uncomfortable environment for everybody. Society's ignorance about peoples with disabilities further perpetuates negative stereotypes about those individuals. A common misconception about people who have disabilities include an inability to live an independent and fulfilling life on their own. Our goal is to teach people the proper and more respectful way to treat and interact with people who have disabilities. By researching Deafness, Blindness, Wheelchair users and Invisible disabilities we hope to educate the general population on how to appropriately integrate and include people who have disabilities. As a result, we hope that our presentation can positively change people's view into creating an inclusive and understanding community.

**Mitchell, Cedar**
Voahangy Andrianaivoarimanana, Dawn Birdsell, Minoarisoa Rajerison, Paul Keim, Dave Wagner  
**Faculty mentor:** David Wagner, Dawn Birdsell

**Session II, 2:00pm-4:00pm, 12C**

**Title: Using Genetic Fingerprinting to Understand the Source and Dynamics of Human Plague Infections in Madagascar**
Yersinia pestis is the biological agent of the disease plague and is arguably one of the most deadly infectious agents in human history. Despite successful measures to control plague in many parts of the world, this disease persists in the island country of Madagascar, where it remains a serious and significant threat to human health. Previous genetic analyses have been extremely successful in identifying the sources of plague. They also have improved our understanding of historical and modern plague epidemics in other regions of the world. Unfortunately, the genetic tools necessary for such studies have been inaccessible in Madagascar due to a lack of sophisticated technological resources. In this study, we developed a highly reliable genetic fingerprinting technology that is compatible with existing resources available in underdeveloped countries, including Madagascar. We then transferred this technology to our Malagasy colleagues and assisted with its technological adoption through an on-site visit in their laboratory in Madagascar. Results from our colleagues have aligned superbly with our own validation efforts and now the fingerprinting technology is fully employed for use in future plague investigations in Madagascar. The consistency of our joint validation efforts indicates that this is a viable approach for the genetic fingerprinting of diseases in underdeveloped countries, and may serve as a model for genetic analyses of other human pathogens that commonly afflict regions with constrained resources. Our introduction of a simple yet highly informative genetic fingerprinting technology reduces the resource driven limitations to genetics research and aids in epidemiological investigations of human pathogens in resource deprived countries.

**Mitchell, MacKenzie**
**Faculty mentor:** Britton Shepardson

**Session I, 9:00am-11:00am, 67D**

**Title: The Prehistory of Food and Nutrition**
This visual representation allows for an understanding of the nutritional habits of those who lived in the prehistoric world. Also provides an understanding of the evolution of nutrition.

**Mitchell, Marissa**
Edward Forbis, Dejzon Walker  
**Faculty mentor:** Brant Short

**Session I, 9:00am-11:00am, 80B**

**Title:** *All Lives Matter*

The bulk of our presentation will include the dissection of the Black Lives Matter campaign. We will be evaluating the speech Barack Obama gave on both the campaign and the police brutality in general involving our minority youth. It is imperative that we discuss the question of how we can prevent police vs minority youth wars and that we create a solution to the strained relationship between the communities involved and the police.

Moghadasnia, Michael  
George Aubrey, Lauren L'Ecuyer, Alexandra Spotts  
**Faculty mentor:** William Cordeiro

**Session I, 9:00am-11:00am, 106A**

**Title:** *Breaking Breaking Bad*

Our project is based on the chemistry behind the hit television show, Breaking Bad. We will look into the specific sciences that allow the writers of the show, as well as the actors, to create the science based drama as seen on T.V. In the show, they show many different applications of science, such as making methamphetamine, mercury fulminate, and ricin. Our goal is to research and describe exactly how these compounds are made and if they are made accurately.

Mondrow, Jillian  
Ella Stephens  
**Faculty mentor:** Neil Cobb, Lindsie Abbott

**Session II, 2:00pm-4:00pm, 17C**

**Title:** *Arthropod Pollinators Influence the Pollination Nature of Angiosperms along the C. Hart Merriam*

The purpose of the study is to conduct research on the plant and pollinator relationships along the C. Hart Merriam elevation gradient during the summer of 2014. The study focuses on specific lifezones along the gradient Ponderosa Pine, Mixed Conifer, Spruce-fir, Subalpine, and Alpine. There appears to be an evident cut-off point along the elevation gradient where insect-dominated pollination decreases and plant self-fertilization becomes more established. We predict that as the pollinator communities change, so does there reproductive nature of plants, and as elevation increases, the plant shift from insect pollination to wind and self-dispersal. In order to test these hypotheses, we collected local species of bees, flies and the angiosperms that they associate with as well as observed and researched the pollination syndromes along the elevation gradient. The collected specimens were curated and identified in the Colorado Plateau Museum of Arthropod Biodiversity. Data was statistically analyzed using RStudio®. Results demonstrated a decrease in insect-dominated pollination and an increase in wind-dispersal from low to high elevation, in cohesion with our hypothesis. Our data will be a contribution to the C. Hart Merriam modeling effort, which includes the dynamic mechanisms imperative to regulating the distribution of species under different global Climate Change scenarios.

Moon, Charlie  
**Faculty mentor:** Elizabeth Bechok, Josh O'Neal, Leann Leiter

**Session I, 9:00am-11:00am, 113A**

**Title:** *SSLUG Action Research Team: Cold frames and Greenhouse*

This semester the Students for Sustainable Living and Urban Gardening Action Research Team finished construction on several cold frames as well as construction on an insulated large greenhouse. We are working on plans for construction of a vertical pallet garden or a cinder-block art-piece. While we work on these larger projects, we also help to maintain the garden with seed germination activities, planting, and caretaking of the garden space. For some of our students, this is the first time they are involved with growing their own food and sustainable gardening, so a large part of SSLUG's goal is to immerse the students into the various senses of nature, such as sights, sounds, smells and tactile sensations of plants and earth.
Moore, Brendan  
Faculty mentor: Ryan Fitch  
Session II, 2:00pm-4:00pm, 35A  
Title: An Analysis of Las Vegas Hospitality Water Sustainability  
The purpose of this research is to assess the economic effectiveness of water sustainability programs in the hospitality industry particularly in Las Vegas, Nevada and discuss different methods of water management. Water conservation is crucial to maintaining urban growth in Southern Nevada, a thriving metropolis in a harsh desert environment that receives little precipitation. The hospitality industry is biggest driver of economic growth in Las Vegas through its enchantment to tourists both domestic and international. Given the magnitude of the industry and the severity of drought, responsible water usage is key to securing Las Vegas's future. The largest employers in the state primarily operate in the hospitality market and these corporations have a corporate social responsibility to preserving natural resources. The paper will also discuss differentiation and success of strategies of the largest corporations in the Las Vegas hospitality industry, Caesars Entertainment Corporation (CZR) and MGM Resorts International (MGM). While the industry has devoted numerous strategies to the sustainability of energy, reduction of emissions, etc. this study will focus exclusively on water efficiency efforts.

Moore, Brendan  
Faculty mentor: Jim Hilliard  
Session II, 2:00pm-4:00pm, 35B  
Title: A Financial Analysis of Expedia's Acquisition of Orbitz  
An acquisition such as this will have tremendous impacts on the hospitality and online ticket industry. This case researches the acquisition’s effect on Expedia’s economies of scale and discusses the reduction of competition. The research will be formatted as a case study in which students can develop their knowledge on corporate finance from a Merger & Acquisition style focus (including estimating costs of capital). Furthermore, the case will go on to evaluate the merit of Expedia’s decision to purchase Orbitz and reflect on other implications that the transaction may present.

Moore, Gradi  
Faculty mentor: Christine Lemley  
Session II, 2:00pm-4:00pm, 53A  
Title: Fairness in Latina Families  
I did my project on how women in Latina families are treated by their family in comparison to how men are treated in the family setting.

Morales, Jordan  
Wells Jackson  
Faculty mentor: Elizabeth Bechok, Nora Timmerman  
Morning, 10:00am-10:25am, Skydome Roundtable R1  
Title: Public Art: Plastic Bag Ban  
In the Public Art Action Research Team we have been working on understanding the Plastic Bag Ban here in Flagstaff. In class we learn about the various environmental effects of plastic bags and study the political process to pass ordinances in local city governments. I will lead a round table discussion regarding the Plastic Bag Ban and explain some of the art that have been created by the First Year Seminar students in the class.

Morales, Nathan  
Faculty mentor: Marie Baker-Ohler  
Session I, 9:00am-11:00am, 78D  
Title: Alpha Males in Postmodernity
Within the postmodern time, the understanding of knowledge is the primary objective with new worlds, cultures, and technologies are being embraced. However, how do we remain communicative in the forever changing times. The Alpha Male is a figure that was constructed as a figure of guidance for the postmodern time. When all else fails or is questioned, the Alpha Males holds value in demonstrating communicative attributes.

Morcom, Elisabeth  
**Faculty mentor:** Scot Raab

**Session I, 9:00am-11:00am, 45A**

**Title: Costochondritis: A Case Study**

Medical History: Fifteen year old female high school athlete who participates in varsity cross country, soccer, and track. Fell during a soccer game in December of 2013 and hurt her right side. In August of 2014 she developed sharp side pain when exercising. After about a month of exercise induced pain the athlete had four non-exercise induced pain episodes over a one week span. Two of the four episodes required emergency medical transport form the school. After a winding path of diagnoses, the athlete was finally diagnosed with costochondritis. With two months of total rest and treatment the athlete was able to return to activity and has been symptom free ever since.  

**Physical Signs and Symptoms:** During cross country season the athlete developed sharp pain in her right side. This pain would radiate to the c-3 to c-4 area of her right sternum. The non-exercise induced pain was described as extremely sharp, which led to difficulty breathing accompanied with general weakness and numbness and tingling in the extremities. These instances of pain lasted an average of two hours each.  

**Differential Diagnosis:**  
1. Diaphragmatic Spasm  
2. Phrenic Nerve Injury  
3. Diaphragmatic Flutter  
4. Costochondritis  

**Laboratory Tests:** ECG came back normal, Neurological tests came back normal, Blood tests were normal, Psychological evaluation determined the athlete was stressed, but otherwise normal.  

**Clinical Course:** Removed from all physical activity for 2 months, 800mg Ibuprofen 3 times a day for 2 weeks.  

**Deviation From The Expected:** The pain while exercising may not be extremely common but it did not cause concern for the athlete's health, the symptoms seemed to line up with a muscle spasm. The non-exercise induced pain caused greater concern for the athlete since no mechanism was present and signs and symptoms increased to be more than just severe side pain.

Moreno, Robert  
**Faculty mentor:** Brant Short

**Session II, 2:00pm-4:00pm, 80B**

**Title: Communicating with the New Millennials**

The purpose of this paper will be to focus on previous research studies regarding the millennial generation of college students and communication via social networking.

Morris, Breana  
**Faculty mentor:** Christine Lemley

**Session I, 9:00am-11:00am, 53B**

**Title: Students in the Special Olympics**

My project will be a poster board presenting information on students with disabilities who are involved in the Special Olympics. I want to describe how the Special Olympics can empower these students who struggle with the hardships of a disability. I will also be presenting two interviews that I receive involving students that actually participate within the Special Olympics.

Morse, Benjamin  
**Faculty mentor:** Phoebe Morgan

**Session I, 9:00am-11:00am, 87A**

**Title: What's Your Conflict Style? -Techniques To Resolve Conflict**
This is a final project of significance for the Criminal Justice capstone class CCJ480c- Alternative Dispute Resolution. This project involves helping Northern Arizona University students identify their primary conflict style, and aiding them in ways to resolve their daily conflicts. Students will identify their primary conflict style by first taking a brief quiz. Our group will then provide street counseling on ways in which students may alter their existing conflict style. A pamphlet will be provided as reference material. This pamphlet highlights the five main conflict styles and advises the reader on techniques that may be implemented into their own style. This project has the overall objective of aiding individuals in the realization that conflict styles take different forms. It is only by first identifying their individual conflict style that they will be able to adequately resolve disputes.

Mowery, Michael  
*Faculty mentor:* Walter Vannette

*Session I, 9:00am-11:00am, 56B*  
*Title: Mathematics in Archaeology: An Integrative Approach to Mathematical Modeling in Archaeology*  
The poster provides an analysis of Mathematics' foundation in archaeology. Specifically, the poster details Mathematics' pertinence as a source to problem solving on a much deeper scale. Considering Mathematics as a universal language and still having some roots in the archaeological field, the poster outlines and takes into account the applications Mathematics has in terms of: modeling, spatial analysis, statistics and Calculus applications as well as some focus on trigonometric application. The poster will also pose an integrative model that can help archaeology students better understand Mathematics in terms of the complexity. This is important because most archaeologists who go into the field of archaeology do not have a good foundation on how to spatially analyze problems affecting the human antiquity. In other words the poster follows two distinct routes: applying Mathematical modeling in archaeology as well as teaching archaeologist the importance of mathematical applications in the archaeological field. This will allow students who can pick up on these concepts to have a better appreciation for not only the field of anthropological studies, but Mathematics as well.

Mueller, Cory  
*Faculty mentor:* Gulsum Rustemoglu

*Afternoon, 2:06pm-2:18pm, duBois Room A*  
*Title: Rehabilitated Houses: How are Regulation Reviews Processed?*  
How are regulation reviews processed and what do they impact? We will examine that while also learning how to create these documents for an environmental consulting firm for rehabilitated homes in the Phoenix Metropolitan Area, as well as other locations. Global Environmental Permitting, Inc. (GEPermit) is a small environmental consulting firm located in San Diego, CA that specializes in California Environmental Quality Act and National Environmental Protection Act Permitting, but has recently expanded their qualifications to include other forms of permitting. Environmental permitting is an essential part of any construction that happens in the United States because it looks at all of the possible environmental impacts that could potentially happen during construction. Regulation reviews are one of the main documents that GEPermit create. These documents are processed through the US Department of Housing and Urban Development and are used to ensure that the rehabilitation of homes are within local, state, and federal regulations, with regards to environmental parameters. While creating these documents, many different websites are used in order to finalize all the necessary information into one document. These documents are essential in order to proceed with construction on rehabilitated homes because they ensure a quality project and they prevent time delays that could happen due to unforeseen environmental conditions. GEPermit will continue to increase their capabilities and increase their quality of work as they continue to expand their business.

Mueller, Rebecca  
Shannon Boruch, Robert Moreno  
*Faculty mentor:* Brant Short

*Session I, 9:00am-11:00am, 80C*  
*Title: How Persuasive techniques affect Professional Sports Lockouts*  
The purpose of our research will be to analyze (player unions, speeches, and rhetoric of players) and show how our field of Communication Studies can be applied to National Sports Teams of National Basketball Association (NBA),
National Football League (NFL), and National Hockey League (NHL). Through a thorough analysis of persuasive theories of Argumentation & Bitzer's rhetorical situation, we will analyze each lockout and will evaluate how the techniques used were able to bring the lockouts to a close.

Muhammad, Rahmaan  
Faculty mentor: Christine Lemley  
Session II, 2:00pm-4:00pm, 53C  
*Title: Black lives matter: stories from flagstaff*  
Addressing the problems we face as colored people.

Muller, Jordan  
Robert Kellar, Robert Diller  
Faculty mentor: Robert Kellar, Robert Diller  
Session I, 9:00am-11:00am, 15A  
*Title: Electrospinning Proteins as a Method to Create Customizable Scaffolds for Tissue Engineering Applications*  
Customizable electrospun biomaterials can be used throughout the body to treat pathologies or replace damaged or compromised tissues. Protein scaffolds can offer unique characteristics for therapeutic applications that can be tuned or altered through varying parameters in the process of electrospinning. These variations produce unique templates which offer different properties of the biomimetic templates. Protein matrixes were created to explore the different effects of varying electrospinning parameters involved in the creation of the protein scaffolds. Solutions of different proteins were created and exposed to varying flow rates and electric fields to produce unique electrospun prototype scaffolds. The ability to customize scaffolds will allow researchers to vary template characteristics to represent the extracellular matrix of various native tissues. The use of non-synthetic proteins in the process of electrospinning will produce biomimetic templates which may increase implant biocompatibility.

Murphy, Garrett  
Faculty mentor: Frederick Lampe  
Session I, 9:00am-11:00am, 74C  
*Title: Ethnomedicine*  
My project will be a poster consisting of a thorough analysis of the book Ethnomedicine, by Pamela Erickson. The poster will be split by chapter and represent the types of ethnomedicine, causes, cultural interpretation, and reasons why ethnomedicine is still practiced and perceived in different cultures today.

Nagore, Sydnie  
Destiny Simpson, Ty Cureton, Kristen Kenny  
Faculty mentor: Cassandra Dakan  
Afternoon, 2:00pm-3:00pm, Skydome Stage D  
*Title: Unexpected Activism*  
Activism can emerge from unusual sources - and have a significant impact on changing society for the better. Panelists will explore the roles of comedians, rappers, Chicana artists, anti-consumerists, and songwriters on important social movements and protests from the 20th and 21st centuries.

Nasuta, Paige  
Danielle Doty, Eduardo Viramontes, Joshua Benally  
Faculty mentor: Sara Mushro  
Session II, 2:00pm-4:00pm, 38C  
*Title: Lowell Observatory Research*
The goal of this research project is to help Lowell understand the visitors coming to the observatory. A convenience survey will be used to gather information on the visitor’s demographics, their experience, and what would encourage them to return. The far reaching value of the data will help Lowell Observatory to determine how to help visitors come back, and where their advertising will be the most effective.

**Navarro, Alfredo**
Alexis Juergens, Ledu Tomeletso, Jazmine Mincey, Courtney Martin  
**Faculty mentor:** Phoebe Morgan

**Session II, 2:00pm-4:00pm, 87B**

**Title:** Implementing an Alternative Dispute Resolution Approach within Residence Life

During our undergraduate career many of us have had a disagreement or conflict with our roommates in the residence halls. When the issue was presented to the Resident Assistants (RAs) we usually received less than helpful advice on how to resolve the conflict. With no proper consultation on how to deal with the matter, many are left with uncomfortable living situations and ruined friendships. In order to address this issue we have created an Alternative Dispute Resolution (ADR) training to assist RAs and hall staff on how to properly handle these altercations. ADR is a method by which conflict between two or more parties is verbally and calmly negotiated in an attempt to find the best solution for all those involved without placing blame on the people. Our training introduces the administrative staff in charge of the residence halls and the RAs to the basics of ADR and the 'Getting to Yes' method proposed by Robert Fisher and William Ury. This training, along with supplemental materials and a video portion that was created in cooperation with another team, is designed to give staff a good foundation on ADR in order to train not only current staff but also future staff in the method. Our goal is that through the implementation of this training we can help not only RAs but also students solve their problems and maintain a healthy relationship with the people they have to live with.

**Nemeth, Andrea**
Michelle Arbagey  
**Faculty mentor:** Tricia Moore, Ivan Pacheco

**Session I, 9:00am-11:00am, 42C**

**Title:** Glass Ionomer Sealants: Does Conditioner Use Improve Retention Rates?

Dental decay is the most common childhood disease even though, for the most part, decay is preventable. Bacteria on the teeth breakdown foods and produce acid that can destroy tooth enamel. Dental sealants, a protective material placed in fissures and grooves in teeth to protect them from tooth decay, can reduce decay by 81%. Northern Arizona University Dental Hygiene participated in a school-based prevention program that included placement of sealants for 131 children living in a rural area with little access to dental care. Resin sealants are commonly used in private dental practice because they have demonstrated better retention rates than glass ionomer (GI) sealants. However, GI sealants have many benefits in public health settings since they do not require a dry field, they require less time and equipment. The goal of this project was to determine if the use of a tooth-conditioning agent prior to placement of GI sealants would improve sealant retention. Teeth in opposing quadrants of the mouth (split mouth design) were randomly assigned to receive GI sealants with or without a tooth-conditioning agent. A random sample of 50 children were examined for sealant retention after five months. Data was analyzed to determine which method of application yields the best retention.

**Netto, Alden**
Ryan Porter  
**Faculty mentor:** Ryan Porter

**Session II, 2:00pm-4:00pm, 24D**

**Title:** Receiver Function Analysis

There are many unanswered questions regarding the formation and eruptive processes of monogenetic volcanic fields and intraplate volcanism within the North American Cordillera. The San Francisco volcanic field, which contains over 600 volcanoes ranging in age from around 6 million years old to less than 1,000 years old, is situated well within the margins of the North American tectonic plate along the southern margin of the Colorado Plateau. Given the extensive
volcanism associated with the field and the availability of recently collected seismic data, it provides an excellent locale to study intraplate volcanism. Teleseismic P-wave receiver functions are used to investigate lithospheric structure beneath the volcanic field. Measurements of crustal thickness and Vp/Vs ratio were made at five seismic stations deployed in the vicinity of the San Francisco volcanic field and preliminary results depict widespread heterogeneities in crustal structure and thickness throughout the study area. The crust appears thickest in the western and eastern portions of the volcanic field (~50-53km). Towards the center of the field the thickness decreases to ~44-47km, and H-K stacks indicate higher Vp/Vs ratios (around 1.83) within this zone. Receiver functions also indicated a complicated Moho signature beneath the volcanic field, possibly indicative of magmatic underplating at the base of the crust. Beneath Sunset Crater, the youngest volcano in the field, a shallow low-velocity zone is present that may be indicative of a molten zone beneath the crater. Recent fieldwork has located felsic material within the crater, indicative of more crustal interaction than previously thought, which is consistent with the presence of this low-velocity zone. Based on preliminary results, we suggest that the deeper crustal structure is impacted by magmatic addition in the western portion of the volcanic field, which has a diminished effect towards the east. These features correspond with the eastward trend of volcanic activity over the history of the San Francisco volcanic field and suggest that crustal interaction is greater than previously thought in intraplate-monogenetic volcanic fields. As more data are collected we will be able to further assess the validity of these observations.

Newland, Ryan
Dakota Chavez
Faculty mentor: Dennis Foster

Session II, 2:00pm-4:00pm, 36C
Title: Public Choice Aspects of Road Privatization
This study was created in response to the issue of sub-par road maintenance and snow removal in the Flagstaff area during large storms. As a case study in public choice theory the project attempts to identify why the issue has arisen as well as what solutions could be offered to improve overall quality of the roads and traffic issues in the City of Flagstaff and surrounding areas. The main focus of the study revolves around the idea that privatization of road repair and upkeep would be in the best interest of all parties involved: it would allow the local government to free up funds to be used for other pressing issues, a private company to make a profit and create jobs, and for Flagstaff residents to experience more well maintained roads-especially in the winter months. We will argue that government intervention in road repair and upkeep is an inefficient use of taxpayer funds and that a private company will be more effective in this capacity.

Newland, Ryan
Faculty mentor: Ryan Fitch

Session II, 2:00pm-4:00pm, FCB EASEL
Title: Water Feasibility Analysis of Algae as a Bio-Fuel
With fuel prices skyrocketing and alternative fuel methods increasing in popularity, algae based bio-fuel may offer a sustainable source of energy. This study will present the possibilities of using algae in such a manner as well as how it could be done in the most economically friendly way. Additionally, the study will present research on the advantages and disadvantages of farming and using algae as a bio-fuel and will explore the areas in which it could be cultivated successfully. The project will have a particular focus on the issue of the amount of water necessary to properly cultivate algae in this manner and will determine whether or not the massive amount of water which needs to be diverted for algae growth is economically viable. The focus on water will also pertain to whether or not algae should be cultivated in existing rivers, bays, streams, etc. or if dedicated facilities should be created while have water imported to them to properly farm the algae.

Nez, Pearl
Faculty mentor: Micheal Lerma

Session I, 9:00am-11:00am, 76A
Title: End-Stage Renal Disease On The Navajo Community
Research Question: What are the most effective methods for community focus strategies of addressing Chronic Kidney Disease? Treatment Facilities have failed at addressing the social, financial, educational barriers of effective treatment of Chronic Kidney Disease. Context: Treatment facilities have failed at addressing the social, financial, educational barriers of effective treatment of Chronic Kidney Disease (CKD). Tuba City, Arizona that has a population of 8,611 people. Within this community I would like to share with you our Native American people who are the Navajos, one of the largest tribes who are affected by end-stage renal disease. There is a disproportionate rate of diabetes affecting the Navajo people. Chronic kidney disease is a condition in which the kidney is damaged and cannot filter blood as a healthy kidney. Because of this, wastes from the blood remains in the body and may cause other health problems. Native Americans with early CKD tend not to feel ill or notice any symptoms, individuals with diabetes confirm CKD is through lab work by testing your blood and urine. Once detected, Chronic Kidney disease can be treated with medicines, and healthier choices about what you eat and drink. Our people do have access to good healthy nutritional foods. The methods employed will be conducted a community focus. Education, finances, and cultural considerations concerning CKD in Tuba City will be addressed differently than what the norms and sanctions found in in mainstream society. For example, in terms of education the dangers of sugary foods and the benefits of traditional indigenous foods will be stressed. Financial burdens will need to be redirected toward the companies who profit from the western approach to medicine. Cultural considerations will be applied by listening to respected members of the community such as medicine men as opposed to outsiders. Findings: If an individual chooses to go untreated this may cause other health problems. Your kidney may stop working, and that is end-stage renal disease and this permanent for most individuals. Once your kidney fails, a person would have to go through regular dialysis, on a machine that filters your blood like a healthy kidneys would. Or the other alternative is through a kidney transplant. I want the Native Americans to save their kidney against failure disease, you may need to be careful about all the medicines you take. Your kidneys do not filter as well as they did in when they were healthy, which can cause a buildup in a person blood stream, and harm the kidneys. Future research into CKD need to take a qualitative approach and employ my community focus. This approach aims to gather an in-depth study of human behavior therefore it is the best way to circumvent contemporary approaches which are failing the Navajo people. For example, colonialism depends on deductive logic. Under this logic if kidneys are failing, the solution is a dialysis machine. Acute needs are taken care of by large treatment centers which can afford expensive dialysis equipment. This creates a systematic problem whereby motivation to prevent CKD is dissolved. My community focus approach will focus on causal relationships such as the poor relying on convenience stores for nutrition which later results in expensive health care needs.

Nichols, John
Mitchell Thune, Carlen Cyphers, Michael Schauer, Seth Lawrence, Todd Gonzalez
Faculty mentor: John Tester

Session II, 2:00pm-4:00pm, 4A

Title: SAE Aero Design Regular Class

This document describes the research, design, construction and implementation the Northern Arizona University Society of Automotive Engineers (SAE) Aero design regular class team conducted to be able to compete in the 2015 SAE Aero design competition. The competition includes three different classes of aircraft. The regular class aircraft has restrictions on overall dimensions, weight, and available power. By abiding by the rules set forth by SAE team RTF-15 is tasked to engineer an R/C aircraft that can successfully fly with and without a payload. The objective of team Ready to Fly in 2015 (RTF-15) was to design, build, and fly a remote controlled aircraft and optimize its performance to fly with a payload successfully. Through initial design research team RTF-15 built a semi-standard aircraft with innovative features to improve efficiency, stability and construction time. Innovations on the aircraft constructed by team RTF-15 include an adjustable angle of attack which is constructed by incorporating a pivoting connection to the wing and fuselage. Team RTF-15 also designed a pivoting wing that allows for the cargo bay to be accessed from the top of the plane without any major disassembly. Innovative material (Gilfab) was used in the construction of the main wing spar to increase strength while also minimizing weight. Gilfab is used in large scale aerospace applications and its use in the R/C aircraft allows the team to take advantage of its material properties to design an innovative wing with respect to strength and weight.

Nickerson, Samantha
Ryan Geier, Jinglyun Chen, Kirstin Martin, Justin Paothatat, Ryan Smith
Faculty mentor: Jonah Walsh, Sarah Oman, Jonah Walsh, Jason Alger, Scott Bryson, Brandon Short, Timothy A. Becker
Session I, 9:00am-11:00am, 3D

Title: Injection Molded Silicone Mock Vessels for In-Vitro Testing of VIABAHN Endoprostheses

Medical products that are developed for end clinical use first must pass rigorous in-vitro (benchtop) and in-vivo (pre-clinical) testing prior to human implantation. The desire exists for in-vitro tests methods and conditions that simulate the in-vivo environment for reduced development time and costs. In this study, injection molded silicone mock vessels were designed and fabricated to match the researched anatomical and physiological properties of the human superficial femoral artery (SFA) for the purpose of providing a suitable in-vitro model for W.L. Gore & Associates' VIABAHN endoprostheses. Multiple material attributes were characterized for two different mock vessel diameters for comparison to the corresponding properties of the human SFA. Deployment of a GORE VIABAHN device into a mock vessel during testing allows for performance evaluations prior to in-vivo testing and human clinical trials.

Nickerson, Samantha
Ryan Geier, Jingyun Chen, Kirstin Martin, Justin Paothatat, Ryan Smith
Faculty mentor: Jonah Walsh, Sarah Oman, Jonah Walsh, Jason Alger, Scott Bryson, Brandon Short, Timothy A. Becker

Afternoon, 1:30pm-1:55pm, duBois Fremont Room

Title: Injection Molded Silicone Mock Vessels for In-Vitro Testing of VIABAHN Endoprostheses

Medical products that are developed for end clinical use first must pass rigorous in-vitro (benchtop) and in-vivo (pre-clinical) testing prior to human implantation. The desire exists for in-vitro tests methods and conditions that simulate the in-vivo environment for reduced development time and costs. In this study, injection molded silicone mock vessels were designed and fabricated to match the researched anatomical and physiological properties of the human superficial femoral artery (SFA) for the purpose of providing a suitable in-vitro model for W.L. Gore & Associates' VIABAHN endoprostheses. Multiple material attributes were characterized for two different mock vessel diameters for comparison to the corresponding properties of the human SFA. Deployment of a GORE VIABAHN device into a mock vessel during testing allows for performance evaluations prior to in-vivo testing and human clinical trials.

Nielsen, Kaleigh
Faculty mentor: Natalie Cawood

Session II, 2:00pm-4:00pm, 83D

Title: Planned Change: Regular Outdoor Activity

I chose to replace my regular physical activity with an outdoor activity. I set a goal to regularly participate in an outdoor activity for physical and mental health benefits. I have set up a measurement tool to keep track of my activity. I will present my findings and how outdoor activity can be applied in social work.

Nimer, Adrianna
Stephen Shuster, Robert Prather
Faculty mentor: Stephen Shuster

Session II, 2:00pm-4:00pm, 18D

Title: Bateman's Principle and the Effect of Polyandry on Male Fitness in the Marine Isopod, Paracerceis sculpta

Paracerceis sculpta is an invasive marine isopod, native to the Pacific coast of North America and known for its diversity in male mating strategies. Bateman's Principle states that in most species, male fitness increases linearly with increasing mate numbers (polygyny). However, the effect of multiple mating by females (polyandry) on male fitness is largely unstudied, in this and other species. To identify the effect of polyandry on male fitness, we created replicate crosses of three wild type ('+') females with three males, each expressing a different phenotypic marker. Within each replicate, we mated each female to all three males, varying the order of males for each female, and recorded the phenotypes of the offspring produced. We predicted that if (1) sperm mixing occurs; each male will sire an equal proportion of offspring with each female. In contrast, if sperm competition or cryptic female choice occurs, males will sire unequal proportions of offspring. The disproportionate success of particular males (2) among broods will indicate sperm competition, whereas disproportionate success by particular males (3) within broods will indicate cryptic female
mate choice. Our results will reveal whether sperm mixing, sperm competition, or cryptic female mate choice consistently occurs in this isopod species. Moreover, because only in outcome (2) can polyandry enhance male fitness, our results could show that the generality of Bateman's Principle on individual fitness, in this and other species, depends on the mating behavior of females as well as that of males. Paracerceis sculpta is an invasive marine isopod, native to the Pacific coast of North America and known for its diversity in male mating strategies. Bateman's Principle states that in most species, male fitness increases linearly with increasing mate numbers (polygyny). However, the effect of multiple mating by females (polyandry) on male fitness is largely unstudied, in this and other species. To identify the effect of polyandry on male fitness, we created replicate crosses of three wild type ('+') females with three males, each expressing a different phenotypic marker. Within each replicate, we mated each female to all three males, varying the order of males for each female, and recorded the phenotypes of the offspring produced. We predicted that if (1) sperm mixing occurs; each male will sire an equal proportion of offspring with each female. In contrast, if sperm competition or cryptic female choice occurs, males will sire unequal proportions of offspring. The disproportionate success of particular males (2) among broods will indicate sperm competition, whereas disproportionate success by particular males (3) within broods will indicate cryptic female mate choice. Our results will reveal whether sperm mixing, sperm competition, or cryptic female mate choice consistently occurs in this isopod species. Moreover, because only in outcome (2) can polyandry enhance male fitness, our results could show that the generality of Bateman's Principle on individual fitness, in this and other species, depends on the mating behavior of females as well as that of males.

Nishihira, Jaclyn

Faculty mentor: Glenn Hansen

Session I, 9:00am-11:00am, 109D

Title: Environmentalism in Disney Film

The Walt Disney Company has a huge reach on children and families. Many of their animated films contain messages promoting environmental consciousness. I will examine what kinds of messages the company is sending and the effects they are having.

Nishimura Thornton, Deann

Faculty mentor: Michael Lerma

Session II, 2:00pm-4:00pm, 76B

Title: Hawaiian Sovereignty

This research project examines the political implications of the controversial proposal for United States federal recognition of Native Hawaiian status. The research provides a historical overview of the treaty making events that impacted Hawai‘i’s current status as an occupational territory of the United States military. The research also covers a particular set of contemporary conditions that serve as key elements in support of federal recognition, specifically, the right to self-determination and self-governance. The research highlights the complications with the promise of federal recognition as a solution to the Hawai‘i problem, by looking at relevant case studies and policies from Indian Country as well as the oral accounts from Native Hawaiian Kūpuna (elders) and community members. Lastly, the research explores the concept of peoplehood and Malama ‘Aina (care for the land) as an alternative to domestic dependent nationhood.

Noriega, Jacqueline

Tulsi Stransky, Raina Bekis

Faculty mentor: Gerald Wood

Morning, 10:30am-10:55am, Skydome Roundtable R2

Title: How Diverse are You?

Our plan is to create a SafeZone inspired program, that focuses on cultural and diversity awareness in the classroom. We feel that it is important to learn about different cultures in order to be able to teach effectively to ALL students. In order to do this, we are creating a program that goes over why it is important, what can be gained, definitions, appropriate interactions, different approaches, and resources that future teachers can take advantage while attending NAU.
Title: Gender and Academics: Effects on Preferred Characteristics in Mates

The purpose of the study was to explore differences in a person's preferred characteristics in long-term vs. short-term mates between gender and academic major. According to Regan, Levin, Sprecher, Christopher, and Cate (2000), this study is of importance because the desired traits in a potential mate can have further implications on possible relationship choices. While there has been ample research to support the topic of gender differences in mate selection, there is a lack of research in this field between academic majors. Participants, who are students at Northern Arizona University, completed a survey which required them to rank the preferred characteristics in a potential mate from most to least desired. We hypothesized that men and women would have similar preferred characteristics in short-term mates but larger differences in preferred characteristics in long-term mates. In addition, between academic majors, there would be similar preferred characteristics in short-term mates but larger differences in preferred characteristics in long-term mates. A Spearman's Rho was used to analyze the data. This investigation intended to provide more information about the factors that may influence what characteristics an individual looks for in a potential mate.

Title: An Ethnographic Approach to the Pleistocene in the Ukraine

Richard G. Klein collected and analyzed archaeological material in the attempt to define a culture that has no ethnographic material relating to it. This research was focused on Pleistocene groups living in what is now called Ukraine. Klein uses analogous materials from archaeological sites in Europe that are dated to relatively similar time periods in order to understand the lifestyle of groups living in the Pleistocene. Klein's research includes data about the environmental and ecological contexts that the archaeological materials were found in. Instead of comparing these materials to other Pleistocene cultures, I propose that comparing the materials to cultures further separated in time but more similar in ecological factors may help to understand the cultural patterns of Pleistocene groups in Ukraine. Ecological approaches have an important part in anthropological theory and are crucial in building a holistic observation of a culture. An ecological approach to Klein's research in the Ukraine would create a more holistic approach to understanding Pleistocene cultures. Analogies can be made between Pleistocene cultures and more contemporary cultures in similar environments. Using more contemporary cultures for comparison allows for different patterns in the Pleistocene archaeological record to be connected to activities (subsistence strategies, rituals, etc.) that are not apparent in analyses made solely from the archaeological material available. Since ethnographic material is not available for groups in the Pleistocene, ethnographic accounts of more contemporary groups living in similar conditions can be used to fill some of the gaps in the archaeological record.

Title: Dental Referral Compliance and Dental Caries Knowledge Amongst Caregivers of Children Involved in a School-Based Oral Health Program

Project Zero (PZ) is a school-based program that performs dental screenings and other preventative services to children of Yavapai County, Arizona. Schools in Yavapai County with a high percentage of free or reduced lunch program participants were screened at PZ for oral conditions (e.g. dental caries). Referrals were then distributed to the caregivers of the children who were identified with dental needs. The purpose of this study was to determine referral compliance as it related to: (1) the caregiver's perceived importance towards their child's PZ referral; and (2) the caregiver knowledge in regards to caries etiology and prevention. The sample population was randomly selected from the source population using stratified random sampling. The source population included the caregivers of the children.
that received referral letters for early and urgent dental care from two schools in a rural area of Northern Arizona. A follow-up phone survey was conducted 4-8 weeks following the distribution of the referrals. The results show that the majority of the sample population did receive referrals but over half were not compliant. The greatest barrier that the sample population had was finance. Caregivers need more education in regards to caries etiology and prevention to reduce the number of children with untreated decay.

Nunnally, Gabriella  
Faculty mentor: Natalie Cawood

Session I, 9:00am-11:00am, 84A

Title: Behavior Change: Praying and Mindfulness Practice
I chose praying and engaging in mindfulness practice as a behavior that I wanted to increase. I set a goal, assessed my capacity for change, and identified the steps I would take to make the change. I then developed a measurement tool to track my efforts to change mindfulness practice over time. I will present the results of this effort at changing my behavior and I will discuss how this assignment will impact my future social work practice.

Nunnally, Gabriella  
Faculty mentor: Julie Moreau

Session II, 2:00pm-4:00pm, 91D

Title: Who's Lives Really Matter?
I will be creating a painting that portrays the oppression and pain that black women in America face because of their intersectionalities of race, class, and gender. After this painting is created, I will display it in a public setting and provide people with questions to answer about the painting and the "new-age" Black Lives Matter Movement/Civil Rights Movement. I will use people's anonymous responses to reflect on how women are seen in these kinds of movements and how they are affected in the long run (whether they benefit or not).

Oakham, Rebecca  
Faculty mentor: Micheal Lerma

Session I, 9:00am-11:00am, 76C

Title: Integrating Western and Indigenous Healing Principles
Substance abuse is a prevailing problem in Native American communities and many of these communities lack the resources to address these problems. Substance abuse and dependencies are also connected with many other issues in native communities such as violence and suicide. Western counseling seems to be predominantly used within indigenous communities and seemingly is ineffective. Many spiritual leaders suggest these problems stem from our immense loss of cultural knowledge and sacred language. Is it possible to integrate Western styles of counseling with indigenous teaching of knowledge and cultural beliefs in order to effectively remedy this situation?

Ochi, Tricia  
Faculty mentor: Chris Lanterman

Session II, 2:00pm-4:00pm, 52A

Title: Being Smart with Art: How Art Programs Affect the Pursuit of Higher Education
The purpose of this research is to analyze the effects of art programs on student motivation to pursue education past high school. I believe that providing students the time to be creative and think outside of the box will transfer over to the academic subjects as well. Engaging students in music, dance, and other art forms not only changes the way students think about other subjects, but also the way they think about their future. It is important that we consider these influences, so that we may provide our students with the best education we can. There are many studies that show correlation between art education and increased test scores, but I would like to look into the effect that art education has on the pursuit of higher education. According to a 2014 NPR article, 'Young adults in the U.S. are barely any more educated than older adults: About 40 percent of both groups have an associate, bachelor's or advanced degree.' It is quite possible that art education may boost our students' likelihood to pursue a degree, and I believe it is worth looking
into. In this study, I will survey 120 high school students. I will ask their grade, the amount of minutes per week they are involved in arts, estimated absences this school year, and ask them to rate their motivation to attend college.

O'Connor, Liana  
**Faculty mentor:** Anne Scott

**Afternoon, 3:20pm-3:40pm, Skydome Stage B**

**Title: The Portrayal of Abuse in Popular Media**

In popular media today, abusive relationships are often portrayed as being normal, loving, and even romantic. This is especially apparent in the books and films that women and young girls are being exposed to. My presentation will discuss three of the most popular stories in today's society: Disney's Beauty and the Beast, the Twilight saga by Stephenie Meyers, and Fifty Shades of Grey by E. L. James to uncover many of these underlying messages of abuse and the impact that they might have on those exposed to them. These messages encompass everything from the idea that men are incapable of controlling their sexual urges to women having a responsibility to help change an abusive partner. In a world that is already filled with misogyny, it can be dangerous for entertainment media, such as books and movies, to express such messages and portray abusive men as ideal partners. Media that romanticizes abuse negatively affects women of every age and reinforces the rape culture that is already present within society. Rather than being praised as wholesome love stories, these books and films should be re-purposed to educate people about abuse and help council those who have experienced abuse in their lives.

Oden, Wyatt  
Tristan Parkinson, Wyatt Oden  
**Faculty mentor:** Christine Lemley

**Session I, 9:00am-11:00am, 53D**

**Title: Indigenous Cultural Understandings at NAU**

We use Indigenous in reference to Native American and American Indian populations. Our project will include analysis of interviews, readings, and art regarding Indigenous issues. We aim to answer the following question, **How do you feel your Indigenous culture is understood at NAU?** We will use critical oral history, which bridges critical theory and grassroots oral history, to gather the data. We will use multicultural education as a theoretical framework to analyze the data.

O'Hara, Kimberly  
Melissa Santana, Sara Maier, Jim Garretson, Holly Garretson  
**Faculty mentor:** Melissa Santana, Sara Maier, Jim Garretson, Holly Garretson

**Session I, 9:00am-11:00am, 123C**

**Title: An Innovative Design for Fitness**

The purpose of my research is to address how to create and design a LEED accredited Fitness Facility, focusing specifically on sustainable design, space planning, aesthetics, structural concerns, universal design, traffic flow and circulation within the building. The goal of this project is to design a 24-hour Fitness Facility that is sustainable, functional, ADA accessible, and universally designed to appeal to and attract members of any age and any ability through the amenities and aesthetics offered. The facility upholds an elite, modern design, with sleek lines and cutting-edge technology throughout, allowing members to get healthy, active, and involved to become a part of something bigger than themselves with ease and comfort. My research involves learning what the different LEED credits consist of, how I can incorporate those elements into the design of the building, and how the sustainable features of the facility can offer less of an impact on the environment while also lowering the overall costs of operation to create more profit for the company. I had to research the basic functions of a fitness facility, different trends in fitness facilities, equipment needs, square footage needs, typical amenities offered, and aesthetic trends, while also researching how these facilities can become more sustainable, more functional, ADA compliant, universally designed, and versatile for future change or expansion. This research was achieved through site visits, interviews with fitness enthusiasts, employees, and facility owners, as well as through credible websites and articles. From this research, an innovative and aesthetically pleasing fitness facility was designed. The concept of this design was to be modern, spacious, sustainable and functional for everyone. This was successfully achieved through the use of textures, materials, colors,
space planning, circulation patterns, and elements throughout the space that offer visual appeal, durability, and acoustic purposes.

O'Hara, Kimberly  
Faculty mentor: Bruce Aiken

Afternoon, 2:00pm-4:00pm, Skydome CAL floor

Title: A Painterly Professional

The purpose of my research is to address how to create and execute successful landscape oil paintings. The goal of this project is to utilize my technical, detail-oriented painting skills to create photo-realistic paintings and build a professional body of work through learning and adjusting my habits and incorporating a quicker painting technique that will accomplish a similar, satisfying final product in the end. My research involves different painting techniques, constant observation, studying nature from life, photographing scenery, lighting, critiques, and feedback from my peers and instructor to achieve my best work possible. From this research, I have created visually appealing, compositionally successful oil paintings that are photo-realistic yet painterly in style and marketable to the public.

O'Hara, Kimberly  
Faculty mentor: Bruce Aiken

Morning, 9:00am-11:00am, Skydome CAL floor

Title: A Painterly Professional

The purpose of my research is to address how to create and execute successful landscape oil paintings. The goal of this project is to utilize my technical, detail-oriented painting skills to create photo-realistic paintings and build a professional body of work through learning and adjusting my habits and incorporating a quicker painting technique that will accomplish a similar, satisfying final product in the end. My research involves different painting techniques, constant observation, studying nature from life, photographing scenery, lighting, critiques, and feedback from my peers and instructor to achieve my best work possible. From this research, I have created visually appealing, compositionally successful oil paintings that are photo-realistic yet painterly in style and marketable to the public.

Olivarez, Kirsten  
Faculty mentor: Kirsten Olivarez

Session II, 2:00pm-4:00pm, 84C

Title: Behavior Change: Living a Healthy Lifestyle

I chose eating healthy and working out as a behavior that I wanted to begin. I set a goal, assessed my capacity for change, and identified the steps I would take to make the change. I then developed a measurement tool to track my efforts to change my physical health over time. I will present the results of this effort at changing my behavior and I will discuss how this assignment will impact my future social work practice.

Olivas, Sonora  
Amy Bauer, Heidie Hornstra, Paul Keim, April Johnson, Talima Pearson  
Faculty mentor: Talima Pearson

Session II, 2:00pm-4:00pm, 14B

Title: Genetic and Geographic Distribution Differences of Coxiella burnetii Among US Milk Samples with a focus on Indiana

Coxiella burnetii is the causative agent of Q fever and found primarily in livestock but can infect any mammalian host and is transferrable between livestock and people. We sampled more than 950 commercial milk and individual animal milk samples and found that 99% of the milk samples from cows were genotype 'ST20'. As this genotype is common, we developed additional assays based upon differences among whole genome sequences and screened them against our collection of ST20 milk samples. Our purpose was to increase resolution within the ST20 group and potentially determine differences in geographic distribution that could help us understand dispersal patterns and mechanisms. We found no significant segregation of genotypes at the commercial milk plant level. This may be because each
commercial bulk milk sample is a mixture of milk from multiple cows and potentially distant farms. Therefore, we screened and tested bulk milk samples from individual dairies in Indiana to see whether the pattern is present at the county level. Our results show that all three genotypes are present in all the Indiana counties and that there is no genotypic segregation at the county level either. These results indicate rapid spread and persistence of these genotypes across the region.

Ollerton, Alexander
Meghan Belmares
Faculty mentor: Jennifer Duis

Session II, 2:00pm-4:00pm, 27D
Title: Transitioning to NAU in STEM: Transfer-GEMS

Many students decide to start university at a two-year institution while planning to transfer to a four-year school for a range of reasons. However, four-year institutions offer more resources and scholarships to incoming freshman. Additionally, incoming transfer STEM students may not have finished introductory courses, i.e. pre-calculus and general chemistry, which ultimately slows down degree progression. A learning community and scholarship (Transfer-GEMS) was developed to support transfer students in the College of Engineering, Forestry, and Natural Sciences at NAU. Preliminary results will be presented, examining the CEFNS transfer experience and the impacts of Transfer-GEMS. This material is based upon work supported by the National Science Foundation under Grant Number 1260138.

Olsen, Alexa
Faculty mentor: Christine Lemley

Session II, 2:00pm-4:00pm, 54A
Title: Disability in the Classroom

In this project, I am studying and researching, through personal interviews and books on the issue, to show how having a disability influences the quality of education, and the measures being taken, or not taken, to assist these individuals who need special attention. I hope to demonstrate how having a disability can often lead to ostracism within the classroom. I additionally hope to bring to the attention of the general public how we can prevent this from happening, by taking extra measures to ensure a secure learning environment for everyone.

Olsen, Kayla
Kaitlyn Welk-robbins, Trevor Petersen, Grace Gosz, Carl Zapfe, Emily Bowen, Keeley Dietze, Nora Webster, Miranda Mitsis, Celeste Tabares
Faculty mentor: Season Ellison

Morning, 10:00am-11:00am, Skydome Stage B
Title: The O.K. Corral: Shootin' Down the Myths

Myths shape our perception of what it means to be a Westerner in an increasingly complex world. These myths are often brought about by the media and people in power and romanticize the historical reality by converting real people into characters. Performance allows us to explore the various lenses worn by these characters of the historical past in order to empathize with their lived experiences. In this session, we will interpret and perform the myths, characters, and realities we experienced through our research in Tombstone, Arizona.

Olsen, Miller
Faculty mentor: Ryan Fitch, Dean Smith

Session II, 2:00pm-4:00pm, 32A
Title: Santa Catalina Island Water Management

Santa Catalina Island, also known as Catalina Island, is located about 47 miles southwest of Los Angeles in the Pacific Ocean. Ironically, even though it is surrounded by water, it is currently in a severe drought. This location is rather unique because it is expensive to live on and is primarily a tourist location. Management of fresh water sources on the
island includes two reservoirs, ten wells, a desalination plant, 25 miles of pipeline and 13 storage tanks. Southern California Edison (SCE) has provided water service on the island since 1962. They run the desalination plant and continuously update the water infrastructure. However, as the local population and number of tourists continue to increase, there is more pressure on Edison to supply more water. Thus, the problem arises of where and how Edison and Catalina Island will provide enough water to satisfy the increasing demands. Increasing the productivity of the existing water suppliers or even drilling new wells are possible options to increase the supply. However, since this is such a unique location with several water sources, we can study and learn from them and potentially apply them to other locations.

Olson, Elizabeth  
Faculty mentor: Gioia Woods  

Afternoon, 2:30pm-2:42pm, duBois Room A  

Title: Sustainability in the Marketplace: A Comparison of Tuscan and American Farmers Markets  

Food production in Western society has nearly entirely become synonymous with food manufacturing. The United States in particular has become a leader in industrial farming. However, pockets of traditional food production still remain. One such example is farmers’ markets, which combine food production and distribution by directly connecting producers to consumers. While farmers markets have recently gained popularity in the U.S., other regions enjoy a long history of these markets. The Tuscan region of Italy has a remarkably longstanding commitment to bringing fresh local food from farmers to customers in towns and cities. This paper focuses on the many benefits of farmers’ markets in regards to social, economic, and environmental sustainability and the differences in Italian and American farmers markets. Due to differences in infrastructure and culture the distinctions between markets are numerous, but these comparisons reveal possible areas of improvement for both regions. My findings suggest that markets in Tuscany focus on consumer education and engagement in local food concerns while American markets view their local market as a distinguishing event for their city and utilize this area as a social space to talk amongst other shoppers. My research also includes recommendations on ways to improve markets by focusing on adding variety in goods, educating consumers on the benefits of local food, including special events or performances, and maintaining a strong mission while adapting to changing trends.

Olson, Mackenzie  
Alexis Montano, Edward Horn  
Faculty mentor: Brant Short  

Session II, 2:00pm-4:00pm, 57B  

Title: Re-Presentation of Gender: Persuasion of Medial Campaigns  

A rise in social media, as a tool for advocating social issues, has helped to create a movement based on eliminating the inequalities of a gender binary. We chose to analyze multimedia campaigns which promote gender equality to both female and male audience. We believe the campaigns like #HeforShe, #Feminism, #NotThere, #YesAllWomen, on social media have been created to advocate for social awareness by addressing equal pay issues, violence against women, and identity. We examine the semantic triangle of persuasion and communication theories like symbolic interactionism in relation to the campaign's messages on gender roles. By breaking down stereotypes of women, the campaigns are advocating for gender equality in multiple facets ranging from intellectual to physical ability and image. Additionally, we argue that portraying an alternate image of women through these campaigns has an effect on other media geared toward women. Organizations such as Always, Dove, and Verizon have used similar persuasive methods to recreate gender roles and dismiss stigmas through advertisements of the organizations' products. We will look at how social media helps to propel or setback the campaigns of organizations, how the message is transformed, if the campaigns' goals are met, and whether or not these campaigns are effective.

Olson, Mackenzie  
Faculty mentor: Anthony Barnhart  

Session I, 9:00am-11:00am, 94C  

Title: Deceptive Biological Movement in Contact Sports
In an extension of research on deception, pseudo movements are analyzed when offensive athletes, in multiple sports, use actions/behaviors to create misperception in the defensive athlete. The pseudo movements from offensive athletes primarily become deceptive with the over exertion of a movement in one direction and rapid subsequent movement to the preferred direction. The proposal hypothesis states that an extra stimulus used in the deceptive movement, to display a larger motion towards a direction, may create higher deception to increase the chance that the offensive athlete will escape the defensive athlete's reach to impede the preferred direction of the offensive athlete. By previous research of biological deception and sports deception, a conceived prediction that the extra stimulus, an arm/hand wave or directive facial movement to the false direction of the offensive athlete, will generate higher deception in the defensive athlete and therefore incur a slower reaction to the preferred direction of the offensive athlete is possible. The deceptive methods can be helpful to athletes in rugby, football, soccer, basketball, and other activities that require movement to deter impedance of the defensive athlete.

Onofry, Mackenzie
   Andrea Heppner, Gregory Robertson
   Faculty mentor: John Houser

Session I, 9:00am-11:00am, 102A
Title: Effects of Course Facebook Page on Instructor Perception
The study at hand sought to determine how the perception of an instructor is affected by a course's Facebook page. Prior research suggested that instructors who utilize different forms of technology are perceived as being more adequately trained, more credible, and more productive. The current study had a sample of 142 undergraduate students (24% male, 76% female) who were enrolled in three different sections of a Developmental Psychology course. Only one section was aware of the Facebook page. All three sections filled out measures related to teacher rating and classroom climate, along with three open ended questions relating asking for suggestions or feedback about the Facebook page. Results showed that the experimental group was higher in teacher rating, enthusiasm, rapport, and classroom climate. They also reported liking the review questions and reminders provided on the Facebook page more than any of the other features. Future studies could manipulate the resources posted on the page in order to determine the most effective study methods and means of interaction between students.

O'Reilly, Michael
   Faculty mentor: Andrew Sanchez Meador

Session II, 2:00pm-4:00pm, 19D
Title: Using growth releases to identify disturbance events in southwestern dry mixed-conifer
Dendrochronology techniques can expand our understanding of land management practices even without historical written records. Dating cores from a site, identifying releases, and using statistical analysis software such as R to correlate these growth releases allows for the determination of logging dates on this site. This can provide important information to researchers interested in historic stand structure. This study applies these techniques to a site on the Mogollon Rim in Northern Arizona. This study gives land managers and researchers an educated idea when this area in Northern Arizona was harvested, which can aid in spatial reconstructions as well as general land management efforts.

Ormiston, Cliff
   Faculty mentor: Thomas Paradis, Erika Hess

Session I, 9:00am-11:00am, 89C
Title: The Arizona Wine Industry of the 21st Century: The Dynamics of Class and Global Trends in Wine Culture
The culture of wine has steadily grown in popularity and acceptance since the end of the 20th century throughout the world. Changes in the social and status dynamics of wine connoisseurs suggest a shift in the primary base of patronage from traditional haute couture increasingly to the middle class, reflecting the influences of globalization and neoliberalism on the industry. Wine sales constitute an important and growing multimillion dollar contribution to the Arizona economy which reflects an overall national trend: for the first time in 2011, the total cases of wine sold in the United States surpassed those of France. The three principal wine regions in the state include the northern Verde Valley, Sonoita in the south, and the Willcox Wine Country in the southeast. The purpose of this study is to inquire into the criteria and process for developing new grape cultivation areas and successfully transforming them into highly
regarded and established wine producing regions that compete profitably at local, national, or international scales, while investigating impacts to social demographics. An approach following the lead of a case study conducted in Brazil and Uruguay, as well as other international studies, focuses on the Verde Valley region in particular. Interviews of key personnel at selected area vineyards, content analysis of trade publications, products, and the importance of tourism-related materials, and participant observation through tours and vineyard walk-throughs will aid in ascertaining the overall health and future prospects of the Arizona wine industry, with emphasis on best practices and success stories.

Orozco, Alexis  
Faculty mentor: Fredrick Lampe

Session II, 2:00pm-4:00pm, 63A

Title: Native Tours

Our project will compare tourism and anthropology. It will further explain the effects of tourism on native groups and cultures. We will also identify the correlation between tourism and modernization in anthropology.

Ortega, Nicole  
Faculty mentor: Mary Gianolla, Ashley Mackenzie, Tracy Anderson

Morning, 8:30am-8:42am, duBois Meadows Room

Title: Camp Colton: The Legacy of Interdisciplinary Environmental Education in Flagstaff, AZ

I completed an internship with Camp Colton, an environmentally focused education program through the Flagstaff Unified School District. During the internship, I drew upon my own knowledge of the environment to meet the learning objectives of 6th grade students. In addition, I created and delivered environmental education lessons based on curriculum provided by the district. Topics included wildlife, botany, adventure, geology, aquatics, and history of the San Francisco Peaks. Lessons were interactive learning based upon games, experiments, and exploration in the field. My goals for this internship were to gain experience teaching students about the environment, prepare for a career in education, and learn how to run a successful environmental education program. Camp Colton was an edifying and enjoyable internship experience that helped me develop skills in line with my current studies and future goals. The curriculum at Camp Colton coincides with many courses in the ENV program, thus making me a confident facilitator of 6th grade environmental education. This experience has helped me grow as a leader and apply my studies to real scenarios. This internship solidified my desire to teach and learn alongside curious minds.

Ortiz, Alyssa  
Cassidy Crews  
Faculty mentor: Kiisa Nishikawa, Sarah Burcher

Session I, 9:00am-11:00am, 18C

Title: Kinematics and Back Packs

Much is known about the jumping behavior of amphibians, but very little is understood about the processes involved in landing at the conclusion of the jump; the end goal of our study is to determine if differences are present between species in any of the facets of landing behavior, such as timing of forelimb extension or method of energy dissipation upon contact with landing surfaces. We are currently studying the forces and muscle responses involved from a biomechanical perspective, focusing particularly on muscle lengths and energy absorption during contraction. We hope to garner information about the forelimb's particular movements during the landing behavior, both externally (in terms of joint angles and relative position to the body) and internally (muscle lengths and activity). We hope to learn if these parameters differ significantly between species or if they are fairly uniform amongst amphibians. In our research, we have found that the Lithobates pipiens (Pipiens) land with far more mass-adjusted deceleration force than Lithobates catesbeianus (Bullfrogs). We believe this is a result of the fact that L. catesbeianus is much heavier, and its forelimb muscles are not as adept at carefully decelerating the animal after a jump. We are further examining this hypothesis by adding weight to the L. pipiens to compare landing behaviors with both unweighted L. pipiens and L. catesbeianus. In order to achieve increased mass, we use adjustable weighted body packs. These packs are made out of non-abrasive materials (felt, covered elastic, thread) to avoid irritation or harm to the amphibians, and are attached via an elastic band around the midsection, with loops around the forelimbs to secure the pack from slipping. These body packs
contain pockets for weights (in the form of metal washers or similar) that can be individually adjusted based on the mass on the specific amphibian. This investigation will hopefully shed light on the impact of mass on amphibian jumping ability, leading to a better understanding of the mechanics of jumping behavior.

Ortiz, Liliana  
Russell Benford, Nashelly Meneses, Joseph Busch  
**Faculty mentor:** Russell Benford, Nashelly Meneses, Joseph Busch

**Session I, 9:00am-11:00am, 18A**

*Title: Genetic Variability and Population Structure of Wedge-Tailed Shearwater*

The wedge-tailed shearwater is a common seabird with widespread distribution in the Pacific and Indian Oceans. The only known breeding population in the Commonwealth of the Northern Mariana Islands is threatened by introduced predators and human activity. Management and conservation of this population would be improved by knowing more about the genetic structure, dispersal habits, and connectivity of this population to other breeding populations. The purpose of this project was to determine this population’s sex ratio, genetic variability, and population structure. Birds were sexed by amplifying the CHD (Chromo Helicase DNA-binding) gene extracted from feather tissue. Diversity was quantified using three microsatellite markers. Data collection is currently ongoing for the wedge-tailed shearwaters. However, this information has the potential to contribute to larger shearwater project that may identify the population of origin of the Northern Mariana’s shearwaters and provide information about their migratory behavior.

Pabian, Inez  
**Faculty mentor:** Fernando Monroy

**Session II, 2:00pm-4:00pm, 15B**

*Title: Manipulation of the L-Arginine Pathway by Toxoplasma gondii*

Several immunological host defense mechanisms are stimulated during parasitic infections. Apart from the recruitment of effector cells, such as macrophages and neutrophils, which help control parasite proliferation, a biochemical defense response is also implemented. The production of nitric oxide (NO), a cytotoxic molecule when produced at high concentrations, is key for parasite control of replication. Within macrophages, the production of NO results from the metabolism of the semi-essential amino acid L-arginine by the enzyme inducible nitric oxide synthase (iNOS). However, substrate competition of this amino acid by arginase also occurs, leading to production of urea and L-ornithine. The intracellular parasite Toxoplasma gondii has developed several mechanisms to survive and thrive in its hosts, which include humans. One of these mechanisms is the ability to modify the L-arginine pathway by suppressing NO. Because of the enzymatic suppression of iNOS, the activity of arginase is increased, leading to a shift in polyamine synthesis in the cell. The objective of this experiment is to determine the enzymatic activities of iNOS and arginase in macrophages throughout the course of an acute Toxoplasma infection. I will also determine if the parasite will survive or revert to its dormant stage if the products of arginase are inhibited. It is hypothesized that the Toxoplasma gondii will revert to its dormant stage without a product for ornithine decarboxylase in order to increase its chances of survival. Identifying the polyamine that can rescue this effect can provide a better understanding of the parasite's metabolism and ability to establish chronic infections.

Palacios, Erica  
**Faculty mentor:** Anthony Barnhart

**Session I, 9:00am-11:00am, 94D**

*Title: Superstition: An Evolutionary Adaptation*

Superstition is, arguably, very important to animalistic nature and can be an adaptation to humans as well as other animals through the process of evolution. In regards to Darwin's Theory of Evolution, an adaptation occurs in order to support survival as a species and to pass beneficial genes to their offspring. This research proposal examines previous research to investigate theories as to why superstition may be an evolutionary adaptation. This research proposal looks to investigate the evolutionary adaption by using brown nose Norway rats as subjects. In the proposal research, subjects, will participate in a within experimental design in which the brown nose Norway rats will go through three trials. The first trials will establish the belief of superstition while the other trials will have similar experience in which a predictive action is believed to occur. Two different experiments will be performed in order to gather data in hopes to
support the hypotheses. The rats will individually be placed in a container in which they will run through an obstacle. Within the obstacle the rats will encounter minimal shock areas in hopes that they learn to avoid these areas. Throughout the experiment these areas will no longer be used but have an indicator that will create a sense of survival and superstition for the brown nose Norway rats. The prediction drawn from the research is that the experiment will demonstrate that after a negative outcome, the brown nose Norway rats will incorporate the experience with that action and cause a belief of superstition in which the subject is likely to avoid the same scenario the next time.

Palmer, Alexis  
Faculty mentor: Christine Lemley

Session I, 9:00am-11:00am, 54B  
Title: The Growth from K-12  
Stories will be shared about the experiences and discovery from kindergarten through the twelfth grade by those that identify with the gender queer and transgender communities.

Palmer, Elora  
Faculty mentor: Robyn Martin

Session II, 2:00pm-4:00pm, 112C  
Title: Touchdowns and Traumatic Brain Diseases: A Look at Chronic Traumatic Encephalopathy In the National Football League and Beyond  
My presentation explores the ways a degenerative brain disease can drastically affect the lives of football players. The brain disease I researched is caused by multiple concussive hits to the head over time, and football players suffer from this so greatly that this disease kills them. I will also discuss the measures players and committees have taken to protect football players of all ages. Chronic traumatic encephalopathy is a brain disease which eats away the brain tissue and causes a slew of cognitive disabilities and impairments. It is caused by receiving multiple concussions over a short period of one's life. The NFL would deny this causation, along with the number of concussions their players received during the season. Studies were performed, and this disease was found in almost 100 former, diseased NFL football players. The result? Almost 400 former players and their families filed a lawsuit against the NFL for ignoring this disease and claiming that football players do not get this disease from their concussions. However, this disease is also popping up in cases of young, high school football players. This presentation will shed light on the overlooked issue of football and brain injuries, from high school football to the NFL, in a fun, engaging way for the audience.

Palomino, Aydee  
Brandon Ingraham, Alex Williamson, Kevin Donley  
Faculty mentor: Sara Mushro

Session II, 2:00pm-4:00pm, 38D  
Title: Lowell Observatory Market Research  
Nonprofit organizations have historically benefitted society in many ways. Whether it is feeding the homeless, educating children, or even discovering new planets that could potentially house human life, nonprofits are organizations that are unselfish in their attempts to benefit the communities where they reside. This is the reason why students of Northern Arizona University decided to help out the local nonprofit organization, Lowell Observatory. Lowell for the past five years has had issues generating enough revenue to keep its doors open for business and fund their current exploration activities. As marketing students, we are currently trying to put our skills to work and find ways that Lowell could better market themselves to potential customers and visitors. We are doing this by only surveying their current customers. Through this research we hope to help Lowell not only generate ideas for how to attract new customers but also promote return visits.

Palop, Francisco  
Faculty mentor: Cornelia Boggard

Session I, 9:00am-11:00am, 74A  
Title: The Green Science Center
My project describes and clearly goes into depth about how we can change the style of how we teach our future generations about how to take care of this earth and sustain life for a very long time. This project will enhance future business plans and create a whole new market.

**Pardo, Daniel**  
Mahdi Mohammad, Christina Holt, Ali Hasan  
**Faculty mentor:** Jeffrey Heiderscheidt, Bryan Cooperrider, Dennis Madsen, Lester Corum

**Session I, 9:00am-11:00am, 11C**  
**Title:** Separation of Oil from Water - H2Oleum  
Industrial processes that involve the extraction of crude oil, create emulsions which contain microscopic oil particles dispersed throughout water. These contaminants need to be removed from the water before being reused in other processes. The problem is that the microscopic, emulsified, oil particles are so tiny that they will not separate from water over time. Increasing the size of the oil droplets will cause them to coalesce into larger oil particles that are easier to recover as they rise and collect on the surface of the water. The purpose of this task is to design a water treatment system that is able to separate emulsified oil from a brackish (slightly salty) oil-in-water emulsion. H2Oleum's objective for this project is to design a solution that will recover as much oil as possible from the water by creating a high degree of separation between the two liquids. The report will outline H2Oleum's proposed design solution that is able to recover 0.234 kg/m² of emulsified oil from a brackish water stream in under 50 minutes. This design is limited by the initial oil concentration in the water stream, 200 mg/L, and will be more effective with higher oil concentrations and lower oil densities.

**Pardo, Daniel**  
Mahdi Mohammad, Christina Holt, Ali Hasan  
**Faculty mentor:** Jeffrey Heiderscheidt, Bryan Cooperrider, Dennis Madsen, Lester Corum

**Afternoon, 2:55pm-3:20pm, duBois Southwest Room**  
**Title:** Separation of Oil from Water - H2Oleum  
Industrial processes that involve the extraction of crude oil, create emulsions which contain microscopic oil particles dispersed throughout water. These contaminants need to be removed from the water before being reused in other processes. The problem is that the microscopic, emulsified, oil particles are so tiny that they will not separate from water over time. Increasing the size of the oil droplets will cause them to coalesce into larger oil particles that are easier to recover as they rise and collect on the surface of the water. The purpose of this task is to design a water treatment system that is able to separate emulsified oil from a brackish (slightly salty) oil-in-water emulsion. H2Oleum's objective for this project is to design a solution that will recover as much oil as possible from the water by creating a high degree of separation between the two liquids. The report will outline H2Oleum's proposed design solution that is able to recover 0.234 kg/m² of emulsified oil from a brackish water stream in under 50 minutes. This design is limited by the initial oil concentration in the water stream, 200 mg/L, and will be more effective with higher oil concentrations and lower oil densities.

**Parker, Zachary**  
Jordan Hunt  
**Faculty mentor:** Jeff Rushall

**Session II, 2:00pm-4:00pm, 22D**  
**Title:** Eisenstein Amicable Pairs  
An amicable pair (m,n) is a pair of positive integers with the property that the proper divisors of m sum to n and vice versa. In 2013, R. Clark discovered a complex analog to amicable pairs in Z[i], the ring of the Gaussian Integers. We will present our progress towards classifying amicable pairs in another unique factorization domain, Z[w], the using of Eisenstein Integers.

**Parra, Amy**  
**Faculty mentor:** Anthony Barnhart
Session II, 2:00pm-4:00pm, 94D

Title: Autism: Perceiving Moving objects

Autism is ‘a disorder characterized by impairments in social interaction and communication and by restricted and repetitive quality of behavior’ (Kuhn, Kourkoulou, & Leekam 2010). Autistic individuals also have trouble paying attention to a moving object. In this paper an experiment was conducted to test the following hypothesis: If someone has autism, then they will have trouble perceiving a moving object. Forty participants, ranging in the age of 18-40 were recruited from a typical college. Twenty of them had autism and twenty of them did not. In each group of twenty, there were ten females and ten males. Groups of eight were taken into a room and shown four different video clips. During each video clip, their eye movements were measured with an eye tracker. After each video clip, they had to answer the question that corresponded to the video clip. The four questions were exactly the same, the only difference were the video clips. What the participants did not know is that there were two confederates in the back watching their eye movements. The results supported the hypothesis.

Parrish, Matthew  
Faculty mentor: William Cordeiro

Morning, 9:00am-11:00am, Skydome Honors Table

Title: The Struggle of Hierarchy Within Breaking Bad

This project will be following the idea of hierarchy and climbing corporate ladder as presented within the popular television show, Breaking Bad. The poster will follow characters Walt, Jesse, and Hank as they progress through seasons one through five and in the end present how and why each respective party ends up with more power than the other.

Parrott, Alicia  
Mariana Bosch Y Gutierrez, Timothy Broom, Louis Herschel Irving, Miranda Stover, Victoria VanPuyvelde  
Faculty mentor: Nora Dunbar, Ann Huffman

Session II, 2:00pm-4:00pm, 100B

Title: Married Army Couples Program: Perceptions, Experiences, Impacts and Suggestions from Dual-Military Couples

A qualitative methodology was employed to examine the challenges associated with being in a dual-military marriage. With a dearth of research on this population, we used a grounded-theory approach to analyze the data and identified themes associated with challenges experienced by this unique population. Twenty-five focus groups were conducted with soldiers and officers (N = 127) in dual-military marriages at multiple installations. Groups were primarily male (60%) and consisted of enlisted personnel (75%); about half of the participants were non-White (51%). Participants responded to a series of open-ended questions regarding the benefits, challenges, and needs associated with being in a dual-military marriage and the resources and strategies used to cope with identified challenges. One theme that emerged was frustration with the Married Army Couples Program (MACP). As this program is intended for and affects only our target population, we chose to focus our research on it specifically. We examined the negative perceptions and experiences related to MACP as well as the consequent negative impacts both on a personal or familial level and on an organizational level. We also examined the positive counterparts of these constructs, and participants' suggestions for improvement of the program. Statements relating to the constructs described above were organized thematically into nodes and sub-nodes in order to develop a fuller theoretical picture of the relationships at play. The most prominent, and pertinent, story that emerged was that MACP, though well intentioned, in many cases fails to deliver in a consistent, fair manner and therefore propagates an impression of lack of care on the part of the military resulting in tangible negative consequences.

Paul, Joan  
Becca Braunstein, Kara Self, Gregory Busath  
Faculty mentor: Gregory Busath

Session I, 9:00am-11:00am, 98C

Title: Can sexual assault increase the likelihood of planning or attempting suicide? A meta-analysis
Literature regarding the experience of sexual trauma suggests that there is a strong positive relationship between sexual assault and suicide. In this meta-analysis, we investigate whether there is enough research evidence to show that being sexually assaulted or severely sexually harassed will increase the odds of attempting or committing suicide. We are reviewing over 800 studies from PsycInfo, PubMed, and PsycArticles, and Web of Science to identify studies that measure a relationship between sexual assault and suicide ideation and suicide attempt. If we find a moderate effect size our meta-analysis may improve efforts to confront sexual assault more effectively. Furthermore, these findings may encourage insurance companies to cover counseling for sexual assault victims.

Peaches, Erik  
Faculty mentor: Jani Ingram, Jonathan Credo

Session II, 2:00pm-4:00pm, 27B

Title: Quantification of Uranium in Unregulated Wells on the Navajo & Hopi Reservations

Uranium mining on the Navajo Reservation occurred during the mid-1900's. Many individuals live near sites of abandoned uranium mines. Uranium is naturally occurring toxin and carcinogen found in many water supplies around the western United States. The geologic profile of the western United States lends itself to naturally elevated levels of uranium in ground water, which can exceed the United States Environmental Protection Agency (EPA) limit of uranium consumption at 30 parts per billion (ppb) in drinking water. The project is focused on collecting water samples from unregulated wells all over Northern Arizona, which includes the Navajo and Hopi Reservations. We hypothesize that sites around abandon uranium mine will have elevated signs of uranium due to improper disposals and/or remediation of uranium. Inductively coupled plasma mass spectrometry (ICP-MS) is used to determine the amount of uranium in each sample. ICP-MS has the ability to detect low amounts of uranium down to 1 ppt. Over 40 wells were sampled in this study, and the results show a number of wells that contain uranium which are above EPA safety limits. The results of this study will be discussed.

Pearce, Kayla  
Faculty mentor: Monica Lininger, Scot Raab

Session I, 9:00am-11:00am, 48C

Title: The difference in lower extremity injury rates when played on natural grass compared to third generation artificial turf

Injuries are a common occurrence in athletics. Field surface type has been found to have a major impact on lower extremity injuries. Objective: To answer the following questions: Is there a difference in the rate of lower extremity sprains on natural grass compared to third-generation artificial turf? Is there a difference in the rate of lower extremity sprains on third-generation artificial turf compared to natural grass between football and women's soccer? Is there a difference in the rate of lower extremity sprains on third-generation artificial turf or natural grass by body part (knee/ankle)? Is there a difference in the rate of lower extremity sprains on third-generation artificial turf or natural grass during games and practice? Methods: Data was compiled on an Excel worksheet of all injuries that have occurred from 2011-2014. Correlational analyses were performed to determine relationships between variables (team: football and women's soccer; body part: knee and ankle; type of activity: practice and game; and field surface type: grass and turf) as well as logistic regression to determine if differences were seen in rate of injuries on the previously described variables. These findings were then compared to other literature using Medline, CINAHL Plus, and Cochrane Library. Results: There was a significant difference between teams (football vs. women's soccer) on different field surface types (p=0.022). Football accounted for 11 injuries on artificial turf, women's soccer accounted for 6 injuries on grass. There was a significant difference between body part (knee vs. ankle) on different field surface types (p=0.039). There was a total of 9 injuries that occurred on artificial turf and 7 ankle injuries on grass. There was no difference between the rate of injuries in competition between the given field playing surfaces (p=0.085). Conclusion: This data shows that there is a higher occurrence of sprains for Football on artificial turf. Nevertheless, there is a higher occurrence of injuries for Women's Soccer on natural grass. There is a higher occurrence of knee sprains on natural grass; however there is a higher occurrence of ankle sprains on artificial turf. These instances of injury may be due to, biomechanics or shoe-surface interactions, these variables were not included in this research study and should be examined further. Preventative rehabilitation techniques may be advised to reduce these instances of lower extremity sprains.

Pelletier, Benjamin
Faculty mentor: Jonathan Paklaian, Scott Anderson, Rob D'Andrea

Morning, 8:30am-8:42am, duBois Room A

Title: Paleoecology of the Chuska Mountain Region: A Study of Sediment Cores

My undergraduate internship experience was completed in the Bilby Research Center's Paleoecology lab assisting a graduate student named Jonathan Paklaian with his master's thesis project. The center of his project is a number of sediment cores taken from dried up Deadman Lake and Beaver Run in the Chuska Mountain region on the northern Arizona-New Mexico border. By sieving half of the sediment core, Jonathan and I are trying to discover what the Chuska mountain region may have looked like just before the Holocene. Pollen will indicate the prevalent species in the area and charcoal will help us determine what the historical fire regime was like. Current studies suggest that Ponderosa Pines were prevalent, however other evidence suggests that it may have been too cold during the turn of the Holocene for such trees to exist in the area. The majority of time was spend sieving sediment samples, the result was plenty of charcoal but far less macrofossils than we were initially expecting. Jonathan's mentor, Scott Anderson, suggested that other cores taken from an area closer to the lake shore might yield better results, and so Beaver Run has. The most exciting part of the internship was the fieldtrip to Stoneman Lake with Dr. Anderson to take a much longer sediment core from that lake. The final core was almost 300 feet long; much longer than the ones from Deadman Lake. Overall I enjoyed the semester and working in Bilby; I found the work simple and engaging but the overall experience was a fascinating opportunity to use my degree and work in the field.

Peña, Vincent
Matt McElroy, James Garner
Faculty mentor: Brant Short

Session I, 9:00am-11:00am, 80D

Title: Influence, advocacy and the dilemma of journalism

NBC Nightly News anchor Brian Williams, once a beacon of journalistic integrity, recently saw all of his established credibility as an anchor crumble around him with the news of him fabricating his involvement in Iraq while covering the war in the early 2000s. But Williams isn't the first journalist to do this kind of thing, which is seemingly a result of the growing celebrity TV-news journalists have. The celebrity status Williams has acquired seemed to outweigh his responsibility of truth and accuracy as a journalist. The problem is journalism has been overcome by the celebrity status of its biggest names, and given how mass media can create and change discourse in society, it should be even more alarming when considering what else is affected in coverage of major events or issues of advocacy. There is a large amount of corporate and political influence that affects the way news, and therefore information, is misappropriated because of these influences. We believe the media as a form of advocacy in America is fundamentally flawed in that the views, beliefs, and allegiances of journalists and their respective news outlets seems to take precedent over the accuracy and truth of the coverage. The research for this project will center on viewing the way different media outlets covered major events in the U.S. and how their coverage of those events was influenced by either corporate/political influence or the apparent celebrity of the journalists covering the event, and what that says about the overall ethics of journalism and how it can generate discourse.

Perea, Aubrie
Faculty mentor: Ryan Fitch

Session II, 2:00pm-4:00pm, 32B

Title: Water Crisis in Africa

Every day in rural communities and poor urban centers throughout Africa, hundreds of millions of people suffer from a lack of access to clean, safe water. This project will address this ongoing issue. First, an analyses of the negative impacts associated with the lack of clean drinking water will be discussed. I will also discuss some of the main causes and challenges. Then look at the options available to solve the water crisis in Africa. Look at what positive outcomes are associated with these current projects. Possibly compare and contrast a community that has implemented a clean water project to a community that has not. And lastly, provide a conclusion/recommendation.

Peshlakai, Florisa
Faculty mentor: Anthony Barnhart
Session I, 9:00am-11:00am, 95A

Title: Cultural Factors and Beliefs of the Modern Navajo

Shamans in the Navajo culture are those that have the power to heal, change, and see what we generally cannot. In this paper I am attempting to show that the more a person believes in special powers, the more likely the individual will disregard the scientific facts. This goes hand in hand with the Navajo culture because the shamans are constantly 'healing' individuals and most of the time this leads the person who was ill to avoid going to the hospital or clinic. In order for the shamans to exercise their powers they must have a reason for people to see them as powerful, to do so, the Navajos have a list of ongoing taboos which increases the chances for individuals to keep in contact with their local shamans. With traditional Navajo culture and the western culture converging, I am proposing that when it comes to deciding whether a phenomenon, that cannot be readily explainable by science, is told to an older Navajo, the older Navajo would decide that it is due to special powers rather than seeking a scientific explanation. This phenomenon was first researched by Subbotsky and Quinteros (2002). Subbotsky and Quinteros (2002) concluded that two cultures (Navajo and western culture in this case) may hold different beliefs but the mental processes are not fundamentally different.

Peshlakai, Leonard
Faculty mentor: Sheryl Howard

Session I, 9:00am-11:00am, 10B

Title: Repeat-Accumulate Codes with Modified Iterative Decoding Algorithms

Transmitting data to earth from satellites can be challenging; noise corrupts the transmitted data. Error correction codes (ECC), allow for error correction of noisy data. ECCs such as RA (repeat-accumulate) codes use iterative decoding of probabilistic messages to improve performance. This project examines min-sum decoding, which is much simpler than the better performing sum-product decoder. However, min-sum decoding in binary noise failed due to some probabilistic log-likelihood ratio (LLR) messages summing to zero. A zero-mean Gaussian-distributed random offset was added to each LLR message to prevent zeroing of messages during decoding. MATLAB simulations of the systematic RA code for min-sum decoding with and without random offset were conducted. Several variance values for random offset (with \( \frac{1}{\sigma^2} \leq 0.07 \)) were examined. All random offset variance values significantly improved the min-sum bit error rate (BER) performance in binary noise to near sum-product levels.

Petersen, Trevor
Willem Arjana, Christopher Gass, Stephen Kuluris, Reejay Martinez, Alexander Moore, Leonard Peshlakai, Lucas Philipsen, Dylan Steyer
Faculty mentor: Michael Shafer, Carol Chambers, Bryan Cooperrider, Julie Heynssens, Sheryl Howard, John Sharber, Niranjan Venkatraman

Session I, 9:00am-11:00am, 9A

Title: Wildlife Telemetry Drone

The purpose of this project is to develop a tool to aid in the research of bat habitats and migration patterns. The current methods for conducting such research are strenuous and time consuming due to the requirement of finding vantage points of high ground in order to get a clear signal from radio frequency identification tags attached to the bats to triangulate their location. This projects aims to develop an autonomous drone to collect this data in a more efficient manner by flying into the air at multiple locations, effectively creating these points of high ground, expediting the data collection process. To achieve this, a quadcopter-style drone is to be built and outfitted with an antenna. The drone will fly straight up, rotate while collecting signal data, then land and send the data collected to a separate computing device to be processed into a GPS location where the bats are likely to be found. The presentation will provide an overview of engineering design analyses completed, results from tests performed, and a description of the resulting design.

Petersen, Trevor
Willem Arjana, Christopher Gass, Stephen Kuluris, Reejay Martinez, Alexander Moore, Leonard Peshlakai, Lucas Philipsen, Dylan Steyer
Faculty mentor: Michael Shafer, Carol Chambers, Bryan Cooperrider, Julie Heynssens, Sheryl Howard, John Sharber, Niranjan Venkatraman
**Afternoon, 3:20pm-4:10pm, duBois Southwest Room**

**Title: Wildlife Telemetry Drone**

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**Phillips, Daniel**
Jayna Schmitt, Carissa Halliday, Jack Jess

**Faculty mentor:** Eric Yordy

**Session II, 2:00pm-4:00pm, 28D**

**Title: 3-D Printing**

We will be creating a poster that is analyzing the law of copyright infringement in regards to 3-D printing.

**Phillips, Natalie**
Tanya Tobiason, Scotti Dick, Richmond Barkemeyer, Matthew Brandel

**Faculty mentor:** Nora Dunbar, Matthew Anderson

**Session I, 9:00am-11:00am, 100C**

**Title: The Effects of Music Tempo on the Memory Recall of Introverts and Extroverts**

The purpose of the experiment was to test the effects of fast tempo classical music, slow tempo classical music, and no music on individual's memory recall. A personality test was employed after the experiment to determine whether introverts and extroverts were affected differently based on the tempo of music. It was hypothesized that extroverts would perform better on the recall test after listening to the music with the fast tempo and introverts would perform better on the recall test after listening to the music with a slow tempo. In order to test this hypothesis, research methods students studied a list of twenty words while listening to one of the three music conditions for three minutes. After studying the list of words, the participants then completed a distraction task for one minute, before recalling as many words that they studied for two minutes. The participants then completed a short demographics and personality survey. We expect that the results of the experiments conducted will support the hypothesis that introverts will be able to recall more words when listening to music with a slow tempo while studying, and extroverts will be able to recall more words when listening to music with a fast tempo while studying.

**Phillips, Tenille**

**Faculty mentor:** Linda Robyn

**Afternoon, 2:00pm-4:00pm, Skydome SBS Table**

**Title: Broken Glass Theory: How the 1980s turn the 2010s into a racist police force**

My project will be research on the Broken Window Theory that was introduced in the 1980s. The basic theory suggest that if a person does not fix a window in their house it probably means they will not be aware of other issues of their house. This translates to the criminal justice field in that this theory states if a city or state does not focus on the petty crimes such as vandalism and prostitution then they are more likely to not capture the bigger crimes.

**Phoenix, Kyla**
Jael Harper

**Faculty mentor:** Sumner Sydeman

**Session I, 9:00am-11:00am, 60A**
Title: A Systematic Review of Outcomes in Public Speaking Phobia: Efficacy of Virtual Reality Cognitive Behavioral Therapy

The objective of the current study was to assess the efficacy of Virtual Reality Therapy (VRT) in the treatment of Public Speaking Phobia (PSP) by conducting a systematic review of psychotherapy clinical trials for this treatment. The methods used to execute this systematic review followed the standards dictated by the Preferred Reporting Items for Systematic Reviews (PRISMA: Moher at al., 2009). The poster will review the literature, including strengths and weaknesses of clinical trials of VRT. Suggestions for further research will be provided.

Pieropan, Rebeca
Kevin Romacker, Lauren Bruni, Conrad Scott
Faculty mentor: Eric Yordy

Session II, 2:00pm-4:00pm, 29A


The United States economy is dependent upon competitive and growing markets. Patent law is designed to give inventors exclusive rights to their inventions for an identified amount of time, thus reducing the levels of competition while launching their inventions. But at what point does excessive use of patents leave the realm of patent law and become an issue of anticompetitive behavior? When does a patent become a ruling monopoly? Depending on what side you stand on, patents can be viewed as promoting competition or anticompetitive. This paper gives a background on patent use in the United States and analysis various patent court cases and their possible anticompetitive behavior.

Pieropan, Rebeca
Faculty mentor: Ryan Fitch

Session II, 2:00pm-4:00pm, 32C

Title: The Risks and Safety Protections of Arizona Water

Drinking water is derived from various sources which may contain contaminants and natural chemicals. The treatment of water also adds additional chemicals which may pose health concerns over the short and long run. Water quality and treatment are subject to regulations from the EPA which specify limits and standards. This project's purpose is to combine these related elements in relation to the water distributed in Arizona to provide a consensus on how potentially harmful it can be.

Pinto, Bronson
Faculty mentor: Robert Kellar, Aaron Tabor

Session II, 2:00pm-4:00pm, 15A

Title: In-vitro wound healing scratch assay using platelet-rich plasma demonstrates expedited wound closure

Platelets play a key role in the normal wound-healing process. The initial clotting effects of platelets prevent excess blood loss of damaged tissues and blood vessels. Additionally, growth factors and cytokines that are released from platelet granules initiate migration and chemotaxis of key cells to the wound site. Autologous platelet-rich plasma (PRP) is a form of blood that can be readily created and utilized as an expedited wound-healing supplement. Through a double centrifugation process, modified from methods created by Nagata et al., 2009, whole blood is spun down to create a high concentration of platelets. To test PRP's expedited wound healing effect, an in-vitro study was designed. This in-vitro 'scratch assay' can be used as an effective tool to evaluate cellular migration, proliferation and wound closure. These outcomes can help investigators make predictions on future in-vivo experiments and future clinical effects. In the current study, human neo-natal dermal fibroblasts were used for the scratch assays. Dermal fibroblasts play a large role in the matrix remodeling and scar formation stage of the wound healing response. They work with matrix metalloproteinases and other cells to degrade and lay down new extracellular matrix for newly synthesized cells to adhere, proliferate and take residence. PRP, as a wound-healing supplement, demonstrated accelerated wound closure. Wounds were completely closed (healed) by 12 hours compared to 16 hours for control wounds. The scratch assay as an in-vitro wound healing model allows for efficient, rapid testing and evaluation of numerous therapeutics and supplements prior to in-vivo testing.
Pioux, Mathilde  
Luka Radjenovich, Jakob Klein, Jonathan Schwartz  
Faculty mentor: Eric Yordy

Session II, 2:00pm-4:00pm, 29B

Title: Construction Contract Breaches Involving Questions of Due Diligence
Construction Contract Breaches Involving Questions of Due Diligence

This paper centers on issues relating to the performance of contracts and breaches thereof within the construction industry. Its primary objective is determining the legal treatment of such issues in a domestic context (i.e. within the United States). However, the research paper will also compare and contrast such treatment with examples drawn from international disputes. Two terms must be defined to better the reader's understanding of the targeted issues. These issues are: breach of contract and lack of due diligence. In a broad sense, which is sufficient for this paper's intended purpose, a breach of contract is any erring from the legal stipulations arising from an agreement between two parties. Due diligence is also taken in a broad sense by specifically meaning the exercise of prudence in the performance of one's responsibilities or duties. This research paper will explore the connections between due diligence, the involved parties' conception thereof, and breaches of contract.

Pipitone, David  
Faculty mentor: Anthony Barnhart

Session II, 2:00pm-4:00pm, 95A

Title: False Memory and Eyewitness Interviews

Witness interviews are a concern for law enforcement. They are often used to help determine what happened; however, they are not always reliable. Past research has shown that language influences memory. Loftus and Palmer (1974) found that different verbs could influence how fast individuals estimated two cars going when they crashed into each other. This study attempts to take the findings a step further and examine if they would work in the criminal justice field. In this study, participants watch the video of an attack. After, they are verbally administered a survey by a researcher. The variable in this study is the gender of the attacker. The hypothesis is that participants will describe the attacker with more gender biased replies if the gender is given when the researcher asks the question. When the gender remains neutral in the question, the description of the attacker should also remain neutral. For example, with a male gender bias, the attack may be described as more brutal. This study will show if the information acquired by the Loftus and Palmer study can be related to specific fields such as law enforcement.

Pirronello, Cecile  
Faculty mentor: Scot Raab

Session I, 9:00am-11:00am, 49B

Title: Psychological Aspect Of Athletic Training: A Literature Review

Athletes are injured everyday and one in six of these injuries are enough to keep the athlete from preforming their sport. Athletic trainers must then consider rehabilitation of the athlete, one of the parts that must be considered is the psychological effect an injury may have on an athlete and how to deal with these effects. An athletic trainer must consider ways to treat the athlete that are not just physiologically effective but also psychologically effective. Athletes report having negative thoughts at the time of being injured, then quickly refocuses to being optimistic and hard work. Objective: To research and evaluate how the athletic trainer views the psychological aspects of rehabilitation, how athletic trainers use different psychological techniques, and if the different techniques are effective. To review to what extent athletic trainers use psychological techniques. Also important how the athlete views the athletic trainer is as an implementer of psychological aspects. Methods: In order to answer the question in the objective literature was found on EBSCOhost, CINAHL Plus, Cochrane, PubMed, Medline, and PsycINFO using established search terms, (psychology, sports injury, rehabilitation, athlete, athletic trainer), the search was limited to 1970-2014, on humans, and in English. Results: Based on the articles reviewed forty-seven percent of athletic trainers view psychology as an important part of the injury rehabilitation process. Athletic trainers feel more education is needed in this area to be proficient. Athletes in the review express that social support is most important to receive from the athletic trainer after injury.
Plummer, Jenna  
Aaron Done, Nathan Nieto, Tinna Traustadottir  
**Faculty mentor:** Tinna Traustadottir, Nathan Nieto, Aaron Done

**Session II, 2:00pm-4:00pm, 13D**

**Title:** Exercise-induced stimulation of gene expression: Comparison between whole blood versus isolated mononuclear cells

A prevalent issue with time-course gene expression studies in exercise science is the wide variability with tissues chosen for analyses. Two of the most common are Peripheral Blood Mononuclear Cells (PBMCs) and Whole Blood (WB). Gene expression changes in PBMCs appear to be consistent with changes in skeletal muscle, providing insight into systemic response to an exercise challenge. However, measuring gene expression in PBMCs presents challenges including long processing time, and the possible confounding effect of where the isolation technique may also activate cells independent of the exercise challenge. WB requires less work to prepare, but contains several subpopulations of cells that may respond differently to exercise. The purpose of this study was to compare antioxidant gene expression in PBMCs and whole blood after an exercise challenge. Blood was drawn at three time points: Pre-, ten-minutes, and four hours-post exercise. RNALater was added to the WB samples immediately and stored at -80°C. PBMCs were isolated by Ficoll-Paque density centrifugation, then placed in RNALater and stored at -80°C. The samples are in the process of mRNA extraction and conversion to cDNA. The relative expression levels of mRNA will be determined by qPCR using SYBR green and their respective primer pairs. The respective gene expressions will then be compared to determine any differences. It is hypothesized that there will be no significant differences in the responses between the two tissues. These results will allow researchers to decide which tissue is preferred and potentially give rationale for a less labor intensive option.

Pocknell, Victoria  
Alexis Sanchez  
**Faculty mentor:** Michael Alban

**Session II, 2:00pm-4:00pm, 58C**

**Title:** Priming a Behavioral Freeze Response in Humans

In addition to a flight/fight response, animals and humans alike may exhibit a freeze response under conditions that reduce the perceived efficacy of fleeing or fighting. Prior research has shown that both trauma and laboratory-based biological challenges may produce a perception of tonic immobility, which has been construed as a kind of human freeze response. Here, we offer a behavioral demonstration of a human freeze response. In Experiment 1, we introduce a priming phase in which we vary the probability of success as participants respond to simulated threats by choosing a fleeing/fighting versus a freezing option. We predict that freezing during a final phase will be more likely among participants who experienced high failure with the fleeing/fighting option during the priming phase. In Experiment 2, we add a personality questionnaire and predict that the frequency of freezing in response to simulated threats will be greater for loss-avoiding versus reward-seeking individuals.

Podnar, Sara  
**Faculty mentor:** Christine Lemley

**Session II, 2:45pm-3:00pm, Skydome Stage E**

**Title:** LGBTQ: Is It Really Sunshine And Rainbows?

Many people know of the LGBTQ movement and may have an understanding of the certain problems that the group has to deal with on a daily basis. I’d like to address the issues within the LGBTQ itself and how it may negatively affect certain identity groups.

Pontes, Keola  
**Faculty mentor:** Becky Butcher

**Session II, 2:00pm-4:00pm, 117C**

**Title:** Perpetuation of Culture in Polynesia
This project helps to understand how culture is perpetuated in Polynesia, specifically through the Hawaiian and Samoan people. I will be taking a look at how this is done from cultural, historical, and biological perspectives. This project emphasizes how taking an interdisciplinary stance in research provides a greater influence in one's education. Although the Hawaiian and Samoan peoples are both located within the Polynesian triangle, their cultural differences vary greatly across the Pacific. Culture encompasses all of a people's livelihood and the way in which they view the world. As generations of people continue to live on, the importance of passing down values, language, and customs becomes vital in perpetuation of culture. It is important for any person to know where they come from and how they fit into the scheme of their culture.

Pooley, Cori  
**Faculty mentor:** Anthony Barnhart

**Session I, 9:00am-11:00am, 95B**  
**Title:** Effect of Magic in Hand Therapy on Home Exercise Program Motivation

The focus of this research proposal is on the effect of magic in hand therapy on home exercise program motivation. An experiment would be conducted with the experimental group participating in magic hand therapy condition and control group in a typical hand therapy condition. We will recruit hand therapy patients from Flagstaff Medical Center, Derosa Physical Therapy, and Flagstaff Bone and Joint to participate. It is expected that the participants' time spent in home exercise program in the experimental group will be higher than those in the control group. Thus supporting the hypothesis. A secondary analysis is expected to find that participants in magic condition rated the HEP enjoyment higher than participants in control condition. As a part of new research on the use of magic in hand therapy and home exercise program motivation, this study may be useful for hand therapists and researchers to examine the benefits of magic in hand therapy not only for adherence but effectiveness as well.

Porter, Tayler  
**Faculty mentor:** Britton Shepardson

**Session II, 2:00pm-4:00pm, 67D**  
**Title:** To the Point

To know in which ways our ancestors used the weapons they had, it is very important to know how we survived. If we think about it now, we have so many weapons at our disposal we don’t realize how we would manage without them. Back in ancient history they had to make their own weapons to defend and to feed themselves. How would we survive if we were put back into their time? We probably wouldn’t. These were ruthless beings and their mindset was to kill or be killed. What I am hoping to show is the different choices our ancestors had to make during times of war and the weapons that were used. When taking a closer look we can see possibly if those weapons won them a fight or lost them a fight and how they may have learned from it, if they learned from it at all. In figuring out if there is a correlation in the weapons used and wins and loses I will also be taking a closer look in to how they made their weapons and if there were multiple uses for one or more. Lastly, I do not believe this research will solve any age old question, it is more to strengthen my understanding of this topic. The sources I will be using will be books and of course the internet to search for what I cannot find in paper. I will do my best to use credible sources that are up to date and are not portrayed like a blog post type.

Potts, Lindsey  
Tyler Leamer, Cassandra Chavez  
**Faculty mentor:** Brant Short

**Session I, 9:00am-11:00am, 81A**  
**Title:** Analysis of Persuasive Techniques Utilized in Anti-Tobacco Campaigns

Our group will analyze the methods of persuasion used in anti-tobacco campaigns. We will evaluate campaigns that apply various mediums that successfully incorporate their message to advocate to the public the discontinuation of tobacco use. The objectives of all artifacts being analyzed are to persuade the general public to either not smoke or to quit smoking cigarettes. The artifacts target varying ages, ethnic backgrounds, current tobacco users, and those who have not started smoking. Through the analysis and application of our sources regarding the effectiveness of persuasion used in these artifacts, we will be able to further understand and apply theory to the methods used. Our findings and
applications of theoretical methods will produce a clear understanding for the persuasive techniques used by particular anti-tobacco organizations.

**Poupore, Jack**  
**Faculty mentor:** William Cordeiro

**Session I, 9:00am-11:00am, 106B**  
**Title: Breaking Bad and the Wolf of Wall Street**

My project will be assessing and dissecting the differences and similarities between the AMC TV series Breaking Bad and the 2013 film, Wolf of Wall Street. Walter White and Jordan Belfort both exemplify numerous characteristics that are displayed on their ascent to infamy, and I will be analyzing and breaking these down.

**Powell, Tessa**  
**Faculty mentor:** Scot Raab, Monica Lininger

**Session I, 9:00am-11:00am, 49C**

**Title: Treatment of pain in Osteoarthritic patients: A Review of Literature**

Osteoarthritis (OA) affects approximately 27 million Americans in the United States, with the knee joint having the highest incidence of osteoarthritis when compared to the hip, hand, and spine. The signs and symptoms of osteoarthritis is the deterioration of cartilage found within the joint resulting in bone on bone contact. The continuous repetition of activity on a joint can create wear and tear which is known as 'degeneration'. For those that have been diagnosed with osteoarthritis there is several noninvasive treatment techniques considered prior to surgery. Some of the most common are the unloading brace, electrical stimulation, bionicare and medication. Although these treatment techniques can commonly help the patient with pain they often do not address the disorder itself. The objective for this literature review is to analyze patients 30-65 years of age diagnosed with osteoarthritis of the knees, what treatments have the greatest impact: unloading brace, transcutaneous electrical nerve stimulation, the combination of the two, or bionicare, in the reduction of pain caused by osteoarthritis.

**Prather, Robert**  
**Faculty mentor:** Stephen Shuster

**Session I, 9:00am-11:00am, 13A**

**Title: Intensity of Postcopulatory Sexual Selection in the Ectoparasitic Pea Crab, Dissodactylus primitivus (Brachyura: Pinnotheridae)**

Crustacean mating systems are diverse. The pea crab Dissodactylus primitivus inhabits multiple echinoid hosts. Male and female crabs move among hosts in search for mates, with both sexes mating multiple times. Multiple mating by females creates opportunities for postcopulatory sexual selection in males. The relative intensity of postcopulatory sexual selection is unknown in this species, and in most crustaceans. To determine the intensity of postcopulatory sexual selection in this species, we reanalyzed the data of Jossart et al. 2014, who used four microsatellite loci to document parentage and mating frequencies of both sexes. With these data we identified proportions of the male population that (1) mated and sired offspring, (2) mated but failed to sire offspring, and (3) failed to mate altogether. Using these proportions, and the average and variance in female fitness from parentage data, we partitioned the total variance in male fitness into pre- and postcopulatory components and identified the fraction of total sexual selection occurring in each context. Our results show that the total opportunity for selection upon males arising from postcopulatory sexual selection is 37%. Although our results cannot distinguish between sperm competition and cryptic female choice, we provide the first documentation of intensity of postcopulatory sexual selection in crustaceans, using this approach.

**Pristo, Lauren**  
**Faculty mentor:** Jinhee Yi, Joseph Busch, Erik Settles, Paul Keim

Karen Hernandez, Christopher Allender, Heidie Hornstra O'Neill, Bart J. Currie, Joseph D. Busch, Erik Settles, Jinhee Yi, Paul Keim
**Title: Characterization of the antibody-mediated immune response in patients infected with Burkholderia pseudomallei**

A lethal infectious disease known as melioidosis is caused by the bacterial pathogen Burkholderia pseudomallei. This deadly disease of Southeast Asia and Northern Australia is difficult to diagnose in the early stages of infection, and there is currently no approved vaccine. Subsequently, there is a demand to understand the human immune response to this deadly agent and develop diagnostics that will facilitate rapid diagnosis and proper patient treatment. The focus of this work is to identify the B. pseudomallei proteins that are targeted by the immune response (antibody-mediated) in humans. Proteins were prepared from patient-isolated B. pseudomallei strains. Serum samples from melioidosis patients with different clinical presentations were also collected and used with the matched patient B. pseudomallei strain. The host's immune response to proteins from B. pseudomallei was quantitatively and qualitatively characterized using proteomic analysis and immune assays. Eight common immunogenic proteins across 15 different patient sera had elevated signal intensity compared to the average spot intensity, which indicate good diagnostic antigens for earlier detection. The most common proteins with the strongest reaction include GroEL (100%), Translation Elongation Factor TU (93%), Chaperone Protein DnaK (93%), ATP synthase beta chain (80%). All of the common and elevated signal spots indicate proteins that are potential diagnostic assay targets which can be used for earlier diagnosis and therefore better treatment of melioidosis patients. Furthermore, these proteins are candidates for vaccine development against B. pseudomallei.

**Pugh, Heather**  
**Faculty mentor:** Melissa Santana

**Session II, 2:00pm-4:00pm, 123D**  
**Title: Concert Venue Design for the Millennial Generation**

The millennial generation is making the largest impact in the economy by spending ample amounts of money, all for a very central reason: their fear of missing out on remarkable events and experiences. The design of a themed, multi-purpose concert venue based in Chicago, Illinois markets itself towards the 'indie' cycling culture that has sprouted from the age group and manifested within large cities. The different performances that the venue can host are advantageous for booking managers, entertainers, and patrons of the live arts. The growing interest in music festivals and unique experiences led to an interior design that considers the best acoustical options for a medium sized, multi-purpose venue: including ideal reverberation times for different types of performances, a superlative floor plan and space plan for both the concert-goers and entertainers, and is designed to appeal aesthetically to the millennial market segment. Overall, the process of carrying out market research on currently existing concert venues, their acoustics and the millennial generation uncovered a connection between the intriguing psychology of today's 18-35 year old individual, and the growing opportunities for the design of interior spaces that can accommodate their relentless desire to share their experiences with their peers.

**Qazi, Mahjabeen**  
Mariah Calvani, Mackenzie Florence, Denny Little  
**Faculty mentor:** Nicole Bies-Hernandez, Matthew Anderson

**Session II, 2:00pm-4:00pm, 97B**  
**Title: Primary Reasons for Exercise and its Relationship to Self-esteem**

Self-esteem is related to people's exercise habits. Previous research has found that those who exercise have higher self-esteem. The purpose of this study was to determine whether this relationship varied based on reason for exercise. Specifically, the study distinguished between those who exercised for health-based reasons and those who exercised for appearance-based reasons. The study recruited undergraduate students from a research methods class, the health and learning center, and the student union. An independent-measures t test was used to analyze the data. Results for the study will be available on the poster.

**Quenelle, Jack**  
**Faculty mentor:** Britton Shepardson

**Session I, 9:00am-11:00am, 68A**
Title: The Prehistory of Religion and Spirituality
This poster states how spirituality was used, practiced and developed in the prehistoric world.

Quinn, Jillian
Faculty mentor: Becky Butcher

Session II, 2:00pm-4:00pm, 114A

Title: Does Increased Physical Activity Decrease the Symptoms of Parkinson's Disease?
Physical activity is a vital part of healthy living for everyone. However, for people with Parkinson's disease, exercise is not only a healthy option, but also an important component to maintaining balance, mobility, and everyday life activities. To see if there is correlation between physical activity and the effects on Parkinson's symptoms, this capstone project seeks to determine whether people with Parkinson's disease were physically active pre-diagnosis, and if increased physical activity (post-diagnosis) decreases tremors or other symptoms.

Quinn, Kaitlyn
Faculty mentor: Frederick Lampe

Session II, 2:00pm-4:00pm, 63B

Title: Witchcraft in Africa
My project will compared the work of Dr. Evan-Pitchards in the 1930s and modern examples of witchcraft still present in Africa today. Although Dr. Evan-Pitchards works were focused on the Azande people and took place in the 1930's, it still provides a base for further Anthropological exploration on the subject of witchcraft. I am going to relate the works of a traditional anthropologists to the modern events of witchcraft on the Africa continent for my poster.

Racette, Erin
Faculty mentor: Marie Baker-Ohler

Session II, 2:00pm-4:00pm, 78D

Title: Who Are You Showing the World? Presentation of Online Identity
Social networking sites have hit and all time high with millions of users around the world. This allows for users to communicate with new people and strengthen the bonds with friends and family. The problem is that online identities are no longer just online. Everything you do online is now directly linked to you in person. The idea of anonymity online no longer exists and yet many people still behave as if it does. They often post and comment on subjects that drastically changes how others view who they are. Their identities are being socially constructed through their presentations with an online audience. Online users often change their identity to grab a larger audience without realizing the harmful effects to their face-to-face identities. Looking at presentation of self in everyday life, looking glass self and identity this project breaks down how/why we form our online personas. The main point is to spread awareness that anonymity no longer exist online and user must be more aware of who they are showing the world.

Raggio, Daniel
Oleg Abramov
Faculty mentor: Oleg Abramov

Session I, 9:00am-11:00am, 21A

Title: Heating Models of Tiger Stripes on Enceladus
Long, roughly parallel structures in Enceladus' South Polar Region, known as 'tiger stripes,' are a young geological feature. Elevated temperatures at and near the fractures within tiger stripes have been observed by the Cassini spacecraft. These fractures are a subject of intense study, as their thermal activity is associated with water ice particles escaping from Enceladus' interior, possibly due to the presence of subsurface liquid water. Heating models in which the fractures are set to ~185 K appear to result in the best match to Cassini data. Flat topographic models show that elevated temperatures are distributed on the surface for over 300 meters, and for over 15.5 km in the deep interior. Using Cassini's instruments to obtain a topographic cross section allowed for tiger stripe models to include surface
topography. An analysis which includes spacecraft observation geometry is currently being performed, with results anticipated in April.

Ramey, Sean  
Faculty mentor: Britton Shepardson

Session II, 2:00pm-4:00pm, 68A

*Title: The Prehistory & Morphological Evolution of the Domestication of Animals*

I will describe the change in the lifestyles and body types of animals who were domesticated by early man. I will be creating a graph-like project showing the morphological change of each, key, domesticated animal. Along with the diagram I will have information over where and when these animals were domesticate, and also how they were used by man kind.

Ramirez, Karely  
Faculty mentor: Natalie Cawood

Session I, 9:00am-11:00am, 79B

*Title: Behavior Change: Personal fitness and Nutrition*

I chose personal fitness and nutrition as a behavior that I wanted to change. I set a goal, assessed my capacity for change, and identified the steps I would take to make the change. I then developed a measurement tool to track my efforts to change my personal fitness and nutrition over time. I will present the results of this effort at changing my behavior and I will discuss how this assignment will impact my future social work practice.

Ramirez, Michael  
Faculty mentor: William Cordeiro

Session I, 9:00am-11:00am, 106C

*Title: Misogynistic Language of Breaking Bad*

Breaking Bad is notorious for its use of misogynistic language. This poster will discuss the usage of various negatively charged words that are associated with misogyny.

Randazzo, Ryan  
Jeffrey Chambers, Brian Jew, Kody Kirchner, Max Schwart, Erin Valentine  
Faculty mentor: Srinivas Kosaraju, John Tester

Session I, 9:00am-11:00am, 4B

*Title: SAE Aero Design (Micro)*

The SAE Micro Aero Design West competition requires teams to design a compact, light-weight, remote controlled airplane that can be quickly assembled and capable of lifting heavy payloads. The NAU student team designed an aircraft that meets the competition requirements. The aircraft utilizes a powerful motor with a high discharge rate to generate large amounts lift in order to take off with a heavy payload. It is made up of lightweight materials (balsa wood and polymer) to reduce weight and incorporated rapid prototyped parts to maintain structural integrity. The wings are segmented and pivoted to allow for compactness and quick assembly. The airplane uses pivoting horizontal stabilizers for maneuverability and eliminating complex linkages for ailerons on the wings. The empty weight of the airplane is approximately 1.8lb and is predicted to carry up to 2.5lb of cargo during flight. Multiple test flights has been conducted to assess the performance of the airplane in order to meet the objectives and constraints of the competition. The design team is participating at the SAE Aero Design event, in Van Nuys, California, during the weekend of April 24th.

Randolph, Jessica  
Kohlton Gray, Brad Turcott, Dale Mongeau, Brian Gilpin  
Faculty mentor: Krista Branch, Niranjan Venkatraman, Julie Heynssens, John Tester

Session II, 2:00pm-4:00pm, 10C
Title: Child Mobility Project: Learning Through Assisted Movement

During early childhood, babies learn and develop at an astounding rate. The increase of independent mobility such as crawling and walking at a young age allows children to further develop their brains through exploration, socialization, and self-discovery. Children with physical disabilities such as Spina Bifida or Prader Willi Syndrome are often unable to achieve independent mobility which restricts their cognitive development. The Child Mobility Team has researched existing mobility solutions and in response, designed and built a microcontroller-based custom mobility platform for the NAU Institute for Human Development. The joystick-operated, electric-powered, wheeled platform was designed to be a safe and effective physical therapy tool that allows children with restricted movement to participate and learn in a way that they otherwise would not be able to. The end product will be used to help children achieve significant cognitive gains, through augmented mobility, in therapy sessions across northern Arizona.

Randolph, Jessica
Jessica Randolph, Kohlton Gray, Brad Turcott, Dale Mongeau, Brian Gilpin, Brendan Jacobs,
Faculty mentor: Krista Branch, Niranjan Venkatraman, Julie Heynssens, John Tester

Morning, 9:45am-10:10am, duBois Southwest Room
Title: Child Mobility Project: Learning Through Assisted Movement

During early childhood, babies learn and develop at an astounding rate. The increase of independent mobility such as crawling and walking at a young age allows children to further develop their brains through exploration, socialization, and self-discovery. Children with physical disabilities such as Spina Bifida or Prader Willi Syndrome are often unable to achieve independent mobility which restricts their cognitive development. The Child Mobility Team has researched existing mobility solutions and in response, designed and built a microcontroller-based custom mobility platform for the NAU Institute for Human Development. The joystick-operated, electric-powered, wheeled platform was designed to be a safe and effective physical therapy tool that allows children with restricted movement to participate and learn in a way that they otherwise would not be able to. The end product will be used to help children achieve significant cognitive gains, through augmented mobility, in therapy sessions across northern Arizona.

Ray, Dylan
Tad Theimer
Faculty mentor: Tad Theimer

Session I, 9:00am-11:00am, 13D
Title: Techniques for identifying individual skunks based on pelage patterns
Techniques for identifying individual skunks based on pelage patternsDylan Ray and Tad C. Theimer, Department of Biological SciencesDavid Bergman, USDA-APHIS Wildlife Services.Recognizing individual animals is critical for understanding many aspects of animal ecology and behavior, including estimating population size and the potential for disease spread, but individually marking animals can be costly in both time and money. Some species have enough variation in naturally-occurring markings that individuals can be recognized without adding artificial. We tested 1) whether striped skunks in Flagstaff, Arizona could be reliably recognized based on naturally-occurring color patterns and 2) whether camera trap position influenced how effective that technique was under field conditions. To answer the first question, we asked volunteers to estimate the number of skunks they could distinguish from an array of 28 photographs taken of striped skunks anesthetized and captured for other studies. To answer the second question, we placed 2 trail cameras at each of three winter den locations and photographed skunks either with the camera oriented vertically 30cm above ground so that photographs were taken from the side, or with cameras mounted 2 meters above the den entrance to capture photos from above. We then asked volunteers to estimate how many individuals they could recognize from a subset of 24 photos. We found that 1) volunteers reliably identified individual skunks based on coat color variation and 2) field identification was significantly better when cameras were mounted to capture photos from above. We demonstrated that natural variation can be used to recognize individual striped skunks if cameras are correctly positioned, and this should facilitate future studies of behavior, ecology, population dynamics and disease management.

Reed, Cody
Faculty mentor: Becky Butcher
Session I, 9:00am-11:00am, 115B

Title: Recycling Plastic Using Pyrolysis
My research has been done on the application of pyrolysis as a way to recycle plastic and produce oil for use as a fuel in Flagstaff.

Reed-McDorman, Tate
Faculty mentor: Anthony Barnhart

Session II, 2:00pm-4:00pm, 95B

Title: Men, Magic, and Control
Men dominate the world of magic by a landslide. Why is this? Men's need for control could possibly be a very important reason. The ability to manipulate and fool people into believing something is a great form of control. To test this hypothesis, the researchers will first instantiate a feeling of control by giving positive or negative feedback on a zener card divination task. The participants will then perform a snowy pictures task to test whether or not that feeling produces a specific reaction between each group. During the snowy pictures task participants will be required to indicate whether an image is hidden within the static display, or if the static shown is merely just that, static. The illusory pattern perception may indicate a stronger or weaker feeling of control. The expected result is that male participants will be more affected than females and that their sense of control, or lack of control, will significantly affect their overall outcome.

Reimers, Nick
Faculty mentor: Erika Hess

Afternoon, 2:48pm-3:00pm, Skydome Stage A

Title: Senegalese Water Quality and Resource Issues
In this project I will be analyzing the current water infrastructure development and water quality in Senegal. Currently there are a lot of wells installed in the cities in Senegal, such as Yeumbeul, but the coliform and nitrate concentrations are far above the recommended levels instated by the WHO (World Health Organization). The nitrate concentrations in the wells increase in a linear fashion as the population rises. This problem arises primarily from old latrines leaking sewage into the wells. One solution to the well contamination issue, therefore, is to discontinue the use of the old latrines and build new sewage infrastructure farther from the wells. This is simply one possible solution, but many others will be analyzed in the project. Another issue is education. When a community has resources and education, the community’s quality of life improves. In order to analyze the water issues in Senegal, I have done research to educate NAU students, the faculty and myself. I have been writing a research report in French and will present my findings to the Undergraduate Symposium. Education and awareness help everybody. With the presentation and report I create, I will raise awareness of the pressing issues in Senegal and their quality of life.

Reyes, Jocelyn
Faculty mentor: Colleen Maring

Morning, 9:00am-9:25am, Skydome Roundtable R1

Title: Deaths in Detention Facilities Operated by ICE
Immigration and Customs Enforcement (ICE) operates the largest detention program in the United States. Within these detention facilities are thousands of people suffering a variety of health problems. These range from chronic health deficiencies to mental illnesses. Although ICE has established standards for providing care to these detainees (Performance-Based National Detention Standards 2011), there is no enforcement mechanism to ensure compliance. My research connects the lack of adherence to these standards to the preventable deaths of detainees in ICE custody. Conclusions from this study are made by analyzing personal stories of detainees, media coverage of detainee deaths, and reports from a variety of groups, including ICE itself, all of which provide information on the inadequate conditions and care at the time of these deaths. Viewed as a whole and comparatively, these sources highlight specific themes that illuminate the inconsistencies in ICE's standards as directly related to the deaths of the detainees.

Reynolds, Zach
Faculty mentor: Becky Butcher

Session I, 9:00am-11:00am, 117D

Title: The Reynolds Project

A self reflection paper about my life, Zach Reynolds, as a child as an underprivileged youth and how athletics was able to help me achieve a college degree. The paper will describe how people are able to overcome a disadvantaged background in order to overcome the odds to become successful.

Rice, AnaClara

Faculty mentor: Anna Spsa

Session I, 9:00am-11:00am, 41A

Title: The Correlation of Pausing and Child Vocalizations between Parents and Children

Expectant waiting, or pausing, is a strategy that proposes parents should pause while interacting with their children in order to encourage their child to talk more. The purpose being that with expectant waiting children are given more time to use words or utterances to reply during social interactions. The idea is that when there is less pausing children do not have as much time to respond during conversational turns. This is a strategy that is often taught to parents of children with language delay (Pepper & Weitzman, 2004). The purpose of this project was to determine the influence of parent pausing on child vocalizations during interaction with parents. Six infants and their mothers or fathers participated in 15-minute play sessions with books. All infants were in the preverbal stage of language development and were between 11 months and 15 months of age. Play sessions were coded for Adult Talk Time per minute, Adult Pause Time per minute, Child talk time per minute, and number of Child Vocalizations per minute. Scatter plots were created and correlations were run to observe the relationship between variables. The relationship showed that as parents had greater Adult Talk Time per minute, the child had higher Child Vocalization per minute, meaning that the more a parent speaks to their child, the more the child babbles. There were a few outliers within the data, one being the parent had very little Adult Talk Time per minute, but the child had high Child Vocalization per minute. On the reverse there was a parent who displayed high Adult Talk Time per minute but this child had low Child Vocalization per minute. For these two outliers the data can be interpreted as the child may have some variation in language acquisition that is independent from Adult Talk time per minute, compared to that of the other parent-infant pairs. The results suggest that pausing may not be as significant a factor in Child Vocalization, but rather that Adult Talk Time may more important.

Richardson, Leah

Hasan Mohammand, William King, Holly Swenson

Faculty mentor: Mark Lamer

Session II, 2:00pm-4:00pm, 11D

Title: Sinclair Wash Restoration Project

The purpose of this project is to evaluate, analyze and create potential of a restoration plan along a portion of unhealthy stream called Sinclair Wash. This wash is supposed to operate as an ephemeral stream, preserving and continuing a healthy habitat by transporting flood flows, sediment, and nutrients downstream. When functioning properly, these streams reduce erosion, improve water quality, provide groundwater recharge and aid in floodplain maintenance (Levick et al, 2008). The team's main goal is to use tools such as site visits, surveying, hydrologic analysis, hydraulic analysis, ecological assessments, biological assessments, mapping and comparisons to healthy parts of the reach to determine a Sinclair Wash, at Northern Arizona University, improvement plan which includes: increasing plant diversity, improving the current eco life, saving cultural heritage, extending recreational opportunities and improving the overall function of the stream channel.

Richardson, Leah

Hasan Mohammand, William King, Holly Swenson

Faculty mentor: Mark Lamer

Morning, 11:10am-11:35am, duBois Agassiz Room

Title: Sinclair Wash Restoration Project
The purpose of this project is to evaluate, analyze and create potential of a restoration plan along a portion of unhealthy stream called Sinclair Wash. This wash is supposed to operate as an ephemeral stream, preserving and continuing a healthy habitat by transporting flood flows, sediment, and nutrients downstream. When functioning properly, these streams reduce erosion, improve water quality, provide groundwater recharge and aid in floodplain maintenance (Levick et al, 2008). The team's main goal is to use tools such as site visits, surveying, hydrologic analysis, hydraulic analysis, ecological assessments, biological assessments, mapping and comparisons to healthy parts of the reach to determine a Sinclair Wash, at Northern Arizona University, improvement plan which includes: increasing plant diversity, improving the current eco life, saving cultural heritage, extending recreational opportunities and improving the overall function of the stream channel.

Richeson, Chelsea  
Faculty mentor: Francis Smiley

Session I, 9:00am-11:00am, 71C  
Title: The Huaorani of Ecuador: An Amazonian Society and the Archaeological Record

Through visual and textual elements, this poster presents an examination of the material correlates of the ethnographically known Huaorani in Ecuador. By examining the material record of contemporary societies, archaeologists can learn a great deal of past societies and activities. The Huaorani are a highly mobile hunter gatherer band in the Amazon rainforest. The Huaorani construct longhouses on hilltops and manufacture plentiful materials to ensure survival. The majority of materials produced pertain to subsistence strategies such as blowpipes, spears, and nets. The organic nature of most materials leads me to predict that preservation of artifacts will be limited. The poster sets out a model of material correlates created by the Huaorani. Additionally, the poster presents examples of archaeological research of similar societies to compare archaeological findings, and the potential difficulties, with the ethnographic model.

Richwine, Jacqueline  
Faculty mentor: Becky Butcher

Session II, 2:00pm-4:00pm, 118A  
Title: Arts within Arizona State Public School Curriculum

My capstone project focuses on researching Art within Arizona Public School curriculum over the last 35 years. A sample of state standards will be examined utilizing content analysis. Along with this research I will conduct interviews with NAU faculty with expertise in Art Education to learn their perspective on the positive and negative effects on students within Arizona school districts.

Rivas, Stephanie  
Katy Parise, Paul Keim, Bridget Barker  
Faculty mentor: Bridget Barker, Katy Parise

Session II, 2:00pm-4:00pm, 17B  
Title: Detection Methods of Coccidioides from Soil Samples, the Causative Agent of Valley Fever

Valley Fever, or coccidioidomycosis, is a serious health threat people living in the southwestern United States and northern Mexico. This mammalian disease is caused by Coccidioides immitis or C. posadasii, a soil fungus endemic to areas of the desert southwest. Accordingly, soil samples were collected from parts of Arizona, California, and Mexico in April/May and September/October when the fungus is thought to be actively growing in the soil. DNA was extracted from soils using kit-based extraction methods. DNA extractions then were screened for the presence of fungal DNA by using primers that amplify the ITS region. Previous molecular detection methods were not specific in sequence detection to identify Coccidioides, but recent applications of two real-time quantitative polymerase chain reaction (RT-qPCR) assays proved successful. Samples positive for fungal genes were screened for the presence of Coccidioides with these assays, both of which use multiple primer sequences to amplify Coccidioides DNA without amplifying closely-related fungi. With slight variation, particularly in those samples with a low Coccidioides load, both assays identified the same samples as positive. Finally, we amplified the bacterial 16S and fungal ITS sequences in all samples for sequencing on the Illumina MiSeq instrument. The data were analyzed using a bioinformatics pipeline for microbiome research called QIIME, and the preliminary results suggest that all methods detect similar positive
samples. Altogether, these methods apply advanced molecular techniques to determine the presence of Coccidioides in the soil shortly after DNA extraction, providing quick identification to the community and increased understanding of Valley Fever's ecology.

Rivera, Andrew
Ekaterine Zhgenti, Dawn Birdsell, Roxanne Nottingham, Ekaterine Khmaladze, Gvantsa Chanturia, Stephen Beckstrom-Sternberg, James S. Beckstrom-Sternberg, Jason Sahl, Merab Kekelidze, Paata Imnadze, Mikeljon Nikolich, Paul Keim, David M. Wagner
Faculty mentor: David Wagner, Dawn Birdsell

Session I, 9:00am-11:00am, 17A

Title: Identifying the Genetic Basis for Flea-borne Transmission in Plague

Plague has caused detrimental effects to humanity throughout history and is caused by the bacterium Yersinia pestis, which is transmitted through flea bites. Y. pestis arose from an ancestor found in soil environments and genetically evolved over time to become the virulent pathogen that can now infect wildlife and humans. Just four key genetic mutations were experimentally demonstrated to have conferred the capability of flea-borne transmission of Y. pestis. But not all modern Y. pestis underwent every genetic change and, as a result, there appears to be variation in the capability of human transmission among different Y. pestis populations. A unique variant of Y. pestis genetically classified as 0.PE2a is an atypical group, found in countries along the European-Asian border, including the country of Georgia. Interestingly, Georgian Y. pestis from the 0.PE2a group are most commonly found in rodents but not reported in humans. We hypothesize that full capability for vector-borne transmission is key for human infection but not required for certain wildlife such as rodents. Here we analyzed the four key genes between human pathogenic Y. pestis strains and 0.PE2a strains from Georgia to identify genetic differences. We found genetic differences at two genes between these two Y. pestis populations, which provide insight into the specific genes responsible for host-specific infectivity. This allows us to better understand the function of these genes and the complete pathway of flea-borne transmission in Y. pestis.

Rivera-Mendez, Jairo
Saad Almonneay, Robert Blaskey, Daniel Chief, Christopher Mesko, Jacob Seitzer
Faculty mentor: Srinivas Kosaraju

Session II, 2:00pm-4:00pm, 5A

Title: Parabolic Trough - Tracking and Energy Extraction

Northern Arizona University owns a solar parabolic trough that can produce up to 20kW of power. However, it has been inoperable and inactive for the last 15 years. The parabolic trough is rotated by a motor attached to a gear box, which can be used to ensure the trough is exposed to the most sunlight possible throughout the day. One of the team's goals was to repair and update the tracking system of the parabolic trough in order to collect as much solar energy as possible. The team repaired the tracking system by installing a DC motor with a motor drive and a controller. Once the tracking components of the trough have been repaired and updated, a solar extraction system is designed. The solar extraction system will heat up water placed inside a pipe that runs through the focal point of the trough through a closed system. The water temperature is measured using a thermocouple, which informs the tracking system to turn the trough down when the necessary temperature is reached. The trough will be used by faculty members in NAU engineering for solar energy research.

Rivera-Mendez, Jairo
Saad Almonneay, Robert Blaskey, Daniel Chief, Christopher Mesko, Jacob Seitzer
Faculty mentor: Srinivas Kosaraju

Morning, 11:10am-11:35am, duBois Fremont Room

Title: Parabolic Trough - Tracking and Energy Extraction

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Rizza, Theresa
   Rex Rolan Bergamini, Catherine Propper
   Faculty mentor: Rex Rolan;Rex Rolan Bergamini, Catherine Propper

Session II, 2:00pm-4:00pm, 18A

Title: Chronic population-level exposure to estrogenic micropollutants selects for estrogen exposure resistance in a naturally occurring fish population

Human made estrogenic chemicals released through both point and non-point pollution outputs are commonly found in surface waters. These compounds may exert a selective pressure on exposed species. We tested the hypothesis that populations of Western Mosquitofish, Gambusia affinis, from areas receiving such exposure will be less sensitive to estrogen exposure than will native populations. Populations from two sites (one with demonstrated estrogen exposure-related biomarkers, and one with no evidence of exposure) were placed in water containing either 0 or 1 nM ethynyl estradiol (EE2). We evaluated shifts in expression of male primary and secondary sexual characteristics as well as measurements of growth. Fish from estrogen native populations were smaller following estrogen exposure than controls from the same population, while fish from waters with demonstrated estrogen activity had no response to estrogen exposure. Our results suggest that chronic estrogenic compound exposure may select for resistance to responsiveness to micropollutant exposure.

Robbings, William
   Faculty mentor: Christine Lemley

Afternoon, 2:00pm-2:15pm, Skydome Stage E

Title: Discrimination of Woman in the Business Field

The question I am trying to answer is How has gender discrimination in the past and present influenced woman in NAU's business field? I will analyze this by interviewing woman who are in NAU's business field and create an environment where questions can be answered to contribute to the overarching question.

Robbins, Manda
   Jennifer Goedinghaus, Dana Dal Soglio
   Faculty mentor: Gregory Busath, Matthew Anderson

Session II, 2:00pm-4:00pm, 98C

Title: Emotional state affects moral judgments

Emotional State Affects Moral Judgments Emotional state plays an important role in moral decisions. This study will explore the affect positive and negative emotions have on moral decision making. The research will be conducted by first priming participants by playing positive or negative music while participants write about a personal memory that is either happy or angry depending on the music they are listening to. The memory will not be collected so there will be no personal identification in the study. Participants will then complete the PANAS scale and read a moral dilemma scenario and complete a short scale on the likelihood of saving one person or saving the lives of many. The scale will be from 1 (save the life of one) to 6 (save the lives of many) so researchers can determine if positive emotional state increases the likelihood of saving the life of one. The test that will be used in the study is the independent measures t-test. The hypothesis of this study is: Positive emotional state will increase the likelihood of saving one life over the lives of many.

Roberts, Kailey
   Faculty mentor: Randy Wilson

Session II, 2:00pm-4:00pm, 2D

Title: Science Writing and Public Outreach

Science writers act as a link between researchers and an audience who wants to learn about advancements, current projects, and community events related to science. With the Space Grant, I wrote articles for the Arizona Daily Sun, covering a topics and public events around town. I found stories by learning about the research of local scientists at Lowell Observatory, USGS, or other offices around town. I conducted interviews, and did independent research to
make sure my stories were accurate and informative. The stories were then passed on to my mentor and editor, Randy Wilson who would suggest changes, and eventually send it to be printed. All the stories I wrote were about people in Flagstaff, and would go on to be read by people in Flagstaff. This position allowed me to explore many fields of discovery and let me show others what their city contributes to these fields.

Robertson, Anna
Emily Wilson, Suzanne Daiss
Faculty mentor: Suzanne Daiss

Session I, 9:00am-11:00am, 99C
Title: Sleep Characteristics of Overweight Female Undergraduates in a Weight Loss Program
Previous research strongly demonstrates the relationship between sleep and weight. Findings suggest that increased food intake is a response to insufficient sleep (Markwald et al., 2013). Moreover, insufficient sleep compromises the efficacy of dietary interventions. Congruently, fat loss will increase with hours of sleep among adults in dietary intervention programs (Chaput & Tremblay, 2012). Given the strength of the relationship between weight loss and sleep, further research describing sleep characteristics in weight loss interventions is necessary. Study Purpose: To evaluate baseline sleep characteristics among treatment-seeking overweight female undergraduates.
Methods: Participants (n = 52) were female undergraduates of typical college age recruited for a weight management intervention (mean weight = 163.5 lbs; mean BMI = 28.8; overweight). Researchers objectively measured height and weight and computed BMI. Participants completed the Pittsburgh Sleep Quality Index (PSQI) on Survey Monkey prior to intervention.
Results: Mean PSQI total score was 7 (0-21 scale, 21=worse), indicating mild clinical sleep disturbance. Mean bedtime and wake-time occurred at 12:14am and 8:05am, respectively. Participants took approximately 25 minutes to fall asleep, slept an average of 6 hours and 43 minutes and achieved a mean sleep efficiency of 86.9%. Sleep disturbance, daily dysfunction, and sleep quality subscales were clustered around 1 (0-3 scale, 3=worse). Frequency of sleep medication use was relatively low, with a mean of .25 on the same scale.
Conclusions: Overweight female participants reported mild-moderate clinical sleep disturbance. Because sleep quality is related to weight status, improving sleep quality may facilitate positive weight loss outcomes.

Robertson, Anna
Julianna Aliberti, Genoveva Machado
Faculty mentor: John Houser, Matthew Anderson

Session II, 2:00pm-4:00pm, 99C
Title: Keep Calm and Focus: The Effects of Doodling on Memory
Learning improves when students engage in a number of activities (Gwo-Dong Chen, et al., 2013). We studied the affect of doodling in lecture on the amount of information retained, along with the effect of retention with doodling on easy versus difficult lectures. Participants were undergraduate students enrolled in a Research Methods in Psychology course in the spring of 2015. Students were asked in two conditions to doodle while listening to podcasts, either easy or difficult. Students in the other two conditions were asked to clear their desks and sit quietly while listening to podcasts, either easy or difficult. We expect to see students who listened to both difficult and easy lectures to have better scores on quizzes about the lecture when they doodle, rather than when they sit quietly and listen. It is important to study the optimal conditions in which students learn to teach students to the best of our ability.

Robertson, Brianna
Faculty mentor: Anthony Barnhart

Session I, 9:00am-11:00am, 95C
Title: Humor as a Cognitive Distraction
Previous research suggests that humor receives enhanced attention relative to nonhumorous information; in other words, a positive effect of humor can be seen on memory. However, due to this phenomenon, humor takes up more attention, leaving less cognitive resources available for other tasks. As such, this study hypothesizes that if humor receives enhanced attention when encoding information then there will be a decreased ability to pay attention to other nonhumorous stimuli. This can be tested using a target detection task in which participants are instructed to focus their attention on finding a red square amongst other non-target stimuli, specifically red circles, in numerous trials.
Participants would be randomly assigned to one of two conditions. The first, the experimental condition, would involve participants completing the target detection task while listening to a humorous distraction stimulus in the form of a comedic podcast. The second would be the control condition, wherein the same detection task is completed in silence, without the humorous podcast. Reaction times, how quickly the red square was found in each trial, would be recorded and averaged for every participant. The expected results are that those in the experimental condition would have slower reaction times due to humor being a cognitive distractor.

Rodriguez, James
Anthony Javier
Faculty mentor: Dennis Foster

Session II, 2:00pm-4:00pm, 34D

Title: Privatizing Grand Canyon Water Supply

Privatizing the Grand Canyon water supply may be the optimal way in which to remedy the current market failure of the inability to fix or replace the water pipeline. Although the pipeline fixes are currently being addressed by portions of the Grand Canyon park entrance fees, it is merely a short term remedy that will be out-passed by the continually degrading pipeline system. Offering the water supply to a private entity would remove the need for the Park Service to fund the replacement of the pipeline and allow the private entity handle the costs and profits possible from the replacement of the pipeline and matter meet the needs of consumers.

Rodriguez, Karely
Heather Hatcher, Emily Nelson, Kiersten Gaetano, Cristina Guerrero
Faculty mentor: Gerald Wood

Session II, 2:00pm-4:00pm, 55A

Title: Through the Public Eye

The focus of our group is on changing the views that society has on the teaching profession and making the public aware of the positive aspects of it. We would like to have a poster with information about some of the root causes for the changes in the perspective of education, such as the issue of the privatization. With our poster we would include some flyers that have more information about the barriers that teachers are facing and the real causes behind failing schools. We would also like to include small clips of a video we are working on that focuses on teachers and calls attention to the negative comments people make about them. Our video is inspired by the Always commercial, 'Like a Girl' and we would like to put it up on social media to hopefully get more people to change the way they talk about teachers and give them a little more respect. As a group we are working on changing the minds of the community so that there is more respect towards our teachers and a greater awareness about the politics behind it.

Rodriguez, Karla
Faculty mentor: Elizabeth Bechok

Session II, 2:00pm-4:00pm, 113B

Title: Immigration Action Research Team

Immigration is a large issue that affects many areas of the Flagstaff community. Our work is on campus and within the community seeking to educate the public and share the stories of marginalized immigrants. The Immigration Action Research Team places considerable emphasis on building a more just, humane, and inclusive community alongside the United States-Mexico border, as well as in our very own Flagstaff neighborhoods. This poster presents students' research on understanding global issues of immigration, and a series of trainings that were intended to address two weaknesses we observed from the previous years.

Romero, Alexis
Faculty mentor: Viktoria Tidikis

Session II, 2:00pm-4:00pm, 104D

Title: The Correlation of Religiousness and Kaufman’s Domains of Creativity Scale
The purpose of this study was to examine the relationship between the strength of religious affiliation and creativity. Two hypotheses were tested in this study. The first hypothesis predicted that higher religious affiliation will be related to higher creativity as measured with the Kaufman’s Domains of Creativity Scale (K-DOCS, Kaufman, 2012). The second hypothesis predicted that higher religiousness will be related to the higher score in the domain of Self/Everyday creativity. Participants were first asked to rate how religious they were on a scale ranging from one to five, one being not very religious and five being very religious. Then participants filled out the K-DOCS. Our first hypothesis was not supported; there was no significant relationship between the strength of religious affiliation and the total creativity score. Our second hypothesis was supported; we found that higher religious affiliation predicted higher scores on Self/Everyday domain of creativity.

Ronan, Ana
Amber Jones, Alice Gibb
Faculty mentor: Alice Gibb, Amber Jones

Session II, 2:00pm-4:00pm, 16A

Title: Have substrate-feeding killifishes (Cyprinodontiformes) lost the ability to suction feed?

The intramandibular joint (IMJ) is a secondary joint located between the dentary and angular-articular bones of the lower jaw, and has evolved independently multiple times in teleost fishes. The IMJ generates large gape angles which are advantageous for herbivorous fishes because they allow increased contact between the jaws and attached food items. Poecilia mexicana, a teleost in the order Cyprinodontiformes, possesses an IMJ, allowing it to feed on attached food items such as algae and detritus. We hypothesized that the increased lower jaw flexibility provided by the IMJ may inhibit ability to suction feed, although this is the primary feeding method for most teleosts. We predicted that the species most closely related to P. mexicana will rely on ram feeding over suction feeding, while those most distantly related to P. mexicana will rely on suction feeding. We calculated the ram-suction index (RSI) to quantify the tendency for each species to use ram or suction during food-capture from video of feeding events for P. mexicana and six other Cyprinodontiform species. The calculated RSI values suggest that P. Mexicana, with a mean RSI of 0.67, and species most closely related to it rely more on ram feeding, while those more distantly related to it, such as F. rubifrons, with a mean RSI of -0.59, rely more on suction feeding. We conclude that P. mexicana and its closest relatives have an increased reliance on ram feeding because species that possess the IMJ may have lost the ability to produce effective suction during prey capture.

Rosic, Stefan
Faculty mentor: Frederick Lampe

Session I, 9:00am-11:00am, 63B

Title: What The Fall of Oil Prices Means for Angola

This poster will cover the current fall and trajectory of oil prices in the future in respect the Angolan economy. This project is not economically based but instead will focus on the impacts on society. More specifically, it will examine who in society is affected and which members of society are remaining unaffected. This project will use the fall of oil prices to examine power concentration, which religious groups are doing better (if any are), and also how the differing ethnic groups are impacted.

Rouhani, Monique
Faculty mentor: Glenn Hansen

Session I, 9:00am-11:00am, 110A

Title: Race in Disney's Pocahontas

This project discusses whether or not the movie, Pocahontas, is seen as racist by the wider community. It will compare the response of when the movie was released and that of current times.

Roy, Amy
Faculty mentor: Francis Smiley

Session II, 2:00pm-4:00pm, 71C
Title: The Archaeological Problem of Groundless Archaeology: Ethnoarchaeological Investigations into the Kombai of West Papua.

The poster presents a visual and textual examination of the material correlates and what will remain in the archaeological record in comparison to similar archaeologically known societies. Archaeologists can learn about societies with groundless archaeology by studying the material record now before these materials disappear from the archaeological record. The Kombai are a hunting and gathering society of the jungles of West Papua. The Kombai are an isolated group and live entirely off of what the jungle provides, limiting the material record to mostly organic materials that degrade over time. There are neighboring tribes with whom the Kombai conducted warfare, but today the Kombai remain relatively at peace. The Kombai are known for their treehouses that are built as temporary dwellings and as a defensive refuge from animals, bugs, and other tribes. I predict that the content of the archaeological record will be very limited. The purpose of the poster is to present the material items that the Kombai use and the resulting presence, or lack thereof, in the archaeological record. The poster also presents examples of archaeological research on similar societies to represent the difference in the materials in the archaeological record and the issue of groundless archaeology.

Rust, Dylan
Leah Manak
Faculty mentor: Harvey Charles

Session I, 9:00am-11:00am, 1A

Title: The Global Peace and Tolerance Garden at the New International Pavilion

The Global Peace and Tolerance Garden at the new International Pavilion building will be a site for education of NAU sustainable design practices. The garden will feature environmentally sustainable site design through xeriscape and reclaimed water irrigation. Native plant species will be used for the garden and the use of reclaimed water will allow for the garden to be maintained with no use of potable water. The site will use a rainwater filtration system to convey storm flows through underground filtration media prior to release offsite, serving to attenuate storm water flows while significantly reducing the amount of sediment discharging from the site. Education signage will be installed along the Peace Path in the Global Peace and Tolerance Garden, and will highlight the sustainable landscape and building practices at the site. One display will show daily energy savings and building performance for students and visitors to see the benefits of NAU sustainable design. The garden is a part of the overall International Pavilion project, which will be a LEED Platinum building. This project was made possible through the support of the NAU Green Fund.

Rutledge, Kayla
Michael Crutcher, Emily Powell, Sean Buechel, Darrion Edwards
Faculty mentor: Cassandra Dakan

Morning, 9:00am-10:00am, Skydome Stage D

Title: The Quest of Euphoria?

Everyone wants to be happy, and there are many ways to pursue this subjective state. Why, then, is happiness so elusive? Panelists will delve into the topics of self pity, materialism, solitude, and the technology that pervades everyday life to examine some roots of unhappiness and happiness.

Ryan, Lauren
Allie Jessen, Ashley Hanlon
Faculty mentor: Sumner Sydeman

Session II, 2:00pm-4:00pm, 60B

Title: A Qualitative Review of Published Research on Electronic Nicotine Delivery Systems (ENDS): An Analysis of a Rapidly Expanding Literature

Electronic Nicotine Delivery Systems (ENDS), also referred to as e-cigarettes, are battery-operated devices that deliver nicotine vapor orally to users. E-cigarettes were introduced to the U.S. market in 2007; however, prominent advertising by a major tobacco company (Lorillard Inc.: Blu-Cigs) only started in 2012. ENDS use is increasing very rapidly in the U.S. and these products seem to be an emerging public health problem. The purpose of the current project is to review the rapidly growing scientific literature on ENDS products. Currently, we are in the process of conducting a systematic
literature review using relevant academic search engines consistent with Preferred Reporting Items for Systematic Reviews and Meta-Analyses standards (PRISMA: Liberati et al., 2009). Search terms include 'electronic nicotine delivery systems' and 'electronic cigarettes' and we have set date limits for calendar years 2007 to 2014, inclusive. The data presented in our poster will be organized by journal name and publication date. We will also categorize publications by type of research on ENDS: e-liquid nicotine concentration, contaminants, types of delivery system, and surveys research about ENDS knowledge, attitudes, and smoking behaviors. This poster will provide a useful summary of scientific research surrounding ENDS products. Implications for future research will be discussed.

Ryan, Randi  
Jackson Bain, Renee LeQuense  
Faculty mentor: Ashley DeBoard

Session II, 2:00pm-4:00pm, 7B  
Title: Raising Awareness on Cycling Safety within the Flagstaff Community  
Nine percent of the Flagstaff community commuting through town everyday uses a bike as their primary sources of transportation. Unfortunately, as bikers we often blame cars for their ignorance of sharing the road but in fact statistics show bikers are just as likely to be at fault for collisions as cars are. Cyclists have often been known for applying the pedestrian rule of 'always having the right of way' to how they ride their bike - this is not true. Due to this common misconception, we made it our goal through citizen science to find out the most common mistakes made by cyclists by comparing them to top reasons for collisions. After gathering statistics we created a survey to give random people around Flagstaff in order to gather some insight on the knowledge of those who use biking as a primary source of mobility. Surprisingly, we found more cyclists who claimed to be avid bikers to be those who got more answers wrong on the laws and regulations of safety on the road. To reach our goal of increased awareness on biker safety, we applied the data collected from our surveys and put together an organized brochure that provides accessible facts about biking safety, common biking mistakes and disregarded law, as well as things to look out for on the motorists' end. The final stages of our project will include dispersing these informative brochures to different biking communities around town, followed by a formal collaboration to measure the effectiveness of our efforts to improve awareness.

Ryan, Randi  
Faculty mentor: Ashley DeBoard

Morning, 10:18am-10:30am, duBois Meadows Room  
Title: Spreading awareness on air quality while introducing alternatives to current EPA opacity standards  
Greenhouse gas emissions continue to be a huge issue in our world today. As new companies look to find sustainable ways to reduce them I had the opportunity to work with Sustainable Skys – a non-profit organization devoted to air quality recognition and awareness in communities worldwide. Sustainable Skys is in partnership with Virtual Technology LLC that has created an alternate EPA certified standard to method 9. Sustainable Skys developed a free application that can be used via smart phones to analyze the amount of opacity being released from any visible emissions source. Once trained on how to analyze visible emissions and digital opacity compliance systems (DOCS), a range of tasks were then focused around social media outreach and becoming familiar with Sustainable Skys web page and software. Efforts as an intern helped to build more data in strengthening Virtual Technology LLC’s DOCS II software towards becoming an EPA certified method in measuring the amount of opacity released from visible emission sources. As data is further collected, outreach and awareness will resume and there is high hopes of continuing with this organization, as they become more known in environmental sustainability and protection.

Saalfeld, Megan  
Faculty mentor: Carrie Brugger-Schorr

Session I, 9:00am-11:00am, 24A  
Title: Magmatic processes revealed by crystal textures of Elden Mountain lava dome, northern Arizona  
Textures in extrusive igneous rocks record information about the crystallization history of magma during ascent and surficial cooling. Quantitative textural and chemical analyses of glass and plagioclase microlite populations have been used to provide insights into the crystallization history of the Elden Mountain lava dome in northern Arizona. Major element chemistry indicates that all Elden Mountain lavas were derived from the same parent magma. Glass
compositions vary from 70-84 wt% SiO2; however there is no relationship between sample age and SiO2 content. The total crystal content of Elden Mountain lavas varies from ~60-100%. Previous studies have shown that the maximum eruptible crystallinity of dacite magma is 60%, thus a significant amount of post-emplacement crystallization occurred in many of the Elden lavas. The degree of crystallization appears to depend on the position of each sample in relation to the surface of the flow, and the resulting cooling rate. Samples collected near the original flow surface cooled quickly and were less crystalline. Samples further from the surface of the flow were insulated and cooled slower, which resulted in higher crystal contents. All samples contain the crystal assemblage: plagioclase, alkali feldspar, pyroxene, quartz, Fe-Ti oxides, and apatite. In addition, scarce amphibole microphenocrysts were present in about half of the samples. Some amphibole crystals have reaction rims, which form as a result of water loss from the coexisting melt during ascent. Reaction rims thicknesses vary between 0-40 microns. Based on experimental data from Mount St. Helens, amphibole reaction rims of this thickness correlate to a minimum magma ascent rate of 17 meters per hour.

Sachs, Carlene  
Sharcie Coker, Tahnee Noe  
Faculty mentor: Nora Dunbar, Matthew Anderson

Session II, 2:00pm-4:00pm, 100C  
Title: Do College Students' Level of Alcohol Consumption Depend Upon Peer Pressure or Self-esteem?

The purpose of our research project is to determine if our moderating factor, self-esteem, influences the relationship between peer pressure and alcohol consumption. Our hypothesis stated that the influence of peer pressure on alcohol consumption will be higher among those with low self-esteem. To measure this, we are using two Pearson r Correlation Tests with an alpha level of .05 (2-tailed). We will be determining the strength and direction between these two correlation tests. This study was conducted by asking Northern Arizona University Students that were in Research Methods (PSY302W) to participate in a survey packet. The results will be presented on a poster at the Research Symposium.

Sage, Alissa  
Faculty mentor: Michael Lerma

Session II, 2:00pm-4:00pm, 77B  
Title: Native American Community

With each Native community they face obesity which can be linked to many health problems today. As the doctors like to link it to the Genes I want to prove that because many of these tribes are dealing with obesity that it also can be link to other health problems. Within this problem i would like to solve it by re-introduction many fun activities and a program to help people loose weight this will all be within the Navajo community which I am most familiar with.

Salewske, Whitney  
Faculty mentor: Elizabeth Bechok, Jacob Dolence, Caitlin Fader

Morning, 10:00am-10:25am, Skydome Roundtable R3  
Title: New Economy NAU ART: Center for Social Innovation and Entrepreneurship

New Economy Northern Arizona University works to provide spaces for alternative economies in the university and off campus. Currently we work at the Mercado de Suenos in the Sunnyside Neighborhood. This project is a space for local artisans to sell products as well as educate others in the community. For the round table discussion for the symposium, I would like to focus on the creation of a Center for Social Innovation and Entrepreneurship on campus.

Salters, Chris  
Faculty mentor: Ryan Fitch

Session II, 2:00pm-4:00pm, 32D  
Title: Economic Analysis of Desalination in California
There has been an ongoing water crisis in California. To mitigate the issues dealing with the shortage of water in California, many solutions have been proposed. This project investigates and analyzes the efficiency and effectiveness of desalination in solving California's water crisis, specifically a recent desalination project near San Diego, CA.

**Saquella, Alexandria**  
Chelsea Hightower  
**Faculty mentor:** Brant Short

**Session II, 2:00pm-4:00pm, 80D**  
**Title:** When It's Hard To Talk, It's Up To Us To Listen: An Analysis Of The Advocacy Groups Against Domestic Violence

Domestic violence and sexual assault against women are pressing issues in American society. Advocacy for change is easiest when there is an ethical code unanimously agreed upon. In this case, sexual assault and violence against women is mostly deemed unacceptable in the United States and other places around the world. For this research paper, we plan to analyze the persuasive tactics used in three artifacts; President Obama's 2015 Grammy Speech, the 'No More' PSA and campaign, and the 2013 UN speech by Lakshmi Puri, to critique the success of the message. The goal of the three artifacts is to spread awareness about this issue, have an open dialogue about the topic, and get cultures world wide to agree that this is a problem that needs to be addressed. Our hope, however, is to uncover the reasons why this issue has recently become so salient and prominent.

**Satterthwaite, Grant**  
**Faculty mentor:** Gregory Busath

**Session II, 2:00pm-4:00pm, 95D**  
**Title:** How Do You Sleep?

Previous research has revealed a significant relationship between sleep patterns and rates of depressive symptoms. The purpose of the current study was to measure which variables contributed most to college students' levels of depression. This study examined college students' dietary and exercise habits, as well as sleep patterns and perceived stress as they relate to depression. Using a standard multiple regression analysis, it was found that perceived stress and sleep patterns have a strong relationship with levels of depression in college students. The results imply that perceived stress, sleep patterns, and depression are all interrelated.

**Satterthwaite, Grant**  
**Faculty mentor:** Anthony Barnhart

**Session II, 2:00pm-4:00pm, 99B**  
**Title:** Effects of Rapport-Building on Perceived Strength of Magic Illusions

Previous research indicates there is a relationship between rapport-building in therapy and therapeutic success. The aim of the current study was to examine the relationship between rapport-building and the strength of a magical illusion. By implementing rapport-building techniques such as self-disclosure, the researchers hoped to assess whether a significant relationship existed between rapport-building and the perceived strength of a magical illusion. Participants were recruited from Northern Arizona University in Flagstaff, Arizona. The results indicate that there is a relationship between rapport-building and the perceived strength of a magic illusion. The results imply that magicians who attempt to build a rapport with their audience may have more success in their illusion. Magicians who attempt to build a rapport with their audience may also receive more engagement from their audience, thus strengthening the illusion even more.

**Sattler, Sarah**  
**Faculty mentor:** Natalie Cawood

**Session II, 2:00pm-4:00pm, 84A**  
**Title:** Stretch It Out
'Stretch it out ' is a behavioral change project I am partaking in for Human Biology for Social Work. The problem is the state of my emotions and mood levels are fluctuating due to high levels of stress from school, work, and personal situations. Because my levels of stress are fluctuating, I do not feel at my best. I am not putting forth the same level of effort in my attempts at work, school or home compared to the effort I used to put forth. This is due to the amount of stress that has been affecting my life and my reactions. The way I am processing the information in my life is unhealthy; therefore, my mind and body do not feel healthy. In attempting to maintain the priorities in my life, while managing my emotions in a wholesome way, I have found the process of stretching and yoga to be therapeutic. Once a day, through the use of stretching, breathing properly, and implementing a clam mind, I attempt to calm my body and relax my mind from the day's stressors. The solution will occur when my body is feeling more fit, when my mind is relaxed, and when I can live my life while managing my emotions in a suitable way. After using the calming techniques of yoga, I will feel better balanced in my life. In using the yoga five to six days a week, I will feel lighter, more able and content with my priorities. I want to feel connected, engaged and balanced; with the practice of yoga, I feel like I can process these emotions more properly.

Saunders, Brandi  
Danielle Perry  
**Faculty mentor:** Sumner Sydeman  

**Session I, 9:00am-11:00am, 103D**  
**Title:** *The Effectiveness of Trauma-Focused Cognitive Behavioral Therapy on Children with Post-Traumatic Stress Disorder as a Result of Sexual Abuse*  

Trauma-Focused Cognitive Behavioral Therapy (CBT) was systematically review for its effectiveness when treating children with Post-Traumatic Stress Disorder (PTSD) as a result of sexual abuse. Using Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA: Liberati et al., 2009) Standards a literature search was conducted. The search revealed that trauma-focused CBT is reported as the most efficacious therapy for childhood PTSD. Studies supporting this idea will be reviewed in the poster presentation.

Sawyers, Riley  
**Faculty mentor:** Thomas Paradis  

**Session II, 2:00pm-4:00pm, 89D**  
**Title:** *Baja For Sale*  

Uneven development has been a key concept in the history of explaining the movement of capital among regions of the world and the growth patterns of cities. This research is going to analyze the uneven development that is present in Baja California and to discover the variables that are coming in to play in the peninsula. With all the various regions of Baja that are experiencing rapid growth there are others that are staying the same.

Schauer, Elizabeth  
**Faculty mentor:** Bruce Aiken  

**Afternoon, 2:00pm-4:00pm, Skydome CAL floor**  
**Title:** *Seeing The Portrait*  

I am an artist in love with painting portraits. The thrill of bringing a canvas to life by creating shadows and pulling out light is fantastic. When I am painting it is important to create a physical and spiritual representation of the figure I see. Often that is the most challenging, yet exciting part about my process. I admire the paintings of John Singer Sargent and look to his portraits for inspiration and guidance. I strive to often create a universal truth behind each portrait. In each figure I pull out certain aspects that speak to me; and in doing so I gently guide the viewer into seeing what I see. As Edgar Degas said, Art is not what you see, but what you make others see.

Schauer, Elizabeth  
**Faculty mentor:** Bruce Aiken  

**Morning, 9:00am-11:00am, Skydome CAL floor**  
**Title:** *Seeing The Portrait*
I am an artist in love with painting portraits. The thrill of bringing a canvas to life by creating shadows and pulling out light is fantastic. When I am painting it is important to create a physical and spiritual representation of the figure I see. Often that is the most challenging, yet exciting part about my process. I admire the paintings of John Singer Sargent and look to his portraits for inspiration and guidance. I strive to often create a universal truth behind each portrait. In each figure I pull out certain aspects that speak to me; and in doing so I gently guide the viewer into seeing what I see. As Edgar Degas said, “Art is not what you see, but what you make others see.”

Schnucker, Claire
Faculty mentor: Paul Donnelly

Morning, 9:20am-9:40am, Skydome Stage A
Title: Patriotism, Common People, and Saboteurs: Alfred Hitchcock’s American Pilgrimage in Saboteur (1942)

Alfred Hitchcock’s film Saboteur (1942) is a story of American pilgrimage as it depicts the foundations of American identity and nationalism as well as the sacred places from which American heritage and belief systems stem. Throughout the film, Barry meets citizens who teach and tell him what it means to be American, welcoming him into the ranks of the common people who work and live for democracy. The people of the film are drawn together in communitas through heritage based national beliefs, or guiding fictions, that unite them under a unified thought of Americanism and civil religion. The definition of ‘The American way of life’ engages with fictive and dynamic qualities which shift interpretation and meaning with time. As civil religion changes, so does the sacred places on which its fictions are built. The Hoover Dam and the Statue of Liberty, the sacred places within Saboteur, were major icons of what it meant to be American during World War Two. They upheld the epitome of democracy and free enterprise within central and decentralized government. Yet both monuments to the American spirit depict what it meant to be an American during that age. Understanding the characters and people for which the monuments represent, helps to distinguish the truth from the fiction in dealing with major icons of a nation.

Schrader, Cassie
Faculty mentors: Stella Elam, Zoe Anaya, Andrea Morales
Faculty mentor: Nicole Bies-Hernandez, Matthew Anderson

Session I, 9:00am-11:00am, 97C
Title: The Relationship Between Internet Usage and Loneliness

There has been much debate as to whether technology has a positive or negative affect on one's life. We explored the relationship between internet usage and one's loneliness through a comparison study using two different questionnaires. The two questionnaires measured loneliness and internet usage, respectively. In order to analyze our data, a Pearson r coefficient was utilized to examine the relationship. We hope to contribute to future research involving quality of life in relation to technology, considering technology is integral in modern-day life.

Schumacher, Heidi
Faculty mentor: Gerald Wood

Morning, 10:15am-10:30am, Skydome Stage E
Title: Story of Self, Story of Us, Story of Now: High Functioning Autism in Schools

This project started off as a class assignment in which I had to write a public narrative written in the format of the story of myself, the story of us; how I connect to the audience on this topic, and the story of now; what I want to change in education based on this topic. My story is about living with high functioning autism and not knowing it until recently. My story goes on to talk about how I wish I knew early on that I had this because I had a difficult time in school; especially elementary school. The story goes on to talk about how I’m becoming a teacher and that this story goes out to the students that were isolated from the community of the classroom based on a disability or other underlying issues. The story of now is that I want to reach out to other teachers and to help them understand their students with disabilities, focusing mostly on high functioning autism, and provide them with ways in which they can connect to their students and give them the proper means of supports and accommodations that will help their students become successful both socially and academically in the classroom.
**Scott, Meaghan**  
Amanda Williamson  
**Faculty mentor:** Bjorn Krondorfer, Martin Kalb, Gretchen McAllister, Patricia Murphye

**Afternoon, 3:00pm-3:10pm, Skydome Stage C**

**Title: Through the Eyes of Youth: Life and Death in the Będzin Ghetto**

Through the Eyes of Youth: Life and Death in the Będzin Ghetto is an interdisciplinary undergraduate research project that was created in January 2013 for the purpose of constructing an educational exhibit on the Będzin ghetto in Poland during the Holocaust. The framework of the exhibit centralizes the impact of the Holocaust with a unique focus upon the lives of Jewish youth of Będzin. By highlighting the experiences of the young voices from the small town, this project aims to expose the severity of the implications of intolerance, prejudice, and hatred, while communicating the importance of tolerance, empathy, and reconciliation. By conducting a case study on the Będzin ghetto, which has received minimal attention in Holocaust scholarship, Through the Eyes of Youth provided students with the opportunity to conduct historical research, interview survivors, conceptualize the display and design of the exhibit, identify exhibit vendors, and write narratives on the lives featured in the project. The objective of the second phase of the project, which began in Fall 2014, is to create a digital history archive building off of the exhibit and was facilitated by the students in this presentation. This stage includes additional historical research to supplement the content provided in the exhibit, more interviews with Będzin survivors and their family members, conceiving the visual design of the Through the Eyes of Youth online component, programming the functional website, and the development of lesson plans and teaching materials to accompany the traveling exhibit. The interdisciplinary nature of the project helps ensure the success of its creation. Fundamentally, the contributions of the students participating in the project have resulted in rewarding and invaluable educational experiences.

**Scott, Trevor**  
Mohammed Aldosari, Abdulrahman Alhamdi, Joel Asirsan, Samuel Martin  
**Faculty mentor:** Srinivas Kosaraju

**Session I, 9:00am-11:00am, 4D**

**Title: Mobile Computer Cart**

A mobile computer cart can carry a workstation and a variety of other equipment such as medical devices and engineering sensors. It can be conveniently moved to any requirement location, both indoor and outdoor. Unfortunately the current products available for purchase are much too expensive and incapable of easily being transported outside and left for longer periods. Our team is tasked to design and build a mobile computer cart that is inexpensive and can be operated both indoor and outdoor for prolonged periods. The team came up with a two-wheeled dolly-style design based on relatively low cost, manufacturing capability, and functionality. A square A36 tubing is welded together to create a structurally sound frame. Sheet metal is then welded to the exterior to create an aesthetically pleasing and weather proof shell from the outside elements. A telescoping mechanism is manufactured to allow two monitors to be pulled out of the frame when in use. The exterior of the cart is painted to prevent corrosion. During transportation, the monitors can be easily stowed inside the structure and the cart is rolled around on two large inflatable rubber wheels. To ensure the cart is completely weather proof rubber weather stripping was used to seal any potential entry point for water. To further increase the carts capability, windows are installed on either side, allowing the operator to leave the testing equipment running while the monitors are in the stowed position. The prototype is tested for ease-of-use by different operators and environments.

**Scott, Trevor**  
Mohammed Aldosari, Abdulrahman Alhamdi, Joel Asirsan, Samuel Martin  
**Faculty mentor:** Srinivas Kosaraju

**Afternoon, 2:55pm-3:20pm, duBois Fremont Room**

**Title: Mobile Computer Cart**

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be operated both indoor and outdoor for prolonged periods. The team came up with a two-wheeled dolly-style design based on relatively low cost, manufacturing capability, and functionality. A square A36 tubing is welded together to create a structurally sound frame. Sheet metal is then welded to the exterior to create an aesthetically pleasing and weather proof shell from the outside elements. A telescoping mechanism is manufactured to allow two monitors to be pulled out of the frame when in use. The exterior of the cart is painted to prevent corrosion. During transportation, the monitors can be easily stowed inside the structure and the cart is rolled around on two large inflatable rubber wheels. To ensure the cart is completely weather proof rubber weather stripping was used to seal any potential entry point for water. To further increase the cart's capability, windows are installed on either side, allowing the operator to leave the testing equipment running while the monitors are in the stowed position. The prototype is tested for ease-of-use by different operators and environments.

Segal, Rachel
  Faculty mentor: Frederick Lampe

Session I, 9:00am-11:00am, 63C
Title: Genders Differentiation
Defining the labels that are constructed by genders, and how it's different for each society and culture. How men and women are viewed, what you identify as and the affects.

Selna, Gabrielle
  Faculty mentor: Melissa Santana, Roger Vitello, Carl Clark

Session I, 9:00am-11:00am, 124A
Title: Coming Home from War: Designing a PTSD Treatment Center for Our Veterans
After the Vietnam War Post Traumatic Stress Disorder became more apparent than ever. The soldiers returning home had garbage thrown at them, they were spat on and ridiculed. There was no strong support system for them; rather, they had to face the effects of war alone with no idea on how to tame the brutal memories and violent flashbacks that they faced. PTSD became widely known to the public after Vietnam and has continued to surface in our veterans returning home from war ever since. With strong admiration for these brave soldiers I have set out to design a facility specifically for those veterans affected with PTSD. This treatment center is to be a healing atmosphere rather than a clinical environment. I want these vets to enjoy their time here and be in a positive environment where they can begin to rebuild. With the option of bringing loved ones for support, this facility is built to accommodate families staying with the veterans. The design of the facility will be entirely ADA accessible and will exude elegance that is of a hotel and spa. There will be airy, bright open spaces that do not bring unwanted memories to the surface. Closed off corridors and dimly lit rooms will be avoided seeing as these spaces trigger the symptoms of PTSD. Through nature, universal design and a strong sense of community and family, this facility will help the veterans to come full circle to decompress, rebuild and live their lives fully after war.

Shadwick, Andrew
  Trevor Hook, Ryan Nowicki, Tiffany Curry, Philip Schab, Daesy Lozano
  Faculty mentor: Phoebe Morgan

Session I, 9:00am-11:00am, 87C
Title: Conflict Management Styles
The purpose of this project was to create understanding of various conflict styles. Particularly, if an individual can ascertain the conflict style of another while engaging in a conflict, the individual can adapt/change their style to come to an effective solution. The project-group personally engaged with students to educate about the specifics of each conflict management style using a survey. Students were distributed among the five conflict management styles, which include: accommodating, avoiding, collaborating, competing, and compromising. The students were then able to apply the conflict management styles to come to a compromise.

Shainin, William
  Faculty mentor: Ryan Fitch
Session II, 2:00pm-4:00pm, 33A

Title: Behavioral Economics and Water Markets

The market for water differs from most other markets in ways that make it complex and difficult to model. There is an ideological schism between the traditional and behavioral economic schools of thought, and opinions especially differ with respect to the allocation of natural resources like water. Traditional economic frameworks assume that an individual’s decisions are perfectly rational and consistent. Behavioral economics posits that humans are biased, use heuristics, exhibit inconsistent preference, and work with limited information. The efficient allocation of water requires a holistic understanding of the behavior exhibited by the agents who use it. The goal of this research project is to investigate the applicability of both the traditional and behavioral economic frameworks to determine which is more appropriate for modeling and analyzing water markets.

Shannon, Austin
Mitch Keener, Mukoma Simpanya, Joseph Busch, Fernando Monroy, Richard Bowen, David AuCoin, Pandit S.G., Paul S. Keim
Faculty mentor: Mukoma Simpanya

Session I, 9:00am-11:00am, 13C

Title: Measuring Humoral Immunity Over the Course of an Infection Using Surface Plasmon Resonance

Burkholderia pseudomallei is the causative agent of the disease known as melioidosis. It is a severely debilitating and often lethal disease endemic to Northern Australia and Southeast Asia. Diagnosis is currently performed by culturing bacteria from patient specimens or by the unreliable method of indirect hemagglutination assay. During this time, patient health can deteriorate rapidly and a prompt diagnosis with treatment may be needed. This research aims to identify antigens found in B. pseudomallei that will allow for rapid and accurate diagnostics. With these goals in mind, it will be useful to know 1) the relative host antibody affinity for these serodiagnostic antigens, and 2) how affinity changes over the course of a B. pseudomallei infection. To address these questions, we purified recombinant seroreactive B. pseudomallei protein antigens and structural components of the bacterial cell wall (lipopolysaccharides, or LPS). The avidity of goat antibodies for purified B. pseudomallei antigens was measured using surface plasmon resonance (SPR). This highly sensitive method uses reflected polarized light to measure the rate of association and dissociation of antibodies to their antigen. Our research provides information useful in the diagnosis of acute and chronic B. pseudomallei infections by determining which lipopolysaccharides and protein antigens induce a strong humoral response. Moreover, such antigens could possibly lead to the identification of potential vaccine candidates.

Sheffield, Alexis
Faculty mentor: William Cordiero

Afternoon, 1:35pm-1:55pm, Skydome Stage B

Title: Breaking [f]ead

This paper examines the similarities between Jesus Christ and the protagonist of the popular television series Breaking Bad, Walter White. A well-known religious icon, Jesus is recognized and often revered for his purity, self-sacrifice, and forgiving nature. Walter White is a chemistry teacher turned meth cook, idolized by fans as an in-charge symbol of masculinity and occasionally violence and misogyny. While seemingly different figures initially, both share similar qualities. Jesus represents a physical manifestation of Walt’s personality. Through the convergence of human and divine, Jesus becomes the physical representation of how Walt sees himself. Not only does the religious symbolism throughout the show have significant meaning, the small coincidences and spoken words lend themselves to a religious undertone. How can someone so pure and holy represent someone at the height of self-corruption? How can a prominent religious figure share so much in common with a nefarious meth kingpin?

Shelton, Courtney
Nicole Escamilla Guardiola
Faculty mentor: Sibylle Gruber, Nancy Barron

Session II, 2:00pm-4:00pm, 129A

Title: The Dreadful Paper: Student and Teacher Perspectives on Writing
In this presentation we address the student and teacher misconception of writing expectations. We created a short video specifically focused on the faculty misinterpretation of student writing and how a student submitting a paper misinterprets the intent of the assignment. The short was created through the process of storyboarding, writing a script, and using the information to film a faculty member and a student. Presenter 1 will focus on the theoretical background and storyboarding and Presenter 2 will focus on script writing and actual filming of the short. We discuss the process involved in documentary creation, the theories used to conceptualize the project, and we will premiere the short at the end of the presentation.

Shimkus, Maria  
**Faculty mentor:** Britton Shepardson

**Session I, 9:00am-11:00am, 68B**  
**Title:** The Archaeology of Weapons and Warfare  
This project will describe the archaeology of weapons and warfare throughout time in human prehistory. Five different time periods will be discussed and how different cultures during their respective time periods advanced their weaponry and war tactics.

Shirley, Kraig  
**Faculty mentor:** Frederick Lampe

**Session II, 2:00pm-4:00pm, 63C**  
**Title:** African Anthropology  
This project will consist of multiple readings and discussions from Peoples of the World course. It will cover the basis of how Africa has had to deal with immigration, migration, tourism, and becoming a part of the cash economy. This will be a poster board filled with facts, stories, and pictures. Impact of the project is how customary lifestyles of Africans completely changed and how the elderly and younger generations are trying to find ways to keep their culture consistent amongst each other.

Shook, Kristine  
**Faculty mentor:** Melissa Santana

**Session II, 2:00pm-4:00pm, 124B**  
**Title:** South Beaver School  
This research was to address the rehabilitation of an old building and turn it into apartments. The theoretical rehabilitation, for this project, will take place in South Beaver School. The school was built in 1935 and funded by Public Works Administration (PWA). The gymnasium and primary wing annex were added in 1946. School closed in 2010 and is currently vacant. South Beaver I am going to rehabilitate it and adapt it to an apartments for mainly for students due to its location. Since the exterior has no architecture style, I will follow the styles of the 1930s. The corridors will be showcase to propaganda posters for PWA. I want to keep the school's history in the new use. Pastel colors will be used throughout the public spaces. The flooring will remain but touched up and the acoustical ceiling tiles that were added to the classrooms and hallways will be removed. The old entry will remain as the entry which leads to a small foyer. The reception/lobby, administration, and manager's offices will be on the right where the principal's office is and the model apartment to the left replacing the faculty lounge and a classroom. The library, turned into a social room, walls will be lined with the existing bookcases. The library will showcase the history of the school, Flagstaff, and PWA information. The gymnasium will continue to remain as a gym with exercise equipment and yoga mats. The classrooms will transform into the apartments.

Sidak-Loftis, Lindsay C.  
**Faculty mentor:** David Wagner, Joseph Busch, Nathan E. Stone

**Session I, 9:00am-11:00am, 12D**  
**Title:** Comparison of Ohi'a tree genotypes on old versus new lava soils in Hawai'i
Soils represent one of the first selective environments that plants face. Conditions on newly formed substrates, such as volcanic lava, are especially harsh and can impose a strong selective force on plants. On the Hawaiian islands, one of the first native plants to colonize fresh lava is the Ohi’a tree (Metrosideros polymorpha). Ohi’a show a wide variety of growth forms (phenotypes), ranging from small shrubby plants on barren lava to tall trees that dominate mature forests on older soils. In this project we asked whether Ohi’a trees that colonize new lava are a genetically distinct group compared to nearby trees on older soil. Both phenotypes inhabit a lava flow formed by the Mauna Loa volcano in 1854-1855. Fragments of untouched mature forest, called kīpuka, survived as islands in the middle of the fresh lava and provide an optimal study site to compare the different tree phenotypes growing in close proximity on old and new soils. We used DNA fingerprinting techniques to genotype 200 Ohi’a trees for this comparison. We expect to see one of two outcomes in this study: 1) each tree phenotype is a distinct genetic variety that has adapted to old versus new soils, or 2) all trees are genetically similar, which would indicate that any Ohi’a genotype is capable of developing into any phenotype, regardless of soil age. The results will help answer a basic and important question about whether specific plant genotypes associate with the early stages of soil development on Hawai’i

Siebert, Eric  
Faculty mentor: William Cordeiro

**Afternoon, 2:00pm-4:00pm, Skydome Honors Table**

**Title: Breaking Bad Overview and Analysis Website**

A website created for the purpose of providing an overview of the major characters, locations, factions, themes, and motifs of Breaking Bad. There is a heavy focus on critical analysis in an overall view of the series. This website also outlines the main focus of the HON. 294 class and its purpose in identifying the sociopolitical issues depicted in the show and associated literature.

Silva, Paulo R.  
Lindsie M. McCabe, Neil S. Cobb  
Faculty mentor: Neil Cobb, Lindsie M. McCabe

**Session I, 9:00am-11:00am, 17D**

**Title: Seasonality effects on pollinator communities along an elevation gradient**

Pollination processes play an important role in maintaining biodiversity as well as propagating many species. This ecosystem service can be achieved through abiotic factors or living organisms. The insects are among the most relevant pollinators, and, as plant communities, they can be influenced by several factors, such as altitude, climate, and geographic location. This research project aims to analyze and quantify effects on pollinator communities, species richness and abundance throughout elevation gradient in three different seasons. We focused on two main types of pollinators: bees and flies. Pollinator cups were used to sample five areas according to three community and elevation gradient: Desert shrub (1000m), Desert Grassland (1500m), Pinyon-juniper (2000m), Ponderosa Pina (2500m), and Mixed Conifer (3000m). In addition, these areas were sampled at three different times during the year 2012 (May, August and October). Because of natural factors, it is expected that as elevation increases, the seasonality will limit the pollinator abundance and species richness of each community. However, it is also possible that within an elevation, August will be the most abundant period for species richness for pollinator communities, followed by May and October due to favorable conditions.

Silvernale, Claire  
Deziere Acker, Shannon Rivers  
Faculty mentor: Ashley MacKenzie, Angie Moline

**Session II, 2:00pm-4:00pm, 8B**

**Title: The Impacts of Snowmaking on the San Francisco Peaks**

Snowbowl, after decades of legal battles, started making snow from reclaimed sewage water on the San Francisco Peaks in the winter of 2012. This report compiles factual unbiased information concerning the impacts of reclaimed sewage water use on the San Francisco Peaks in three areas of concern: the impact on the economy of Flagstaff, the impact on the indigenous tribes, and the impact on the health of people and the ecosystems within Flagstaff. Supporters of snowmaking on Snowbowl argue that its tourism drives the local economy for the city of flagstaff. Some
studies have indicated that Flagstaff's local economy is stable year-round regardless of Snowbowl's tourism. Snowbowl is the only ski area in the world to make snow from 100% reclaimed sewage water. This instigated health concerns for the ecosystem and people that come into contact with the reclaimed sewage snow. There is not yet solid evidence of long term health effects from the reclaimed sewage water. Cultural concerns include the degradation of a sacred site to 13 native tribes. Many indigenous people have reported not having access to their ceremonial areas.

Silvernale, Claire  
**Faculty mentor:** Ashley MacKenzie, Angie Moline

**Morning, 11:00am-11:12am, duBois Meadows Room**

**Title: Food Sustainability: Siena's Various Food Operations and Connections to Operations in Arizona, United States**

The purpose of this study was to observe from the various ways that Siena, Italy obtains the majority of its food and draw conclusions about sustainable systems that may be brought back to the United States. The United States is nearing a crisis in its food systems due to a lack of sustainability. Observing, experiencing and analyzing various sustainable food operations in Siena allow new perspectives to be born and brought back to the United States. Three food operations were thoroughly examined in regard to sustainability: La Bottega di Stiglion, a local food shop arrangement in Siena; GAS (Gruppi di Acquisto Solidale), a large-scale food co-op that works in small groups throughout Italy; and Spannocchia, a midsized, self-sufficient farm in Siena. Three main values were considered in analyzing these three food operations: community, education, and ethics. It was found that each of the three food operations had differing strengths and weaknesses in the values of community, education, and ethics and could not be considered a fully sustainable system when standing alone. It was concluded that the three food operations could be considered a sustainable food system in regard to the values of community, education, and ethics when combined. While Arizona has specific food operations like the operations examined, they generally stand alone and cannot be considered sustainable in themselves. Acknowledging the conclusion that these food operations create a sustainable system when combined may aid in the evolution of the food systems within the United States.

Simmonds, Mackenzie  
**Faculty mentor:** Jani Ingram, Andee Lister

**Session I, 9:00am-11:00am, 25A**

**Title: Uranium and Arsenic Contamination in Grasses from Leupp, Arizona**

Uranium mining was introduced to the Navajo community during the 1920s and has been shown to have negative health effects on workers and community members living in close proximity to the uranium mines. Over 500 abandoned uranium mines remain on the Navajo Nation, including 91 abandoned mines in Cameron, Arizona. The community of Leupp is located forty miles southeast of Cameron, Arizona along the Little Colorado River and has been significantly impacted by Cameron's rich uranium mining history. Elevated concentrations of uranium have been linked to several health impacts including increased likelihood of cancer and kidney damage after exposure. The purpose of this study is to determine the concentrations of uranium in grasses from Leupp, AZ. The samples were strategically collected from various sites around Leupp community. The samples were dried for two weeks, broken into two sections (roots and shoots) based on the composition of the grass. The samples were sifted, milled, and decomposed in the furnace at 550 degrees Celsius for twenty-four hours. After removing samples from the furnace, samples were digested with nitric acid and hydrogen peroxide to remove organic components of the plant. The remaining solutions will be tested for uranium utilizing the Inductively Coupled Plasma Mass Spectroscopy (ICP-MS). This study is being done in conjunction with research determining the concentration of uranium in sheep from Leupp, Arizona and Cameron, Arizona. Results of these studies will be used to create a baseline for safe grass consumption for livestock in the area.

Simmons, Javonte  
Matthew Montero, Patrick Curtin  
**Faculty mentor:** Frederick Lampe

**Session I, 9:00am-11:00am, 63D**

**Title: Tourism**
Anthropology 301 project
Simon, Alexandra  
**Faculty mentor:** Britton Shepardson

**Session II, 2:00pm-4:00pm, 68B**

**Title: The archaeology of weapons and warfare**  
A description and poster of The archaeology of weapons and warfare.

Skorich, Blake  
**Faculty mentor:** Ann Huffman

**Session II, 2:00pm-4:00pm, 37C**

**Title: Business Leadership Program**

The purpose of this project is to understand the diversity of the Business Leadership Program at NAU. I am examining Cultural Diversity to assess its prevalence within the Business Leadership Program. In my poster I will discuss the importance of why it is important to have a diverse program within the W.A. Franke College of Business. My poster will also propose some ideas on how the BLP can be more diversified and/or maintain its diversity.

Sliva, Clotilde  
**Faculty mentor:** Zsuzsanna Gulácsi

**Session II, 2:00pm-4:00pm, 127C**

**Title: Material Culture of the Song Dynasty**

China's Song Dynasty (960-1279 C.E.) was an era of prosperity, fostering a rich and diverse material culture. The migration of Chinese people from the drier north to the lush south brought forth more exotic crops, such as tea, and increased rice production, creating an industry full of materials relating to these staples. Changes in lifestyles also brought changes in Chinese furniture, with the rise from mats to chairs, and the evolution of furniture adapting to chairs in Chinese households. Much of this culture is preserved, allowing anybody to explore the interesting lifestyles of people from the Song Dynasty.

Sloan, Kelly  
**Faculty mentor:** Francis Smiley

**Session I, 9:00am-11:00am, 71D**

**Title: The Mosuo of Southwest China: Material Culture and the Archaeological Record**

The poster presents a visual and textual examination of the material record of the ethnographically known Mosuo society of Southwest China focusing on gender roles and social organization, in comparison with similar archaeologically known societies. The material record of living societies is important for archaeologist to understand more about prehistoric societies. The Mosuo are an agrarian society located along Lake Lugu in China. The Mosuo are a matrilineal society that focuses on the importance of the household. Since the household is of such importance to the Mosuo, they also have unique gender roles to maintain the household. The Mosuo are an agricultural society and use many tools, I predict the archaeological record will have evidence of their subsistence, but contain scant evidence of the Mosuo social organization.

Smiley, Mariah  
**Faculty mentor:** Micheal Lerma

**Session II, 2:00pm-4:00pm, 76D**

**Title: Parenting Programs on the Navajo Reservation**

Parenting Arizona utilizes the research-based program called "Families and Schools Together" program (FAST) and through activities it builds the communication between parents and children. Parenting AZ offers their services on the reservation in Leupp and Winslow. Through parenting education services that the FAST program offers on the Navajo Reservation, Navajo parents can build the communication with their children. In turn, those children are mostly likely to excel emotionally and academically.
Smith, Ian
Jake Cowin, Corey Mueller
Faculty mentor: Robert Sanford

Session I, 9:00am-11:00am, 7C

Title: Project FeederWatch
Project FeederWatch is designed to track the changes in abundance and distribution of birds for the ornithological research laboratory at Cornell University. Our feeder needed to be moved from my house to the forest next to the Babbitt Administrative Center on south campus. To accurately attain data, our group alternates viewing the feeder at the times of 9-10 am and 6-7 pm on Monday and Friday. Our group records feeder activity during those times collecting data on which species is at the feeder and the number of birds feeding during that time. Our preliminary results indicated that we needed to change the time of our observation and location. Our bird observations show several dark eyed juncos and the occasional house finch. These preliminary results are accurate with the FeederWatch regional data and we expect that to continue. The expectation is that data will remain consistent or show improvement because of our experimental changes in feeder location and observation times.

Smith, Ian
Faculty mentor: Diana Elder, Kira Russo, Phil Basehart, Jake Cowin, Michael Reynolds

Afternoon, 2:54pm-3:06pm, duBois Meadows Room

Title: Earthship Biotecture: Sustainable Systems Thinking within the Housing Market
Systems design and technology is the foundation of sustainable housing with an emphasis on making the most efficient home possible. Intern objectives were to study and look at the varying techniques for sustainable housing in the Southwest climate zone specifically in Taos, New Mexico. Working for Earthship Biotecture gave me experience working with systems application, construction, and systems design. I examined the different sustainable power options such as sewage and water treatment/ filtration options for homes. I found that there are three main sources of power for your home, solar, wind, and hydroelectricity. In addition, found that you have only one option with sewage and one option with water collection and purification. Gaining valuable experience working with systems design and hands on application of various construction techniques gave me the knowledge I was looking for when I arrived.

Smith, Michael
Faculty mentor: Glenn Hanson

Session I, 9:00am-11:00am, 110C

Title: California Adventure: Disney's Next Mousetrap
This poster will try to convey the ideas that California Adventure was a theme park built as a mousetrap. It is not like Disneyland in any shape or form, because I believe that it is desired to target the older generation of people. This is an elaborate plan to attract nostalgic parents as well as fun seeking teenagers away from Disneyland and into the new California Adventure

Smith, Sara
Faculty mentor: Natalie Cawood

Session I, 9:00am-11:00am, 84B

Title: Behavior Change: Study of the Bible
I chose to study the bible more as my behavior that I wanted to change. I set a goal, assessed my capacity for change, and identified the steps I would take to make the change. I then developed a measurement tool to track my efforts to change how much I study the bible over time. I will present the results of this effort at changing my behavior and I will discuss how this assignment will impact my future social work practice.
Smolenski, Catherine
Faculty mentor: Laura Feyrer, Kira Stevens, Marek Olsen, Kyle Hujdic

Afternoon, 3:06pm-3:18pm, duBois Meadows Room
Title: Grey Whales in Clayoquot Sound, Canada: Are the moving further North?
We examined Grey Whales in Clayoquot Sound over a three week period to see if they are moving further north. In this time we did a whale count along an already known whales transect, we took photographs of the whales and tried to identify them in the Whale Identification Book, and we took samples of their prey and analyzed them. We conducted this study in order to see if these whales are returning to the same spots to forage, or if they are moving farther up north. We also took samples of the prey in order to compare length of the amphipods and mysids to last year's data. Prey samples were taken using a Ponor Grab and Bongo Nets. They prey we collected were amphipods and mysids. The Ponar Grab captures the amphipods that are in the benthic zone and the bongo nets capture the mysids that are in the pelagic zone. There was a difference in size found between the data taken in 2014 vs. data in 2013. However, no statistical tests were conducted in the three week period and so there is no definitive result.

Snodgrass, Zachary

Session I, 9:00am-11:00am, 72A
Title: The Archaeology of Music
I will be explaining the evolution of music and musical instruments of various cultures, as discovered through the field of archaeology.

Sobie, Christopher
Faculty mentor: Mark Lamer, Jeff Bauman, Martin Ince

Session I, 9:00am-11:00am, 10A
Title: Kendrick Street Bicycle Boulevard Design
The Flagstaff Urban Trail System (FUTS) in Flagstaff, AZ is segmented from the US 180 to the US 66. One of the primary functions of the FUTS is to provide a medium for bicyclists to travel throughout Flagstaff. North Kendrick Street in Flagstaff is located between the FUTS at US 180 on the north end to Birch Ave on the south end, cutting through the bicycle-unfriendly downtown area of Flagstaff. As such, N Kendrick St is being looked at as a possible extension of the FUTS trail by redesigning the road as a bicycle boulevard. This report examines the merit of several National Association of City Transportation Officials (NACTO) approved design options for bicycle boulevards along N Kendrick St. NACTO-approved traffic calming techniques, project saving measures, community input, existing signage changes, signage additions, and new striping alternatives are all considered within the designs presented in the report.

Sobie, Christopher
Faculty mentor: Mark Lamer, Jeff Bauman, Martin Ince

Afternoon, 2:20pm-2:45pm, duBois Agassiz Room
Title: Kendrick Street Bicycle Boulevard Design
The Flagstaff Urban Trail System (FUTS) in Flagstaff, AZ is segmented from the US 180 to the US 66. One of the primary functions of the FUTS is to provide a medium for bicyclists to travel throughout Flagstaff. North Kendrick Street in Flagstaff is located between the FUTS at US 180 on the north end to Birch Ave on the south end, cutting through the bicycle-unfriendly downtown area of Flagstaff. As such, N Kendrick St is being looked at as a possible extension of the FUTS trail by redesigning the road as a bicycle boulevard. This report examines the merit of several National Association of City Transportation Officials (NACTO) approved design options for bicycle boulevards along N Kendrick St. NACTO-approved traffic calming techniques, project saving measures, community input, existing
signage changes, signage additions, and new striping alternatives are all considered within the designs presented in the report.

Solheim, Jonathan  
Faculty mentor: Mark James  
Session I, 9:00am-11:00am, 20A  
**Title: The Effect of Trapped Charge on Series Capacitors**  
If capacitors are initially charged before placing them in series, charge becomes trapped on the electrically isolated plates. The effect of this trapped charge on the final charge and voltage distributions in series capacitor networks provides instructors with a new class of engaging capacitor problems not currently addressed in introductory physics textbooks. General formulae for the final charges on two series capacitors connected to a battery in terms of in terms of initial values are derived, and various special cases are considered. The condition where trapped charge is zero leads to the familiar result where charges on the series capacitors are equal. The differential form of the definition of capacitance is used to show that the overall capacitance of a combination of series capacitors with trapped charge is the same as that for series capacitors with no initial charge. Results are verified experimentally using DC voltage and RC time constant measurements, and practical considerations for experimental design are discussed.

Solis, Alma  
Joshua Calvano, Adam Pilkington, Kathleen Slocum, Nathan C. Nieto  
Faculty mentor: Nathan Nieto, Anita Antonika, Nancy Johnson  
Session I, 9:00am-11:00am, 15D  
**Title: Prevalence of Rickettsia spp. the causative agent of Rocky Mountain Spotted Fever in Arizona**  
Rickettsiales are intracellular bacteria that are primarily transmitted by hard ticks (Ixodidae) globally. Rhipicephalus sanguineus, the Brown Dog tick, is a newly recognized vector of the pathogen in Arizona. This tick is found globally and is associated with high population densities of dogs (Canis familiaris). The pathogen infects a human or dog via the bite of an infected tick and cause Rocky Mountain Spotted Fever (RMSF). The objective of this research was to calculate the prevalence and diversity of Rickettsii spp. in Arizona. 476 R. sanguineus ticks were collected throughout Arizona with the help of a veterinarian. The ticks were identified to species, as well as sex and life stage. DNA from each tick was extracted and analyzed using both qualitative PCR and nested-PCR. qPCR assays for all Rickettsia spp. and specifically R. rickettsii used targeted the 16S rRNA sequence. Nested-PCR assays targeted the outer membrane protein gene (ompA). We calculated a 13.7% total prevalence of Rickettsia spp., 0% prevalence of R. rickettsii. After sequencing we specifically identified R. massiliae in R sanguineus from AZ. We hypothesize that the diversity of Rickettsia spp. in AZ may be unrealized, in distribution, under-estimated, and increasing.

Sowden, Jamie  
Faculty mentor: Marie Baker-Ohler  
Session I, 9:00am-11:00am, 79A  
**Title: Unlock the Love**  
Communication Studies:The study of interpersonal communication within romantic relationships are crucial to the relationships satisfaction and longevity. Within the field of Communication studies, we learn that there are several ways to communicate responsively when faced with a difficult conversation. The focus of this project is to bring awareness that communication within romantic relationships are important even though difficult to have. The purpose of this project is providing ways to overcome those difficult conversations and to communicate effectively within a romantic relationships. Research shows that communication is the foundation for romantic relationships success bringing a happier and longer life.

Stadelmeier, Lauren  
Noel Cruz, Sarah Higgins, Wendy Clark  
Faculty mentor: John Tingerthal, Mark Lamer  
Morning, 9:20am-9:45am, duBois Agassiz Room
Title: 2015 ASCE Steel Bridge Design Project

This project is to design, fabricate, and construct a steel bridge for the American Society of Civil Engineers regional conference. Rules and regulations for the bridge are provided by the American Society of Civil Engineers and the American Institute of Steel Construction. At the conference, the bridge will undergo a timed building competition and loading. The team will be judged on build time, weight of the bridge, deflections from loading, and overall aesthetic of the design. Conference will be held in Tucson, AZ in April 2015. This year, the dimensions of this bridge are 19.5’ long and 4.5’ tall constructed of ¾’ and ½’ piping.

Stafford, Payton
Faculty mentor: Zsuzsanna Gulácsi

Session II, 2:00pm-4:00pm, 127D

Title: Ceramics in Delft: A Comparison of Chinese Export Porcelain and Imitative Dutch Ware

Uninhibited by the barrier of language, art encourages the integration of ostensibly dissimilar cultures. This proves evident in the production and trade of Chinese export porcelain, which became widely popular between the 17th and 20th centuries. Chinese porcelain became tied to Western cultures specifically as Western needs and desires predominantly determined the appearance and function of exported pieces. As such, while porcelain production occurred primarily in the Chinese city of Jingdezhen, Western consumers, specifically the Dutch, were largely if not chiefly responsible for the evolving and ranging designs of exported wares. Export porcelain produced specifically for trade with the Dutch became known as kraakporselein, or carrack-china, and even inspired the production of imitative Dutch wares produced in Delft. Therefore, my research not only focuses upon the production and evolving appearance of Chinese porcelain, but furthermore the ways in which Chinese Porcelain differed from seemingly similar Dutch wares.

Stalley, Alisha
Faculty mentor: Dianna Repp

Session I, 9:00am-11:00am, 64A

Title: Gender Roles: A Learned and Socially Constructed Concept

The purpose of this project is to gain an understanding of how gender roles are learned and socially constructed through interaction and discourse with not only people--such as parents, teachers, and peers--but also by toys, multimedia, and play. This project focuses on how parents, teachers, and peers teach gender-appropriate and correct gender-deviant behavior, why, and with whom. Toys, play interactions, and mixed media were also taken into account for the part each share in how gender is learned. It was commonly found that toys, play, and media readily gave children ideas of what is traditionally acceptable for their gender. Furthermore, research found a correlation between toy-choice and gender, as well as a link between genderized toys and curriculum-related skills. Overall, this research may provide valuable information regarding genderized interactions and discourse in education and parenting.

Stanfield, Sita
Catherine Alex Smolenski, Jennifer Blanks
Faculty mentor: Robert Sanford

Session I, 9:00am-11:00am, 7A

Title: Dark Sky Meter: Measuring Night Sky Light Pollution in Flagstaff, Arizona

The goal of this Citizen Science project aims to measure the light pollution in urban areas with the technology of the Dark Sky Meter app and contribute to a national database. Based in Flagstaff, Arizona, measurements were taken on a bi-weekly basis using a smartphone with a camera that would take a thirty second reading of the sky from the chosen locations of the San Francisco Parking Garage and Highland Village. Through data interpretation gathered in units of magnitude per square arcsecond (SQM), brightness of light pollution in the night sky was recorded. Readings would include the moon phase, SQM, weather conditions, and time of sunset and sunrise. Once data was collected, it would be submitted to a national database compiled of similar readings in different areas around the United States, revealing the tendency of brightness in urban regions. The preliminary results in Flagstaff show a constant trend of the night sky readings. On the San Francisco parking garage, Sunday has a higher SQM reading than Wednesday, while Highland Village shows a higher SQM on Wednesday. With the human population tipping over seven billion, the amount of
light pollution is expected to increase over time as cities become more dense with individuals. This nationwide database will help environmentalists strategize the best methods needed to help reduce light pollution in the neighborhoods whose readings are high, causing detriment to natural landscapes. As Flagstaff expands, readings obtained will be useful for zoning measures that assess the placement of proposed buildings to maintain the city’s ‘dark sky’ title.

Stanfield, Sita
Faculty mentor: Moran Henn, Hannah Perkins, Ashley MacKenzie, Deana Tatro

Afternoon, 3:06pm-3:18pm, duBois Room A

Title: Community Engagement of Social and Environmental Sustainability at Friends of Flagstaff's Future

Friends of Flagstaff's Future (F3) is a non-profit organization located in Northern Arizona created to enlist locals in environmental stewardship and educate the public about events that promote sustainably just lifestyles. The two main objectives aimed to facilitate these ideals incorporate understanding the internal duties of how events were proposed and second was to execute these planned initiatives. Duties involve participating in events, while spreading news to the public about the importance of shaping a community committed to embracing sustainable lifestyles that are comprehensive for future generations. While often difficult to inform locals about ways to be involved in socially conscious ways, we found that once participants were engaged, the messages were embraced and expanded community-wide. The events include community clean up day, voter registration, fundraising auctions, surveys, and recycling awareness projects were only limited by the amount of attendees, but can become more predominately spread in the community with further outreach and education. The reason this internship was conducted was to create networks of individuals around Flagstaff who are able to engage in events that can help promote healthy lifestyles for local business and residents as well as the environment. This spread of like-mindedness can instill in the public, inspiration and incentive to continue an individual care about local, social and environmental issues and encourage civilians to play a role in shaping the future. By the end of this internship F3 was able to develop in outreach and communication, advocacy, projects and programs, and non-profit administration.

Stapleton, Elizabeth
Cara Pocano
Faculty mentor: Ted Martinez, Peter Friederici

Session II, 2:00pm-4:00pm, 112A

Title: The Truth About Climate Fiction

This project explores the different methods aimed at informing the public of the ways that science, art, literature, and especially fiction explain the problems of climate change. Pure science has shown to be very ineffective as a method towards relaying the major issues of climate change to the general public. Our project explores how more creative methods have been recently employed as a way to shed light on the real issues surrounding climate change. Many fiction novels are discussed and analyzed to explain these unique methods of outreach. This project provides a background that explains the scientific mechanisms of climate change that are present today, and the efforts, whether conventional or unconventional, that seek to alleviate these issues and the public's opinion on them.

Starostecki, Megan
Faculty mentor: Roxanne George

Afternoon, 3:42pm-3:54pm, duBois Meadows Room

Title: Where The Wild Wolves Are

The Mexican gray wolf is critically endangered, that once had numbers reaching the thousands throughout Arizona, southern New Mexico, Texas and Mexico. Now their numbers are dwindling down to about 60 in the wild. Mexicanwolves.org is a collaborative effort of concerned citizens and local, regional, and national conservation, scientific and sportsmen's organizations using the Internet to help save the endangered Mexican gray wolf. The main goal is to do our part to create healthy populations of the wolves and restore them to their natural balance to the Southwest lands. Overall, this will bring back the natural balance to the ecosystem including keeping elk and deer populations healthy. In order to do so I took part in retrieving relevant articles to inform the public formatting and posting them to the www.Mexicanwolves.org website. I researched and selected websites and social media content to post as well as write updates for action alerts, handouts, and website content. I also entered data for member/contact
I assisted in many volunteer opportunities and educated the public in what was going on with the Mexican wolves. I learned a great deal through this internship but I would recommend that the advisor give more of a variety of tasks to work on throughout the day. Some of the tasks became very repetitive doing them every day.

Statom, Johanna
Faculty mentor: Theodore Martinez

Afternoon, 2:00pm-2:20pm, Skydome Stage B

Title: An Interdisciplinary Honors Learning Experience in Ecological Restoration

The environment of the Colorado River Delta in Mexico has become extremely threatened after the building of dams and redirection of the water for cities in the US and MX. Invasive species have thrived while key habitat for native and migratory birds has declined. After an agreement between the governments of the United States and Mexico in the spring of 2014, the Morelos Dam opened for the first time in history to provide water for environmental restoration. Students enrolled in an NAU Honors seminar witnessed first-hand the affect the water release had on, not only the environment, but also on the people that live near the parched areas in Mexico. This experience caused participants to develop new ideas about ecological restoration that include community development, restoration of people with the environment and a focus on process and ritual over restoration outcomes. A deeper understanding of the relationship between society and nature and the restoration and reunion of the two was gained.

Steadman, Tara
Faculty mentor: Kristen Waring

Session II, 2:00pm-4:00pm, 19 EASEL

Title: Using electrolyte leakage testing to determine cold hardiness in southwestern white pines (Pinus strobiformis)

Ratios of cellular damage were measured using electrolyte leakage following intensive cold treatments in foliage taken from southwestern white pine seedlings that had been grown in a greenhouse common garden. These seedlings were taken from three populations from different elevations to determine if the elevation of the mother trees had any effect on the relative cold hardiness of the offspring. Though there were some statistically relevant differences in individual population responses, there was not enough evidence to suggest that genetic variation from our three sites played an important role in cold hardiness when grown under the same conditions. In addition to determining if there is a genotypic variation in cold hardiness across elevation ranges in northern Arizona, it was important to determine the temperature in which the species began to suffer high levels of cold related damage. The greatest damage increase occurred between -25°C and -35°C, where there was a five to seven fold increase in the damage observed across all populations, while the temperature reduction from 4°C to -25°C showed only minor damage increases. This research suggests that genetic variation cold hardiness may not be an important consideration when determining seed transfer zones for southwestern white pine.

Steinbacher, Alison
Faculty mentor: Michael Vasquez

Session II, 2:00pm-4:00pm, 81A

Title: Themes of Structural Violence and Struggles of Love in Northeastern Brazil

This poster presents a visual and textual consideration of Nancy Schepker-Hughes' research and work in Northeastern Brazil with women, child rearing, and healthcare practices, relating this work to theories introduced in anthropology by Ruth Benedict, Margaret Mead, and Marvin Harris. Schepker-Hughes found that the people of Alto do Cruzeiro face everyday structural violence and conditions of scarcity, particularly affecting women in the community. These factors occur due to lack of governmental and economic support, as well as lack of healthcare and health related resources. These constraints on the community over many decades have led to sickness, poverty, death, hunger, psychological strain, and most importantly loss within the community. This loss remains most prominent in infant mortality, and relates back to how mothers and other members of the community situate themselves with grieving, loss, and love in ways much different from the average American. By examining Schepker-Hughes' work, this poster relates the factors of scarcity and structural violence back to the important core concepts of Psychology in Anthropology and the theory of Cultural Materialism.
Stewart, Harrison
Vernon Jamison, Jasmine Barnes, Joslyn Harris, Blair Wishom
Faculty mentor: Phoebe Morgan

Session II, 2:00pm-4:00pm, 87D

Title: Conflict Management Conference
This project summarizes the evolution of conflict management conference for student athletes. The conference is held for the teams to learn and manage conflict amongst each other, along with the method of getting to yes, for negotiating agreement. This poster will include pictures, graphs, and charts of the conference that is held. This conference fulfills requirements for a senior capstone project for a course topic of alternative dispute resolution, taught by Dr. Phoebe Morgan.

Stewart, Stevie
Caitlynn Tompsett, Wendy Millar
Faculty mentor: Tricia Moore, Ivan Pacheco

Session I, 9:00am-11:00am, 43A

Title: Do NAU Students Know How To Prevent Tooth Decay?
The aim of this study is to assess the knowledge of NAU students on tooth decay prevention. Materials and Methods: NAU students (n=102) at the student union were asked a simple question: 'In your opinion, can tooth decay be prevented?' If participants said yes, they were asked the follow up question, 'How is decay preventable?' Each student's major and gender were also recorded. Results were recorded and interpreted. Results: Most participants (98%) knew that decay was preventable. Responses to how decay was preventable included brushing (n=86.3%), flossing (n=66.7%), toothpaste (n=8.8%), irrigation (n=2%), chewing gum (n=2.9%), rinsing with water (n=1%), rinsing with mouthwash (n=28.4%), going to the dentist (n=32.4%), not eating sweet (n=36.3%), not eating acidic foods/beverages (n=5.9%), and using fluoride (n=5.9%). More health profession majors than non-health profession majors reported fluoride as a method of preventing caries (chi square p < 0.05). Conclusion: Across gender and education majors, a significant number of NAU students understood that tooth decay is preventable. Most of them agreed that removing plaque with a tooth brush and floss could help prevent tooth decay. There were several areas in which NAU students did not demonstrate adequate knowledge about tooth decay prevention. These areas include the use of fluoride, the role of nutrition in the tooth decay process, and the use of dental sealants. These topics should be the focus of education intervention in the future.

Stihl, Carina
Faculty mentor: Anthony Barnhart

Session II, 2:00pm-4:00pm, 95C

Title: The Psychological Consequences of Change Blindness
Change blindness is a term used to describe the blindness that people experience when a visual change happens and it remains undetected. The purpose of this study was to determine whether a relationship exists between change blindness over a period of time, rather than an instant change. In particular, I chose to determine whether the change blindness that occurs over time differs, or is similar to change blindness experienced from a single event. I hypothesized that slower change of the presented stimulus over a period of time would increase the chances of change blindness. If the experiment had been carried out, I would have tested the student volunteers with a series of photographs presented on computer screens. I expect that I would find a significant relationship between change blindness and the variation of time used to display the change. Limitations and suggestions for future research in this field are examined and discussed.

Stolze, Lindsey
Rebecca Beresic-Perrins, Isabel Moya-Gonzalez
Faculty mentor: Stephen Shuster, Rebecca Beresic-Perrins

Session II, 2:00pm-4:00pm, 13A
**Title: Possible Infection of Leeches by Amphipod Parasites at Montezuma Well, AZ**

Montezuma Well is a collapsed travertine well that supports a unique and isolated ecosystem of invertebrates. The water is thermally constant and high in both arsenic and CO2, limiting the invasion of non-native species and creating a stable environment for all trophic levels, including parasites. Trematode and acanthocephalan parasites of ducks that use amphipods as intermediate hosts are known to inhabit the Well. Leeches (Helobdella spp.) also inhabit the Well, and have been observed consuming both infected and healthy amphipods, although leeches are not known to serve as intermediate hosts for these helminths. To determine if leeches may serve as parasite hosts, we fed infected and uninfected amphipods to each of two Helobdella species. After two weeks we preserved the leeches in 95% ethanol and dissected their body cavity to determine if infection had occurred. We found evidence of a single trematode metacercaria in 1/20 possible infections, suggesting that leech parasitism is possible but may be uncommon. Experiments to examine the possible effects of increased sample size and longer post-infection duration are now underway.

*Storr, Garrett*

**Faculty mentor:** Ryan Fitch  

**Session II, 2:00pm-4:00pm, 33B**

**Title: Desalinization of Water in the West**

My project goes over the economic viability of desalinizing water in the western United States as a means of supporting the economy and ecosystems found there. I will discuss the costs and benefits of creating more desalination plants on the west coast as well as any environmental, economic, and legal issues that will likely arise in a shift from new water allocation.

*Strading, Kylie*

Kelsey Landstrom, Hollie White, Taylor Brooks  

**Faculty mentor:** Nicole Bies-Hernandez, Matthew Anderson  

**Session II, 2:00pm-4:00pm, 97C**

**Title: Human Sexuality**

Many theories surrounding human sexuality involve a heterosexual, evolutionary basis. Previous studies show that women seek men with high waist-to-hip ratio, broad shoulders, and overall physical fitness. It has been found that men seek women who have a low waist-to-hip ratio, larger breasts, and overall youth. This study tested the hypothesis that homosexual individuals and heterosexual individuals look for different physical characteristic in a partner. To test this hypothesis, researchers created an online survey. Data collected were analyzed using an independent t-test with sexual orientation as the grouping variable and rated attractiveness of various physical characteristics. Results can be found on the Spring 2015 Undergraduate Symposium: Human Sexuality poster.

*Strauss, Kristen*

Janay Wiggins, Anaheed Hill, Darrell Marks, Camille White, Jazmin Pedroza  

**Faculty mentor:** Christine Lemley, Gerald Wood, Sara DePinte  

**Morning, 10:30am-11:00am, Skydome Stage E**

**Title: Communities Engaging Cultural Knowledge**

Our project uses critical oral history which bridges the disciplines of critical theory and grassroots oral history in order to engage oral history through critical methodologies that address issues of power, structure and agency in order to collect data for our presentation which is comprised of students speaking of the importance of culture. Our presentation will be in the form of a video followed by a discussion analyzed through the culture of caring framework. We are members of the Communities Engaging Culture Knowledge club through the College of Education.

*Strauss, Paiton*

**Faculty mentor:** Britton Shepardson  

**Session I, 9:00am-11:00am, 68C**
**Title: The Prehistory of Death and the Afterlife**

The project I have chosen will illustrate how the topic of death and the afterlife evolved over time and space in human prehistory. I will illustrate both similarities and differences over five specific times and places. My poster will highlight each of these five sights and include the main points relevant to the topic I have chosen.

**Strebe, Josh**  
**Faculty mentor:** Christine Lemley

**Morning, 9:15am-9:30am, Skydome Stage E**

**Title: You're Not Alone**

Many people with emotional illnesses feel like they are all alone, and that no one else knows what they are going through. But that is not the case. I want to be able to spread awareness that there is help out there. There are people who care and who are willing to help them get through their struggle.

**Styrmoe, Lily**  
**Faculty mentor:** Andrew Shallcross, Chad Stone, Amber Rae Heft

**Afternoon, 1:54pm-2:06pm, duBois Room A**

**Title: Environmental Education in the Backcountry with NAU Outdoor Adventures**

Outdoor Adventures (OA) at Northern Arizona University is an on-campus recreation department that leads students into the backcountry for class credit. We teach backpacking, river rafting, wilderness first aid and outdoor survival skills. I completed my internship with OA creating comprehensive environmental information sheets for student leaders to use in the field. After leading backpacking trips with OA throughout the Southwest for three years, I was passionate about improving the program for future participants. It was important for me to give our trip leaders a better resource to understand the unique environments and be able to pass on their knowledge to participants. I designed, researched and created 10 facts sheets specific to our most popular trip locations. Locations include Havasuapi Falls, Colorado River, Zion National Park, and the Grand Canyon. The fact sheets contain pertinent anthropological, geological and environmental information. They highlight key plant and animal species in the area and contain one environmental current event affecting each specific location. Each fact sheet is an accessible, laminated, and succinct resource that trip leaders can simply put in their pack and reference while encouraging environmental stewardship on the trail or in camp. It facilitates important conversations relative to their immediate surroundings. Throughout this project, I was able to achieve a greater understanding about the Southwest, and convey that knowledge to a wider audience. When participants have a better understanding of their natural environment, they can connect with that place in a more meaningful way.

**Sullivan, Sierra**  
**Faculty mentor:** William Cordeiro

**Session I, 9:00am-11:00am, 105A**

**Title: Breaking Bad Meth in the Human Body**

This poster will be based off of the hit television series, Breaking Bad and how the audience is intrigued about how meth reacts in the body. The poster will specifically show how meth benefits/destroys the human body.

**Sullivan, Sierra**  
**Faculty mentor:** Robyn Martin

**Afternoon, 2:40pm-3:00pm, Skydome Stage B**

**Title: Exercise vs. Cancer**

This paper is based off of how exercise correlates with diseases, specifically cancer.

**Suyama, Michelle**  
**Faculty mentor:** Britton Shepardson
Session II, 2:00pm-4:00pm, 68C

*Title: Prehistory of Death and the Afterlife*

This project digs into the prehistory of death and the afterlife of early humans. We explore what beliefs about death our ancestors had before historical civilizations.

**Swanson, Christina**  
**Faculty mentor:** Anthony Barnhart

Session II, 2:00pm-4:00pm, 96A

*Title: Schizophrenia and Magic*

This is a research proposal on the way that people with Schizophrenia perceive magic tricks that involve top-down or bottom-up processing. Previous research has shown that people with Schizophrenia sometimes don't fall for illusions the way that neurotypical people do. However, whether that is due to deficits in top-down or bottom-up processing remains unknown. This study looks at the science of how people with Schizophrenia perceive illusions in the context of magic. It consists of three different magic tricks: one that involves top-down processing, one that involves bottom-up processing, and one that involves both types of processing for the illusion to work. The expected result is for the people with Schizophrenia to be unable to be fooled by the bottom-up and top-down processing tricks, but to successfully be tricked with the magic trick that involves both top-down and bottom-up processing.

**Swearingen, Cole**  
**Faculty mentor:** Dennis Foster

Session II, 2:00pm-4:00pm, 35C

*Title: Recycling in Flagstaff: A Case Study in Public Choice Theory*

This project will explain the reasons why the private sector is more equipped to deal with city recycling than the city itself. By examining aspects such as cost, accessibility, and the forced rider problem, we will be able to prove through empirical data that the way recycling in Flagstaff is operated now is insufficient and lacks the necessary recourses to have a successful operation. By having recycling as a private good, the private sector would insure that they were maximizing the benefits received from recycling as it would result in larger profits for them and more choice on the consumers end. Furthermore, there is a selling point in that consumers generally like the idea of 'being green' and recycling to save the environment and so when such options are available at private businesses it can give a good impression to consumers that the private business has the same mindset and therefore they will be more likely to engage in the business because of it.

**Swift, Traci**  
**Faculty mentor:** Noelle Fletcher

Session II, 2:00pm-4:00pm, 8A

*Title: Northern Mexican Gartersnake Public Outreach Project*

Completed under the ENV capstone 'Change the World Project' guidelines, our team chose to help the NAU Garter Snake Project with public outreach activities. After meeting with Noelle Fletcher, the NAU graduate student spearheading the NAU Garter Snake Project, we came up with two final products that would make a difference. These were an analysis of the NAU Garter Snake Project's citizen science website, and an informational poster for the visitor center at Dead Horse Ranch State Park about the Northern Mexican Gartersnake. The citizen science website has the potential to be useful tool in conservation and monitoring of this snake and other gartersnake in the Northern Arizona region. So, it needs to be easy to use as well as provide enough information for researchers. The poster for Dead Horse Ranch State Park is targeted at those who visit the Park. The goals are to inform the visitors that the Northern Mexican Gartersnake is located there, that it has threatened status, why the snake is important, and what they can do to help. This project taught the team about the importance of teamwork, effective communication, and the circuitous route of project work.
Swift, Traci  
**Faculty mentor:** James Heitholt, Steven Bluemer

**Morning, 10:18am-10:30am, duBois Room A**

**Title: Internship on the Range: Where Managing Cattle and Water Meet**

I completed an internship experience with the Sierra Vista Ranger District in the summer of 2014. I chose this internship to gain a basic understanding of the United States Forest Service (USFS) operations, specifically in the Range and Watershed Department. This program includes administering grazing allotments and managing watersheds across the district by conducting mandatory monitoring. These are important activities in maintain a balance between cattle and wildlife, as well as sustaining a healthy ecosystem. Water is a limiting factor in southern Arizona to both cattle and wildlife so the water sources located within the forest boundary need to be monitored. My supervisors, James Heitholt and Steven Bluemer, were key in making this internship enjoyable and educational. They were always available, encouraged questions, and supportive throughout the summer. I was the first long-term intern for the Range Department so it was an experiment on their side as well. Approximately 85% of my time was spent in field either completing water source inventory forms, conducting pasture monitoring, or working on other projects as they came up. Examples of other projects included me being lent out to other programs such as fire, recreation, and wildlife. The other 15% was spent in the district office working at the front desk answering the phone, or doing data entry and compilations. I gained valuable experience and improved skills during my time such as 4WD vehicle operation, communication skills, data interpretation and map utilization. Overall, this was a very satisfying internship, a great experience, and puts the USFS as one of my top employer choices.

Swigart, Abigail  
Keira Lowry  
**Faculty mentor:** Summer Sydeman

**Session II, 2:00pm-4:00pm, 103D**

**Title: Is Dialectical Behavior Therapy Worth the Time Invested? A Systematic Review of Available Evidence**

Dialectical behavior therapy (DBT) is the most strongly supported cognitive behavioral psychotherapy technique used for the treatment of borderline personality disorder. The purpose of this project is to conduct a systematic literature review of current clinical trials of dialectical behavior therapy for female patients with borderline personality disorder. In order to obtain information about the efficacy of DBT, a systematic literature review was executed to seek out peer reviewed journals as well as meta-analyses according to PRISMA. Throughout the literature search, there were many randomized controlled trials testing how effective DBT is for patients diagnosed with borderline personality disorder. A review of the results gathered from the trials found during the literature reviews, it was concluded that these trials supported the conclusion that DBT has a positive effect on patients with borderline personality disorder. However, suggestions for further research are provided to confirm the reliability and success of DBT as a form of psychotherapy for patients with borderline personality disorder.

Swygert, Jessica  
Michelle Hensel, Lindsey Harper, Kaitlyn McNalley  
**Faculty mentor:** Sara Mushro

**Session II, 2:00pm-4:00pm, 39A**

**Title: Lowell Observatory Marketing Research**

We will perform marketing research on behalf of Lowell Observatory because as a non-profit organization, Lowell Observatory finds it difficult to afford the needed research. We will perform the following services for Lowell: create a survey after discussion with the client, incorporate the things he wants to know about Lowell and the visitors into a questionnaire, and then go onsite and engage customers so that we can take the data and analyze it then make suggestions to Lowell on what they should do to its their business.

Takacs, James  
James Takacs, Shayana Galliher, Alex Wellman, Hannah Dalsing  
**Faculty mentor:** Sara Mushro, James Takacs, Shayana Galliher, Hannah Dalsing, Alex Wellman
Session II, 2:00pm-4:00pm, 39B

Title: Lowell Observatory

We developed a survey questionnaire to better understand why people visit the Lowell Observatory, why they would return, and other questions related to the effectiveness of Lowell's current marketing strategy.

Tatafu, Tiffany
Faculty mentor: Melissa Santana, Sara Maier, Markie Rhoads, Mary Freer, Darwin Mann

Session II, 2:00pm-4:00pm, 124D

Title: The Future is Suite: Designing the Hotel Suite of the Future

Hotel Suite is synonymous for high class vacations and luxury living. Many hotel guests simply feel they are too high priced, while others see the benefits in renting a suite over a typical room. Some of the issues people have run into at hotels that encourages this decision is the amount of people traveling together, a family's ability to supervise all members simultaneously in a room, larger living space, a proper work station for those doing business, or even the amenities a suite offers. The common goal for any hotel suite design must then be to provide a space that can accommodate all of these guests at any point in time. The Hotel Suite of the Future must be designed in a way that guests are enticed by whatever their influence may be. The goal of this project is to design a hotel suite design that is Universally Designed. Universal design is design that makes the use of a space more efficient and possible for all. It recognizes all abilities and disabilities as well as making the design function more efficiently and easier for all who use the space. Technology advances, the American Disabilities Act, and changes in travel expectations all call for new suite design. The Hotel Suite of the Future must then become accessible for all and provide Universally Designed elements that not only make guests satisfied, but broadens the scope of guests the hotel can expect to stay in their suites.

Taylor, Andrea
Faculty mentor: Melissa Santana

Session I, 9:00am-11:00am, 124C

Title: Generation Berlin

The purpose of this project was to address the problem: How can the hospitality world create a new environment that appeals to the new type of traveler? After much research, the Millennial Generation is making a powerful entrance into the hospitality and tourism market, especially in Europe. Millennials want to travel on a budget without having to give up location, luxury, amenities, and design. Allowing to select the program of the project, I chose to design a boutique hotel in Berlin, Germany revolving around avant-garde design. After much research, I noticed that boutique hotels were becoming a new phenomenon in the hospitality industry, but still only made themselves available to the elite. However, as a designer, I believe that design should be available to everyone, not only the rich. For the concept of the hotel, Gen Berlin, I drew inspiration from the city’s street art and through that developed the vision of the kaleidoscope. The kaleidoscope represents Berlin in a visual and philosophical sense and I manipulated these ideas in a way that will appeal to this younger generation. Each space is graphically stimulating and will make the viewer addicted to the physical world rather than the digital one. Not only is this boutique hotel unique and aesthetically pleasing, it also concentrates on the functional features for what a hotel requires. Based off of research, observational site visits, and interviews, a unique yet practical environment was designed.

Taylor, Zach
Becca Richardson
Faculty mentor: Sumner Sydeman

Session I, 9:00am-11:00am, 97A

Title: A systematic review of the available empirical research on the efficacy of behavioral parent training for attention deficit hyperactivity disorder in

The objective of the current project was to gather available empirical research concerning the effects of Behavioral Parent Training (BPT) on attention deficit hyperactivity disorder (ADHD) in children. A systematic literature search was conducted according to Preferred Reporting Items for Systematic Reviews and Meta-Analyses standards.
9 randomized controlled trials (RCTs), 1 non-randomized controlled trials, and 1 within subjects pre-post trials were collected and will be reviewed in this poster. BPT was generally found to work effectively, which was supported in most of the trails collected. The strengths and limitations of the collected published trails in the review are discussed, and suggestions for future endeavors on this topic are also provided.

Teague, Colleen
    Andrew Shadwick, Taylor Pondy, Donna Zastrow
    **Faculty mentor:** Nora Dunbar, Matthew Anderson

**Session I, 9:00am-11:00am, 100D**

**Title: Social Bonds in Aging**

This research project was to explore the relationship between levels of happiness and social relationships in older adults. More specifically, we evaluated how the quality and quantity of relationships impacts levels of happiness. The research project was conducted for the lack of literature on quantity and quality of social bonds. Participants were individuals over the age of 65 who voluntarily provided information via online survey. Our first hypothesis was when the amount of social contact an older adult has, the perceived level of happiness will also increase. Our second hypothesis was when the perceived quality of contact increases, individuals will perceive a higher level of happiness.

Tegtmeyer, Taylor
    Anthony Santos, Hannah Simpson, Bianca Rojas
    **Faculty mentor:** Jay Sutiffe

**Session I, 9:00am-11:00am, 45C**

**Title: Educating Post-Exercise Nutrition**

This program's focus centered on the education of healthy post-exercise nutrition options. The target population addressed by the Post-Exercise Nutrition Program was the after-school exercise program at Summit High School in Flagstaff, AZ. This population frequently indulged in unhealthy, highly processed food and drinks after the conclusion of the exercise program, setting the stage for our intervention. Through a two part design of education and application, our program sought out to provide students with the knowledge to make better post-exercise nutrition choices. Similar studies induced an increased sense of self-efficacy and personal dietary control among students (Tse & Yuen, 2009). The program's implementation also supplied the after-school program with the means to provide students with healthy post-workout nutrition options.

Terrazas, Daniel
    **Faculty mentor:** Britton Shepardson

**Session I, 9:00am-11:00am, 68D**

**Title: The archaeology of weapons and warfare**

In this project I am to attempt to organize information by a particular topic rather than focusing solely on one individual archaeological site. I will then create a professional poster that demonstrates how that particular topic evolved over time and space in human prehistory.

Theis, Madison
    Shayna Maniscalco
    **Faculty mentor:** Sumner Sydeman

**Session II, 2:00pm-4:00pm, 102B**

**Title: A Systematic Review of the Efficacy of Prolonged Exposure Therapy on Veterans with Post-Traumatic Stress Disorder**

The purpose of this project is to conduct a systematic literature review of prolonged exposure (PE) therapy for military personnel diagnosed with posttraumatic stress disorder (PTSD). A systematic literature review was conducted following the standards set by Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA: Liberati, et al., 2009). Randomized controlled trials (RCTs), as well as literature reviews, were located and will be
reviewed in the poster. Research for prolonged exposure as a treatment for PTSD has generally been supportive. The limitations and strengths of published clinical trials will be discussed in the poster, as well as suggestions for future research.

**Theobald, Melissa**  
**Faculty mentor:** Terence Blows

**Session I, 9:00am-11:00am, 22A**  
**Title:** Cycles in various nonlinear, age-structured population models  
We consider N-dimensional, age-structured models of the normally 1-dimensional Beverton-Holt, Ricker, and Pennycuick population models. Our particular interest is in the impossibility of certain k-cycles in k-dimensional models.

**Thompson, Brian**  
David Wagner, Paul Keim, Andrew Rivera, Roxanne Nottingham, Amy Vogler, Alzira Almeida  
**Faculty mentor:** David Wagner, Roxanne Nottingham

**Session II, 2:00pm-4:00pm, 12D**  
**Title:** Genetic Characterization of Yersinia pestis in Brazil  
Yersinia pestis, the causative agent of the disease plague, disseminated out of China during the 3rd pandemic in the mid to late 19th century. In November of 1900, plague made its way into Rio de Janeiro, Brazil where it killed 570 individuals. It then spread further inland across northeastern Brazil. Geographical representation of plague in Brazil is prominent in the northeast of the country. However, without a strong understanding of epidemiological patterns of plague in Brazil, and its ability to emerge, disappear, and re-emerge; preventative measures against transmission will be limited. Even though this disease has affected Brazil for decades, the genetic diversity of plague in this area remains unclear. We characterized 450 isolates that date back to the 1960s using Single Nucleotide Polymorphisms (SNPs) and 43 hypervariable regions, or Variable Number Tandem Repeats (VNTRs). We determined that three unique SNP genotypes have co-existing since the 1960s within four plague-affected provinces in Brazil; one of those three genotypes was previously undiscovered. This new genotype formed a new node on the pre-existing global phylogenetic tree. The VNTR data revealed local differentiation of plague in neighboring regions. By plotting SNP and VNTR data on a map, we are able to observe geographic patterns that correlate with genetic data, giving us a better understanding of the epidemiological patterns occurring in Brazil.

**Thomson, Carl**  
**Faculty mentor:** Season Ellison

**Session II, 2:00pm-4:00pm, 110D**  
**Title:** Conquerors or Settlers? Two Visions of the American Frontier  
Frederick Jackson Turner's Frontier Thesis, written in 1893, declared that the American Western Frontier was closed, and with the closure of the Western Frontier, so ended the first chapter of American History. Turner uses the American settlement of the West as a representation of the cultural transition from immigrants of European ancestry into 'true' Americans. Turner illustrates the settlement of the West as a triumphant achievement for the American people, demonstrating their resilience in a dangerous unknown land. The strong individuality of the Western Settlers is the most admirable trait of the developing American culture. Turner's thesis follows the Machiavellian ideology of ends justifying means, emphasizing the positive outcomes of western settlement while ignoring the atrocities committed during it. The New Western Historian movement has gained favor over Turner's Frontier Thesis over the past three and a half decades. Two of the most prominent advocates for New Western History are Patricia Nelson Limerick and Richard White. The goal of the New Western Historians is to reveal the 'true' nature of western settlement. The New Western Historians show the western migration as a conquest, rather than a settlement. I examine the pros and cons of both ideologies, and show how they contribute to the overall definition of what it meant to be a 'true' American in the 19th and 20th centuries. Finally, I investigate how that image translates into the contemporary Western Frontier, and how it influences our interpretation of American character.

**Tisdale, Shanell**
Faculty mentor: Natalie Cawood

Session II, 2:00pm-4:00pm, 84B

Title: Self - Care

My behavioral Change that I want to focus on is Self - Care. This is something that I have struggled with all my life. I tend to stress a lot, I put to much pressure on myself, and most importantly I think of everyone else's happiness before my own. I understand that self-care is such a broad behavioral change but it focuses on the six dimensions of health. I feel by attacking each of those dimesions I can change the way I feel about myself and my health. (Six Dimensions : Spiritual, Mental, Physical, Enviromental, Social, and Emotional

Torres, Elizabeth
  Faculty mentor: Britton Shepardson

Session II, 2:00pm-4:00pm, 69C

Title: Human Archeology of Sexuality

My project is to research and inform myself and other people about human sexuality in the past and in the present. This project will also be able to justify how it has changed during time.

Toubman, Max
  Faculty mentor: Glenn Hansen

Session I, 9:00am-11:00am, 110B

Title: Arabic Disney

Disney's representation of Arabic culture has a large affect on viewers' perception if the region. The culture is diluted, Westernized, and treated in a Eurocentric way.

Tran, Tiffany
  Faculty mentor: Marianne Nielsen

Session I, 9:00am-11:00am, 85A

Title: Comparison of American Asian, Hispanic Street Gang Subcultures, and Police Subcultures

In theory, the structures and subcultures of law enforcement, collectively, have similar features as seen in American Asian and Latino street gangs. Instead of seeing this a negative characteristic, law enforcement could use these similarities to prevent criminal activities committed by gangs. This study was focused on comparing and contrasting three groups: Asian street gangs, Latino street gangs, and law enforcement agencies using criminological theories including cultural deviance theory, social learning theory, and others.

Traum, Lauren
  Mikah Hatcher, Alethia Halbig, Rachael Yohai, Lauren Traum
  Faculty mentor: Sara Mushro

Session II, 2:00pm-4:00pm, 39C

Title: Lowell Observatory

Lowell is a non profit organization that has partnered with our marketing 439 (consumer marketing) class. They are asking us to develop a questionnaire that researches how people hear about Lowell Observatory and what intrigues them about their facility. The questionnaire will be used to help Lowell's organization in finding out what drives people to want to return to their facility and experience it again.

Trethaway, Mara
  Jill Sawyer, Riley O'Brien
  Faculty mentor: Jay Sutcliffe

Session I, 9:00am-11:00am, 47C
Title: Nutrition Intervention with Fit Kids in Title I Flagstaff Public School

A Title I Flagstaff school has limited access to fruit and vegetables, among other nutrition deficiencies. To address this and other nutrition issues, the intervention focuses on nutrition education through physical activity. The curriculum will consist of educational tools that focus on basic nutrition, including the Go, Slow, Whoa strategy and proper identification of fruits and vegetables. The kindergarten and first graders at this school will have an improved understanding of proper nutrition. The overall goal is to increase knowledge, fruit and vegetable intake, and water intake. To ensure success of these goals, evidence-based practices, ideas, and strategies will be used.

Trillo, Irma
Faculty mentor: Becky Butcher

Session I, 9:00am-11:00am, 118B

Title: Cannabinoids: Medicinal Marijuana vs. Pharmaceutical Medicine

As states move to legalizing the use of marijuana for medicinal purposes my concentration is on the CBD oil and the benefits of using CBD oil of a marijuana plant with little side effects and being able to get relief from chronic pain verses pharmaceutical prescriptions that cause added side effects.

Trotter, Chandler
Faculty mentor: Francis Smiley

Session II, 2:00pm-4:00pm, 71D

Title: The Sami of Scandinavian Europe: Archeological Correlates of the Symbolism of a Semi-Nomadic Tribal Society

The poster examines the material record of the symbolism of the ethnographically known Sami of Scandinavia in comparison to similar archaeological known groups. Archaeologists studying the symbolism of tribal herding societies can learn a great deal by examining the material record of the symbolism of the Sami. The Sami are a semi-nomadic tribe of reindeer herders from the Sapmi area of Scandinavian Europe. The Sami's religion and craftsmanship provide examples of the the Sami's symbolism. The Sami's religion shows symbolism in the offerings made to the various gods of Sami religion and visits to religious sites. The craftsmanship shows symbolism in carved objects and the creation of the Sami drum. With the weather of the Arctic helping in preservation and the material used, I predict the attendant archeological record will have sufficient examples. The purpose of this presentation is to create a model of the material cultural of the symbolism produced by a society that has a tribal social organization and specializing in herding. The poster also presents examples of archeological research on other tribal herding societies to compare the archeological reality to the ethnographically derived model.

Trottier, Allison
Faculty mentor: Michael Vasquez

Session II, 2:00pm-4:00pm, 72A

Title: Ethnography of the Comanche Indians

This project is about the ethnography of the Lords of the plains, the Comanche Indians. I will show their cultural values and customs, along with the impact of Spanish and European influences. The Comanche's skills in horse breeding and training will be displayed and their impressive techniques that granted them control of a vast amount of land. I wish to relate my study to two theorists, Julian Steward and Leslie White. I will draw upon their theories to relate ecology and theoretical perspectives on energy within their tribe.

Trzcinski, Ryan
Faculty mentor: Neil Cobb, Lindsie McCabe

Session I, 9:00am-11:00am, 9C

Title: Do climate and elevation effect fly pollinator morphology and behavior?

While bee pollination and the effects of climate on their behavior/morphology are currently being studied by graduate students at the university, they have overlooked a crucial contributor to pollination--flies. Often overlooked as a
simple nuisance, research has shown that thousands of fly species play important roles in the pollination of plants, but these species have yet to be modeled on the San Francisco Peaks. This project involves modeling some of these fly species and closely observing the morphology and behavior of each species at each elevation zone, to determine why any particular fly chooses to inhabit a particular region. Using Merriam C. Hart’s elevation zones, some of the more common fly species of each elevation are studied and conclusions are drawn as to why each species lives where it does, in hopes that a trend will be discovered that shows that flies residing in the same elevation zone distribute similar morphological characteristics and behaviors. By doing so, it can be determined how changes in climate as elevation increases/decreases lead to either morphological/behavioral changes in a species over time, or the migration of said species to that elevation zone, because it better suited it’s habitual needs in comparison to another region. Flies were collected from bee pollinator cups for a similar project over the course of a similar bee-related project in 2013-14, so the fly species collected will be used to conduct this research. If fly morphology and behavior proves to be similar at each elevation zone, then it can be assumed that these similarities have stemmed from the analogous climate that the species’ inhabit together.

Tso, Harlan
Matthew O’Neill
Faculty mentor: Matthew O’Neill

Session I, 9:00am-11:00am, 19C

Title: Comparing Metabolic Rates of Native Chubs Species and Non-Native Fish Species of Arizona

Arizona’s water bodies have a variety of both native and non-native fish species. Most of the native fish species are either threatened or endangered. Though energetic requirements can help describe ecological differences between native and non-native fish species, little is known about metabolic rates in native chub and non-native fish species. Metabolic rates in still and flowing water will help describe the energetic requirements of top predators as non-native fish displace native species. Fish metabolism was measured using a custom-built flow chamber with a propeller to precisely control the water velocity. A dissolved oxygen meter was used to measure the amount of oxygen in the water while the fish were swimming. Oxygen consumption of three native and four non-native fish species found in Arizona was measured. We expected to find that the introduced species of non-native fish consume more oxygen swimming in the faster flowing water for a longer period of time than the native chub species. Results to date show an increase in oxygen consumption with increasing water flow of both native and non-native fish species, though our chamber or meter may not be sensitive enough to detect differences.

Tsosie, Emmett O.
R.S. Anderson
Faculty mentor: R. Scott Anderson

Session I, 9:00am-11:00am, 8D

Title: Reconstructing Past Environments to Understand Human Land Use: Paleoeecology of Montezuma Well, Arizona.

A large body of literature exists describing human land use change throughout the greater southwestern United States, including wildfires, overgrazing by domestic animals, and desertification. The objectives of this study are: (1) to examine the history of fire recorded in a sediment core at Montezuma Well, Arizona; (2) to compare the findings to archaeological and historical records; and (3) to understand how humans might have been using fire to manipulate the landscape. Our hypothesis is: That greater evidence of fire and fire use will be found during the occupation of Montezuma Well, which occurred sometime prior to A.D. 700 to about A.D. 1400, by the Sinagua people, an indigenous culture who lived in and around the area. Previous studies from Montezuma Well have examined past vegetation regimes and patterns, and have included pollen analysis and plant macrofossil analysis. However, no studies have investigated the realm of fire and fire history, so this research is a pioneering project in this respect. This site is unique in that no streams enter the lake, and the rim of the Well is above the surrounding terrain, so that surface runoff from the small catchment area is minimal. Therefore, air transport is the primary source of pollen and charcoal fragments in the sediment. This fire history analysis will be accomplished by using high-resolution sedimentary charcoal analysis following methodologies of Long et al. (1998) and Whitlock and Anderson (2003). The results of the analysis will provide additional information on the question of how human occupation impacts the landscape and the
environment, providing a better understanding of the relationship between human occupation and fire. This will contribute to the body of knowledge regarding the extent of ancient Native American impacts of the Southwest.

Tsosie, Emmett O.

R. Scott Anderson

Faculty mentor: R. Scott Anderson

Afternoon, 2:18pm-2:30pm, duBois Meadows Room

Title: Reconstructing Past Environments to Understand Human Land Use: Paleoecology of Montezuma Well, Arizona.

A large body of literature exists describing human land use change throughout the greater southwestern United States, including wildfires, overgrazing by domestic animals, and desertification. The objectives of this study are: (1) to examine the history of fire recorded in a sediment core at Montezuma Well, Arizona; (2) to compare the findings to archaeological and historical records; and (3) to understand how humans might have been using fire to manipulate the landscape. Our hypothesis is: That greater evidence of fire and fire use will be found during the occupation of Montezuma Well, which occurred sometime prior to A.D. 700 to about A.D. 1400, by the Sinagua people, an indigenous culture who lived in and around the area. Previous studies from Montezuma Well have examined past vegetation regimes and patterns, and have included pollen analysis and plant macrofossil analysis. However, no studies have investigated the realm of fire and fire history, so this research is a pioneering project in this respect. This site is unique in that no streams enter the lake, and the rim of the Well is above the surrounding terrain, so that surface runoff from the small catchment area is minimal. Therefore, air transport is the primary source of pollen and charcoal fragments in the sediment. This fire history analysis will be accomplished by using high-resolution sedimentary charcoal analysis following methodologies of Long et al. (1998) and Whitlock and Anderson (2003). The results of the analysis will provide additional information on the question of how human occupation impacts the landscape and the environment, providing a better understanding of the relationship between human occupation and fire. This will contribute to the body of knowledge regarding the extent of ancient Native American impacts of the Southwest.

Tyler, Ariana

Griselda Santos, Jessica Javer

Faculty mentor: Jay Sutliffe

Session I, 9:00am-11:00am, 47D

Title: Shake it Up at Summit

Our program at Summit High School was 3 weeks long, with one visit each week. The first week's focus was pre-workout nutrition and the proper ways to prepare for a workout, including a good breakfast and good snacks. The school lunch is at 10:40 am and the workout program begins nearly four hours later. The second week was about nutrition during the workout, as many of the students are working out for about an hour and a half with little to no break, except maybe one water break. The final week was about post-workout nutrition, specifically on good meals to eat after a workout, not just smoothies that can help replenish right after working out. The teachers specifically asked for meals so that the kids are getting some actual sustenance, because many of the kids go to get fast food right after working out.

Tyler, Elizabeth

Dylan Cannon, Darin Gilliam, Eli Palomares, Jiyan Wang, Tyler Winston

Faculty mentor: Srinivas Kosaraju, Robert Witkodd

Session II, 2:00pm-4:00pm, 5D

Title: Aquascooter 2.0

Aqua Scooter is a portable, gasoline powered personal watercraft that can propel the users up to 5mph while floating. The current design of aqua scooter has a two-stroke engine that is no longer in agreement with new EPA regulations. The capstone team is tasked with designing and analyzing different alternative engine options that meet current and immediate future EPA regulations. We propose to use a Honda GX-25, 4-Stroke engine to satisfy the customer requirements. A propane conversion system is also designed for this engine in order to provide the client with a long-term solution to EPA regulations. The team conducted emissions testing for the engine with both gasoline and propane fuel. To verify the power output of the engine, an experimental setup was created. This was used to determine whether
the engine conversion to propane would be a viable solution. Additionally, there are experimental procedures the team can conduct to measure any potential differences in thrust created by using alternate fuels on the purchased engine. The team also designed an updated, functional and aesthetically pleasing outer shell. A half-scale model of the outer shell is made out of ABS plastic using rapid prototyping.

Tyler, Elizabeth  
Dylan Cannon, Darin Gilliam, Eli Palomares, Jiyan Wang, Tyler Winston  
**Faculty mentor:** Srinivas Kosaraju, Robert Witkodd

*Morning, 9:20am-9:45am, duBois Fremont Room*  
**Title:** *Aquascooter 2.0*

Aqua Scooter is a portable, gasoline powered personal watercraft that can propel the users up to 5mph while floating. The current design of aqua scooter has a two-stroke engine that is no longer in agreement with new EPA regulations. The capstone team is tasked with designing and analyzing different alternative engine options that meet current and immediate future EPA regulations. We propose to use a Honda GX-25, 4-Stroke engine to satisfy the customer requirements. A propane conversion system is also designed for this engine in order to provide the client with a long-term solution to EPA regulations. The team conducted emissions testing for the engine with both gasoline and propane fuel. To verify the power output of the engine, an experimental setup was created. This was used to determine whether the engine conversion to propane would be a viable solution. Additionally, there are experimental procedures the team can conduct to measure any potential differences in thrust created by using alternate fuels on the purchased engine. The team also designed an updated, functional and aesthetically pleasing outer shell. A half-scale model of the outer shell is made out of ABS plastic using rapid prototyping.

Tzinberg, Andy  
Alexis Senkow  
**Faculty mentor:** Christine Lemley

*Morning, 9:30am-9:45am, Skydome Stage E*  
**Title:** *What are the benefits of medicinal marijuana?*

We are going to inform about how marijuana is beneficial in a medicinal way. We have interviewed people around Flagstaff and we have hands on experience with the medication to help convey the information. We will talk about being educated about Marijuana as well as how to use it effectively and not in an abusive way.

Urbon, Bob  
**Faculty mentor:** Ryan Fitch

*Session II, 2:00pm-4:00pm, 33C*  
**Title:** *Water Consumption*

Water is an extremely important resource and yet many of us turn on our faucets and shower's with out even thinking about What is actually happening. Through econometric analysis, prominent factors in household water consumption will be identified. Based on this analysis, appropriate recommendations will be made and opportunities for further research will be discussed.

Valente, Matthew  
Matthew Valente, Christopher Cuellar  
**Faculty mentor:** Weidler Daniel

*Session I, 9:00am-11:00am, 99D*  
**Title:** *Anxiety Attachment, Emotional Dependency, and Effects on Romantic Relationship Compliance*

A self-report survey was implemented in order to examine the relationship between three variables: anxiety attachment (AX), emotional dependency (ED), and romantic relationship compliance (RRC). Anxiety attachment, first proposed by John Bowlby, stated that children who come across as anxious will generally seek close proximity to their caregiver out of fear that they may be left and/or abandoned. According to Campbell and Marshall (2011), romantic partners who
exhibit this same attachment style later on in adulthood will tend to display an excessive need for support and
reassurance from their significant other. Thus, this study wanted to further explore if varying levels of anxiety
attachment and emotional dependency were related to higher levels of romantic relationship compliance. The
participants (n = 180), who took part in this study, were all undergraduate students from Northern Arizona University.
Each participant, who took part in the self-report survey, was also currently involved in a romantic relationship.
Overall, the results conveyed three distinct findings. First, the data showed that there was interaction between anxiety
attachment and emotional dependency in predicting romantic relationship compliance. For the two other findings, a
Pearson product-moment correlation was used to determine that there was a significant positive correlation between
anxiety attachment and romantic relationship compliance. The data also showed that there was a significant positive
correlation between romantic relationship compliance and emotional dependency as well. The concluding results
analyzed from this study suggest that an individual is more likely to be compliant in a romantic relationship if he or she
is emotionally dependent on their partner or if he or she exhibits a high level of anxiety attachment in the relationship.

Valente, Matthew
Matthew Valente, Zach Kaiser
Faculty mentor: Sumner Sydeman

Session II, 2:00pm-4:00pm, 99D

Title: The Efficacy of Individual versus Group Treatment regarding Motivational Interviewing for Adolescents with
Substance Use Disorder: A Systematic Review
The purpose of this project was to examine the efficacy of individual versus group treatment outcomes for
Motivational Interviewing (MI) in adolescents classified with substance use disorder. Motivational Interviewing was
first developed by Dr. William Miller as a way to help problem drinkers eliminate self-destructive tendencies (Miller,
1983). Over the past decade, research on MI has started to focus its attention on adolescents with alcohol and/or drug
abuse. This project systematically reviewed and located eight MI randomized controlled trials: four receiving
individual treatment and four receiving group treatment with adolescent participants (13-19 years old) with substance
use. A systematic literature search was conducted according to Preferred Reporting Items for Systematic Reviews and
Meta-Analysis standards (PRISMA: Liberati et al., 2009) All MI studies, regardless of treatment condition, had
randomly assigned participants and consisted of an initial follow up period (1-15 months) after treatment had ensued.
Limitations of the project are discussed as are implications for future directions regarding MI therapy for non-
substance related issues.

VanArsdel, Mikayla
Chelsea Heintz, Alexis Richardson, Leanne Milner
Faculty mentor: Nicole Bies-Hernandez

Session I, 9:00am-11:00am, 101B

Title: Parenting Styles and Personality
The purpose of this study was to evaluate the association between parenting styles and personality in college students.
Previous research showed that the way a caregiver parents their children is associated with their child's personality. To
further this research, the current study focused on the personality of college students and how their caregiver's style of
parenting is correlated. To do this, two self-report surveys were used to assess the personality types of the student,
along with their caregivers parenting style. If the student has divorced parents, they were instructed to choose the one
they lived with majority of the time. In this study, the HEXACO-60 and the Parental Authority Questionnaire (PAQ)
tests were used in assessment. Researchers had then compared the scores of both tests to associate the personality type
to their caregivers parenting style. The results were reported in the associated poster. This study allowed for potential
impact on the way caregivers parent their children.

Vargas, Brianda
Martha Trujillo, Marisa Smestad
Faculty mentor: Jay Sutcliffe

Session I, 9:00am-11:00am, 49D
**Title: Fit Kids, Healthy Kids**

This intervention will target second grade students at Mountain Charter Elementary School, involved in the Fit Kids program to increase vegetable and fruit consumption. Children will be exposed to different vegetable serving styles that attract them to increase their willingness to eat the vegetables. To increase their self-efficacy, children will be involved in making smoothies and other fruit and vegetables recipes. At the end, children will be tested on their knowledge of differentiating between healthy choices and junk food, as well as their willingness to eat fruits and vegetables.

Vasquez, Courtney  
Faculty mentor: Carly Long

**Session II, 2:00pm-4:00pm, 79B**

**Title: Social Penetration Theory and how it shapes every relationship you have**

Social Penetration Theory, conceived by social psychologists Irwin Altman and Dalmas Taylor, it is a method used to describe the emotional and relational closeness that occur in all types of relationships and how it develops. An onion is used as the visual representation of this method and how each layer represents apart of us, the outside layers are what we allow everyone to see and the deepest layers are reserved for those who we trust. As we shed each layer, the relationship goes from superficial to complete trust. In my display, I hope to explore this concept with my own day to day relationships and how it affects how you treat certain people and how much they mean to you and what that means for your own future and decisions.

Veligos, Tim  
Erin Bailey, Curtis Bilbrey, Alex Farmer  
Faculty mentor: James Palmer

**Session II, 2:00pm-4:00pm, 9C**

**Title: Interactive Point Visualization**

From September 2007 to June 2009, the Japanese lunar orbiter Kaguya went into orbit around the moon to collect spectrometer data from its surface. This data was then given to the United States Geological Survey (USGS) for open distribution and scientific use. Until now, USGS has not had an efficient way to access, analyze, and visualize this data. The Geographical Point Visualization (PointViz) project is a web application designed to view specific data retrieved from Kaguya. An example of a problem this system could solve would be using several different spectrometer attributes to identify iron deposits below the lunar surface. The project is composed of two key components: a database to store the large quantities of data, and a web application that allows users to customize the range of data they wish to see. Users will be able to view the point data in a graphical form, and use visualization techniques, such as a heatmap diagrams, to format the data and visualize connections and correlations that may not otherwise be apparent. The Geographical Point Visualization project will allow USGS to use and distribute the data gained from the Kaguya lunar orbiter, so that scientists, researchers, and the general public may view data gathered from the surface of the moon.

Veligos, Tim  
Erin Bailey, Curtis Bilbrey, Alex Farmer  
Faculty mentor: James Palmer

**Morning, 8:55am-9:20am, duBois Festival Room**

**Title: Interactive Point Visualization**

From September 2007 to June 2009, the Japanese lunar orbiter Kaguya went into orbit around the moon to collect spectrometer data from its surface. This data was then given to the United States Geological Survey (USGS) for open distribution and scientific use. Until now, USGS has not had an efficient way to access, analyze, and visualize this data. The Geographical Point Visualization (PointViz) project is a web application designed to view specific data retrieved from Kaguya. An example of a problem this system could solve would be using several different spectrometer attributes to identify iron deposits below the lunar surface. The project is composed of two key components: a database to store the large quantities of data, and a web application that allows users to customize the range of data they wish to see. Users will be able to view the point data in a graphical form, and use visualization techniques, such as a heatmap diagrams, to format the data and visualize connections and correlations that may not otherwise be apparent. The Geographical Point Visualization project will allow USGS to use and distribute the data gained from the Kaguya lunar orbiter, so that scientists, researchers, and the general public may view data gathered from the surface of the moon.
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Vento, IsaBella  
Bree Hawkins, Erika Peña, Ashley Segarra  
Faculty mentor: Gregory Busath, Matthew Anderson

Session I, 9:00am-11:00am, 98D  
Title: The Point of it All: Happiness or Financial Gain

This research will explore the relationship between happiness and money in influencing the choice of one's college major. We believe that there are certain individuals who specifically choose a major because they think it will provide the type of salary and lifestyle that will also provide them with life satisfaction. Others choose their major because it will provide them a different type of life satisfaction through pure enjoyment of their job, whether it provides financial stability or not. This research project will seek to determine if there are specific majors that individuals choose based on whether life satisfaction provided by happiness or financial stability is more important to them. We are only surveying psychology and business majors to simplify our study and to make a clear determination regarding which majors are associated more with happiness or financial gain. We predict that students majoring in psychology will report that they chose their major based on happiness over financial gain and people majoring in business will report that they chose their major based on financial gain over happiness. Data were collected using SurveyMonkey and analyzed in SPSS using two independent measures t-tests. Results will be reported on the poster.

Verduzco, Adrian  
Faculty mentor: Ryan Fitch

Session II, 2:00pm-4:00pm, 33D  
Title: NAWAPA: Not Because It is Easy, But Because It is Hard

The 1960's in American history were marked by ambitious pursuits and drastic change in the ways mankind interacts with the universe. Unfortunately, much of the dreaming done then has been lost today in the face of a global climate crisis and depleting natural resources. Water supplies are currently being depleted around the world, with droughts occurring in places like the state of California. While these factors have been putting immense strains on agriculture and conservation requirements, the Army Corps of Engineers proposed a major water project in the 1960's possessing the power to alleviate not only this issue, but also a myriad of other issues concerning our economy and infrastructure. The North American Water and Power Alliance is a project this report aims to re-examine as a necessary endeavor the country should pursue to revitalize water reserves in North America and bolster the countries energy production and job creation. This report takes a close look at the costs and benefits of this project and what it would take to get us from an idea to a real solution.

Vergara, Fernando  
Faculty mentor: Britton Shepardson

Session II, 2:00pm-4:00pm, 68D  
Title: Anthropology Project

I will be conducting my anthropology project on the history of warfare and weapons.

Vermeer, Sayer-Jane  
Cayden Cupper, Adisen Hennessy, Ricki Steffan, Shelby Nowell  
Faculty mentor: Nora Dunbar, Matthew Anderson

Session II, 2:00pm-4:00pm, 100D  
Title: The Relationship Between Masculinity and Female Leadership Moderated by Self-Efficacy
This research project assessed the relationship between masculinity and leadership with self-efficacy working as a moderator. This means that the relationship between masculinity and leadership depends on the levels of self-efficacy. It was hypothesized that the relationship between masculinity and leadership will be strong and positive under conditions of high self-efficacy and will be weak and positive under conditions of low self-efficacy. To measure this, we conducted two Pearson r correlations, and then compared them with an alpha level of .05 two-tailed test. This method serves an alternative to multiple regression. The surveys used consisted of the BSRI, the GSE inventory, and a leadership inventory that were administered to Northern Arizona University's Psychology 302W young adult female students. Half of the participants are given a masculine scenario while the other half are given a feminine scenario prior to completing the leadership emergence survey.

Vermillion, Stephanie  
Faculty mentor: Scot Raab

Session I, 9:00am-11:00am, 45B

Title: Platelet Rich Plasma and its Healing Effects on Tendinopathies

Platelet rich plasma is a treatment utilizing growth factors and cytokines of a patient's autologous blood platelets to influence. Platelet rich plasma was first utilized in surgery but has now begun to receive exposure to sports related injuries. An example is its use for tendinopathies, a common pathology in sports. Tendinopathies are chronic injuries usually caused by overuse. This tissue is avascular providing it with poor healing abilities. Platelet rich plasma can be injected into the tendon injury site to possibly promote healing, but more research needs to be conducted to support this theory. The purpose of this review is to examine the efficacy of platelet rich plasma and if the growth hormones it possesses can facilitate healing of tendinopathies. Literature was found and reviewed through Google Scholar, EBSCOhost, CINAHL Plus, PubMed, and Medline. The results were found by using the words tendon, tendinitis, tendinopathy, platelet enriched plasma, and PRP. After reviewing the literature it is supported that using the growth hormones and cytokines in platelet rich plasma to promote healing could drastically change rehabilitation and return to play time lines. There have been many claims for the decrease of pain and increase of function after the platelet rich plasma intervention. Although, there have also been claims disputing these results. Research results about both of these claims have been inconclusive thus far. Further research needs to be done to find if platelet rich plasma truly does promote healing at the cellular level for tendon injuries.

Vielma, Jorge  
Hussain Mohammad, Alex Hunter, Hengming Dai, Alyosha Sandigo  
Faculty mentor: David Willy, Sarah Oman, Kansas State University

Session II, 2:00pm-4:00pm, 4C

Title: Micro Wind Turbine

Environmental, economic and social infrastructures are influenced by renewable energy. Power plants in the United States produce more than 2.5 million tons of carbon dioxide on a yearly basis. Carbon dioxide, a greenhouse gas, reflects energy emitted from the Earth back to its surface, consequently contributing to a global increase in temperature. Economically, the oil industry relies on overseas supplies to maintain energy demands, thereby negatively impacting the national economy. Renewable energy investments typically remain within the nation and energy expenditures fuel the local economy. Despite its demand in contemporary society, fossil fuels are a finite resource prone to fluctuating costs due to inconsistent, ever-depleting supplies. Contrarily, wind, solar and water energies are perpetual fuel sources that may be harvested with increasing efficiency in a technologically-evolving global society. Sustainable energy designs, including dams, solar panels and wind turbines, are adaptable energy acquisitioning systems teeming with potential. In conclusion, this project focuses on improving the design of a micro-wind turbine.

Vielma, Jorge  
Hussain Mohammad, Alex Hunter, Hengming Dai, Alyosha Sandigo  
Faculty mentor: David Willy, Sarah Oman, Kansas State University

Morning, 10:20am-10:45am, duBois Fremont Room

Title: Micro Wind Turbine
Environmental, economic and social infrastructures are influenced by renewable energy. Power plants in the United States produce more than 2.5 million tons of carbon dioxide on a yearly basis. Carbon dioxide, a greenhouse gas, reflects energy emitted from the Earth back to its surface, consequently contributing to a global increase in temperature. Economically, the oil industry relies on overseas supplies to maintain energy demands, thereby negatively impacting the national economy. Renewable energy investments typically remain within the nation and energy expenditures fuel the local economy. Despite its demand in contemporary society, fossil fuels are a finite resource prone to fluctuating costs due to inconsistent, ever-depleting supplies. Contrarily, wind, solar and water energies are perpetual fuel sources that may be harvested with increasing efficiency in a technologically-evolving global society. Sustainable energy designs, including dams, solar panels and wind turbines, are adaptable energy acquisitioning systems teeming with potential. In conclusion, this project focuses on improving the design of a micro-wind turbine.

Villezcas, Ruben
Jasem Alhabshy, Riyadh Alzahrani, Brandon Gabrelcik, Ryan Murphy
Faculty mentor: Srinivas Kosaraju

Session II, 2:00pm-4:00pm, 3C
Title: 2nd Generation Charging Station
The objective of this project is to design and build a bike attachment that will provide electricity to charge electronic devices such as laptops and cellphones. The design has to be portable and should not use a battery storage system. The team finalized on a design that uses an alternator coupled with a capacitor to produce and stabilize electrical energy. The DC power from capacitor is reduced to 5V to charge devices such as cellphones. An inverter is used to convert DC power to AC to accommodate charging of large electronic devices such as laptops and tablets. The capacitor and inverter system is covered in an enclosure for the safety of user, and is located conveniently within bike frame itself. An electronic display is installed on the handle bar to read the voltage and power produced by the system along with the speed at which user is pedaling the bike. During testing the system is observed to create approximately 300W of power, which is enough to charge up to 30 devices. This system is a viable option for providing small quantities of power to a single user in a way that is both efficient and sustainable.

Villezcas, Ruben
Jasem Alhabshy, Riyadh Alzahrani, Brandon Gabrelcik, Ryan Murphy
Faculty mentor: Srinivas Kosaraju

Morning, 10:45am-11:10am, duBois Fremont Room
Title: 2nd Generation Charging Station
The objective of this project is to design and build a bike attachment that will provide electricity to charge electronic devices such as laptops and cellphones. The design has to be portable and should not use a battery storage system. The team finalized on a design that uses an alternator coupled with a capacitor to produce and stabilize electrical energy. The DC power from capacitor is reduced to 5V to charge devices such as cellphones. An inverter is used to convert DC power to AC to accommodate charging of large electronic devices such as laptops and tablets. The capacitor and inverter system is covered in an enclosure for the safety of user, and is located conveniently within bike frame itself. An electronic display is installed on the handle bar to read the voltage and power produced by the system along with the speed at which user is pedaling the bike. During testing the system is observed to create approximately 300W of power, which is enough to charge up to 30 devices. This system is a viable option for providing small quantities of power to a single user in a way that is both efficient and sustainable.

Villotti, Julie
Faculty mentor: Melissa Santana

Session I, 9:00am-11:00am, 125A
Title: Trinity Recovery Center
Drug and alcohol addiction is a devastating problem that effects millions of people world wide. Men and women both suffer from this disease, with addiction and suffering stories varying dramatically. Researching the topic of addiction and substance abuse, I found that men and women often need gender specific treatment plans in order to be successful toward their road to recovery. Due to the empathy factor towards women, I have decided to design a recovery center
solely focused on benefiting the lives of women around the nation. Trinity Recovery Center is an 30-day inpatient residential treatment center for women ages 18-65 who suffer from severe drug and alcohol addictions. Outpatient care is also offered for women who suffer from anxiety, depression, and mood disorders. Our goal is to help our clients reach long term sobriety by providing the necessary resources and tools to address the core reasons for their behaviors. We hope by introducing clients to our 12-step holistic recovery program we will strengthen their focus on mind, body, and soul allowing them to overcome the barriers prohibiting their recovery. Mind, body, and soul is the main concept for Trinity Recovery Center. The holistic treatment program revolves around the idea of restoring one's physical, emotional, and spiritual health. Besides the treatment plan, the building is designed in the shape of a triad symbol. The triad has been around for thousands of years and has represented many different meanings, one of them being: mind, body, and soul.

Viniegra, Luis  
Faculty mentor: Micheal Lerma

Session I, 9:00am-11:00am, 77C  
Title: The Second Corporate Takeover

The first corporate takeover occurred during the first contact with Europeans. Here it was a takeover of land and its resources. The second takeover was a more modern day attempt at specific resources and political power. Through this corporations and institutions have successfully accomplished and secured the resources and power to continue to thrive as an institution.

Volin, Megan  
Jasmine Handy, Grace Aire-Oaikhimire, Qingmiao Yang  
Faculty mentor: Eric Yordy

Session II, 2:00pm-4:00pm, 29C  
Title: Copyright Infringement in the Music Industry

In our project, we have examined the issue of copyright infringement in the music industry by analyzing cases and law review articles.

Vossberg, Clayton  
Torrey Westfall  
Faculty mentor: Eric Yordy

Session II, 2:00pm-4:00pm, 29D  
Title: Civil Asset Forfeiture

It is important to remember there is a difference between Civil Asset Forfeiture and criminal forfeiture. In criminal forfeiture, the government can take one's property following a criminal conviction. In criminal cases, the government must prove beyond reasonable doubt that the person convicted is guilty in order to remove property. In contra to Civil Asset Forfeiture cases, they are technically in rem proceedings; which indicates that the charges are placed on the property as opposed to the owner. Under Civil Asset Forfeiture, the ceased property is automatically guilty and it is up to the owner's responsibility to prove the innocence of their ceased property and pay all necessary litigation expenses. This begs the question, is the government looking out for the public's best interest, or is this law an easier method of financing the government? Is this process ethical, and what is the rationality behind these laws?

Wagy, Megan  
Faculty mentor: Erika Hess

Afternoon, 2:12pm-2:24pm, Skydome Stage A  
Title: Genocide and Politics in Rwanda

Rwanda has been labeled as a developing country because of its current economic, political and social standings. Economic, political and social issues in Rwanda began hundreds of years ago when European colonizers came to Rwanda and drew arbitrary boundaries to create a state that three indigenous groups inhabited with a history of tension.
The tension between the Hutu, Twa and Tutsi created a deadly genocide in 1994, which cost hundreds of thousands of lives. Currently, Rwanda has been unable to develop and improve the economy, government and safety of the country. As a result of these various problems, widespread poverty has ensued across the state. Rwanda is stuck in the developing world, as are various other countries in Sub-Saharan Africa. This issue is relevant because it affects the international community as millions of people are forced to live in poverty and African developing countries are not able to assimilate into the international community. This project identifies problems that have caused economic and political stagnation in this country. The main factors are the affects of colonization, a brutal history between the indigenous groups of Rwanda and the corruption of an unsustainable government. In order for Rwanda to further develop and improve the quality of life for its inhabitants, political changes must be made, infrastructure, education and healthcare must be enhanced and it is crucial that Rwanda becomes a part of the international community.

Walker, Nicholas
Kurt Van Denburg
Faculty mentor: Dennis Foster

Session II, 2:00pm-4:00pm, 35D
Title: Why Flagstaff Should not be a Dark Sky City
Flagstaff was the world's first International Dark Sky City it has brought many tourists and astronomers to Flagstaff. However the current infrastructure of street lights is aging and needs to be replaced. The city of Flagstaff has already tested amber LED lights on the 89 north of the mall. These lights are failing because they are too heavy for the current light posts. There are around 3000 light posts that will not hold these new lights and the cost is $28 million to replace all of them. Currently there are multiple plans that are on the table. Who is paying for these upgrades? Taxpayers? Our project will analyze the upgrade options, the ways that it can be paid for, and costs and benefits of keeping Flagstaff a Dark Sky City.

Walker, Shauna
Faculty mentor: Melissa Santana, Jessica MacKenzie, Natalie Cawood

Session II, 2:00pm-4:00pm, 125B
Title: Flagstaff Women's and Children's Crisis Center
Interior Design is often looked at as a profession that dresses up rooms to awe visitors. As an interior design student, I have found that the profession deals largely with the functionality of a space and focuses on how to help people interact with their environment. Design can assist people of all needs and abilities. Healthcare design has taken a leap forward in making facilities more welcoming and comfortable for patients. Mental healthcare is a section that poses specific challenges to design. My desire was to design a facility that addressed all of the unforeseen challenges of crisis patients here in Flagstaff. It was important to consider the Navajo culture, which approaches mental health treatment in a unique fashion. My crisis center is focused around the needs of women and children and offers both a crisis treatment center and a respite center. The aim was to provide Flagstaff with a facility that could house and treat victims of domestic violence, depression, sexual, drug, and alcohol abuse. The center is safe, clean, and functional, as well as aesthetically pleasing. These attributes offer a warm and inviting place for rest and care. I want to assist people in need through the use of Interior Design and the skills I have learned and developed in my undergraduate study.

Walsh, Lauren
Faculty mentor: Julie Moreau

Session I, 9:00am-11:00am, 92A
Title: Understanding Senate Bill 1070 (SB1070)
In 2010, the state of Arizona passed new legislation to enforce immigration law. This legislation is known as Senate Bill 1070, or SB1070. SB 1070 was passed in the interest to enforce federal immigration law throughout the state of Arizona. The intentions of this legislation were to deter unlawful entry and presences of illegal immigrants in order to maintain lawful economic activity in the state of Arizona. While the intention of Senate Bill 1070 is to keep illegal alien immigrants out of Arizona, it allows for racial discrimination. Law enforcement officers are required to stop anyone on the basis of probable cause, which means people are stopped based on what they look like. In Arizona, the populations of illegal immigrants are predominately Latinos coming from Mexico and the rest of Latin America.
SB1070 is a way for law enforcement officers to use racial discrimination to deter immigrants from coming to the United States and Arizona. This research will provide information about how the SB1070 requires law enforcement officers to pin point suspicious racial others. The law perpetuates racism against Latinos or anyone who is perceived to be an alien. This research will identify the problems associated with SB1070 and how the legislation works to target certain groups of people, affecting the lives of many.

Wang, Zijing  
Faculty mentor: Ryan Fitch  

Session II, 2:00pm-4:00pm, 34A  
Title: Desalination projects in the world  
This project introduces the general information about desalination, including the definition, applications, considerations, the working process, technological development and the economics in desalination. The project then lists some successful desalination examples in Middle East and Australia, since they have the longest desalination history. There is detailed cost-benefit analysis about the desalination plants these districts. This project then introduces the Carlsbad desalination project in San Diego, which is the nation's largest desalination plant and will be in use at the end of 2015. This project shows the current water resource allocation in California. There is a cost-benefit analysis about the Carlsbad desalination plant in the project. Finally, there is a forecast about the future of desalination in the world and the water resource in California.

Washington, Cayla  
Luis Castillo, Kaitlyn TenHaken, Charles Molitor, Jeremiah Johnson, Michael Bulriss, Isreal Urbina-Muniz, Steven Michael Cordovana  
Faculty mentor: William Cordeiro  

Afternoon, 1:15pm-1:45pm, Skydome Roundtable R1  
Title: Breaking Bad and the Drug Culture  
The panel discussion will be about how class, race, and gender are represented in the drug culture of the AMC hit show Breaking Bad.

Waters, Matthew  
Faculty mentor: Sanjay Joshi  

Morning, 10:20am-10:40am, Skydome Stage A  
Title: History and Cinema: Exploring the Lasting Ramifications of the Partition of India  
The purpose of this project is to present a historical inquiry into the Partition of India as it has been portrayed through Indian cinema. Specifically, this work seeks to frame the effects of Partition (the splitting of British India into the modern nations of India and Pakistan) that became realized in the proceeding decades of the 20th Century. Several films are showcased, from the early days following Partition to those created in the 21st Century in order to demonstrate the changes, as well as the enduring constants, witnessed throughout time. Ultimately, this academic venture seeks to educate the audience on a very critical event that has shaped the lives of millions through the familiar and relatable medium of film.

Watkins, Kathleen  
Faculty mentor: Julie Moreau  

Session II, 2:00pm-4:00pm, 92B  
Title: Black Feminism: A Starting point to Freedom  
Black feminist have been overshadowed by white feminist for a very long time and their work is not being appreciated by everyone else. Black feminist are not the only type of feminism that has been overlooked by people, the majority of the minority groups are being overlooked. Since we live in a White dominated country, there is chance that the minority groups can make a positive difference to the country. The project is going in depth on black feminism and seeing where it started and where it is heading to in the future. Did Black Feminism tackle the same issues that black
feminist are dealing with in the present? What were some of the challenges that they had to overcome? Race? Gender? Economic status? Or all of these put together. The project will explore black feminist from all time periods and see how they progressed throughout time. Looking back and seeing the difference or similarity of a 1960s Black Feminist to a 2015 Black Feminist. There could be a bond that doesn't change over time and that the fight is still the same. The project will also see how black feminist react towards the Black Lives Matter campaign and other movements like the NAACP associated with African American people. Lastly, the project will go more in depth with the specific relationship between black feminist and white feminist throughout the years. Was the relationship between White feminist and Black Feminist positive or negative? Will Black Feminism be a one-hit or could it stand against or with White Feminism?

Watts, Solan  
Charles Drost  
**Faculty mentor:** Charles Drost, Nancy Johnson, Anita Antoninka  
**Session II, 2:00pm-4:00pm, 7D**  
**Title: Crayfish Abundance in Water with High Carbon Dioxide Concentrations in Central Arizona**  
Invasive species damage the ecosystem at a global level. In the United States one species can cost 12.5 billion dollars in damages and eradication efforts. The Virile crayfish (Orconectes virilis) was introduced into Arizona in the 1970s, invading most habitats by the 1980s. Crayfish are known to harm macroinvertebrates, herpetofauna and vascular plants damaging the ecosystem. Since the introduction of crayfish, finding communities that have not been disturbed by crayfish is rare. Preliminary research has shown that crayfish cannot survive in water with high Carbon Dioxide (CO2) concentrations. This study tests crayfish ability to live in water with high CO2 levels in central Arizona. If crayfish cannot live in water with high CO2 concentrations then these areas will be used as a refuge for species affected by crayfish and used to study their population health in comparison to the areas with crayfish. One of the many species this will be beneficial for is the Sonora mud turtle (Kinosternon sonoriense). In this study we will test CO2 levels along Fossil Creek using USGS standard water sampling methods. Traps will then be set along a gradient of CO2 concentrations to test for relative abundance of crayfish. We expect to find no crayfish in high CO2 levels and more crayfish in lower CO2 levels. If we determine that crayfish cannot inhabit water with high CO2 concentrations, we will survey other water bodies with high CO2 concentrations to see whether such sites may provide refuge from the negative effects of crayfish.

Watts, Solan  
Charles Drost  
**Faculty mentor:** Charles Drost, Nancy Johnson, Anita Antoninka  
**Morning, 9:54am-10:06am, duBois Room A**  
**Title: The Presence of Non-native Crayfish and their Effects on the Sonora Mud Turtle in Central Arizona**  
Invasive species damage the ecosystem at a global level. In the United States one species can cost 12.5 billion dollars in damages and eradication efforts. The Virile crayfish (Orconectes virilis) was introduced into Arizona in the 1970s, invading most habitats by the 1980s. Crayfish are known to harm macroinvertebrates, herpetofauna and vascular plants damaging the ecosystem. Since the introduction of crayfish, finding communities that have not been disturbed by crayfish is rare. Preliminary research has shown that crayfish cannot survive in water with high Carbon Dioxide (CO2) concentrations. This study tests crayfish ability to live in water with high CO2 levels in central Arizona. If crayfish cannot live in water with high CO2 concentrations then these areas will be used as a refuge for species affected by crayfish and used to study their population health in comparison to the areas with crayfish. One of the many species this will be beneficial for is the Sonora mud turtle (Kinosternon sonoriense). In this study we will test CO2 levels along Fossil Creek using USGS standard water sampling methods. Traps will then be set along a gradient of CO2 concentrations to test for relative abundance of crayfish. We expect to find no crayfish in high CO2 levels and more crayfish in lower CO2 levels. If we determine that crayfish cannot inhabit water with high CO2 concentrations, we will survey other water bodies with high CO2 concentrations to see whether such sites may provide refuge from the negative effects of crayfish.

Webster, Kendle  
Sidney Michl, Philip Minette  
**Faculty mentor:** Robert Sanford
Session I, 9:00am-11:00am, 6B

Title: FeederWatch Citizen Science Project at Northern Arizona University's Southwest Forest Science Complex

Project FeederWatch is a national organization that focuses on surveying winter bird counts at feeders placed in backyards, nature preserves, community centers, and locales throughout the country. It is recognized as a form of citizen science where individuals can help scientists track broad scale movements of winter bird populations and recognize trends in bird distribution and abundance. The purpose of this project is to count and monitor birds and bird species through Project FeederWatch by observing a feeder placed at the Southwest Forest Science Complex at Northern Arizona University. The hypothesis of this citizen science project is that lesser goldfinch will be the most numerous bird sighted at this location due to its high frequency in the area. The feeder at the Southwest Forest Science Complex is watched for half an hour, two consecutive days of the week in the afternoon by one or more group members. The day's high and low temperatures are recorded, as well any snow or precipitation received that day. Bird species are identified using binoculars and an identification book authored by Sibley. Birds are then tallied by how many are feeding at one time as to not count the same bird twice. Within the preliminary results, the lesser goldfinch is by far the most common visitor, followed by the mountain chickadee, cassin's finch, dark eyed junco, and house finch.

Webster, Kendle

Faculty mentor: Andrew Sanchez-Meador, Ecological Restoration Institute

Afternoon, 3:18pm-3:42pm, duBois Meadows Room

Title: Mortality Rates for Young Ponderosa Pine Seedlings Following Disturbance

Regeneration in ponderosa pine forests is rarely successful. In the past, ponderosa pine trees established themselves infrequently, thus creating open and park-like forest stands that historical accounts mention. These open forests have been lost over the years due to fire suppression, which has created much denser stands. These dense forests that lack the low-intensity frequent fires that were present in the past make it difficult for seedlings to establish themselves due to the large amount of litter and duff on the forest floor which prevents seedlings from reaching the mineral soil they need for growth and stabilization. This study determined which forest treatment had the highest mortality of seedlings according to the thinning treatment of the area using a control group as the base. Square meter quadrats were used at random plots at the control sites and three different treatments to determine the average number of seedlings per treatment from fall 2013 - fall 2015. Undergrowth factors such as plant cover and litter depth were analyzed as well to determine their significance in contributing to seedling mortality. The most seedling mortality occurred on the control plots, which concludes that with current forest conditions of northern Arizona, seedlings will not be able to establish themselves to regenerate the forest. By looking at past conditions and utilizing thinning and prescribed burning where it is historically accurate, we can inform management actions on regeneration and the factors that hinder it to determine current and future options for this ecosystem's episodic regeneration.

Weiland, Josie

Faculty mentor: Britton Shepardson

Session I, 9:00am-11:00am, 69A

Title: The Prehistory of Spirituality and Religion

I would like to present a series of posters explaining the prehistory of spirituality, and analyzing the beginning of religion. Religion has virtually affected every aspect of our lives, and I believe it is important for society to be knowledgeable about the beginning of religion as a socialized institution, and the beginning of human spirituality.

Weis, Kirsten

Nathan Curnow

Faculty mentor: Gerald Wood

Session I, 9:00am-11:00am, 55B

Title: Fighting for Inclusion

Our aim is to make people more aware of inclusion in the community of Flagstaff. By providing them with information of resources and programs for citizens with disabilities after high school.
Session I, 9:00am-11:00am, 13B

Title: COI Sequencing of an Undescribed Leech Species Found at Montezuma Well, Arizona

Montezuma Well, a collapsed limestone spring in Central Arizona, has been separated from other major aquatic systems for over 11,000 years and provides a habitat for multiple endemic species. One of the four leech species found in the Well is currently identified as Helobdella triserialis. To investigate the hypothesis that this population instead represents an endemic species distinct from H. triseralis, we extracted DNA from this and other AZ Helobdella populations, and sequenced the mitochondrial cytochrome c oxidase subunit I (COI) region. The maximum likelihood tree constructed with MEGA 6.1, morphological data and the life history traits from the compared species indicate that the undescribed Helobdella species inhabiting Montezuma Well is, indeed, an endemic species. Formal classification of this species is now underway.

Welsh, Rachel

Tyler Pledger

Faculty mentor: Dennis Foster, Tyler Pledger

Session II, 2:00pm-4:00pm, 36A

Title: Flagstaff’s troubling Bed, Board and Booze Tax

My partner and I will be explaining why Flagstaff should get rid of the BBB tax. We will discuss the various public choice issues associated with the tax.

Wentz, Morgan

Faculty mentor: Nancy Barron, Amber Nicole Pfannenstiel

Session II, 2:00pm-4:00pm, 128B

Title: Pinning Motivation: An non-academic platform for academic needs

Exigence: The need for students and writing center mentors to have resources to turn to when in need of writing help. This term my goal was to create a resource that students could turn to when they needed help focusing or working. I used Bitzer’s theory of the rhetorical situation and initially designed a blog. My audience was students and writing center mentors. My constraints were choosing an appropriate platform, and generating student interest. Initially I created five blogs that had information about where to study in Flagstaff, recipes of easy meals and snacks, presentation help, grammar tips, and editing/revising strategies. The purpose of this blog was to be social while still remaining academic. Then I decided to put this information in a different format, Pinterest. I looked at several different containers that are similar to Pinterest like Learnist, Scoop-It!, and Edcanvas but came to the conclusion that Pinterest was the most familiar to me and would be an easy container to work within. Instead of blog posts, my information would now be made into five boards with five pins in each that pertained to the topic. Also, I designed a mock-up of what I wanted it to look like and then created the boards on Pinterest. At the symposium I will present twelve boards with a minimum of five pins in each and provide an explanation of each board that I created while displaying the five pins I put in each of them.

Werner, Cody

Faculty mentor: Britton Shepardson

Session II, 2:00pm-4:00pm, 69A

Title: Religion and Spirituality in Prehistory

This project will mainly focus on examples of Religion and Spirituality in Prehistory. Using a poster, this project will break down the importance of religion and spirituality in prehistory. Along with that, this project will take a look at specific artifacts, describing their spiritual or religious meanings. Furthermore, the project will attempt to tie together
common motifs found throughout different prehistoric cultures, and try to explain the importance of said motifs. In the end, this project will attempt to broaden people's knowledge of religion and spirituality before recorded history.

Westby, Kiley  
Lawrecia Jones, Chloe Hotman  
**Faculty mentor:** Laura Umphrey

**Session II, 2:00pm-4:00pm, 57C**  
**Title: Impacts on the Adjustment of International Students**

When it comes to adjusting to a new college environment, international students not only face the same problems as domestic students, but additionally, they often experience the struggle of acclimating to an entirely new culture. Problems for international students include feelings of homesickness which can lead to depression (Hendrickson, Rosen, & Aune, 2010), trouble building new relationships (Wang & Hannes, 2013), and hindrances to their academic performance, such as difficulty conducting research using university resources and overcoming language and culture barriers in the classroom (Wang & Hannes, 2013). The present study was conducted to examine the experiences of international students at Northern Arizona University (NAU) with a specific focus on environmental factors that may have an impact on college adjustment. A grounded methodology was used to understand the lived experiences of international students. Semi-structured interviews were conducted with international students attending NAU for the Spring 2015 semester. The results suggest several interesting themes that both facilitate and hinder college adjustment. Implications are presented.

Westerlund, Kortney  
Julia Conway, Anita Abers, Kathleen Heidt  
**Faculty mentor:** Tricia Moore, Ivan Pacheco

**Session I, 9:00am-11:00am, 43B**  
**Title: The Relationship Between the Oral Health Literacy of Parents/Caregivers and the Incidence/Severity of Childhood Decay in School-Aged Children**

A higher than expected prevalence of dental caries was seen in children screened as part of the Verde Valley Project Zero School-based Prevention Program. The purpose of this study was to examine the relationship between the oral health literacy of parents/caregivers (pre-questionnaire) and the severity of decay (oral screenings) in these children. There was a correlation between the parents/caregivers oral health knowledge and child decay severity. Parents/caregivers were provided oral health education. A post-questionnaire determined that parent oral health literacy improved as a result of the educational program.

Western, Brian  
Denisse Nunez, Alyssa Soto, Brittney Harmon, Brett Robbins  
**Faculty mentor:** Phoebe Morgan

**Session I, 9:00am-11:00am, 88A**  
**Title: Alternative Dispute Resolution Peacemakers**

Alternative Dispute Resolution (ADR) consists of a variety of processes that help individuals to resolve disputes. Processes that are involved in ADR include mediation, conciliation, and arbitration. For our capstone project, our group wanted to focus on providing alternative dispute resolutions to fellow college students at Northern Arizona University. The capstone project will be conducted for CCJ 480C: Alternative Dispute Resolution with Dr. Phoebe Morgan. Our group will be focused on establishing the ADR Club (Peacemakers) on campus. We will be assisting other NAU clubs with fundraisers and sponsoring club events, as well as advising and coaching other groups with effective ADR skills. Being seniors, we wanted to leave an impact on our school. We want to use the ideas and methods from CCJ 480C to guide others through difficult personal and interpersonal disputes, putting into practice the skills we have learned.

Wheeler, Hannah  
**Faculty mentor:** Carly Long
Session I, 9:00am-11:00am, 79C

Title: Mainstream Media in Relation to Communication Theory

In a society that promotes consumerism, it sometimes becomes necessary to call into question the quality and integrity of what we consume and what effect it has on the way we live. Said questions, however, are sometimes easier posed than answered. The purpose of this report is to explain, through the application of communication theories, how messages displayed in mainstream film and media impact the way that media consumers perceive the world around them. This study will focus primarily on the effect of representation (or the lack thereof) of all genders, races, and sexualities in the media, as well as delving into how communication theory can help us understand the influence that the presentation of a message has on the consumer. Communication theory aids us in explaining why and for what reasons people communicate, both verbally and nonverbally, as well as assisting researchers in predicting future patterns of behavior based on past occurrences. The application of communication theory to film and media is critical in understanding how messages displayed in films, both subliminal and outright, impact viewers and why the impact it has on viewers is so important.

White, Emily
    Hannah Prawzinsky, Michael Hastings, Levi Heath, Nathan Diefenderfer, Alyssa Whittemore, Briahna Preston,
    Faculty mentor: Dana Ernst, Jeff Rushall

Session II, 2:00pm-4:00pm, 22B

Title: Prime Vertex Labelings

A prime vertex labeling is an injective assignment of the labels 1, 2, ... , n to the vertices of an n-vertex simple connected graph such that adjacent vertices receive relatively prime labels. We will present new labelings for several infinite families of graphs.

White, Kristina
    Faculty mentor: Julie Moreau

Session II, 2:00pm-4:00pm, 92C

Title: Filipino Women in Feminism

It seems as though it is uncommon to identify what Asian and Pacific Islanders have done for feminism. This project is to attempt uncover the women that have been lost to erasure. This project will hopefully help women of Pacific Islander descent find themselves in the depths of feminist history and writing. It will also help women of Pacific Islander descent find themselves in a world where women of color are not often acknowledged.

White, Kristina
    Mariah Hartin, Caitlin Lobb
    Faculty mentor: Gregory Busath, Matthew Anderson

Session I, 9:00am-11:00am, 99A

Title: Ideal Characteristics Versus Real Life Partners

The purpose of this experiment was to test whether or not participants' ideal dating partner characteristics aligned with their current or past relationships. Our hypothesis is that ideal characteristics stated will not correlate with their current or past relationships. We sent the survey to Northern Arizona University students, specifically enrolled in PSY 302W classes, as well as utilizing social media and other connections, such as Greek life, clubs, family, and friends of the researchers. With the use of a correlational design the researchers will be able to determine the relationship between our variables, ideal preferences and current or past relationships.

Wicks, Josie
    Faculty mentor: Britton Shepardson

Session I, 9:00am-11:00am, 69B

Title: Prehistory of food and nutrition

The prehistory of food and nutrition.
**Wiggins, Janay**  
Garrett Maier  
**Faculty mentor:** Gerald Wood  

**Afternoon, 2:00pm-2:25pm, Skydome Roundtable R2**  

**Title: Shades of Gray: Who Pays the price for the disconnect In teacher education**  

In this presentation we focus on this disconnect between content and pedagogy in the secondary education program. We examine this disconnect through our own personal experiences completing coursework in this program. We use Shulman's (2008) discussion around the criticality of pedagogical content knowledge, focusing both on content knowledge and pedagogical knowledge, in order to sufficiently prepare teacher educators. Within the community of teacher candidates I have found that individuals' content knowledge is not sufficient without pedagogical content knowledge. Our community does not function properly without full collaboration of both knowledge bases. I discuss how I have found ways to fill the gap of pedagogical knowledge and make recommendations for the university to consider employing to better prepare future teacher candidates.

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**Wilgus, Justin**  
David Brumbaugh  
**Faculty mentor:** David Brumbaugh  

**Session I, 9:00am-11:00am, 25C**  

**Title: Seismicity and Tectonics of the West Kaibab Fault Zone, AZ**  

The West Kaibab Fault Zone (WKFZ) is the westernmost bounding structure of the Kaibab Plateau of northern Arizona. The WKFZ is a branching complex of high angle, normal faults downthrown to the west. Three main faults lie within the WKFZ: the Big Springs, the Muav, and the North Road. Previous work suggests the faults are likely Quaternary with the most recent offsets occurring <1.6 Ma. The WKFZ is one of the most seismically active areas in Arizona and lies within the Northern Arizona Seismic Belt (NASB), which stretches across northern Arizona trending NW-SE. The data set for this study includes 156 well documented events, the largest being a M5.75 in 1959 and including a swarm of seven earthquakes in 2012. The seismic data set (1934-2014) reveals that seismic activity clusters in two regions within the study area coined the Fredonia and Kaibab clusters. These clusters reveal a seismic gap at the apex of fault curvature. Fault plane solutions confirm the overall stress fabric being as being roughly E-W. This study uses the comprehensive seismic data set, available data on faults, and the regional physiography to search for source relationships for seismicity. Analysis includes source parameters of the earthquake data (location, depth, and fault plane solutions), and comparison of this output to the known faults and areal physiographic framework to indicate any active faults within the WKFZ. This research contributes to a better understanding of the present nature of the WKFZ and the NASB as well.

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**Wilgus, Justin**  
Paul Geissler  
**Faculty mentor:** Paul Geissler  

**Session II, 2:00pm-4:00pm, 25D**  

**Title: The Mystery of Transverse Aeolian Ridges on Mars**  

Transverse Aeolian Ridges (TARs) are distinctly bright sedimentary structures on the Martian surface. The origin of TARs remains unknown years after their discovery in the Viking (1970's) and Mars Global Surveyor (1990's) missions. This research aims to test the hypothesis that TARs are indurated antidunes formed from dusty turbidity currents. This project uses High Resolution Image Science Experiment (HiRISE) images and resolved digital terrain models (DTM). Analysis of 44 TAR sets has been made thus far using Integrated Software for Imagers and Spectrometers (ISIS). We measured TAR orientations, wavelengths, and heights. Slopes were measured locally and at the 1, 10, and 100 km scales. Findings include 14 m tall TARs exceeding previously recorded max TAR heights of 7.8 m, previously unknown latitude locations, additional banded TARs, and height to wavelength ratios less than 0.130 except one case of 0.186 (greater than the hypothesized equation projection of <0.142). This global survey helps to identify significant TAR trends and document characteristics contributing to a better understanding of TARs and their possible origins.
Williams, Clark
Faculty mentor: Christine Lemley, Christopher Jocks, Carissa June Tsosie

Session II, 2:00pm-4:00pm, 50C
Title: The American Indian Pursuit of Higher Education
The project focuses on the cultural and material differences that individuals who have grown up in American Indian homes have had to deal with or face in order to pursue higher education as opposed to other cultures.

Williams, Jazmine
Faculty mentor: Natalie Cawood

Session I, 9:00am-11:00am, 84C
Title: Eating Chocolate While Doing Homework
This is an individual behavior change project. I have a bad habit of eating chocolate while doing my homework. I decided to switch out chocolate with healthier snacks like applesauce and fruits. I kept track of how well I have been doing and how it affected the time I finish my homework in and my daily diet.

Williams, Justin
Faculty mentor: Tara Kohn, Liza Minno

Morning, 9:40am-10:00am, Skydome Stage A
Title: Queering Islam: Queer Muslim Identity as Exhibited in Museums
This research project represents a case study analyzing Just Me and Allah, an independent photography exhibit presented in various venues throughout Toronto, Canada from July 18th to October 5th, 2014. This exhibit provided audiences with photographic portraits and interviews of Canadian individuals who identified as both queer and Muslim. The project was created by writer and photographer, Samra Habib. Habib's portraits and interviews sought to create a visual representation of the existence of queer Muslims. By engaging with and analyzing Just Me and Allah, this project seeks to debunk prevailing arguments in academia which portray Muslim and queer identities as monolithic and incompatible with one another. In turn, the project will also compare Just Me and Allah with Hide/Seek, a prior exhibition of similar scope and topic that was showcased at the National Portrait Gallery in Washington D.C. between October 30th and February 13th, 2011. Hide/Seek focused on American portraiture and the exploration of queer identity through such art. It is the stance of this research that Hide/Seek sought to represent the narrative of white queerness as a national one in the context of the United States/North America. As such, through a comparative approach, this project argues that both homonationalist and orientalist rhetoric can be found in national museums seeking to re-present historical and cultural narratives of queerness and race.

Williams, Kasey
Faculty mentor: Britton Shepardson

Session II, 2:00pm-4:00pm, 69B
Title: The Natural History of Humans and Horses
Today, horses and humans share a special bond, but it wasn't always this way. Humans and horses first interacted and hunted and prey. Since then, our use of horses has evolved greatly. Horses were first domesticated in Central Asia 5000 years ago, but not for transportation. They were domesticated for meat and milk. Soon the efficiency of equine transportation was realized. Following that was the invention of the horse-drawn cart and plows. Horses were easily the one of the best assets of early humans. Horses were extremely valuable to human development for thousands of years. The domestication of the horse is one of the most integral moments of pre-history. The advancement and success of the human race rode on the backs of horses.

Williams, Kaydee
Faculty mentor: Becky Butcher

Session II, 2:00pm-4:00pm, 115C
**Title: Childhood Obesity Prevention in American Indian Communities - Building Healthier Generations**

Obesity is a growing epidemic that is clearly effecting American Indian communities. Obesity is an avoidable disparity. The two factors Environmental and Economic are the result of the epidemic. There is a lack of Obesity Preventions and therefore through research, a prevention aimed at children to establish healthier eating habits and increased physical activity is the answer to reducing obesity among future generations. According, to the Epidemic of Obesity in American Indian Communities, 'the poor success rate of adult obesity treatment programs in the general population points to the need to develop prevention approaches aimed toward children' (Story & Evans et. al. 1999). The prevention strategy is to educate the youth about healthy eating habits, while practicing those higher intakes of fruits and vegetables with fun recipes. Proper physical activity techniques will be established, with the involvement of parents, because children are vicarious learners. The Social Cognitive Theory (6-step process) established by Albert Bandura will be used to strategically plan the Childhood Obesity Prevention (Bandura, 2011).

**Wilson, Bobbi**
Katie Cloud, William Pleitgen  
**Faculty mentor:** Robert Sanford

**Session II, 2:00pm-4:00pm, 6B**

**Title: Take Back the Tap Campaign at Northern Arizona University**

Bottled water undermines the fundamental human right to water by making it a corporate commodity. Communities and institutions are resisting the bottled water industry and fighting to maintain control over their water. Northern Arizona University has invested in reusable water bottles and water filling stations however disposable bottles of water are still being distributed. The Take Back the Tap campaign, a project of Food and Water Watch, has been implemented at NAU to achieve the goal of eliminating bottled water on campus. Students were surveyed and asked to pledge to choose tap water instead of bottled water. Class announcements and campus demonstrations were used to educate the NAU community and fliers were posted to spread awareness about the campaign. Finally, petitions were collected to urge administration to eliminate bottled water from vending machines. Preliminary results indicate that the majority of NAU students a) believe bottled water is bad for the environment; b) rarely purchase bottled water on campus; and c) own a reusable water bottle. Therefore, continuing to distribute bottled water on campus is unnecessary. The Take Back the Tap campaign will be carried out until bottled water is eliminated from Northern Arizona University. Success of this initiative will contribute to continued public control over our most precious natural resource.

**Wilson, Bobbi**
Tyrell Pauling, Erik Van Der Maas  
**Faculty mentor:** Russell Benford, Nashelly Meneses

**Morning, 11:24am-11:36am, duBois Meadows Room**

**Title: Demand and Proposed Methods for Local Food Production on Saipan**

In the United States increasing demand for local food is evident. This trend is less evident in the Pacific Island of Saipan. This study assessed the demand for increased local food production, barriers to farming, and potential for growing greens on Saipan. A survey of 20 restaurant owners evaluated dependence on imported food, challenges to increasing local food production and demand for locally-grown produce. Also, arugula, spinach and lettuce were grown outdoors to determine crop success. Productivity of lettuce was then compared to lettuce grown hydroponically. The results of the survey showed that 67% of produce used in Saipan's restaurants is imported and only 33% is locally-grown. The vegetables in highest demand (lettuce, tomato, cabbage, broccoli, eggplant, carrot, onion and spinach) are not typically grown on Saipan. However 62% of restaurant owners report that serving locally-grown produce would positively affect their business. The results of the soil-gardening experiment showed that arugula was moderately successful and spinach and lettuce were unsuccessfully grown outdoors. Lettuce grown hydroponically was more productive than lettuce grown outdoors. Therefore there is high demand but inadequate local supply of the vegetables used most in Saipan's restaurants. Hydroponics offers an alternative approach; however, some disadvantages exist. Diversifying local food production and adapting to seasonal availability may reduce dependence on imported food. The results of this study may inform future farming methods, the development of which will contribute to greater variety of local produce on Saipan.
Wilson, Cheyenne
Madisen Hachey, Trey Mohoroski, Sierra Vaughn, Aaron Ferris
Faculty mentor: Ana Maria Varela-Lago, Christi Lyn Carlson

Session II, 2:00pm-4:00pm, 129C

Title: Spain in the 1930s: Teaching History and Historical Analysis Skills Through Newspapers

This poster illustrates how newspapers can be used in the classroom to teach history and historical analysis skills. As primary sources, newspapers offer a wealth of information about the time period they cover, but they can also serve as valuable and engaging tools to teach students how to critically read, analyze, and evaluate information through texts and images. The years spanning the Spanish Republic and Civil War (1931-1939) yield a large and varied archive of newspaper articles. Coinciding with the rise of war photojournalism, this conflict also provides an excellent context within which to study the importance of photographs as instruments of propaganda. By assessing the strengths and weaknesses of newspapers as historical sources, students can develop essential skills as they learn about a defining event of the 1930s in Spain, Europe, and the world through a medium that is frequently overlooked or underutilized.

Wilson, Emily
Jacob Atkins
Faculty mentor: Karen Schairer

Session I, 9:00am-11:00am, 130B

Title: The Value of Oral Histories in a Global Community: Experiences from the Salvadorian Civil War

For learners, the benefits of authentic language are plentiful. There is evidence that authentic language supplies linguistically and culturally rich material for language learners (Rahman, 2014). Learning from authentic language sources incites interest in students, and prepares them for real-world communication. As opposed to scripted language, authentic language features regional speech patterns and vocabulary. Typically, marginalized peoples, such as agricultural workers, elderly, and indigenous peoples are not represented in language learning texts. Our research purposes to preserve authentic language and original anecdotes of individuals who lack representation in many language learners' texts, by archiving video interviews of Salvadorian people who experienced the civil war in El Salvador, and creating transcriptions of their interviews. The civil war in El Salvador was an extremely violent conflict between the militarized government and a revolutionary group, entitled the Farabundo Marti- National Liberation Front (FMLN). The conflict started in 1979 and ended in 1992. The interviews featured in the research were conducted by Karen Schairer, Ph.D, in 2000. The researchers transcribed and indexed the interviews, so that the unique experiences of these Salvadorian people are preserved and accessible to a global community.

Wilson, Emily
Crystal Reynolds
Faculty mentor: Michael Alban

Session II, 2:00pm-4:00pm, 59C

Title: Cue-based Differences in Memory Monitoring Accuracy

The availability and diagnosticity of memory confidence cues vary as a function of how people approach an information-learning task. Our research adds to a series of experiments designed by Alban, Kelley and Mitchum (in preparation) to examine the relationships between study time, confidence, monitoring accuracy, and performance level. Alban et al. found that study time, an easy-to-collect measure of memorizing effort, is used as a cue for judgments of learning (JOLs). Analysis of the study time-JOL correlation across levels of performance revealed that high performers tend to make more use of study time as a cue for metacognitive judgments than low performers, which may be the case even when participants are given a deep processing task (e.g., sentence generation). Interestingly, the validity of study time in terms of its correlation to performance may be quite low when sentence generation is used as a study strategy, possibly because successfully generating a sentence may be more important than the time it takes to form a sentence. We sought to shift participants to rely on sentence generation, rather than study time as a cue for JOL. We predicted that participants in a sentence instruction-only condition will too heavily rely on study time, to the detriment of their metacognitive accuracy, whereas participants in a condition which emphasizes a sentence generation cue will shift to reliance on successful sentence generation, resulting in high levels of metacognitive accuracy.
Wilson, Hannah
Tonya Keno, Krystal Anderson

Faculty mentor: Erika Nowak

Session II, 2:00pm-4:00pm, 14A

Title: Analysis of Enclosure Conditions for the Construction of a Thamnophis rufipunctatus Vivarium

In 2014, narrow-headed gartersnakes (Thamnophis rufipunctatus) were listed as a threatened species under the Endangered Species Act. Threats to the species in the wild include habitat destruction through fire and declining fish populations. Following the Slide Fire in 2014, a multi-agency team worked to collect wild gartersnakes from Oak Creek and bring them to Northern Arizona University in order to secure a breeding population in captivity. Captive husbandry has been challenging in this species, in part because this species is adapted to higher-elevation environmental conditions which are difficult to replicate in indoor settings. The NAU Green Fund and other state and federal partners have provided funding to build a new vivarium to house these sensitive snakes in a naturalistic setting where they will be encouraged to breed. This project will assist with species recovery in Oak Creek and possibly provide animals for release elsewhere in their former range. There are four possible existing enclosures which could contain the vivarium. We evaluated which enclosure is the most suitable (thermally stable) by comparing temperature and humidity data between enclosures and also to outdoor weather in Flagstaff from November 2014 to March 2015. The dataloggers will be redeployed to assess spring and early summer conditions before deciding on the best location for the vivarium. This project is critical to determining the best conditions for siting the gartersnake vivarium, which is a much needed component to preserving this threatened species.

Wilson, Lindsay

Faculty mentor: Robyn Martin

Afternoon, 2:20pm-2:40pm, Skydome Stage B

Title: Using Journalism to Foster Science Literacy

Science literacy is a necessary component of a well-informed and capable society. Individuals need to be able to understand the difference between an opinion and a supported, peer-reviewed fact. However, there are many barriers preventing development of a scientifically literate public, such as flaws in education and negative cultural feelings towards scientific progress as a whole. Scientists themselves must learn to communicate their research to a less concentrated audience through mass media in order to spread the importance and impact of their work while educating the public. By creating content through news sites, blogs, and other social media, scientists can be confident that there is no misinformation regarding their research being consumed by the public. My presentation focuses on how to translate science from complex methodologies and results to an understandable format by reframing the topic into something the public will want to read.

Wilson, Sydney

Faculty mentor: Christine Lemley

Afternoon, 1:30pm-1:50pm, Skydome Stage C

Title: Integrating LGBTQIA Issues Into the Choral Classroom

As a future music educator, I have found that there is a distinct lack of discussion and education of LGBTQIA issues within the education system. The idea behind this project is to create a unit plan that combines LGBTQIA issues into the choral classroom in a non-imposing way. The central idea of this project is to use critical oral history, both for the students who will use this lesson plan and for myself while I create this unit plan. Critical Oral History is the use of oral history to promote social justice transformation as well as to conduct interviews whose primary focus is to elaborate on structural inequities and injustices. Throughout my lesson plan, I will focus on LGBTQIA icons throughout music history, as well as to require my students to conduct interviews of LGBTQIA individuals within the choral community. The endgame of this project is to have a unit plan that other teachers can use if they would like to integrate LGBTQIA studies into their choral classroom. Ultimately this lesson plan will be published in Dr. Christine Lemley's book, Connecting School to Community: Using Critical Oral History to Promote Transformation. Not only will it include the unit plan, it will also include explanations of my universal design and culturally relevant pedagogy and how they will be incorporated into my lesson plan. Finally, I will also discuss the pros and cons of completing the project, and how I can use this project to maximize critical engagement amongst my peers and my students.
Wilson, Tomoko
Tanya Sutton, Catherine Propper
Faculty mentor: Catherine Propper, Tanya Sutton

Session II, 2:00pm-4:00pm, 14C

Title: The Effects of Wastewater Effluent on Gonadal Development in the American Bullfrog (Rana catesbeiana)

Wastewater effluent (WWE) contains endocrine disrupting compounds that have the potential to cause adverse effects on gonadal development across a number of vertebrate species, including amphibians. Research demonstrates that amphibians exposed to WWE containing a number of different compounds have female skewed sex ratios and a high occurrence of intersex gonads. Amphibians act as an indicator species revealing the impacts of environmental pollutants, and observed homeostatic disruption could have potential human health implications. We tested the hypotheses that reproductive development and sex-determining gene expression in pre-metamorphic populations of amphibians are influenced by pollution, and that remediating the environment influences gonadal development. A reference site and a WWE receiving site were identified and pre-metamorphic Rana catesbeiana tadpoles were collected. In a reciprocal transplant experiment, half of the tadpoles from each group stayed in their original water, while the other half were exposed to water from the opposite site for 43-45 days. Gonadal tissues were collected and animals were sexed using gross and histological examination. Gonadal tissues were also analyzed for the expression of SF-1 and CYP19, genes involved in gonadal development. Comparative analysis of gene expression and sex ratios will confirm whether exposure to WWE alters reproductive development, and whether the animals have the plasticity to overcome these effects once exposure to pollution has ended. This study has the potential to guide future management of WWE and remediation.

Wilson, William
Christopher Dosdall
Faculty mentor: Dennis Foster

Session II, 2:00pm-4:00pm, 34C

Title: A Case Study in Public Choice Theory of the Flagstaff Aquaplex

The Aquaplex in Flagstaff is a publicly run facility that would be better suited as a privately run facility. The building of the Aquaplex cost about $16.6 million dollars to build and was paid for through property taxes, while maintenance and operations were to be paid for through admission fees. This is unfortunate for the people who live in the city of Flagstaff. These residents have to pay property taxes for the Aquaplex as well as an admission fee, so they are being charged twice to use the Aquaplex. Also, in 2011, the city was considering closing the Aquaplex on Tuesdays, which would save the city about $60,000 per year. Even though the movement never took place, this shows the Aquaplex was having a hard time funding itself. Privatizing the Aquaplex would benefit the city of Flagstaff, the residents of Flagstaff, and the Aquaplex itself. The city would no longer have to run a facility that is not profitable. The new ownership, if privatized, would probably not have to pay off the debts. But they could design a pricing strategy that would make the Aquaplex profitable. The residents of Flagstaff would no longer have to pay property taxes on a facility that many residents may not use. Finally, the Aquaplex would benefit by possibly providing better service to its customers through privatizing the ownership, causing more people to go to the Aquaplex.

Winkler, Robert
Nancy McCollough, Kevin Meyer, Tomas Zukowski
Faculty mentor: Steven Jacobs, Brian Conn

Session II, 2:00pm-4:00pm, 9B

Title: Implant Battery Charger GUI Research & Development

One in eight people over the age of 12 have hearing loss in both ears. To help these people live convenient and fulfilling lives, Cochlear Boulder LLC created the Carina Middle Ear Implant to replace inconvenient and bulky hearing aids. This implant uses an integrated battery to power the device and must be charged on a regular basis. However, the current interface of this charging device is non-intuitive and does not provide the user with relevant information about the implant or charger batteries. This forces the user to estimate information that should be easily accessible, including the charger battery and implant battery levels, and the connection status between the two devices.
Cochlear wishes to combine the implant charging functionality with the RA230 remote assistant, a device which allows patients to control various implant settings. The team analyzed and researched many charging interfaces to provide demos of better charging Graphical User Interfaces (GUIs) to reference when incorporating the charging functionality into the RA230. These demos created will not be implemented onto the hardware by the team, but aim to demonstrate potential charging GUIs that Cochlear can reference when designing the new charging hardware GUI. The team created two interface variations in an Android environment to simulate the portable hardware. The first emulates all the physical limitations imposed by the RA230 hardware (e.g. screen size, buttons, etc.). The second makes use of a touchscreen interface in case Cochlear creates an entirely new hardware set to include such functionality.

**Winkler, Robert**  
Nancy McCollough, Kevin Meyer, Tomas Zukowski  
**Faculty mentor:** Steven Jacobs, Brian Conn

**Morning, 10:45am-11:10am, duBois Festival Room**  
**Title: Implant Battery Charger GUI Research & Development**

One in eight people over the age of 12 have hearing loss in both ears. To help these people live convenient and fulfilling lives, Cochlear Boulder LLC created the Carina Middle Ear Implant to replace inconvenient and bulky hearing aids. This implant uses an integrated battery to power the device and must be charged on a regular basis. However, the current interface of this charging device is non-intuitive and does not provide the user with relevant information about the implant or charger batteries. This forces the user to estimate information that should be easily accessible, including the charger battery and implant battery levels, and the connection status between the two devices. Cochlear wishes to combine the implant charging functionality with the RA230 remote assistant, a device which allows patients to control various implant settings. The team analyzed and researched many charging interfaces to provide demos of better charging Graphical User Interfaces (GUIs) to reference when incorporating the charging functionality into the RA230. These demos created will not be implemented onto the hardware by the team, but aim to demonstrate potential charging GUIs that Cochlear can reference when designing the new charging hardware GUI. The team created two interface variations in an Android environment to simulate the portable hardware. The first emulates all the physical limitations imposed by the RA230 hardware (e.g. screen size, buttons, etc.). The second makes use of a touchscreen interface in case Cochlear creates an entirely new hardware set to include such functionality.

**Winters, Christopher**  
**Faculty mentor:** Gregory Busath

**Session II, 2:00pm-4:00pm, 99A**

**Title: The Effects of Physical Attraction on Forgiveness in a College Population**

Physical attraction plays a vital role in any human interaction and influences decision-making processes. Diversity in cultures and ethnicity influence perception in attraction and interaction. The innate competition in same sex genders for the opposite sex influence behaviors towards rivals. All of these processes are contributing variables that influence human behavior when interacting with others. Factorial analyses are conducted to measure the differences in same sex rivals, opposite sex subjects, and racial discriminations in correlation to physical attraction. Correlations were found that suggest higher degrees of physical attraction are related to the amount of forgiveness one may have towards the opposite sex. Furthermore, harsh judgments were significant in same sex judgments for those who were perceived to be an attractive rival. Lastly, there are correlations linking racial discrimination in determining forgiveness.

**Wipf, Stephen**  
Stephen Wipf  
**Faculty mentor:** Chad Woodruff

**Session I, 9:00am-11:00am, 104B**

**Title: Self-Other Differences in Mu Suppression Do Not Require Observer-Movement**

Previous research demonstrates a reliable difference between the level of mu suppression elicited by observing others and that elicited by participant movement-execution. Furthermore, these self-other differences in mu suppression have been linked to empathic perspective-taking, with larger self-other mu suppression differences being related to greater self-reported perspective-taking. It is unclear however whether these self-other differences obtain only when the self-
condition involves movement execution, or would a reliable difference obtain when no movement is executed by participants. We tested this question by using a common motor movement, handshaking, to assess mu suppression self-other differences in healthy undergraduate students. Using electroencephalography (EEG) to quantify the mu suppression elicited by self and other, we individually video recorded 22 participants extending their hands toward a researcher, as if to shake it (self-condition). We then video recorded a researcher perform the same handshaking movement toward the participant (other-condition). Task by electrode analysis was conducted using a repeated-measures ANOVA (n=20) in which was found a significant main effect of task (p<.01) in the mu band-range for electrodes F3, Fz, and F4. To our knowledge, these results are the first to reveal self-other differences in mu suppression even without participant movement-execution. These results suggest that mu suppression differs as a function of the identity of the social target, rather than the participant initiating a movement themselves and replicates and extends previous findings of the self-other differences in mu suppression.

Wipf, Stephen
Victoria Lopez, Stephen Wipf
Faculty mentor: Chad Woodruff

Session II, 2:00pm-4:00pm, 104B

Title: Self-Other Differences in Beta Enhancement/Suppression Do Not Require Movement Execution

Beta enhancement and suppression are related to one's ability to identify emotions of others as well as one's self. In order to fully empathize with another, one must be able to discriminate between emotions one experiences because they belong to the self, compared to emotions one is experiencing vicariously through simulation processes. While research has shown that beta suppression obtains during movement observation and execution, we assessed whether differences would occur between observing oneself compared to observing another. Participants viewed videos of an actor extending his/her hand to another actor, as if to shake hands. In two blocks, videos involved the participant performing the action while two additional blocks involved a stranger performing the action, forming two conditions, self and other. EEG data were collected from electrodes F3, Fz and F4 were bandpass filtered 15-30Hz and submitted to a repeated-measures ANOVA (N = 20). This ANOVA revealed a marginally significant main effect of task (self/other; p = .05). An independent sample t-test revealed that beta suppression in electrode F4 was significant in the self-condition only. While initially we expected to see beta enhancement in the self-condition, we believe that there was suppression because the participants were not actively being asked to identify an emotion. We will attempt to account for these results with a model that assumes beta suppression and enhancement arise from different populations of neurons.

Wisniewski, Emily
Faculty mentor: Bruce Aiken

Afternoon, 2:00pm-4:00pm, Skydome CAL floor

Title: Landscape Painting

This is an art exhibit, in which I will display three finished landscape paintings while creating a fourth. I have chosen the topic of landscapes because they are powerful, spontaneous images that have unbelievably deep subject content. For example, a single leaf may have several underlying colors to it. Furthermore, in its natural context with light hitting it depending on the time of day and it's positioning on the tree, surrounding foliage reflecting their colors or textures, and the color of bark beneath it. The purpose of my landscape study is to compliment and interpret innate complexities found in nature. I paint with oil paints to further the richness of color and texture in my paintings. With oil paints I can better express the beauty of mountains, valleys, and trees. Through engaging in the age-old technique of landscape painting, I hope to further my personal understanding and appreciation of the complex beauty of nature that we are surrounded by every day. But more than this, I hope to inspire my viewer to do the same. Through this exhibit, I hope to make my love of landscapes infectious, and help show other people what a beautiful world we live in.

Wisniewski, Emily
Faculty mentor: Bruce Aiken

Morning, 9:00am-11:00am, Skydome CAL floor

Title: Landscape Painting
This is an art exhibit, in which I will display three finished landscape paintings while creating a fourth. I have chosen the topic of landscapes because they are powerful, spontaneous images that have unbelievably deep subject content. For example, a single leaf may have several underlying colors to it. Furthermore, in its natural context with light hitting it depending on the time of day and it's positioning on the tree, surrounding foliage reflecting their colors or textures, and the color of bark beneath it. The purpose of my landscape study is to compliment and interpret innate complexities found in nature. I paint with oil paints to further the richness of color and texture in my paintings. With oil paints I can better express the beauty of mountains, valleys, and trees. Through engaging in the age-old technique of landscape painting, I hope to further my personal understanding and appreciation of the complex beauty of nature that we are surrounded by every day. But more than this, I hope to inspire my viewer to do the same. Through this exhibit, I hope to make my love of landscapes infectious, and help show other people what a beautiful world we live in.

Wood, Katherine  
Faculty mentor: Erika Hess

**Afternoon, 2:24pm-2:36pm, Skydome Stage A**

*Title: Culture in My Language*

Culture is defined in the Miriam-Webster dictionary as 'the act of developing the intellectual and moral faculties, especially by education'. This project examines the way in which regional nuances in culture affect the language-learning classroom. In this project I am analyzing one foreign language program in Flagstaff, AZ and two different programs in France. The three language programs that I am examining are: the Program of Intensive English (PIE) at Northern Arizona University, Français Langue Étrangère (FLE, or French as a Foreign Language) at l'Universite de Caen Basse-Normandie, and the integrated international program at l'Universite de Nice Sophia-Antipolis. I have devised a study of cultural impact within language-learning classrooms through a series of observations and interviews, personal experiences, and pedagogic and linguistic research. I am focusing on the interrelationships between applied linguistics and ones' home culture, ultimately analyzing the perceived importance of different aspects of language. In France, for example, I have identified the importance that is placed on upholding tradition, specifically the French language, and the value instilled in its written forms. In the United States, I have found a pattern of discussion and debate which has often driven the auditory and verbal competencies of students. I am particularly interested in the speaking and listening aspects of language learning and how their instruction is influenced by regional and national customs. This project is important because it gives an insight to the influences of culture on language learning. I am completing this project to fulfill the capstone requirement for my undergraduate degree in Global Languages and Cultures with a French Emphasis.

Woody, Michael  
Chloe Lira, Sarah Carpenter, Meaghan Scott, Amanda Williamson, Aryn Hudak, Jenna Wright, Taylor Chesley  
Faculty mentor: Patricia Murphey, Bjorn krondorfer, Martin Kalb, Gretchen McAllister

**Session I, 9:00am-11:00am, 129B**

*Title: Through the Eyes of Youth: Life and Death in the Będzin Ghetto*

Through the Eyes of Youth: Life and Death in the Będzin Ghetto is an interdisciplinary undergraduate research project that was created in January 2013 for the purpose of constructing an educational exhibit on the Będzin ghetto in Poland during the Holocaust. The framework of the exhibit centralizes the impact of the Holocaust with a unique focus upon the lives of Jewish youth of Będzin. The objective of the second phase of the project, which began in Fall 2014, is to create a digital history archive building off of the exhibit and was facilitated by the students in this presentation. This stage includes additional historical research to supplement the content provided in the exhibit and more interviews with Będzin survivors and their family members. The graphic design team conceived the visual design of the Through the Eyes of Youth online component and worked with the computer science team in programming the functional website. The education team developed lesson plans and teaching materials to accompany the traveling exhibit.

Worden, Jennifer  
Faculty mentor: Ana Varela-Lago

**Morning, 10:40am-11:00am, Skydome Stage A**

*Title: Stalin, Stanislavski, and the System: An unlikely creative boom in a country of censorship and shortages*
Within the Western theatre community, the name Konstantin Stanislavski is revered. Theatre practitioners from the high school to professional levels know his name and have been influenced, knowingly or not, by his work. In a similar but opposing vein, the name Josef Stalin evokes negativity and images of oppression. Yet in interwar Russia, these two men, Stanislavski and Stalin, not only co-existed with, but also co-depended on each other. Stanislavski provided the Soviet leader theatrical propaganda while Stalin provided the theatre director funding and protection. This gave Stanislavski the flexibility, not afforded to other thespians, to continue the revolutionary practices he had begun in 1898. But Stanislavski's rise to international renown did not take place overnight. As is the case with most influential artists, he contended with a large number of critics. Surprisingly, Josef Stalin was not among them. In a time period generally characterized by censorship and state-controlled industries, the most innovative and important theatre company of the twentieth century flourished and solidified its place as the standard by which all other Western theatres would be measured. This analysis examines the relationship between Stalin and Stanislavski by interpreting a number of newly accessible primary sources as well as expanding on the research and findings of various scholars. It will argue that this relationship allowed Stanislavski and his colleagues to influence the official party line regarding theatre and opened avenues by which Stanislavski was able to continue his relatively experimental work.

Wright-Garba, Nuria
Faculty mentor: Lisa Chien

Session II, 2:00pm-4:00pm, 6C
Title: Star Formation in the Tadpole Galaxy (UGC20124)

Studying star clusters in merging galaxies gives a greater understanding of star formation and galaxy dynamics, as well as the variances in both. This project focused on multi-object spectral data of the disrupted galaxy UGC 20124, gathered with the Low Resolution Imaging Spectrometer on the Keck I Telescope on Mauna Kea, Hawaii. Data were collected of star clusters in the core, arms, tail, and disrupted disk of the galaxy. They were then reduced using the Image Reduction and Analysis Facility (IRAF). Graphs of the spectral data were made, plotting wavelength vs. relative flux of features from 3000 to 5500 angstroms. These plots displayed emission features from the ionized gas around young clusters and absorption features from the stars themselves after gas had dispersed from old clusters. The most prominent features were the hydrogen Balmer series and singly and doubly ionized oxygen forbidden lines. The equivalent widths of these features were measured to determine the ages of these clusters. A variety of ages were found, scaling between magnitudes of 105 to 106 years. Some of the younger clusters were found to be in the tail of the Tadpole galaxy and are speculated to be within the disrupted disk. This presents hints as to what brought about star formation in these regions of the galaxy.

Yamauchi, Kerry
Evan Atwood, Brendan Hollenbaugh
Faculty mentor: Sara Mushro

Session II, 2:00pm-4:00pm, 39D
Title: Lowell Observatory Market Research

This study was conducted to analyze Lowell Observatory's target audience in order to identify strategies to penetrate, engage, and retain this audience. Primary market research was conducted via survey in order to identify specific demographics and consumer behaviors of Lowell Observatory's target audience. The ultimate goal of this research project is to provide Lowell Observatory with the necessary information concerning marketing functions in order to employ effective marketing campaigns.

Yaney, Matthew
Faculty mentor: Becky Butcher

Session II, 2:00pm-4:00pm, 118C
Title: Universal Design as a Standard

Universal design is become an important part of interior design. There are a lot of codes and regulations that are put in place to help the handicapped or the elderly in having a better standard of living. My presentation will be in support of universal design being the standard for design, more importantly it will be the benchmark for new codes and regulations to further advance the standard of living. I believe that it should be implemented so that houses and
buildings built with universal design will actually withstand the test of time. For example as one family or business moves out and the next moves in, there will be less renovations and more money will be saved. This just scratches the surface on what universal design can do if it were developed into a standard for the nation.

Yazzie, Santana
Jessica Bush, Grant Pooley, Brittany McKee
Faculty mentor: Phoebe Morgan

Session II, 2:00pm-4:00pm, 88B
Title: Alternative Dispute Resolution Club: 'Getting To Yes!'
This poster will depict the evolution of a senior capstone project completed by a team of CCJ majors to fulfill the requirements for CCJ 480: Alternative Dispute Resolution. The target of this project is to effectively implement methods for dispute resolution through an Alternative Dispute Resolution Club on campus. The mission of this club is to put these methods into action by helping other students, clubs, and organizations find ways of alternative ways to resolving their disagreements. This is one of two groups in the CCJ 480 capstone class working on this project. Together we organized and hosted events for recruitment and fundraising. Our first event was a kickoff event organized to gain recruits for the following years in order to maintain the sustainability of the club so it can continue to be a resource on campus after the club member's graduate. In addition, we sponsored other capstone projects and held events for fundraising throughout the semester.

Yellowhair, Jonathan
Jonathan Yellowhair
Faculty mentor: Michael Lerma

Session I, 9:00am-11:00am, 77A
Title: Post Traumatic Stress Disorder on the Navajo Nation
Many people among the tribe of the Navajo suffer from PTSD and little research is being done about it. Two of the main groups that are dealing with it are, the veterans returning from service and their tours of duty and children that deal with domestic violence in the home at a very young age.

York, Michael
Faculty mentor: Carly Long

Session II, 2:00pm-4:00pm, 79C
Title: George (Babe) Ruth and George Mead have more in common than just their names
My project is about how the social penetration and symbolic interactionism theory relate to my future career. I'm aspiring to be a sports reporter. In the sports world it is important for reporters to gain the trust of the players. One benefit from players trusting a reporter is that the players will do a better interview. The social penetration theory can allow for reporters and players to gain a better understanding of each other. Symbolic interactionism is also important in the reporting field. The three main aspects of communication in this theory are meaning, language, and thought. All three of those aspects are vital in the reporting field.

Yoshioka, Harrison
Faculty mentor: Britton Shepardson

Session I, 9:00am-11:00am, 69C
Title: Prehistory of Weapons and Warfare
I would like to pursue the topic of the prehistory of weapons and warfare. My format will be the default poster made on Microsoft PowerPoint; to be printed through the anthropology department. For a few of the sites and cultures that I will be looking at are the technologies and development of the atlatl, the progression of the Clovis spearhead, and the war cultures of Polynesia (specifically Hawaiian and Maori cultures). I would like to map out the chronology of these weapons and cultures and determine the effectiveness each cultures' weapons. Having family scattered throughout the islands of Hawaii, I am very interested in the cultures of this part of the world.
Young, Janalie
Louis Irving
Faculty mentor: Ann Huffman, Blake Miley

Session I, 9:00am-11:00am, 93A
Title: Dual-Military vs. Dual Career Marriages with Children Still at Home: Work and Family Related Outcomes
Parents in recent times have had to adapt to balancing often-competing demands of work and home life, and depending on the age of children those demands can seem overwhelming. Though these stresses can be seen throughout the whole spectrum of today's society, perhaps no population is more affected by this than those with families who serve in the Armed Forces. This study compares military personnel parents who have spouses who also serve in the army (i.e. dual-military) with military personnel parents who have a spouse with a career outside of the army (i.e. dual-career) to see if there is a difference in work and family outcomes. Additionally, we examine whether age of child for both of these groups is an important predictor of work and family outcomes. Members of the army completed a battery of surveys on a variety of work and family related constructs, including family satisfaction, family functioning, work-family conflict, job satisfaction, and job performance.

Yubeta, Jason
Maranda Breese, Paige Kimble
Faculty mentor: Ted Martinez

Session II, 2:00pm-4:00pm, 112B
Title: Children in Nature
This poster examines the importance of nature in the lives of children. With an ever-increasing availability of technology, children are turning more often to electronic entertainment and less towards outdoor enjoyment. This poster will attempt to shed light on the effects that overexposure to technology has on child development, while also showing that exposure to natural environments can reap long-term mental and physical health benefits. Early exposure to nature among young children can lead to healthy bodies as well as healthy minds.

Zagar, Rhea
Carter Hranac, Benjamin Turner, Ashley Gun andersen, Nathan Nieto
Faculty mentor: Nathan Nieto

Session II, 2:00pm-4:00pm, 15D
Title: The Prevalence of Tick-borne Pathogens found in Rodentia spp. in Regions of Northern Arizona
Many tick-borne diseases are associated with wildlife populations, specifically throughout the southwest regions of the United States. In the eastern portion of Arizona, the emergence of Rocky Mountain Spotted-fever (Rickettsia rickettsia) has given rise to the importance of surveillance for tick-borne diseases in this area. This study was aimed at detecting the presence and prevalence of tick-borne pathogens that are endemic to Northern Arizona. The reservoir magnitude of Rodentia in northern AZ is still unknown, but because of the wide-range of wildlife in this region, they are excellent potential hosts for tick-borne pathogens. Wildlife also has an important part in the ecology of ticks, and helping maintain tick populations. Many species of Rodentia were assessed for the presence of tick-borne pathogens, specifically Anaplasma phagocyophilum, and R. rickettsia. The data collected will give evidence to the maintenance and reservoirs of tick-borne pathogens in northern Arizona. The prevalence of pathogens in wildlife is of clinical importance in predicting the risk of human infections from tick-borne diseases in northern Arizona.

Zamora, Lyndsey
Faculty mentor: Melissa Santana, Gary Vallen

Session I, 9:00am-11:00am, 125C
Title: Designing for the Millennial Generation
The Spotlight Sushi Bar and Teppanyaki at the Gas Lamp draws San Diego's rich history where gas lamps lined the streets to its new up and coming new generation of design and contemporary look and feel. The highlight for the
millennial generation as they crave excitement, relaxation, interaction with nature, people, and technology, the Spotlight provides all of the aesthetics that this generation wants and needs. With the perfect location of the Gaslamp will provide The Spotlight wants to attract tourists, locals, business, and sport enthusiasts as the Gaslamp and Spotlight are located near the San Diego Conference center and Petco Park. Interactive, and Exhilarating, and Enjoyable are the descriptive words my clients want to provide their new restaurant and bar.

Zarr, Sarah
Faculty mentor: Viktoria Tidikis

Session I, 9:00am-11:00am, 104D

Title: The Relationship Between Self-Report and Behavioral Measures of Creativity

The data from this study was drawn from a larger study examining variables involved in the creative process. This study examined the relationship between self-report and behavioral measures of creativity. The Kaufman Domains of Creativity scale (Kaufman, 2012) was used to measure the domains of self/everyday, scholarly, performance, science, and artistic creativity. The Creative Behavior Inventory (Hocevar, 1980) was used to measure creativity in the domains of literature, music, arts, math, craft and performance. Divergent thinking tasks (Guilford et al., 1951) were used to assess fluency, originality, flexibility and elaboration. After performing a Pearson's correlation, significant correlations were found between the both self-report measures overall, as well as, between the self-report measures overall scores and the divergent thinking fluency and originality. Domains of creativity from the Kaufman Domains of Creativity scale including scholarly, performance and artistic all exhibited significance with divergent thinking fluency and originality. Domains of creativity from the Creative Behavior Inventory including literature, craft, arts, and math exhibited significance with all variables of the divergent thinking task.

Zhang, Katie
Faculty mentor: Zsuzsanna Gulaci

Session I, 9:00am-11:00am, 129D

Title: Cats as Pets in Song Dynasty Painting

Cats in the Song Dynasty transformed from working domestic animals to household pets. This addition to Chinese elite culture is seen clearly through imperial court paintings. Using specific details such as color saturation, balance, and viewpoint, we can make the argument that cats were an integral part in the culture of the noble elite.

Zhang, Liyi
Faculty mentor: Britton Shepardson

Session II, 2:00pm-4:00pm, 73B

Title: The archeology of weapons and warfare

Examines all the archeological evidence regarding weapons in the Early Iron Age.

Zhou, Wuke
Ning Zhang, Chenxu Fu

Faculty mentor: Nancy Barron

Session II, 2:00pm-4:00pm, 128C

Title: International Writing Consultation Project

At Northern Arizona University the two majority international student groups are of Chinese origins (population, 296) and of Saudi Arabic origins (population, 213). Both groups of students need immediate attention to improve their English proficiency in writing, speaking, and formal presentations in the classroom. Our internship team's primary focus is the Chinese international students who have more cultural barriers that interfere in the classroom than the Saudi international student group. Differences between the student groups include introverted interactions from Chinese international students as opposed to extraverted interactions from Saudi international students that can be useful in an American classroom. The International English Majors' Mentor Group (IEMMG) began as a part of Interdisciplinary Writing Program (IWP) on Fall 2013 and has faced many administrative obstacles. However, on Fall
2014, we designed a two-year English major mentor plan for the next academic year that didn't interfere with any existing organizations. The two-year plan aim at building a trustworthy relationship with Chinese international students and then help them improving their English proficiency. We approach students in a way that they will make sense in their own culture, such as holding culture nights and face-to-face communication in their native language. As a result, on spring 2015, we have two new students join the term as interns. In the mean time, we have both graduate and undergraduate students that inquire writing consultation from us regularly. For the symposium, we will present more details about our results and findings from the two-year plan.

Ziems, Amy
    Aaron J. Done, Michael Newell, Tinna Traustadottir
    Faculty mentor: Tinna Traustadottir

Session I, 9:00am-11:00am, 12A

Title: Effect of Estrogen on Resistance to Oxidative Stress

Oxidative stress is an imbalance between the production of reactive oxygen species and antioxidant defenses. It is associated with the onset of many age-related diseases, including cardiovascular disease (CVD). Premenopausal women exhibit lower risk for CVD compared to age-matched men, however this difference disappears after menopause, suggesting that estrogen plays a role. Estrogen is known to work as an antioxidant that affects the cell both directly and indirectly. Previous research has shown that postmenopausal women taking estrogen replacement have significantly greater resistance to oxidative stress as compared to age-matched postmenopausal women not taking estrogen. This study tested the hypothesis that resistance to oxidative stress would change across menstrual cycle phases of premenopausal women where estrogen levels fluctuate. Ten women participated in the study (mean age: 21y ± 3y). Resistance to oxidative stress was measured using forearm ischemia/reperfusion (I/R) trial, an acute challenge designed to induce oxidative stress. The I/R trial was administered at two different time points in the menstrual cycle: early follicular phase (days 3-10) and luteal phase (days 19-24). Estrogen was significantly higher during luteal phase compared to follicular phase (171 ±34 vs. 80 ±18 pg/mL, respectively, p<0.01). The challenge was successful in inducing oxidative stress (p<0.05), but there were no differences between follicular and luteal phase responses. These results suggest that the normal fluctuation of estrogen within a menstrual cycle does not change the resistance to oxidative stress. The contradictory results observed in postmenopausal women may be due to wider and more prolonged differences in estrogen levels.