UNDERGRADUATE SYMPOSIUM

TO DISCOVER, CREATE, AND SHARE
FRIDAY, APRIL 27, 2018  |  9 AM – 4 PM

nau.edu/symposium

2018 SPONSORS

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In recognition of outstanding pursuit of new knowledge through experimentation

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College of Social and Behavioral Sciences
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Dan and Cindy Klingberg CEFNS Dean’s Innovation Fund
Honors College
Dr. Henry Hooper

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Office of the President
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Office of the Vice President for Research
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WLB Group

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EAST CONCOURSE

CHECK IN / Entrance

INNOV
HHS
SBS
CEFNS
CAL
COE
HONORS
FYS

Display tables
Poster display
Presentation Stage
Kiosk
Information map
Display tables

DOME FLOOR MAP

du Bois Center – First Floor

N

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Dear Students, Faculty Mentors, and Guests:

I am privileged to welcome you to NAU’s tenth annual Undergraduate Symposium. The students presenting their ideas, creative endeavors, and research today will fill the Skydome and du Bois Center with the excitement of new discoveries.

The sheer scale of the symposium reflects the NAU community’s commitment to research and creative work at the undergraduate level. It also represents our shared dedication to service learning and collaborative projects that connect students with opportunities to make a difference.

Our faculty, who are world-class scholars with a passion for mentorship, create opportunities for exceptional undergraduate learning every day. Their influence, joined with the support of our donors and sponsors, creates an environment where intellectual discipline and joyful curiosity become lifelong habits for our students.

This devotion to student success pays rich dividends. NAU students are not average—they are exceptional. They are motivated self-starters who make the most of every opportunity we can give them, pursuing knowledge about the world around us and communicating their findings in imaginative ways. In doing so, they craft a brighter future for themselves and for all of us.

My congratulations to our students and everyone who contributed to this event.

Sincerely,

Rita Hartung Cheng
President
Undergraduate Expo: A week-long showcase for research in the arts, business, education, the humanities, and the sciences April 19–29, 2018.

Join NAU students, faculty, staff, and the Flagstaff community at the 2018 Undergraduate Expo, a week-long showcase for research in the arts, business, education, the humanities, and the sciences. Several university events are offered in addition to the culminating Undergraduate Symposium. All events are free and open to the public. Learn more at nau.edu/expo.

Thursday, April 19, 2018
Educate2Act
  • 12 pm – 5 pm
  • Eastburn Education, Room 190, Building 27

Thursday, April 19 – Friday, April 20, 2018
Student Water Symposium
  • Thursday: 9 am – 5 pm
  • University Union, Havasupai C, Building 30
  • Thursday: 6:30 pm – 8:30 pm
  • Cline Library, Assembly Hall, Building 28
  • Friday: 9 am – 5 pm
  • University Union, Havasupai AB, Building 30
  • Friday: 6:30 pm – 8:45 pm
  • Cline Library, Assembly Hall, Building 28

Friday, April 20, 2018
Interdisciplinary Climate Change Teach-in
  • 8:30 am – 5 pm
  • University Union, Kaibab Room, Building 30

Wednesday, April 25 – Sunday, April 29, 2018
Student Artist Series
All events held in Ashurst Hall, Building 11 unless otherwise noted
  • Wednesday, April 25:
    • A String Tuba Thing (Tuba Concert), 7:30 pm

Friday, April 27
Bachelor of Fine Arts Show Opening Reception
  • 5 pm – 7 pm
  • Performing and Fine Arts, Beasley Gallery, Building 37
  • Thursday, April 26:
    • Julio Chavez and Michael Fine, guitar, 4:30 pm
    • Avery Jones, bass, 7:30 pm
  • Friday, April 27:
    • Alice Pratt, soprano, and Jennifer Herbert, soprano, 4 pm
  • Saturday, April 28:
    • Student Wind Chamber Concert, 10 am
    • Dominico Campos, violin, and Caryn-Josephine Carpenter, violin, 12:30 pm
    • Oboe Studio Rectal, 3 pm
    • Cello Studio Rectal, 5:30 pm
    • Samantha Isely, mezzo-soprano, and Katherine Rosenfeld, soprano, 7:30 pm
  • Sunday, April 29:
    • Kimberly Karp, flute, 1:30 pm
    • Megan Fraser, violin, and Neelee Brauner, viola, 4:30 pm
    • Tyler Niedermayer, clarinet, 7:30 pm, Andrey Memorial Auditorium

Hooper Poster Presentations and Reception: Special Event by Invitation Only
The Office of Undergraduate Research and Scholarship celebrates this year’s Hooper Undergraduate Research Award recipients, with special guest, Dr. Henry O. Hooper, retired NAU associate provost for academic affairs and physics professor emeritus.

Thursday, April 26, 2018: 4:30 pm – 6:30 pm
Native American Cultural Center, Building 14, Gathering Room

• Jessica Aerts: Finding Underground Treasures: The Information Gained From Seismic Arrays (Mentor: Ryan Porter)
• Gillian Brailsford: The Molecular Examination of the Hybridization of Northern and Gilded Flicker (Mentor: Russell Benford)
• Holly Buban: A Global Map of Martian Volcanic Landforms (Mentor: Lisa Skinner)
• Austin Dikeman: Tracking Escherichia coli Infections of the Endangered New Mexico Meadow Jumping Mouse (Dapus hudsonius kuroensis) (Mentor: Faith Walker)
• Sydney Eick: Measuring Sarcomere Lengths during Tetanic and Twitch Stimulation (Mentor: Kisia Nishikawa)
• Logan Gonzales: Longer Term Effects of Jackstrawing on Aspen Regeneration and Large Ungulate Presence on the Schultz Fire, Coconino National Forest, AZ (Mentor: David Huffman)
• S. Emily Grims: The Influence of Soil Depth and Grazing Practices on the Quantity and Quality of Soil Carbon in Semiarid Rangelands (Mentor: Nancy Johnson)
• Tristan Hess: Project Shelter (Mentor: Britton Shepardson)
• Shelby Hutton: Developing a DNA-based Assay to Characterize Insecticide Resistance in the Oriental Rat Flea Xenopsylla cheopis, an Important Plague Vector in Madagascar (Mentor: Joseph Busch)
• Morgan Jones: Genetic Analysis of a Chuckwalla Population on South Mountain, Arizona (Mentor: Russell Benford)
• Janus Kuzdon: Identification of Variable Dust Depositions in Elysium Planitia, Mars (Mentor: Christopher Edwards)
• Taylor Larmbringer: Identifying the Undefined: Using Isotopic Analysis to Develop Biological Histories in Forensic Cases from Flagstaff, Arizona (Mentor: Corina Kelner)
• Emelia Lawrence: Milkweeds for Monarchs (Mentor: Richard Hofstetter)
• Jose Marmolejo: Mapping and Structural Analysis of the Las Vegas Valley Shear Zone, Nevada (Mentor: Paul Umhoefer)
• Evan Mee: Characterization of Glandular Trichome Exudate on Yellow Monkeyflower (Mimulus guttatus) (Mentor: Liza Holeski)
• Hayden Niehues: Plato’s Refutation of Empiricism: Commentary on the Grammar and Vocabulary of Theaetetus: 151e-183c (Mentor: George Rudedeus)
• Arnalee Nunnally: Are Soils and Waterways in Flagstaff, AZ, Important Reservoirs for Clostridium difficile? (Mentor: Paul Kein)
• Etude O’Neil-Judy: Nanomotors Driven by Light (Mentor: John Gibbs)
• Katie Pajkos: O2 Depletion along Thaw Gradient using Carbon Isotope Ratios in Soil DNA (Mentor: Egbert Schwartz)
• Angela Rincon: A Study of a North American Freshwater Sponge Living in the Rio de Flag (Mentor: Stephen Shuster)
• Dan Rivera: Predicting Patient Response to Treatment of Crouch Gait with a Winding Filament Muscle Model (Mentor: Zachary Lerner)
• Tanner Rosenberg: Computing Maximal Sorting Length of Signed Permutations in Terms of Reversals (Mentor: Dana Ernst)
• Seth Sheer and McKenna Hedgepeth: Differences in Drought Tolerance of Pinus strobus (Southeastern white pine) from Various Provenances (Mentor: Kristen Waring)
• Siana Turner: Germination of Liberigusticum porteri using Cold Stratification and Gibberellic Acid (Mentor: David Huffman)
• Daniel Valencas: “Ace in the Hole”: Advanced Materials for Solar Cell Applications (Mentor: Stephanie Hurst)
• Ziyang Wu: Development and Update of Rainfall and Runoff Intensity-Duration-Frequency Curves for Arizona State Counties in Response to Climate Change (Mentor: Amin Mohrebi)
• Aaron Young: Measurement of Groundwater Recharge in the Upper Lake Mary Watershed using Repeat Microgravity and Chloride Mass Balance (Mentor: Abe Springer)

Search for presenters, titles, and abstracts at the event kiosks or online at nau.edu/symposium

Recharge in the Upper Lake Mary Watershed using Recharge in the Upper Lake Mary Watershed using Repeat Microgravity and Chloride Mass Balance (Mentor: Amin Mohrebi)
### MORNING SESSION

#### Skydome CAL Floor

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 AM – 11 AM</td>
<td>Exhibit</td>
</tr>
</tbody>
</table>

**Painting as a Perfectionist**  
CAL, School of Art  
Makenna Via

**Live Oil Painting**  
CAL, School of Art  
Hana Lipke

**Process of Painting**  
CAL, School of Art  
Madeline Markus

**Painting**  
CAL, School of Art  
Claire Herron

#### Skydome CAL Table

<table>
<thead>
<tr>
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<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Exhibit</td>
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</table>

CAL, School of Art  
Vivian Phu

**Theatrical Design and Virtual Reality**  
CAL, School of Art  
Amanda Rosas

#### Skydome INNOV Floor

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>9 AM – 11 AM</td>
<td>Exhibit</td>
</tr>
</tbody>
</table>

**4P, the Pedal Powered Pollinator Patch**  
Interdisciplinary, gridLESS Project  
Shyla Cox, Jaime Larson, Lauren Bernas, Darren Bingham, Frances Alvarado, Tyler Linner

#### Skydome Stage A

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
</table>
| 9 AM – 9:20 AM | Oral Presentation  
**Food’s Impact on Southwestern Culture**  
HONORS, Honors College  
Hannah Hansen, Asha Hopkins, Courtney Hale |
| 9:30 AM – 9:50 AM | Oral Presentation  
**Is Anyone Out There? Examining Level of Engagement among the U.S. State Agencies and Citizens**  
SBS, School of Communication  
Kirsten Bagshaw |

#### Skydome Stage B

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
</table>
| 9:00 AM – 9:55 AM | Oral Presentation  
**Degrees of Individual Choice in Expressing Compassion**  
HONORS, Honors College  
Leila Beer, Rylie Corrales, Joshua Geyer, Christopher McGuayer |

#### Skydome Stage C

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
</table>
| 9 AM – 9:20 AM | Oral Presentation  
**Music for Women in the Eighteenth Century: The Italian Institutions for Relinquished Children**  
CAL, School of Music  
Brittany Ferris |
| 9:30 AM – 9:50 AM | Oral Presentation  
**Islamic Sufism**  
CAL, Comparative Cultural Studies  
Sarah Arce |
| 10 AM – 10:55 AM | Oral Presentation  
**Countryman, Keep On: A Full Length Non-Absurdist Play**  
CAL, Theater  
Hadley Singer |

#### Skydome Stage D

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
</table>
| 9 AM – 9:20 AM | Oral Presentation  
**Public Achievement Addressing Bullying at Killip Elementary**  
FYS, First Year Seminar  
Eva Ascencio, Breklee Tanner, Chandler Gaines, Jerri Hatch, Jerel Hall |
| 9:30 AM – 9:50 AM | Oral Presentation  
**Being a Teacher of Color**  
COE, Educational Specialties  
Alexandra Duarte |
| 9:55 AM – 10:35 AM | Oral Presentation  
**Hijabs in the Classroom: A Problem-Based Learning Scenario**  
COE, Educational Specialties  
Valeria Estrella, Kyra Bennett, Kaileigh Walker, Victoria Tosca, Marco Rodrigo De La Torre |
| 10:40 AM – 11 AM | Oral Presentation  
**Snap Swap**  
FCB, Computer Information Systems  
Theresa Agube |
du Bois Center – Aspen A Room

8 AM - 8:20 AM – Oral Presentation
Rube Goldberg Machine Competition
CEFNS, Mechanical Engineering
Riley DeHeer, Madison Lenschow, Ali Alenezi, Faisel Alotaibi, Kyle Kraemer

8:25 AM - 8:45 AM – Oral Presentation
Hydraulics Demonstrator
CEFNS, Mechanical Engineering
Cal Skelisky, Fawaz Alenezi, Mosead Ajebly, Sultan Alenezi

8:50 AM - 9:10 AM – Oral Presentation
Thermodynamics Demo Unit
CEFNS, Mechanical Engineering
Isaac Keene, Jeremy Tilden, Adam Wedell, Andrew Robinson

9:20 AM - 9:40 AM – Oral Presentation
MWI Labs NRL Loss Arch Redesign
CEFNS, Mechanical Engineering
Jacob Head, Daniel Matthews, Mitchell Parker, Zachary McCormick

9:45 AM - 10:05 AM – Oral Presentation
Temperature Programed Desorption
Secondary Ion Mass Spectrometer
CEFNS, Mechanical Engineering
Nikki Cain, Colin Evans, Kirsten Larson, Dalton Stone

10:10 AM - 10:30 AM – Oral Presentation
Catheter Balloon Inspection Apparatus
CEFNS, Mechanical Engineering
Shane Pooler, Kevin White, Ryan Stevenson, Anthony Peters

10:40 AM - 11:25 AM – Oral Presentation
SAE Mini Baja Competition
CEFNS, Mechanical Engineering

10:40 AM - 11:00 AM – Oral Presentation
Environmental Enclosure
CEFNS, Mechanical Engineering
William Creagan IV, Brandon Zgilurich, Ryan Lopez, Austin Kee

10:40 AM - 11:00 AM – Oral Presentation
Launch Vehicle Enclosure
CEFNS, Mechanical Engineering
Brandon Cook, Miriam Deschine, Daniel Edmonds, Joshua Smith

11:00 AM - 11:25 AM – Oral Presentation
Launch Vehicle Enclosure
CEFNS, Mechanical Engineering
Brandon Cook, Miriam Deschine, Daniel Edmonds, Joshua Smith

11:05 AM - 11:25 AM – Oral Presentation
Launch Vehicle Enclosure
CEFNS, Mechanical Engineering
Brandon Cook, Miriam Deschine, Daniel Edmonds, Joshua Smith

du Bois Center – Aspen B Room

8 AM - 8:20 AM – Oral Presentation
Knee Rehabilitation and
Goniometer Device
CEFNS, Mechanical Engineering
Alma Palacios, Grant Borchers, Chris Kornowski, Jackson Reynolds, and Zihao Wang

8:25 AM - 8:45 AM – Oral Presentation
Equinus Exoskeleton
CEFNS, Mechanical Engineering
Brandon Begay, Azalea Grant, Robert Libby, Ethan Michel, Hannah Rentschler

8:50 AM - 9:10 AM – Oral Presentation
Solar Air Heater
CEFNS, Mechanical Engineering
Carl Aaker, Ahmad Abuouf, Alonzo Bzhaloni, Wyatt Bain, Tatum Begay, Brandon Dunn, Taylor McCormack, William Senseman

9:20 AM - 9:40 AM – Oral Presentation
Gore Bioelectric Generation
CEFNS, Mechanical Engineering
Timothy O’Rourke, Bray Moll, Diego Garcia, Andrew Mullen, Ariel Autrand, Zaoyi Chi, Qingkun Liu, Justin Havel

9:45 AM - 10:05 AM – Oral Presentation
Honeywell Reference Pressure Regulator
CEFNS, Mechanical Engineering
William McGinn, Jordan Loos, Alexander Rustaes, Mlya Azofeifa, Yitong Zhang

10:10 AM - 10:30 AM – Oral Presentation
Honeywell Solenoid
CEFNS, Mechanical Engineering
Jourdan Gill, Matthew Marty, Regis Rummfola, Nicolas Russell

10:40 AM - 11:00 AM – Oral Presentation
Micron DRAM
CEFNS, Electrical Engineering
Abdulrahman Alqahtani, Dmetria Shepherd, Colby Weber, Jiming Yang, Zeyu Zhang

10:40 AM - 11:00 AM – Oral Presentation
Predictive Communications
CEFNS, Electrical Engineering
Fahad Almaraghi, Qiuyan Huang, Hanxiaolu, Chaojifang, Yuting Zhang

11:00 AM - 11:25 AM – Oral Presentation
Explosive Ordnance Device Robot
CEFNS, Electrical Engineering
Chu Huiven, Yzhou Li, Cody Varner, Wen Zening, Suxian Zhang

du Bois Center – Pinyon Room

8 AM - 8:20 AM – Oral Presentation
Electrical Information by Location
CEFNS, Computer Science
Brenden Bernal, Chandler Hayes, Michael Hartzell, Anthony De La Torre

8:25 AM - 8:45 AM – Oral Presentation
Low-Cost Mobile Hydrology Reporting
CEFNS, Computer Science
Luis Arroyo, Logan Brewer, Ryan Ladwige, Kelli Ruddy

8:50 AM - 9:10 AM – Oral Presentation
Mars 2020 Rover Dust Analysis for Drill
CEFNS, Computer Science
Hunter Rainen, Alexandra Nelson, Adam Paquette, Charles Beck

9:20 AM - 9:40 AM – Oral Presentation
Mobile CO2 Solutions
CEFNS, Computer Science
Samuel Reals, James Beasley, Andrew Greene, Joseph Kelroy

9:45 AM - 10:05 AM – Oral Presentation
Cloud Storage Reclamation
CEFNS, Computer Science
Itreau Bigsby, Matthew Cocchi, Richard Deen, Benjamin George

9:45 AM - 10:05 AM – Oral Presentation
Micron DRAM
CEFNS, Electrical Engineering
Abdulrahman Alqahtani, Dmetria Shepherd, Colby Weber, Jiming Yang, Zeyu Zhang

10:10 AM - 10:30 AM – Oral Presentation
Low-Cost Mobile Hydrology Reporting
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CEFNS, Computer Science
Samuel Reals, James Beasley, Andrew Greene, Joseph Kelroy

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CEFNS, Computer Science
Samuel Reals, James Beasley, Andrew Greene, Joseph Kelroy

11:05 AM - 11:25 AM – Oral Presentation
Mobile CO2 Solutions
CEFNS, Computer Science
Samuel Reals, James Beasley, Andrew Greene, Joseph Kelroy
### du Bois Center – Pinyon Room

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Presenters</th>
</tr>
</thead>
</table>
| 9:45 AM - 10:05 AM | Oral Presentation  
SISU: FPGA  
CEFNS, Electrical Engineering  
Taylor Bruce, Dillan Mills, Colt Morris, Ziwei Wu, Huanyi Zhou |  
10:10 AM - 10:30 AM | Oral Presentation  
Grid Connected Converter  
CEFNS, Electrical Engineering  
Mohammed Abu Radhi, Fahad Alghareeb, Sayaf Almari, Kaidong Ji, Di Miaoj |  
11:05 AM - 11:25 AM | Oral Presentation  
NASA Solar Array  
CEFNS, Electrical Engineering  
Daniel Krollman, Alexander Mueller |
| 10:40 AM - 11 AM | Oral Presentation  
Hardware One Time Pad  
CEFNS, Electrical Engineering  
Ian Burke, Earl Judge, Bradley Racey, Brayden Villa |
| 10:40 AM - 11 AM | Oral Presentation  
SISU: FPGA  
CEFNS, Electrical Engineering  
Taylor Bruce, Dillan Mills, Colt Morris, Ziwei Wu, Huanyi Zhou |
| 10:40 AM - 11 AM | Oral Presentation  
Grid Connected Converter  
CEFNS, Electrical Engineering  
Mohammed Abu Radhi, Fahad Alghareeb, Sayaf Almari, Kaidong Ji, Di Miaoj |
| 10:40 AM - 11 AM | Oral Presentation  
NASA Solar Array  
CEFNS, Electrical Engineering  
Daniel Krollman, Alexander Mueller |  
### du Bois Center – Juniper Room

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Presenters</th>
</tr>
</thead>
</table>
| 8 AM - 8:20 AM | Oral Presentation  
Beyond the Slopes presents EZ-Ride, a Snowboarding Recreational Training Aid  
CEFNS, Engineering  
Brett Ay/Jward, Journard Collins, Ariana Cor |  
8:25 AM - 8:45 AM | Oral Presentation  
Mukava by Nissnass, a Portable Thermoelectric Cooler and Heater  
CEFNS, Engineering  
Abdullah Alajmi, Kyle Appelt, Jessica Atkinson, Michael Elsdon |
| 8:25 AM - 8:45 AM | Oral Presentation  
Mukava by Nissnass, a Portable Thermoelectric Cooler and Heater  
CEFNS, Engineering  
Abdullah Alajmi, Kyle Appelt, Jessica Atkinson, Michael Elsdon |
| 8:50 AM - 9:10 AM | Oral Presentation  
Visage Processing presents Chronos, a 3D Printing Post-processing Device  
CEFNS, Engineering  
Robert Corbin, Matthew Duray, Michael Stoy, Gavin Wright |
| 8:50 AM - 9:10 AM | Oral Presentation  
Visage Processing presents Chronos, a 3D Printing Post-processing Device  
CEFNS, Engineering  
Robert Corbin, Matthew Duray, Michael Stoy, Gavin Wright |
| 9:20 AM - 9:40 AM | Oral Presentation  
CrossDoc: An Improved Commenting System  
CEFNS, Computer Science  
Garrison Smith, Peter Huettl, Kristopher Moore, Brian Saganey |  
### du Bois Center – Ballroom A

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Presenters</th>
</tr>
</thead>
</table>
| 8 AM - 8:20 AM | Oral Presentation  
ASCE Concrete Canoe  
CEFNS, Civil Engineering and Environmental Engineering  
Katlynn Adams, Gina Boschetto, Joshua Leon, Branden Peterson, Zachary Rudovich |
| 8:25 AM - 8:45 AM | Oral Presentation  
ASCE Steel Bridge  
CEFNS, Civil Engineering and Environmental Engineering  
Isaac Block, Ian Connair, Taylor Erdmann, Matthew Parrish |
| 8:50 AM - 9:10 AM | Oral Presentation  
PCI Big Beam Contest  
CEFNS, Civil Engineering and Environmental Engineering  
Roy Crouch, Stephen Gergal, Fernando Rojo, Brandy Wagoner |
| 9:20 AM - 9:40 AM | Oral Presentation  
Insulated Cinder Blocks and Small Diameter Timber  
CEFNS, Civil Engineering and Environmental Engineering  
Theo Albers, Sam Carnes |
| 9:45 AM - 10:05 AM | Oral Presentation  
Residential Garage Addition  
CEFNS, Civil Engineering and Environmental Engineering  
Meliza Herrera, Matthew Pillari, Taylor Poston, Jessica Sobieski |
| 9:45 AM - 10:05 AM | Oral Presentation  
Residential Garage Addition  
CEFNS, Civil Engineering and Environmental Engineering  
Meliza Herrera, Matthew Pillari, Taylor Poston, Jessica Sobieski |
| 10:10 AM - 10:30 AM | Oral Presentation  
Ryan’s Trail Road Redesign  
CEFNS, Civil Engineering and Environmental Engineering  
Yufei Cheng, McKenzie Moten, Parker Schradnt, Trevor Snipes |
| 10:40 AM - 11 AM | Oral Presentation  
AZ Water Student Design Competition: Wastewater Facility Design  
CEFNS, Civil Engineering and Environmental Engineering  
Nicholas Babcock, Jed Ward, Maxwell Ward, Ryan Winter |
| 10:40 AM - 11 AM | Oral Presentation  
AZ Water Student Design Competition: Wastewater Facility Design  
CEFNS, Civil Engineering and Environmental Engineering  
Nicholas Babcock, Jed Ward, Maxwell Ward, Ryan Winter |
| 11:05 AM - 11:25 AM | Oral Presentation  
Copper Age Mine Site Remediation  
CEFNS, Civil Engineering and Environmental Engineering  
Laura Garcia, Spencer Harvey, Carl Haskie, Sarah Reddinger |
### Skydome Floor: Posters (9 AM – 11 AM)

#### CAL – English

<table>
<thead>
<tr>
<th>Title</th>
<th>Presenter</th>
<th>Display Board</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prosodic Patterns of Speech Acts for Native and Non-Native Speakers of English</td>
<td>Alexander Pompa</td>
<td>[60D]</td>
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</tbody>
</table>

#### CAL – History

<table>
<thead>
<tr>
<th>Title</th>
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<th>Display Board</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning from the Life of Marie Sommerville</td>
<td>William Fusaro</td>
<td>[60A]</td>
</tr>
</tbody>
</table>

#### CAL – School of Art

<table>
<thead>
<tr>
<th>Title</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Renewable Off-Grid Housing Project: Red Creek Ranch, Tonto National Forest</td>
<td>Sabrina Rozendaal</td>
<td>[54A]</td>
</tr>
<tr>
<td>Reinventing the Market Place: Flagstaff Public Market</td>
<td>Allison Mann</td>
<td>[54B]</td>
</tr>
<tr>
<td>Revolutionizing a Parkinson’s Health Center</td>
<td>Dalena Thuy Van Pham</td>
<td>[54C]</td>
</tr>
<tr>
<td>Modular Buildings, the Future of the 2028 Olympic Games</td>
<td>Kayla Schilling</td>
<td>[55A]</td>
</tr>
<tr>
<td>Biophilia &amp; Biomimicry in Sustainable Student Housing Design</td>
<td>Cheyenne Stetson</td>
<td>[55B]</td>
</tr>
<tr>
<td>Merging Market and Restaurant Design: Creating a Cohesive Concept</td>
<td>Monique Rouhani</td>
<td>[55C]</td>
</tr>
<tr>
<td>Repurposing a Restaurant Using Third Place Theory</td>
<td>Caitlin Land</td>
<td>[56A]</td>
</tr>
<tr>
<td>Redesigning a Homeless Shelter</td>
<td>Tristan Hess</td>
<td>[56C]</td>
</tr>
<tr>
<td>Art Therapy and Education</td>
<td>Christine Owens</td>
<td>[57B]</td>
</tr>
<tr>
<td>Food History Education through Immersive and Interactive Museum Design</td>
<td>Anna Horan</td>
<td>[57C]</td>
</tr>
<tr>
<td>Prospect and Refuge Theory in Restaurant Design</td>
<td>Lauren Connell</td>
<td>[58A]</td>
</tr>
<tr>
<td>Incorporating Biophilia into a Creative, Mixed-Use, Historic Hollywood Renovation</td>
<td>Mallory Arndt</td>
<td>[58C]</td>
</tr>
</tbody>
</table>

#### CEFNS – Biological Sciences

<table>
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<tr>
<td><strong>Grand Challenges: Stop Family Violence</strong></td>
<td>Maegan Foltz, Ariana Fiero, Alexis Garcia, Rebecca Carlson, Alycia Darlington</td>
<td>[109D]</td>
</tr>
<tr>
<td><strong>The Effects of Youth Development and Juvenile Susceptibility</strong></td>
<td>Melissa Calderon, Anthony Brown, Ashley Alcantar, Damian Baum, Kiana Buenafe</td>
<td>[110A]</td>
</tr>
<tr>
<td><strong>Medias Fandoms and the Sense of Community</strong></td>
<td>Neda Massalha</td>
<td>[110B]</td>
</tr>
<tr>
<td><strong>Perspectives on Poverty in America</strong></td>
<td>Shanell Yenchik</td>
<td>[110A]</td>
</tr>
</tbody>
</table>
SBS – Sociology and Social Work

**Situational Poverty for Northern Arizona University Students**
Yadira Medrano, Morgan Malech, Ariana Magana, Kianna Mattie, Stephanie Lawrence
Display board [111A]

**Does Having a Sibling Affect Your Childhood?**
Charles Whitten
Display board [111B]

**Trauma-Informed Care**
Michelle Kylaivas, Nelsina Logue, Vanessa Lishner, Dresden Lee
Display board [111C]

**Influence of Sexual Content on Sexual Relationships**
Taylor Clark
Display board [112A]

**Attitudes towards Ghetto Neighborhoods**
Stacy Charron
Display board [112B]

**Acceptance of Tattoos in Professional Environments**
Kate Dickerson
Display board [114B]

SBS – Sustainable Communities

**Filling Your Shoes: a Step into the Real World**
Trace Langley
Display board [116C]

**Civic Engagement at Willow Bend Environmental Education Center**
Cameron Rood
Display board [117D]

**Water Policy and Economic Development in the Navajo Nation**
Caitlin Yates
Display board [112B]

SBS – University Studies

**Charity in Ebay Auctions**
Nathan Pollack
Display board [113C]

**Monoculture**
Valencia Arvessto
Display board [114C]

**Probiotics and You**
Adrianne Tennant
Display board [115B]

**Homelessness and Addiction**
Sheila Cardoza
Display board [117A]

**Cancer Research in the Fire Service**
Austin Houle
Display board [118A]

**Intersecting Versatility and Usability for Guide Dog Users: the Integration of Guide Harnesses and Long Canes**
Isaac Taylor
Display board [119A]

**Peggy Nelson, CFO IHF LCC**
Executive Aerospace Consultant

Friday, April 27, 2018
11:30 AM – 1 PM
du Bois Ballroom

LUNCH
Skydome Stage B: Honors Convocation and Awards Ceremony

11:45 AM – 1:30 PM
## AFTERNOON SESSION

### Skydome CAL Floor

**Process of Painting**  
CAL, School of Art  
Madeline Markus

**Painting**  
CAL, School of Art  
Claire Herron

### Skydome CEFNS Floor

**MWI Labs NRL Loss Arch Redesign**  
CEFNS, Mechanical Engineering  
Daniel Matthews, Zachary McCormick, Jacob Head, Mitchell Parker

### Skydome FCB Floor

**Meal Prep Basics**  
FCB, Hotel Restaurant Management  
Lukas Striegl, Alexander Ketchelos

### Skydome FCB Table

**Meal Prep Basics**  
FCB, Hotel Restaurant Management  
Lukas Striegl, Alexander Ketchelos

### Skydome INNOV Floor

**4P, the Pedal Powered Pollinator Patch**  
Interdisciplinary, gridLESS Project  
Shyla Cox, Jaime Larson, Lauren Bernas, Darren Bingham, Frances Alvarado, Tyler Linner

---

### Skydome Stage A

2 PM - 2:55 PM – Oral Presentation  
*The Social Dimensions of Introversion, Extroversion, and Compassion*  
HONORS, Honors College  
Hannah Beskind, Rebecca Pejak, Sachie Romo, Adrianna Weise

3 PM - 3:55 PM – Oral Presentation  
*Limits of Compassion Resulting from Human Contrived Borders*  
HONORS, Honors College  
Sandenna McMaster, Christina Dodds, Britni Power, Matalynn Slayton

### Skydome Stage B

2 PM - 2:30 PM – Oral Presentation  
*Ebb & Flow: Perspectives of Water in the Grand Canyon Region, Pt. 1 & 2*  
SBS, Sustainable Communities  
Jessica Archibald, Rachel Ellis, Blessings Chibambo, Cadell Anderson, Caitlyn Yates, Dylan Hiatt, Erica Magdaleno, Jillian Wagner, Julia Diaz, Lauren Swol

3 PM - 3:20 PM – Oral Presentation  
*Valley Fever: a Desert Disease*  
CEFNS, Biological Sciences  
Taylor Slevin, Sara Pugsley, Samantha Markey, Andria Embry

3:30 PM - 3:50 PM – Oral Presentation  
*The Science of Communicating*  
CEFNS, Physics and Astronomy  
Eric Duong

### Skydome Stage C

2 PM - 2:20 PM – Oral Presentation  
*Beauty and the Crip: Gender and Disability in Popular Culture*  
CAL, Comparative Culture Studies  
Sally Lobel

3 PM - 3:20 PM – Oral Presentation  
*Stranger Than You Can Suppose: the Life and Ideas of Terence McKenna*  
CAL, Comparative Culture Studies  
Jack Bidese

2:30 PM - 2:50 PM – Oral Presentation  
*The Sacred Art of Tibetan Medicine*  
CAL, Comparative Culture Studies  
Rebecca Billie

3:30 PM - 3:50 PM – Oral Presentation  
*The Effects of Global Warming on the Flagstaff Landscape over Time*  
HONORS, Honors College  
Morgan Selbach
### Skydome Stage D

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:30 PM - 2:50 PM</td>
<td>Oral Presentation&lt;br/&gt;The Extraterrestrial American Southwest&lt;br/&gt;HONORS, Honors College&lt;br/&gt;William McMullan, James Seganti, Rachel Kays</td>
</tr>
<tr>
<td>3:30 PM - 3:50 PM</td>
<td>Oral Presentation&lt;br/&gt;Music Performance- the Mechanical Engineering Degree I Didn’t Sign Up For&lt;br/&gt;CAL, School of Music&lt;br/&gt;Mary Schlanger</td>
</tr>
<tr>
<td>2 PM - 2:20 PM</td>
<td>Oral Presentation&lt;br/&gt;Collegiate Wind Competition&lt;br/&gt;Market Team&lt;br/&gt;CEFNS, Mechanical Engineering&lt;br/&gt;Alana Benson, Anthony Cheslíc, Craig Collins, Mitchell Green, Leopoldo Seguira, Michael Vogelsang</td>
</tr>
<tr>
<td>2:30 PM - 2:50 PM</td>
<td>Oral Presentation&lt;br/&gt;Retekst: Climbing Hold Resurfacer&lt;br/&gt;CEFNS, Mechanical Engineering&lt;br/&gt;Dylan Simon, Kyle Connelly, Drew Shumway, Mohammad Almutairi, Abdullah Alenezi</td>
</tr>
</tbody>
</table>

### du Bois Center – Aspen A Room

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>1:10 PM - 1:30 PM</td>
<td>Oral Presentation&lt;br/&gt;Antenna Gimbal&lt;br/&gt;CEFNS, Mechanical Engineering&lt;br/&gt;Kalli Albright, Kaitlyn Barr, Dustin Branges, Daniel Johnson</td>
</tr>
<tr>
<td>1:35 PM - 1:55 PM</td>
<td>Oral Presentation&lt;br/&gt;3D Filament Recycler&lt;br/&gt;CEFNS, Mechanical Engineering&lt;br/&gt;Abdulaziz Abdulfaqih, Marc Hsu, Nicole Tabac, Micki Yasuda</td>
</tr>
<tr>
<td>2 PM - 2:20 PM</td>
<td>Oral Presentation&lt;br/&gt;SAE Aero Design Competition&lt;br/&gt;CEFNS, Mechanical Engineering&lt;br/&gt;Lucas Veteto, Connor Rich, Michael Torres, Ahmad Almuhandas, Saood Alazmi, Alex Klausenstock</td>
</tr>
<tr>
<td>2:30 PM - 2:50 PM</td>
<td>Oral Presentation&lt;br/&gt;Renewable Energy Toolkit&lt;br/&gt;CEFNS, Mechanical Engineering&lt;br/&gt;Mohammed Jarjhi, Talal Alenezi, Hamad Alsharhan, Mohammad Alsharidah, Fahad Alsuwailm</td>
</tr>
<tr>
<td>2:55 PM - 3:15 PM</td>
<td>Oral Presentation&lt;br/&gt;Mobile In-Vitro Neurovascular Cast System&lt;br/&gt;CEFNS, Mechanical Engineering&lt;br/&gt;Nase Alosaimi, Jalandro Edison, Justin McCallin, Matthew Sussman</td>
</tr>
<tr>
<td>3:20 PM - 3:40 PM</td>
<td>Oral Presentation&lt;br/&gt;BDL Particulate Characterization&lt;br/&gt;CEFNS, Mechanical Engineering&lt;br/&gt;Kevin LoGran, Saleh Aldhufairi, Mohammad Almutairi</td>
</tr>
</tbody>
</table>

### du Bois Center – Aspen B Room

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>1:10 PM - 1:30 PM</td>
<td>Oral Presentation&lt;br/&gt;Collegiate Wind Competition&lt;br/&gt;Mechanical Design&lt;br/&gt;CEFNS, Mechanical Engineering&lt;br/&gt;Soud Alsaheh, Devon Hardy, Kory Joe, Spencer McMahon, Jacob Peterson, Dakota Sallaway</td>
</tr>
<tr>
<td>1:35 PM - 1:55 PM</td>
<td>Oral Presentation&lt;br/&gt;Collegiate Wind Competition&lt;br/&gt;Electrical Design&lt;br/&gt;CEFNS, Mechanical Engineering&lt;br/&gt;Yousef Alali, Alexander Dahlinman, Aaron DeLuca, Evan Heiland, Benjamin Macleod, Tristan Scott, Qian Zhao</td>
</tr>
<tr>
<td>2 PM - 2:20 PM</td>
<td>Oral Presentation&lt;br/&gt;Instrumented Bike - Team 1&lt;br/&gt;CEFNS, Electrical Engineering&lt;br/&gt;Robert Briggs, Junting Chen, Hao Wang, Hongpan Wu</td>
</tr>
<tr>
<td>2:30 PM - 2:50 PM</td>
<td>Oral Presentation&lt;br/&gt;Reston’s Musical Instrument&lt;br/&gt;CEFNS, Electrical Engineering&lt;br/&gt;Cole Kaplan, John Felsch, Paola Montoya</td>
</tr>
</tbody>
</table>

### du Bois Center – Pinyon Room

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:10 PM - 1:30 PM</td>
<td>Oral Presentation&lt;br/&gt;Bluetooth Application for Engine Data Download and Display&lt;br/&gt;CEFNS, Computer Science&lt;br/&gt;Joe Griffith, Robert McIntosh, Brandon Samz, Corban Stevens</td>
</tr>
<tr>
<td>1:35 PM - 1:55 PM</td>
<td>Oral Presentation&lt;br/&gt;Tailored Tutoring Web Portal&lt;br/&gt;CEFNS, Computer Science&lt;br/&gt;Jesus Garcia, Tyler Mitchell, Alex Kahn, Taylor Walker</td>
</tr>
<tr>
<td>2 PM - 2:20 PM</td>
<td>Oral Presentation&lt;br/&gt;Brain Boosting Web Game&lt;br/&gt;CEFNS, Computer Science&lt;br/&gt;Vincent Messenger, Nathan Franklin, Andy Salazar, Anderson Moyers</td>
</tr>
<tr>
<td>2:30 PM - 2:50 PM</td>
<td>Oral Presentation&lt;br/&gt;Automatic SPICE Data Synchronization&lt;br/&gt;CEFNS, Computer Science&lt;br/&gt;Christopher Combs, Kellen Ross, Tyler Thatcher, Daniel Williamson</td>
</tr>
<tr>
<td>3:20 PM - 3:40 PM</td>
<td>Oral Presentation&lt;br/&gt;Multi-factor Analysis to Reduce False Alarms in Intensive Care Units&lt;br/&gt;CEFNS, Computer Science&lt;br/&gt;Nathan Payton- McCauslin, Alexander Grzesiak, James Todd</td>
</tr>
</tbody>
</table>

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Search for presenters, titles, and abstracts at the event kiosks or online at nau.edu/symposium
du Bois Center – Pinyon Room

2:55 PM - 3:15 PM – Oral Presentation  
**Stand Alone Power Converter**  
CEFNS, Electrical Engineering  
Mohammad Alrashidi, Nan Duan, Jason Foster, Lutong Ji, Yu Zhou

3:20 PM - 3:40 PM – Oral Presentation  
**3-Way Syringe Mixer**  
CEFNS, Electrical Engineering  
Vincent Jencks, Colton Smith, Andrew VanDenburgh, Handi Xi, Yunchen Zhu

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du Bois Center – Ballroom A

1:10 PM - 1:30 PM – Oral Presentation  
**Air Quality Analysis**  
CEFNS, Civil Engineering and Environmental Engineering  
Kholood Aldahlan, Mohammad Alkandari, Dylan Chambal, Xiaoying Tang

1:35 PM - 1:55 PM – Oral Presentation  
**USFS Geomorphic Road Analysis and Inventory Package (GRAIP)**  
CEFNS, Civil Engineering and Environmental Engineering  
Julia Campo, AbdulRazaq A. AlQashan, Parker Jones, Zach Kretsch

2 PM - 2:20 PM – Oral Presentation  
**Oak Creek Floodplain Study**  
CEFNS, Civil Engineering and Environmental Engineering  
Robert Coronado, Erin McAnally, Parker Smith, Ziyan Wu

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du Bois Center – Juniper Room

1:10 PM - 1:30 PM – Oral Presentation  
**The Wonder Factory: Spirograph**  
CEFNS, Mechanical Engineering  
Faisal Alanezi, Yousef Almutairi, Saad Albarazi, Barjas Albarazi, Khaled Alhusainan

1:35 PM - 1:55 PM – Oral Presentation  
**The Wonder Factory: Slingshot**  
CEFNS, Mechanical Engineering  
Abdullah Howaishel, Abdullah Alzafiri, Dhary Aldhefeeri, Fahad Alotaibi, Mobarak Alsibiee

2 PM - 2:20 PM – Oral Presentation  
**Design for Disability Simulation**  
CEFNS, Mechanical Engineering  
Zaid Almutairi, E. Almutairi, D. Alshammari, Yousef Alazmiu

2:30 PM - 2:50 PM – Oral Presentation  
**Augmented Mobility Project**  
CEFNS, School of Informatics, Computing, and Cyber Systems  
Mohammed Alfatouh, Yutian Deng, Adam Douglass, Kristen Shryack, Mengyuan Zhang

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du Bois Center – Juniper Room

2:55 PM - 3:15 PM – Oral Presentation  
**Marshall Classroom (Sensory Board)**  
CEFNS, Mechanical Engineering  
Abdullah Almutairi, Mohammad Alkatan, Yousef Alkatan, Taha Alansari, Abdullah Almutairi

3:20 PM - 3:40 PM – Oral Presentation  
**Marshall Playground Interactive Device**  
CEFNS, Mechanical Engineering  
Mohammad Alsewaji, Abdulaziz Alazmi, Khaled Alenezi, Abdullatif Alenezy, Saad Aldavsari
Skydome Floor: Posters (2 PM – 4 PM)

**CAL – Comparative Cultural Studies**

**The Enneagram**
Emily Atkinson
Display board [55D]

**Aggression towards Women through Lady Murasaki in Ancient Japan**
Samantha Sanchez
Display board [60C]

**CAL – English**

**Desert Mirrors: Minority and Majority Relationships in Southern Israel and the Southwest United States**
Dustin Rector
Display board [57A]

**Acquisition of Inflectional Morphology through Artificial Languages**
Maren Greve, Vedran Dronjic, Daniel Keller
Display board [60D]

**CAL – Interior Design**

**Versatile Space: The Art of Multi-Use**
Samantha Staring
Display board [56D]

**CAL – Philosophy**

**Plato’s Refutation of Empiricism: Commentary on the Grammar and Vocabulary of Theaetetus: 151e-183c**
Hayden Niehus
Display board [57D]

**CAL – School of Art**

**One of a Kind Experience for All Kinds of Travellers**
Eszter Giuriani
Display board [54D]

**Reexamining Senior Living Communities - Exploring Modern Solutions for an Aging Population**
Selena Arandia
Display board [56B]

**Big Park Perspectives: Integrated Senior Living**
Josie Kohlan
Display board [58B]

**Exploring Multi-sensory Environments as Therapy for Children**
Phuong Nguyen
Display board [58D]

**Universal Design: Design for Every Body**
Cela Janiec
Display board [59D]

**Project Shelter**
Tristan Hess, Elena Scheafer, Mckenna Craig, Miguel Sotelo, Britton Shepardson
Display board [CAL Easel]

**CEFNS – Biological Sciences**

**Determination of Phosphorous Content in Eriophorum vaginatum**
Abbie Parra
Display board [22B]

**Can Phytochemistry of an Invasive Species be Predicted by Novel Weapons or the Enemy Release Hypotheses?**
Kelly Fulbright
Display board [22C]

**Antimicrobial Effects of Essential Oils against Burkholderia spp**
Jonathan De Leo, Erika Petro-Turnquist
Display board [23C]

**Are Soil and Water Important Reservoirs for Clostridiodes Difficile Disease in Flagstaff, Arizona?**
Amalee Nunnally
Display board [23B]

**Long Hair, Don’t Care: Does Elevation Affect Hair Lengths on Flies?**
Holly Hanson
Display board [25A]

**Phylogenomics of the Tok-Tokkie beetles [Tenebrionidae: Pimeliinae: Sepidiini]: Adaptive Radiations of the Genus Psammodes**
Kai Swichtenberg
Display board [26B]

**Easing Veteran Reintegration One Paw at a Time**
Gabrielle Orsini, Christina Anaya
Display board [27D]

**Visitation Does Not Equal Pollination**
Brett Sayre
Display board [33C]

**Species Distribution Modeling as a Citizen Science Tool**
Atticus Wolf
Display board [28B]

**Isotopic Analysis of Freshwater Food Webs**
Hannah Pigg
Display board [30D]

**Ionic Liquids Demonstrate Antimicrobial Activity and Cellular Compatibility**
Tatum Bardsley
Display board [31B]

**Genetic Analysis of the Common Chuckwalla in Central Arizona**
Morgan Jones
Display board [31D]

**Development of a Multiplex Serodiagnostic Assay by Down Selecting Antigen Targets to Provide a More Accurate Melioidosis Diagnosis**
Kyle Headley, Austin Shannon, Maxx Harvey, Mimi Mbegbu
Display board [32D]

**Revisiting Wombat Hair: Molecularly Tracking a Burrowing Marsupial through Time**
Jordyn Upton, Colin Sobek, Matthew Gaughwin, Faith Walker
Display board [33B]

Search for presenters, titles, and abstracts at the event kiosks or online at nau.edu/symposium
CEFNS – Biological Sciences

Sexual Dimorphism and the Sex Difference in the Opportunity for Selection in Three Mammalian Species
Victoria Allison, Stephen Shuster
Display board [34A]

Growth, Physiological, and Molecular Traits Associated with Salinity Tolerance in Rice
Kristina Khan, Esther Nsende
Display board [34D]

As Forests Go, Do Forest Bees?
Jason Lower
Display board [35B]

Anaerobic Soils Manipulated to Aerobic Soils and Their Metabolic Processes Using Isotopologue Pairs of Position Specific 13C-labeled Glucose and Pyruvate
Alex DeRusha
Display board [36D]

Characterization of E. coli from Clinical UTIs
Alden Miller
Display board [37B]

CEFNS – Chemistry and Biochemistry

Integration of Monocyclonal Antibodies with FKBP12 Binding Protein to Inhibit Additional Bone Tissue Growth Causing Fibrodysplasia Ossificans Progressiva
Lyndsey Dorough
Display board [37D]

Abundance of Ammonia Oxidizing Archaea at Varying Soil Depths at Toolik Lake, Alaska
John Condro
Display board [38B]

Heat Treatment to Inactive Risk Group 3 Coccidioides spp.
Austin Blackmon
Display board [38D]

Molecular Hybridization of Northern and Gilded Flickers
Gillian Brailsford
Display board [39B]

Kinematics of the Burying Behavior in the Pacific Staghorn Sculpin
Nicholas Anable
Display board [40B]

The Comparison and Quantification of Microbial Abundances in Ponderosa Pine Forest and Mixed Conifer Ecosystems in Northern Arizona
Shavindi Edirimarachchi, Alicia Purcell
Display board [41B]

NK Cells Exhibit Reduced Cytotoxicity in Hypoxic Conditions
Courtney Collins, Narendiran Rajasekaran
Display board [3B]

Precious Metal Chemistry: Palladium and Platinum Syntheses
Edwin Miller, Michael Moghadasnia, Julian Herring, Hannah Pigg, James Potvin, Daniel Valencia, Meagan Wheeler, Stephanie Hurst
Display board [4A]

The Evaluation of Antibiotic Potency of Alkylacetylphosphonates against E. coli and S. typhimurium
Yasmeen Smith
Display board [4C]

“Ace in the Hole” Advanced Materials for Solar Cell
Daniel Valencia, James Potvin, Julian Herring, Stephanie Hurst
Display board [7D]

Cost-Effective Synthesis of Methy lammonium iodide from Ammonium iodide and Formaldehyde
Nicholas Lopez
Display board [9D]

Benchtop Deposition of Pentacene Organic Semiconductor Thin Films
Alexis Sheffield, Ramon Mendoza
Display board [10C]

A Three-dimensional Model for Renal Cell Carcinoma for Testing Natural Killer Cell Mediated Cytotoxicity
Olivia Bertram, William Gibson, Aubrey Funke, Archana Varadaraj, Narendiran Rajasekaran
Display board [11B]

Synthesis of Uniform Copper(I) Oxide Nanoparticles with Controlled Size and Shape
Caitlan Patcher
Display board [13D]

CEFNS – Civil Engineering, Construction Management, and Environmental Engineering

NAU Concrete Canoe
Kaitlynn Adams, Gina Boschetto, Joshua Leon, Branden Peterson, Zachary Radovich
Display board [15C]

PCI Big Beam Competition
Roy Crouch, Stephen Gergal, Fernando Rojo, Brandy Wagoner
Display board [16C]

Does Mutton Stew Increase Your Calcium Intake?
Tasha Nez
Display board [16B]

Inorganic Synthesis of Metal Terpy Compounds
Meagan Wheeler, Hannah Pigg, Julian Herring, Michael Moghadasnia, James Potvin, Danny Valencia, Jacob Miller, Stephanie K. Hurst
Display board [29D]

Synthesis of Polymer Electrolytes For Use in Supercapacitors
Dale Cummings
Display board [30B]

Incorporation of Choline Geranate into Electrospun Scaffolds to Resist Biofouling
Charlotte Evans, Tatum Bardsley, Robert S. Kellar, Andrew T. Koppisch
Display board [31A]
CEFNS – Civil Engineering, Construction Management, and Environmental Engineering

**Copper Age Mine Site: Preliminary Assessment and Site Investigation**
Spencer Harvey, Carl Haskie, Laura Garcia, Sarah Reddinger
Display board [19A]

**CEFNS – Mathematics and Statistics**

**Prime Vertex Labelings for Perfect Ternary Trees**
Riley Waechter, Justin Sima
Display board [14B]

**Comparing Function Estimation Techniques: A Simulation Study**
Jaxon Quillen, Kody Gelvin
Display board [14D]

**A Paley-Type Construction of Complex Hadamard Matrices**
Mason Sargent, Kaitlyn Lee
Display board [15B]

**Computing Maximal Reversal Distance of Signed Permutations**
Tanner Rosenberg
Display board [16D]

**Structure of Braid Graphs for Coxeter Groups of Type A and B**
Nur Emalina Binti Bidari, Brandon Samz
Display board [18B]

**The Othello Distribution**
Matthew Daunt
Display board [19B]

**Infinite Trees of Primitive Pythagorean Quadruples**
Marcela Gutierrez, Viola McCarty
Display board [20B]

**A Multiplayer Rating System**
Jordan Wright, Michael Rozinski
Display board [20C]

**Salt River Project Solar Air Heater**
Tatum Begay, Taylor McCormack, William Senseneman, Wyatt Bain, Brandon Dunn, Alonzo Bizahaloni, Carl Aaker, Ahmad Abouf
Display board [5A]

**Temperature Programmed Desorption Secondary Ion Mass Spectrometer**
Dalton Stone, Kirsten Larson, Nikki Cain, Colin Evans
Display board [6A]

**Honeywell Reference Pressure Regulator**
Alexander Rustaey, William McGinn, Myla Azofeifa, Jordan Loos, Yitong Zhang
Display board [6D]

**Honeywell Solenoid**
Jordain Gill, Matthew Marty, Nicolas Russell, Regis Rummola
Display board [7A]

**Normal Stress Developing in Magnetorheological (MR) Fluid**
Nikki Cain
Display board [8A]

**Development of an Ankle Exoskeleton for Children with Equinus**
Hannah Rentschler, Brandon Begay, Azalea Grant, Robert Libby, Ethan Michel
Display board [9A]

**Catheter Balloon Inspection Device**
Ryan Stevenson, Kevin White, Shane Pooler, Anthony Peters
Display board [9B]

**W.L. Gore Bio-Electric Generation System**
Timothy O’Rourke, Bray Moll, Diego Garcia, Justin Havel, Ariel Autrand, Andrew Mullen, Zaoi Chi, Qingkun Liu
Display board [9C]

**Orbital ATK Rocket Enclosure**
William Creagan IV, Austin Kee, Ryan Lopez, Brandon Zgurich
Display board [10A]

**Winding Filaments and Walking Models: the Biology, Mathematics, and Simulation of Human Movement**
Dan Rivera
Display board [10D]

**Design and Fabrication of a Robotic Knee Exoskeleton**
Hannah Rentschler
Display board [11A]

**Uncertainty Quantification using Computational Fluid Dynamics in Prediction of Residential-scale Wind Power Production**
Bray Moll
Display board [12A]

**Hydraulics Demonstrator**
Cal Skilsky, Sultan Alenezi, Fawaz Alenezi, Mosaed Aljebly
Display board [13B]

**Orbital ATK Launch Vehicle Enclosure**
Joshua Smith, Brandon Cook, Miriam Deschine, Daniel Edmonds
Display board [14A]
Understanding Chlorine Salt Spectra through Computational Methods with Implications for Martian Geochemistry
Rachel Huchmala
Display board [11D]

Planet Formation around Binary and Multiple Star Systems
Kyle Lindstrom
Display board [12D]

How Long Can Desert Tortoises, Gopherus agassizii, Hide in Their Burrows from Climate Change?
Jenna Norris
Display board [39D]

Public Education through Film: Uranium Mining and Public Land Order 7877
Ingrid French, Tasha Nez, Liv Ward, Matthew Yazzie
Display board [42C]

CEFNS – Physics and Astronomy

School Pollinator Garden Initiative
Kaileigh Walker, Melody Inthyvong, Zoe Jordan, Shonie Hardeen
Display board [40D]

Soil Crust Conservation, Management, and Education
Courtney Newman, Casee Scott, Rafael Ramirez, Logan Schluter, Erika Magdaleno, Cameron Rood
Display board [41D]

Assessing Campus Light Pollution and Preserving the Dark Skies of Northern Arizona
Sarah Holditch, Riley Forbis
Display board [42B]

CEFNS – School of Earth Sciences and Environmental Sustainability

How Long Can Desert Tortoises, Gopherus agassizii, Hide in Their Burrows from Climate Change?
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Sarah Holditch, Riley Forbis
Display board [42B]

CEFNS – School of Forestry

The Music of Bark Beetles
Maxwell Herbert
Display board [6C]

Ancient Mud: Using Genetics to Uncover Past Communities in Alaskan Lakes
Samantha Hershauer, Colin Sobek, Viacheslav Fofanov, Darrell Kaufman, Scott Anderson, Faith Walker
Display board [7C]

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My Nest is Best: Genetically Analyzing Nest Composition of the New Mexico Jumping Mouse (Zapus luteus luteus)
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CEFNS – School of Forestry

Differences in Drought Tolerance of Pinus strobiformis from Various Provenances
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Energy, Water, and Greenhouse Emissions
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CEFNS – School of Informatics, Computing, and Cyber Systems

Culturing and Sequencing Causative Agents of Early Childhood Caries
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User Interface for Biomolecular Simulator
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<td>Media Communication and the Effects of Emotional Response</td>
<td>Rebecca Chong, Blake Regottaz</td>
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<td>Guilt and Communication</td>
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<td>Blane Hernandez, Sydney Sutter</td>
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<td>Nonverbal Messages and Perceived Approachability: The Effects of Facial Expressions Upon Perceived Approachability</td>
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<td>Diversity in Educators</td>
<td>WenDeja Moore, Darion Michalet, Cassie Miller, Elyse Moreno, Morgan Middendorf</td>
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<tr>
<td>Stopping Family Violence: The Cycles of Violence within Families</td>
<td>Ashley Montayre, Martha Marquez, Madi Moore, Audrey Masters, Megan Montague</td>
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<td>Kaitlyn Kemppainen, Kelsey Kunieje, Ariel John, Jessica Howard, Sun Hee Jeon</td>
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<td>Flagstaff CSA - Arizona Food Map</td>
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<td>Community and University Public Inquiry (CUPI) - Flagstaff Foodlink</td>
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### SBS – Sociology and Social Work

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### SBS – Sustainable Communities

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Daniel Berzins
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**While I Slept**
Avory Lent
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**Micronutrient Deficiencies and Mental Health**
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**Impact of Climate Change and Ocean Acidification on Marine Life and Ecosystems**
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**Restorative Justice: How These Programs Can Help Lower Violence in Inner-City Youth Communities**
Courtney Rogers
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- Parking: Lot P66 (SE of the building) is the closest.
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- Elevator: There are two elevators located inside. One is located on the southwest side near the main entrance of the Symposium and one is on the north side.
- Restrooms: on Concourse level and field level, both all gender and single stall.

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- Restrooms: on first floor and basement. Basement restroom is all gender and single stall.
Thank You

We wish to thank the faculty, staff, graduate students, judges, volunteers, moderators, and student ambassadors, without whom this event would not have been possible.

A special thanks goes to the Organizing Committee, especially Colin Bailey, Kerry Bennett, Becky Butcher, Bryan Sherwood, Heather Tate, and Tina Zecher, and to all the faculty mentors, individuals, companies, organizations, and grant programs that assisted students in the completion of their internships or their research, creative, and design projects.

2018 Judges

We gratefully acknowledge the following faculty, staff, alumni, and friends who volunteered to judge for CEFNS, HHS, SBS, and Cline Library. Thanks, also, to the volunteers who signed up after the program print deadline and could not be acknowledged.

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