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Welcome to the 2016 Joint Meeting of the 20th Annual TU Student Research Colloquium and the 15th Annual OU-Tulsa Research Forum!

This event is a great opportunity for students to showcase their research as well as to learn more about what research is being conducted by fellow students at the University of Tulsa, the University of Oklahoma – Tulsa, and in Tulsa area high schools. We hope that this event exposes you to new ideas and topics, and that it inspires you to do your own research in the future.

This year we have had a great turnout from TU students, OU-Tulsa students, and Tulsa area high school students and external presenters. We are proud to offer such a diverse collection of research topics.

Many people have contributed to this year’s event. We would like to especially thank our sponsors and the many student, faculty, and administrative volunteers who help make these events possible.

We hope that you enjoy the opportunity to learn about the exciting research that TU, OU-Tulsa and Tulsa area high school students are undertaking.
2017 SPONSORS:
Provost Office
Office of Research & Sponsored Programs
Graduate School
Henry Kendall College of Arts and Sciences
Collins College of Business Administration
College of Engineering and Natural Sciences
Oxley College of Health Sciences
Tulsa Undergraduate Research Challenge
Graduate Student Association
Third Floor Designs

2017 COMMITTEE MEMBERS:
Janet A. Haggerty, Associate Vice President for Research & Dean of the Graduate School
Nadia Hall, Coor. of Graduate Recruitment & Student Services
Caitlin Getchell, Recruitment and Student Services Specialist
Hope Geiger, Asst. Director of Graduate Enrollment & Student Services
Dhyaa Kafagy, Student Representative
Nick McMillan, Student Representative
Natalie Merrick, Student Representative
Anass Nassef, Student Representative
Jessie Phillips, Student Representative
Emily Schumacher, Student Representative

2017 Colloquium Artwork Provided by:
Nataly Anderson
ABOUT THE TU Student RESEARCH COLLOQUIUM…

In 1998, the University of Tulsa established the first Annual Student Research Colloquium in order to provide TU students with an opportunity to gain public speaking experience, learn about student research from fields outside their own academic discipline, and experience judging methods used by professional organizations for national and international meetings. The event is typically held during the Spring semester just after Spring Break and open to all TU undergraduate, graduate, and law students.

In terms of event coordination, the Colloquium is organized by students from the Graduate Student Association and the Tulsa Undergraduate Research Challenge, in conjunction with the Graduate School. Student Co-Chairs and Graduate School administrators help facilitate the submission of abstracts, solicit donations from campus administrative offices and organizations, organize session schedules, compile event programs, secure student judges, and coordinate sessions during the event. If students or faculty have questions about participating in or attending the Colloquium, all the inquiries are forwarded to the Student Committee Members via research-colloquium@utulsa.edu.

This year will mark the 19th Annual Student Research Colloquium, which has grown from a one-session event with 6 participants into a week-long event and an average of 150 student presentations a year. The current Colloquium website, where students come to submit abstracts and view session schedules, may be seen at http://www.utulsa.edu/research-colloquium.

Presentation topics may contain anything from original research or scholarship that a student may be conducting to work that has already been submitted for a classroom project over the previous fall semester. Some students have also used the Colloquium as an opportunity to present research proposals or scholarship in which they are contemplating doing an in-depth study, although topics do not have to cover experimental research. Departments are also encouraged to organize subject-specific symposia for inclusion during the Colloquium, to highlight particular student research topics from previous classes or encourage research into a topic of particular interest to their field.

To give students experience with judging methods typically used for national and international meetings, submitted presentations are judged according to criteria commonly used at scholarly professional meetings. Each session is overseen by a team of judges that includes a faculty member from each college and a student, plus one student serving as the session chair. Winners are announced at the Student Research Colloquium Awards Banquet and all the participants (presenters, judges, and sessions chairs) are invited to attend, as well as the advising professors for the student presenters. There are cash awards for first, second, and third place, as well as awards for honorable mention, plus addition awards for the Community Service and Poster sessions.

From start to finish, the Colloquium is an amazing opportunity for students to gain a real understanding of what goes into a professional meeting and encourage them to actively pursue interdisciplinary areas of research. Considering the Colloquium’s success, the event will definitely continue to grow in size and scope, allowing TU students to expand their knowledge base of other fields and enabling the TU community to actively support our students in their endeavors.
ABOUT THE OU-TULSA RESEARCH FORUM...

2017 OU-TULSA RESEARCH FORUM COMMITTEE:
Kent Teague, Ph.D., Assistant Vice President for Research, Forum Chair
Shelly Fowler, B.A.
Heather Chancellor McIntosh, MS, CRA
Danielle Prado

The OU-Tulsa Research Forum is a multidisciplinary event held annually at the OU-Tulsa Schusterman Center that showcases the research efforts of students, residents, and fellows from all of the colleges at the University of Oklahoma-Tulsa. The forum has grown from a small OU College of Medicine event in 2002, with only 14 abstract submissions focused on health research, to approximately 100 submissions per year, that involve the entire campus and all types of research performed at the University of Oklahoma-Tulsa. Participation by colleges located on the OU-Tulsa campus includes, Allied Health, Medicine, Architecture, Arts and Sciences, Engineering, Education, Nursing, Pharmacy and Public Health. In 2011, the OU-Tulsa research forum made a significant shift as it expanded beyond OU-Tulsa to also include research in a variety of fields from students at the University of Tulsa. It also became a part of the University of Tulsa Student Research Colloquium.

Participants from both universities are invited to meet new researchers with related research interests, develop mentor-student relationships, develop interdisciplinary dialogue, and enjoy the opportunity to learn of their colleague’s research efforts. Participants submit abstracts of their research for review by a faculty panel and acceptable abstracts are presented as posters. In-field and out-of-field judges assess the poster presentations and prizes are awarded to the top posters in each category.

Categories for submission include biomedical, education, engineering and applied research, social/behavioral and community service, and the University of Tulsa.

The 2017 OU-Tulsa Research Forum will be held at the OU-Tulsa Schusterman Learning Center at 41st & Yale on Tuesday, April 18th. Participants are asked to setup their posters between 9:00 AM to 11:00 AM and judging will commence at 2:00 PM. Presenters must discuss their poster research with judges between 2:00 PM and 4:00PM.
The University of Tulsa strongly encourages interdisciplinary research and scholarship, and supports several Interdisciplinary Institutes. This year two institutes present to campus the fruits of their work in the opening day of the Annual Research Colloquium. These institute presentations are followed by a reception (4:30–5:30PM). A brief description of each presentation is provided below.

**“EMBRACING FUTURE DELIVERY SYSTEM CHALLENGES: THE TU INSTITUTE FOR HEALTH CARE DELIVERY SCIENCES”**

*Jeffrey Alderman, Director of the Institute for Healthcare Delivery Sciences*

3:30-4:00 PM

Across America, we face challenges in delivering high-quality health care that is accessible, affordable, safe, efficient, ethical, and more satisfying to everyone. Providing care that aspires to each of these traits remains difficult – vast disagreement exists on what exactly constitutes good care. Fortunately, the academic community has rallied to address these challenges, by creating the new field of health care delivery sciences (HCDS.) While not quite ten years old, interdisciplinary programs in health care delivery sciences and its related fields have popped up on university campuses across the U.S. Seeing a strategic opportunity, the University of Tulsa launched their own HCDS program last year - focusing on community-oriented research, along with new educational initiatives geared toward graduate students and professionals alike. In the coming months, we hope to forge stronger partnerships across the TU campus, building excitement for our twin Certificate and MBA Health track education programs. At the same time, we will be working with organizations across the metro to help solve some of Tulsa’s greatest health care challenges - in an attempt to raise the general health and economic prosperity of our entire community.

**A Review of the Activities for the Oklahoma Photovoltaic Research Institute: 2016/17**

*Dr. Parameswar Hari, Director, OKPV Institute*

4:00-4:30 PM

In this presentation, Dr. Hari will review the various activities that took place under the institute during 2016-17
GENERAL INFORMATION

REGISTRATION (Judged Oral Sessions Only)
Allen Chapman Student Union, Second Floor: Lobby

Days and hours are:

- Monday 27 March: 8:00AM - 5:00PM
- Tuesday 28 March: 8:00AM - 5:00PM
- Wednesday 29 March: 8:00AM - 5:00PM
- Thursday 30 March: 8:00AM - 5:00PM
- Friday 31 March: 8:00AM - 12:00PM

All participants are required to check in at the registration tables, where you will sign in and receive meeting materials.

PRACTICE ROOM
The Administrative Conference Room is reserved as a set-up room for practice during the Colloquium. Access to the practice room is only available during the times the registration desk is staffed.

PRESENTER/SESSION CHAIR GUIDELINES
Each participant competing for an oral presentation award has a 20-minute time slot (Not applicable for Poster presenters). Presentations are a maximum of 15 minutes, followed by 3-5 minutes for a question and answer period. The next talk will begin after the completion of the Q & A portion.

Presenters need to report to the meeting room prior to the beginning of their session. A session is defined as the entire morning or afternoon period during which a presentation falls. We ask that participants not arrive just in time to give a presentation or leave immediately after their presentation. Such behavior shows a lack of professionalism. Speakers should attend their whole session. Please maintain the established schedule scrupulously in fairness to persons planning to attend sessions at specific times to hear particular speakers. We will pause for the period allotted if a scheduled speaker fails to appear. Please also note that refreshment breaks do not signal the end of a session.

Please contact the Colloquium Committee to discuss any problems with scheduling that may arise to see if the circumstances warrant a waiver for a portion of your session.

AUDIO/VISUAL REQUIREMENTS
The following items are provided for each session: LCD projector, screen, podium, and microphone. If you need special equipment other than that listed above, please check with the Colloquium Committee to make the necessary arrangements.
# The Twentieth Annual Student Research Colloquium

## Conference at a Glance

### Research Institute Presentations -

**Monday, March 27 (Great Hall B)**  
3:30 PM – 4:30 PM

### Live Mock Archaeological Excavation -

**Thursday, March 30 (Student Union South Patio)**  
11:00 AM – 1:00 PM

### Special Topic Symposia -

**Monday, March 27, 2017**
- **Topics in Occupational Health Psychology – Work Stress, Recovery, and Work-Life Balance (Alcove)**  
  9:00 AM – 10:50 AM
- **TU Research Connect (Chouteau C)**  
  10:00 AM – 5:00 PM

**Tuesday, March 28, 2017**
- **Team Interactions in Interdependent Gaming Simulations (Chouteau)**  
  8:30 AM – 9:50 AM
- **Special Topics in Urban Education I (Great Hall B)**  
  10:50 AM – 12:10 PM
- **Applications in Industrial-Organizational Psychology (Alcove)**  
  12:10 PM – 1:30 PM
- **Citizenship and Service in a Changing World (Alcove)**  
  3:30 PM – 4:50 PM

**Wednesday, March 29, 2017**
- **Museum Science and Management (Alcove)**  
  8:00 AM – 9:50 AM
- **Global Scholars Capstone Projects (Great Hall B)**  
  8:00 AM – 12:10 PM

**Thursday, March 30, 2017**
- **Current Archaeological Research in the Dept. of Anthropology (Chouteau)**  
  8:30 AM – 11:10 AM
- **Special Topics in Urban Education II (Chouteau)**  
  1:30 PM – 3:30 PM

### General Contributed Sessions –

**Monday, March 27, 2017**
- **Biological Sciences I (Great Hall B)**  
  8:30 AM – 11:50 AM
- **Film Studies, Communication, and Sociology (Alcove)**  
  12:30 PM – 4:10 PM
- **Psychology (Great Hall B)**  
  12:30 PM – 2:40 PM

**Tuesday, March 28, 2017**
- **Chemistry and Biochemistry I (Alcove)**  
  8:00 AM – 10:10 AM
- **Industrial-Organizational Psychology (Chouteau)**  
  10:10 AM – 11:30 AM
- **English Literature and Educational Studies (Great Hall B)**  
  8:30 AM – 10:40 AM
- **Mechanical Engineering (Chouteau)**  
  12:40 PM – 4:40 PM

**Wednesday, March 29, 2017**
- **Electrical and Computer Engineering (Chouteau)**  
  8:00 AM – 12:10 PM
- **Chemical Engineering (Alcove)**  
  1:00 PM – 3:10 PM
- **History (Chouteau)**  
  1:00 PM – 3:30 PM
- **Mathematics and Physics (Great Hall B)**  
  12:30 PM – 4:10 PM

**Thursday, March 30, 2017**
- **Chemistry and Biochemistry II (Alcove)**  
  8:30 AM – 10:40 AM
- **Clinical Psychology (Great Hall B)**  
  8:00 AM – 11:20 AM
- **Biological Sciences II (Alcove)**  
  1:00 PM – 4:10 PM

**Friday, March 31, 2017**
- **Petroleum Engineering (Alcove)**  
  10:00 AM – 11:50 AM
- **Computer Science (Chouteau)**  
  8:00 AM – 12:00 PM

**Tuesday, April 18, 2017**
- **College Poster Session (OU-Tulsa Schusterman Campus, Founders Hall)**  
  2:00 PM – 4:00 PM

### Research Awards Banquet -

**Friday, March 31, 2017 (Great Hall A)**  
7:00 PM – 9:00 PM
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<td>Friday, March 31</td>
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<td>Alcove</td>
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<tr>
<td>Soedarmo</td>
<td>Auzan</td>
<td>Friday, March 31</td>
<td>10:40 AM-11:00 AM</td>
<td>Alcove</td>
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<tr>
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<td>Ruizhi</td>
<td>Friday, March 31</td>
<td>11:10 AM-11:30 AM</td>
<td>Alcove</td>
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<tr>
<td>Kolla</td>
<td>Srinivas Swaroop</td>
<td>Friday, March 31</td>
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<tr>
<td>Bailey</td>
<td>Ashley</td>
<td>Tuesday, April 18</td>
<td>Poster</td>
<td>OU Tulsa-Founders Hall</td>
</tr>
<tr>
<td>Basnett</td>
<td>Andrew</td>
<td>Tuesday, April 18</td>
<td>Poster</td>
<td>OU Tulsa-Founders Hall</td>
</tr>
<tr>
<td>Blackwell</td>
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<td>Tuesday, April 18</td>
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<tr>
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<td>Shuddha, Sharmin</td>
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<td>Ryan</td>
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<td>Mariah</td>
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<td>Poster</td>
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<td>Sullivan</td>
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<td>Xiao</td>
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<td>Tecle</td>
<td>Leah</td>
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<td>Poster</td>
<td>OU Tulsa-Founders Hall</td>
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<td>Julia</td>
<td>Tuesday, April 18</td>
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</tbody>
</table>
# 2017 Community Service Symposium

## Judging Criteria

**Speaker/Presenter:**

**Title of Presentation:**

20 minute oral presentation, including 3 - 5 minute question period.

<table>
<thead>
<tr>
<th>Unsatisfactory</th>
<th>Poor</th>
<th>Weak</th>
<th>Below Average</th>
<th>Average</th>
<th>Good</th>
<th>Very Good</th>
<th>Excellent</th>
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<td>4</td>
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</tbody>
</table>

### Service Project Purpose & Significance

- **Purpose:** Presented both a summary of the community service project’s purpose and the possible impact had had or will have on the community and/or target demographic.
- **Innovativeness:** Provided a significant service to community and/or intended recipient through new and inventive methods. Addressed underrepresented areas of concern or population demographics not typically seen in local service projects.
- **Project Promotion/Continuation:** Offered goals and organization of service project to advance and/or perpetuate community and student involvement.
- **Community Collaboration:** Considered the needs and interests of the project’s targeted community/organization/individuals prior to implementation of service work. Determined the preferences of the targeted audience through research and collaboration with the affected community/individuals.

### Student Commitment & Learning Experience

- **Commitment:** Demonstrated a level of commitment to community service project in terms of time and resources for planning, implementation, and/or promotion of project goals and services.
- **Learning Experience:** Expressed project’s impact on student’s personal perspective, professional goals, and/or academic focus.

### Quality of Presentation

- **Organization and Presentation of Topic:** Presented both the purposes of the community service project and the scope of student involvement, and showed the mutual impact on both student and service project alike.
- **Vocalization, Delivery, and Posture:** Addressed the audience with dynamic inflection, modulating vocal volume, poised demeanor, and expressiveness without any distracting or unnecessary physical actions.
- **Timing:** Use of time was proportioned and balanced. Finished within time limit. Allowed time for questions and answers. Handled questions well.

<table>
<thead>
<tr>
<th>Unsatisfactory</th>
<th>Poor</th>
<th>Weak</th>
<th>Below Average</th>
<th>Average</th>
<th>Good</th>
<th>Very Good</th>
<th>Outstanding</th>
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SUBTOTAL: 

**Bonus:** Challenges/Inconvenience Factor: Degree to which student overcame challenges or inconveniences experienced during the course of their involvement with the chosen community service project. *(i.e., distance traveled, difficulties associated with the nature/behavior of service project’s target audience/location)*

TOTAL: 

**Judge’s Name (print):**

**Signature:**

*Please write any additional comments on the back*
In Field Judging Form:  Poster Presentation

Title:
Presenter:

Scoring

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>5 points – Excellent</td>
<td>Excellent in every way. Equal in quality to nationally presented and/or published papers.</td>
</tr>
<tr>
<td>4 points – Very Good</td>
<td>Above average. Adequate for presentation at state/regional meetings; could use additional work to quality for national presentation.</td>
</tr>
<tr>
<td>3 points – Good</td>
<td>Satisfactory or average presentation. Would need additional work to be presented at state/regional meetings.</td>
</tr>
<tr>
<td>2 points – Marginal</td>
<td>Meets minimum expectations. Not of publishable or presentable quality.</td>
</tr>
<tr>
<td>1 point – Poor</td>
<td>Poor. Did not meet minimum expectations. Not of publishable or presentable quality.</td>
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Please circle the appropriate score  

<table>
<thead>
<tr>
<th>Assessment Score</th>
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<tbody>
<tr>
<td>1 2 3 4 5</td>
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</table>

1. The research supported and/or answered the objectives presented.  1 2 3 4 5

2. The methodology or procedure was appropriate for the research presented.  1 2 3 4 5

3. The poster appropriate methods of analysis or interpretation were used.  1 2 3 4 5

4. The poster indicated an understanding of the benefit of the research.  1 2 3 4 5

5. The poster explained the results well.  1 2 3 4 5

6. The poster indicates an idea of what further research is warranted.  1 2 3 4 5

7. Responses to questions were knowledgeable and adequate.  May award a 0 if the presenter was not present.  1 2 3 4 5

8. An overall evaluation score for the presentation.
   a. Poor – 0  
   b. Average – 2.5  
   c. Excellent - 5

   Total Score = ______

General Comments Section:
Out of Field Judging Form: Poster Presentation

Scoring

5 points – Excellent
Excellent in every way. Equal in quality to nationally presented and/or published papers.

4 points – Very Good
Above average. Adequate for presentation at state/regional meetings; could use additional work to quality for national presentation.

3 points – Good
Satisfactory or average presentation. Would need additional work to be presented at state/regional meetings.

2 points – Marginal
Meets minimum expectations. Not of publishable or presentable quality.

1 point – Poor
Poor. Did not meet minimum expectations. Not of publishable or presentable quality.

Please circle the appropriate score

1. The research was presented in a clear and concise manner.

2. There was sufficient detail for an out of field observer to follow the research.

3. The poster was visually appealing.

4. The poster was professionally designed and made good use of the space allotted.

5. The presenter seemed comfortable discussing the topic.

6. The presenter clearly and adequately responded to questions.

Assessment Score

1 2 3 4 5

Total Score =

General Comments Section:
# 2017 Annual Student Research Colloquium

## Oral Presentation Judging Criteria

**Speaker/Presenter:**

**Title of Presentation:**

**Session:**

<table>
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<th>Benchmark</th>
<th>Preparational</th>
<th>Milestone</th>
<th>Capstone</th>
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<tr>
<td>UNSATISFACTORY</td>
<td>WEAK</td>
<td>BELOW AVERAGE</td>
<td>AVERAGE</td>
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<tr>
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</tbody>
</table>

### Primary Criteria

- **Central Message:** Allowed for easy identification of project’s significance, both for those in the discipline and non-specialists, through a clear main point/thesis/“bottom line”/“take-away” to presentation.

- **Organizational and Presentation of Ideas:** Sequenced and grouped ideas and supporting materials clearly, through the use of an introduction, interpretive discussion, and conclusion.

- **Use of Supporting Materials:** Provided examples, explanations, illustrations, statistics (when applicable), analogies, quotations from relevant authorities, and other kinds of information or analysis that supported the principal ideas of the presentation.

- **Language:** Used vocabulary, terminology, and sentence structure, both in relation to the topic and the audience, were free from bias and were grammatically correct, and supported the effectiveness of the presentation.

- **Vocalization, Delivery, and Poise:** Addressed the audience, using adequate inflection and proper modulation of the volume of one’s voice. Maintained regular eye contact and poised demeanor without any distracting or unnecessary physical movements.

### Secondary Criteria

- **Abstract:** Written description adequately prepared audience for presentation of student’s research.

- **Timing:** Use of time was proportioned and balanced, finishing within the time limit, allowed time for questions and answers, and handled questions well.

**Subtotal:**

**Session Chair:** Speaker arrived late for session or left early without permission? (9 point deduction) **YES NO**

**Judge’s Name** ________________ **Signature** ____________________________
SPECIAL TOPIC SESSION: TOPICS IN OCCUPATIONAL HEALTH PSYCHOLOGY
– WORK STRESS, RECOVERY, AND WORK-LIFE BALANCE

Monday, March 27                   9:00 AM – 10:50 AM
Allen Chapman Student Union               Level 2: Alcove

9:00 AM       Luu, Sylvia
TARGET PERCEPTIONS OF ABUSIVE SUPERVISION

9:20 AM        Hoover, Coty
AN EXPERIMENTAL TEST OF RECOVERY EXPERIENCES
CONTRIBUTING TO RESOURCE RESTORATION

9:40 AM        Mol, Matt
RESOURCE RECOVERY AS A RESULT OF RECOVERY EXPERIENCES

10:00 AM       BREAK

10:10 AM       Herrera, Valeria
FAMILY MATTERS: DO FAMILY CHARACTERISTICS IMPACT JOB-RELATED OUTCOMES

10:30 AM       Fonseca, Rose
WORK-LIFE BALANCE: WHAT DOES IT REALLY MEAN?

CONTRIBUTED PAPERS: BIOLOGICAL SCIENCES I

Monday, March 27                   8:30 AM – 11:50 AM
Allen Chapman Student Union               Level 2: Great Hall B

8:30 AM        Raval, Dhvanit
INHIBITION OF CANCER CELL METABOLISM

8:50 AM        Flonard, Michaela
TRACKING SPONTANEOUS HAIR CELL REGENERATION IN WILD-TYPE MICE
9:10 AM Lawrence, Christopher
CHALLENGING THE STANDARD: A MITOGENOMIC COMPARATIVE ANALYSIS FOR THE ORDER HEMIPTERA AND A SUBSTUDY OF THE GENOMIC ARCHITECTURE OF THE FAMILY CIMICIDAES

9:30 AM BREAK

9:40 AM Alanagreh, Lo’ai
DE NOVO ASSEMBLY AND TRANSCRIPTOME ANALYSIS OF HAEMATOCOCCUS PLUVIALIS

10:00 AM Karki, Anand
COMPARATIVE STUDY ON THE SURVIVABILITY OF CAMPYLOBACTER JEJUNI AND CAMPYLOBACTER COLI IN VARIOUS RETAIL MEAT AND LIVER JUICES

10:20 AM Weber, Emily
IDENTIFICATION OF THE FREE-LIVING AMOEBA IN BRADEN PARK AND MOHAWK PARK IN TULSA, OKLAHOMA, USING MOLECULAR METHODS

10:40 AM BREAK

10:50 AM Phillips, John
GENETIC DIVERSITY OF AN ENIGMATIC AQUIFER SPECIES FROM THE SOUTHEASTERN UNITED STATES, THE GEORGIA BLIND SALAMANDER, EURYCEA WALLACEI

11:10 AM Tovar, Ruben
THROUGH THE EYES OF A SALAMANDER, A TRANSCRIPTOME WIDE ANALYSIS OF OCULAR DEVELOPMENT

11:30 PM Heck, Mariah
FINDING SPECTRAL PATTERNS IN BARK BEETLE INFESTATIONS OF THE SIERRA NATIONAL FOREST USING LANDSAT AND AVIRIS IMAGERY
MONDAY AFTERNOON, MARCH 27, 2017

CONTRIBUTED PAPERS: FILM STUDIES, COMMUNICATION, AND SOCIOLOGY
Monday, March 27, 2017                    12:30 PM – 4:10 PM
Allen Chapman Student Union                Level 2: Alcove

12:30 PM  Elliott, Britney
TAXPHONOMIC AND PALEOECOLOGICAL ANALYSIS OF SMALL MAMMAL REMAINS FROM HAYONIM CAVE LAYER E

12:50 PM  Nierenberg, Valerie
WOMEN’S EXPERIENCES OF PREGNANCY AND CHILDBIRTH

1:10 PM   Martuch, Allison
RELIGIOUS CONFLICT: EXAMINING THE EFFECTS OF POLARIZATION AND FRACTIONALIZATION

1:30 PM   BREAK

1:40 PM   Li, Ruiming
MEDIA AND MASS MOVEMENT: 1960S AMERICAN HIPPIES AND CHINESE RED GUARDS

2:00 PM   Smith, Meg
FIGHTING DEHUMANIZATION IN THE FACE OF A GLOBAL CRISIS: RESTORING HUMANITY TO REFUGEES

2:20 PM   Vissers, Hannah
EXPERIENCES OF INTERNATIONAL STUDENTS AT THE UNIVERSITY OF TULSA

2:40 PM   Anderson, Haley
LEADING THE WAY: A FYE COURSE PROPOSAL

3:00 PM   BREAK

3:10 PM   Brooks, Maggie
APPLYING CHARACTERISTICS OF NATURAL ENVIRONMENTS TO ACADEMIC SETTINGS FOR THE IMPROVEMENT OF STUDENT HEALTH AND STUDY HABITS
3:30 PM  Boccacci, Lisandro
INTERNATIONAL 360 CONNECT

3:50 PM  Michalek, Brady
AN EXPLORATION INTO THE LIVES OF WORKING MOTHERS

CONTRIBUTED PAPERS: PSYCHOLOGY
Monday, March 27, 2017  12:30 PM – 2:40 PM
Allen Chapman Student Union  Level 2: Great Hall B

12:30 PM  Dorand, Madison Fae
EXAMINING THE CONTEXTS OF CAMPUS SEXUAL ASSAULT
AND HEALTH RISK BEHAVIORS AT THE UNIVERSITY OF TULSA

12:50 PM  Lapidus, Rachel
INVESTIGATING THE RELATIONSHIP BETWEEN HOMEOSTATIC
THREAT, ANXIETY SENSITIVITY, AND NEGATIVE VALENCE
PROCESSING

1:10 PM  Johnson, Sarah-Nicole
PTSD TRAJECTORIES: A COMPARISON OF INTENTIONAL AND
UNINTENTIONAL TRAUMA

1:30 PM  BREAK

1:40 PM  Cole, Hannah
AN EXPLORATION OF TREATMENT PREFERENCE FOR TRAUMA-
RELATED SYMPTOMS

2:00 PM  Slaughter, Autumn
JOURNALISTS’ SATISFACTION WITH HOSTILE ENVIRONMENT, FIRST
AID, AND SAFETY TRAININGS

2:20 PM  Cogan, Chelsea
DOSE-RESPONSE THEORY IN A BRIEF PSYCHOTHERAPY FOR POST-
TRAUMA NIGHTMARES: DOES SESSION FREQUENCY MATTER?

RESEARCH INSTITUTE PRESENTATIONS
Monday, March 27, 2017  3:30 PM – 4:30 PM
Allen Chapman Student Union  Level 2: Great Hall B
TUESDAY MORNING, MARCH 28, 2017

SPECIAL TOPIC SESSION: TEAM INTERACTIONS IN INTERDEPENDENT GAMING SIMULATIONS
Tuesday, March 28, 2017
Allen Chapman Student Union

8:30 AM Thomas, Christopher
LEARNING AND GAME DESIGN

8:50 AM Boggs, Jacqueline
COMMUNICATION SKILLS IN AN INTERDEPENDENT TEAM TASK

9:10 AM Diep, Alexander
ANALYZING SOCIAL NETWORKS IN AN INTERDEPENDENT TEAM

9:30 AM Luu, Sylvia
TEAM PREDICTORS OF PERFORMANCE IN INTERDEPENDENT GAMES

CONTRIBUTED PAPERS: INDUSTRIAL-ORGANIZATIONAL PSYCHOLOGY
Tuesday, March 28, 2017
Allen Chapman Student Union

10:10 AM Kerr, Alison
THE HISTORY OF PERFORMANCE FEEDBACK

10:30 AM Luu, Sylvia
INDIVIDUAL DIFFERENCES IN PERSONALITY AND GOAL-SETTING PREFERENCES

10:50 AM Kerr, Alison
STRESS AND THE MINDFUL POLICE OFFICER

11:10 AM Hundley, Nathan
A COMPETENCY-BASED TAXONOMY OF LEADERSHIP/MANAGEMENT SITUATIONS

CONTRIBUTED PAPERS: ENGLISH LITERATURE AND EDUCATIONAL STUDIES
Tuesday, March 28, 2017
Allen Chapman Student Union

8:30 AM Stewart, Emma
FOOD AND MEMORY: THE PROUST PHENOMENON
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<tr>
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<th>Name</th>
<th>Title</th>
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<tbody>
<tr>
<td>8:50 AM</td>
<td>Miller, Katie</td>
<td>NAMED AND UNNAMED: FORCES OF IMPERIAL POWER OVER THE INDIVIDUAL IN OUR SISTER KILLJOY</td>
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<tr>
<td>9:10 AM</td>
<td>Pevac, Mikayla</td>
<td>FOOD’S CONNECTION TO MODERN WEIGHT PORTRAYAL</td>
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<tr>
<td>9:30 AM</td>
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<td>BREAK</td>
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<tr>
<td>9:40 AM</td>
<td>Lee, Seungho</td>
<td>DOMESTICATING GLOBAL LITERATURE AND GLOBALIZING DOMESTIC LITERATURE: WORLD CLASSICS IN KOREA</td>
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<tr>
<td>10:00 AM</td>
<td>Mancini, Michael</td>
<td>AN INTERSTATE COMPARISON OF INDIAN REMOVAL ERA SOCIAL STUDIES CURRICULA</td>
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<tr>
<td>10:20 AM</td>
<td>Lane, Chisum</td>
<td>PEDAGOGICAL TOOLS USED IN PLATO'S REPUBLIC</td>
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**CONTRIBUTED PAPERS: CHEMISTRY AND BIOCHEMISTRY I**

- **Tuesday, March 28, 2017**
- **8:00 AM – 10:10AM**
- **Allen Chapman Student Union**
- **Level 2: Alcove**

<table>
<thead>
<tr>
<th>Time</th>
<th>Name</th>
<th>Title</th>
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<tbody>
<tr>
<td>8:00 AM</td>
<td>Makkapati, Teja</td>
<td>FLOATATION TANKS FOR STRESS REDUCTION</td>
</tr>
<tr>
<td>8:20 AM</td>
<td>Morgan, Heather</td>
<td>INCORPORATING THE EFFECT OF ELECTRONIC POLARIZATION IN CLASSICAL MOLECULAR SIMULATIONS OF PROTEINS</td>
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<tr>
<td>8:40 AM</td>
<td>Carr, Austin</td>
<td>USE OF SCANNING TUNNELING SPECTROSCOPY TO CHARACTERIZE DOPED ZNO NANORODS FOR SOLAR CELL APPLICATIONS</td>
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<tr>
<td>9:00 AM</td>
<td></td>
<td>BREAK</td>
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<tr>
<td>9:10 AM</td>
<td>Ostrander, John</td>
<td>ANALYSIS OF PRESSURE INDUCED CONDUCTIVITY FOR VARIOUS LITHIUM CONTAINING CERAMICS FOR POTENTIAL APPLICATION IN SOLID STATE BATTERIES</td>
</tr>
<tr>
<td>9:30 AM</td>
<td>Bensalah, Adam</td>
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</table>
MILD ARENE CHLORINATION USING ORGANIC DYES AS VISIBLE LIGHT PHOTOREDOX CATALYSTS

9:50 AM Jackson, Lauren
EXPLORING THE STABILITY OF SILVER HALIDE THIN FILMS ON AU(111)

SPECIAL TOPIC SESSION: SPECIAL TOPICS IN URBAN EDUCATION RESEARCH I
Tuesday, March 28, 2017 10:50 AM – 12:10 PM
Allen Chapman Student Union Level 2: Great Hall B

10:50 AM Kuehn, Scott
THE EFFECT OF THE PLACEMENT OF PHYSICAL ACTIVITY ON MATH ACHIEVEMENT

11:10 AM Haunga, Steve
THE RELATIONSHIP BETWEEN DIET AND ACADEMIC ACHIEVEMENT

11:30 AM Suits, Craig
THE RELATIONSHIP BETWEEN SLEEP AND ACADEMIC PERFORMANCE

11:50 AM Barbour, Erin
THE EFFECT OF EXTRACURRICULAR PARTICIPATION ON MATH ACADEMIC PERFORMANCE

TUESDAY AFTERNOON, MARCH 28, 2017

SPECIAL TOPIC SESSION: APPLICATIONS OF INDUSTRIAL-ORGANIZATIONAL PSYCHOLOGY
Tuesday, March 28, 2017 12:30 PM – 1:30 PM
Allen Chapman Student Union Level 2: Alcove

12:10 PM Cunningham, Sydnie
EXAMINING CHANGES IN PERSON-ORGANIZATION FI

12:30 PM Royes, Joshua
STRUCTURE AND EVALUATION OF A DIVERSITY TRAINING PROGRAM

12:50 PM Wright, Amber
TEAM INTERACTIONS IN CLASS GROUP PROJECTS
1:10 PM    Arnold, Bret
CONTEXTUALIZING THE EMOTIONAL LABOR AND BURNOUT OF NURSES: INDIVIDUALS, ORGANIZATIONS, AND CULTURES

CONTRIBUTED PAPERS: MECHANICAL ENGINEERING
Tuesday, March 28, 2017                    12:40 PM – 4:40 PM
Allen Chapman Student Union              Level 2: Chouteau

12:40 PM    Nassef, Anass
EROSION-CORROSION BEHAVIOR OF IRON CARBONATE PROTECTIVE LAYER IN A FLOW CONTAINING SAND OR CALCIUM CARBONATE (CACO₃) PARTICLES

1:00 PM    Laney, Samuel
NOVEL DAMAGE DETECTION IN FIBER-REINFORCED COMPOSITE MATERIALS

1:20 PM    Lopez, Evelin
TRICERATOPS SURGICAL DEVICE

1:40 PM    Pulleykigen, Spenser
CULTURAL AND COMPUTATIONAL INTERFACING TOWARDS ANTHROPOMORPHIC ROBOTIC DEVELOPMENT

2:00 PM    BREAK

2:10 PM    Starkweather, Jared
INTEGRATION OF SELF-HEALING CHEMISTRY INTO DENTAL ADHESIVES

2:30 PM    Kinzer, Bryan
HEAT LOSS TESTING OF CPV SOLAR ABSORBER WITH SELECTIVE SPECTRUM NANOPARTICLES

2:50 PM    Waldman, Laura
LOCATABLE PLASTIC PIPE

3:10 PM    BREAK

3:20 PM    Morrison, Tyler
ALGORITHMS FOR SHUFFLING FOOT PLACEMENTS TO MAINTAIN STABILITY OF A QUADRUPED ROBOT ENGAGED IN A COOPERATIVE TASK
3:40 PM Crall, Matthew
MICROFLUIDIC ENCAPSULATION OF NANOPARTICLE REACTANTS FOR AUTONOMIC DAMAGE DETECTION

4:00 PM Wright, David
COB CONSTRUCTION

4:20 PM Al-Naser, Ibrahim
COUPON-BASED PREDICTION OF FULL-SCALE FATIGUE PERFORMANCE OF BONDED REPAIRS

SPECIAL TOPIC SESSION: CITIZENSHIP AND SERVICE IN A CHANGING WORLD
Tuesday, March 28, 2017 3:30 PM – 4:50 PM
Allen Chapman Student Union Level 2: Alcove

3:30 PM Loe, Elisabeth
YOUTH SERVICES SOLAR CELL PHONE CHARGER PROJECT

3:50 PM Trowhill, Kasey
COMMUNITY SERVICE IN OKLAHOMA: SUMMER STEM PROGRAMS FOR MIDDLE AND HIGH SCHOOL YOUTH

4:10 PM London, Alexander
CONNECTING COMMUNITIES: HOW MUSEUMS CAN BRIDGE NEIGHBORHOOD RELATIONS

4:30 PM Raines, Julia
SISTER INDIA "LIKE A SISTER" CAMPAIGN

WEDNESDAY MORNING, MARCH 29, 2017

SPECIAL TOPIC SESSION: GLOBAL SCHOLARS CAPSTONE PROJECTS
Wednesday, March 29, 2017 8:00 AM – 12:10 PM
Allen Chapman Student Union Level 2: Great Hall B

Sustainability, Energy, and Medicine

8:00 AM Tapp, Grace
THE FUTURE OF PROTEOMIC ANALYSIS AND WORLD HEALTH
8:20 AM  Smith, Kirk
POLYMERIC SOLAR THERMAL COLLECTORS AND THE TRANSITION TO A CLEAN ENERGY ECONOMY

8:40 AM  Win, Arthur
TEMPERATURE DEPENDENCE OF ELECTRICAL CHARACTERISTICS IN SI SINGLE-ELECTRON TRANSISTORS

9:00 AM  BREAK

9:10 AM  Mardis, Collin
SUSTAINABILITY AND THE TIME VALUE OF MONEY

9:30 AM  Hicks, Sarah and Luke Wagner
PASCAL: HOW REUSING IS BETTER THAN RECYCLING

9:50 AM  BREAK

Global Challenges

10:20 AM  Moore, Caroline
CONTEMPORARY CATALAN ARTIST & THE SEVEN GLOBAL CHALLENGES

10:40 AM  Willis Cuauhtle, Giselle
RESPONSES TO ONLINE HARASSMENT

11:00 AM  BREAK

11:20 AM  Raines, Julia
SISTER INDIA "LIKE A SISTER" CAMPAIGN

11:30 AM  Cain, Tara
DISCOVERING HIDDEN MEDIA TONES IN THE SYRIAN REFUGEE CRISIS

11:50 AM  Benes, Jeremiah
COMBATING RADICALIZATION INTO VIOLENT EXTREMISM

SPECIAL TOPIC SESSION: IDENTITY AND COMMUNITY – CONTEMPORARY ISSUES IN MUSEUM SCIENCE AND MANAGEMENT

Wednesday, 6 April  8:00 AM – 9:50 AM
Allen Chapman Student Union  Level 2: Alcove
8:00 AM  Bradshaw, Amy
ORAL HISTORIES IN MUSEUMS

8:20 AM  London, Alexander
CONNECTING COMMUNITIES: HOW MUSEUMS CAN BRIDGE NEIGHBORHOOD RELATIONS

8:40 AM  Noah, Molly
COMPOSITE IDENTITIES: REPRESENTATIONS OF INDIGENEITY IN NICHOLAS GALANIN AND KC ADAMS WORK

9:00 AM  BREAK

9:10 AM  Noah, Molly
MODERN ART AND NATIVE FOOD: PATRICK DESJARLAIT’S DEPICTIONS OF ANISHINAABE LIFE IN THE 20TH-CENTURY

9:30 AM  Qualls, Zachary
ARTISTIC FORM IN THE SANDE SOCIETY OF WEST AFRICA

CONTRIBUTED PAPERS: ELECTRICAL AND COMPUTER ENGINEERING
Wednesday, March 29, 2017  8:20 AM – 12:30 PM
Allen Chapman Student Union  Level 2: Chouteau

8:00 AM  Reeder, Ryvers
Adjacent Matrix Storage and Exponentiation

8:20 AM  Kelley, Armand
EMBEDDED SYSTEM DEVELOPMENT FOR THE HYDROSENSE WIRELESS FLOW METER

8:40 AM  Maleki, K. Niki
A RELIABLE SYSTEM DESIGN FOR NONDETERMINISTIC ADAPTIVE CONTROLLERS IN SMALL UAV AUTOPILOTS

9:00 AM  Fuller, Justin
RUN-TIME ASSURANCE TO AID IN CERTIFICATION OF COMPLEX SMALL AIRCRAFT AND SMALL UAS AUTOPILOTS

9:20 AM  Bales, Charles
CYBER-SECURITY MAPPING OF A RESEARCH NUCLEAR REACTOR

9:40 AM  BREAK
<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00 AM</td>
<td>Nichols, Will</td>
<td>INTRODUCING PRIORITIES INTO HYBRID ATTACK GRAPHS</td>
</tr>
<tr>
<td>10:20 AM</td>
<td>Franklin, Chance</td>
<td>RC AIRPLANE INSTRUMENTATION AND SIMULATION MODEL DEVELOPMENT</td>
</tr>
<tr>
<td>10:40 AM</td>
<td>Jones, Zachary</td>
<td>HIGH PERFORMANCE COMPUTING: CONTENT ADDRESSABLE MEMORY</td>
</tr>
<tr>
<td>11:00 AM</td>
<td></td>
<td>BREAK</td>
</tr>
<tr>
<td>11:10 AM</td>
<td>Miraglia, Giovanni</td>
<td>KALMAN FILTER-BASED SENSOR FUSION: COMPARISON BETWEEN TWO TECHNIQUES IN THE UAV TRACKING PROBLEM SCENARIO</td>
</tr>
<tr>
<td>11:30 PM</td>
<td>Johnston, Reid</td>
<td>DEVELOPMENT OF A TEACHING AIDE FOR INTRODUCTORY LEVEL DIGITAL SYSTEMS DESIGN</td>
</tr>
<tr>
<td>11:50 AM</td>
<td>Hutchins, Nathan</td>
<td>ACCEPTANCE, HUMAN FACTORS, AND ETHICS IN AUTONOMOUS VEHICLES</td>
</tr>
</tbody>
</table>

**WEDNESDAY AFTERNOON, MARCH 29, 2017**

**CONTRIBUTED PAPERS: HISTORY**

Wednesday, March 29, 2017 1:00 PM – 3:30 PM
Allen Chapman Student Union Level 2: Chouteau

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00 PM</td>
<td>Prebish, Lydia</td>
<td>THE NATIONAL HISTORIC PRESERVATION ACT AND THE PIONEER AMERICA SOCIETY</td>
</tr>
<tr>
<td>1:20 PM</td>
<td>Olson, Claire</td>
<td>THE AMERICAN LIBRARY ASSOCIATION AND CENSORSHIP</td>
</tr>
<tr>
<td>1:40 PM</td>
<td>Pirok, John</td>
<td>THE JOHN BIRCH SOCIETY’S CIVIL RIGHTS CONSPIRACIES</td>
</tr>
<tr>
<td>Time</td>
<td>Name</td>
<td>Title</td>
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<tr>
<td>2:00 PM</td>
<td>Welch, James</td>
<td>MARK HANNA: THE CREATOR OF EDUCATIONAL BIASED CAMPAIGNS AND THE PERPETUATION OF DOLLAROCRACY</td>
</tr>
<tr>
<td>2:20 PM</td>
<td></td>
<td>BREAK</td>
</tr>
<tr>
<td>2:30 PM</td>
<td>Christensen, Jean Marie</td>
<td>ATTACKING CATHOLIC MOTHERHOOD: PRINCESS ANNE, MARY OF MODENA AND ROYAL MOTHERHOOD IN LATE STUART ENGLAND</td>
</tr>
<tr>
<td>2:50 PM</td>
<td>Orr, Tabitha</td>
<td>FROM EXODUST TO DUST BOWL: THE AFRICAN AMERICAN EXPERINCE IN OKLAHOMA (1929-1940)</td>
</tr>
<tr>
<td>3:10 PM</td>
<td>Berrett, Chandler</td>
<td>RECONSTRUCTION ON FILM</td>
</tr>
</tbody>
</table>

**CONTRIBUTED PAPERS: MATHEMATICS AND PHYSICS**

Wednesday, March 29, 2017       12:30 PM – 4:10 PM  
Allen Chapman Student Union    Level 2: Great Hall B

<table>
<thead>
<tr>
<th>Time</th>
<th>Name</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:30 PM</td>
<td>Seiders, Amanda</td>
<td>SOLVING LAPLACE’S EQUATION IN A RECTANGULAR DOMAIN USING THE BOUNDARY ELEMENT METHOD</td>
</tr>
<tr>
<td>12:50 PM</td>
<td>Jameson, Carter</td>
<td>MODELING PHARMOCOKINETICS: ORAL-TRANSMUOSAL ADMINISTRATION OF FENTANYL USING DELAY DIFFERENTIAL EQUATIONS</td>
</tr>
<tr>
<td>1:10 PM</td>
<td>Mathur, Nitesh</td>
<td>THE SPECIAL CASES OF THE BINOMIAL THEOREM AND SQUARE NUMBER PATTERNS</td>
</tr>
<tr>
<td>1:30 PM</td>
<td>Hernandez, Alejandro</td>
<td>ESTIMATING DYNAMIC CONNECTIVITY STAES IN RESTING-STATE FMRI</td>
</tr>
<tr>
<td>1:50 PM</td>
<td></td>
<td>BREAK</td>
</tr>
<tr>
<td>2:00 PM</td>
<td>Schriewer, Luke</td>
<td>SPHERICALLY SYMMETRIC NEUTRON STAR SIMULATIONS USING MODERN, TABULATED EQUATIONS OF STATE</td>
</tr>
</tbody>
</table>
2:20 PM  Tiwari, Ram Chandra
STUDY OF ELECTRICAL AND THERMAL PROPERTIES OF CO-DOPED ZNO NANOPARTICLES

2:40 PM  Kaphle, Amrit
OPTICAL AND ELECTRICAL CHARACTERIZATION OF COBALT DOPED ZNO NANOPARTICLES FOR THE ENHANCEMENT OF POWER CONVERSION EFFICIENCY OF SILICON BASED SOLAR CELLS

3:00 PM  BREAK

3:10 PM  Liu, Yingdi
MOLECULAR MODELING OF COAL SWELLING

3:30 PM  Lux, Adam
GENERAL NO-SCALE SUPERGRAVITY: THE F-SU(5) MODEL

3:50 PM  Shaw, Zachary
ANALYSIS OF MAGNETOHYDRODYNAMIC ALGORITHMS

CONTRIBUTED PAPERS: CHEMICAL ENGINEERING
Wednesday, March 29, 2017
Allen Chapman Student Union
Level 2: Alcove

1:00 PM  McFee, Grace
VOLLEYBALL AERODYNAMICS

1:20 PM  Ramasubramanian, Vaidheeshwar
INVESTIGATING THE ROLE OF MOLYBDENUM DURING THE DIRECT CONVERSION OF METHANE TO LIQUIDS UNDER NON-OXIDATIVE CONDITIONS

1:40 PM  Neeli, Sai Teja
SUNTHESIS AND CHARACTERIZATION OF BIOCHAR-BASED CARBON SUPPORTED METAL NANOPARTICLES

2:00 PM  BREAK

2:10 PM  Xue, Sha
DIFFUSION OF LI IONS IN AMORPHOUS AND CRYSTALLINE PEO3:LICF3SO3 POLYMER ELECTROLYTES
THURSDAY MORNING, MARCH 30, 2017

SPECIAL TOPIC SESSION: CURRENT ARCHAEOLOGICAL RESEARCH IN THE DEPARTMENT OF ANTHROPOLOGY
Thursday, March 30, 2017 8:30 AM – 11:10 AM
Allen Chapman Student Union Level 2: Chouteau

8:30 AM Bowman, Paul
3D MORPHOMETRICS OF BONE SURFACE MODIFICATIONS FROM ARCHAEOLOGICAL ASSEMBLAGES: A CURSORY INVESTIGATION

8:50 AM Miller, Melissa
DEFINING BESTWOOD: A DISSERTATION PROPOSAL

9:10 AM Bell, Colleen
EXAMINING THE RELATIONSHIP BETWEEN LANGUAGE AND EARLY STONE TOOL PRODUCTION: PRELIMINARY BEHAVIOURAL DATA

9:30 AM BREAK

9:40 AM Mraz, Veronica
PRESSURE OR PERCUSSION, WHICH ONE IS IT? AN EXPERIMENTAL AND STATISTICAL ASSESSMENT OF HOW FLAKES ARE IDENTIFIED IN THE ARCHAEOLOGICAL RECORD

10:00 AM Tochtrop, Emily
MICRO-WEAR ANALYSIS OF MULTI-PURPOSE STONE TOOLS

10:30 AM Martinez Galicia, Marco
ANALYZING DIVERSITY OF CASAS GRANDES CERAMIC POLYCHROMES USING DIVERSITY INDICES

10:50 AM Schumacher, Emily
MORE THAN INDIANA JONES: CULTURAL RESOURCES, AMERICAN ARCHAEOLOGY, AND THE NATIONAL PARK SYSTEM
CONTRIBUTED PAPERS: CHEMISTRY AND BIOCHEMISTRY II
Thursday, March 30, 2017  
Allen Chapman Student Union
8:30 AM – 10:40 AM  
Level 2: Alcove

8:30 AM  
Yungbluth, Jack  
ELECTROCHEMICAL CONTROL OF PHASE CHANGE PROPERTIES IN NANOPARTICLES OF SILVER SELENIDE

8:50 AM  
Keating, Claire  
VISIBLE-LIGHT-PROMOTED FORMATION OF °-TERTIARY AMINES VIA A N-CENTERED RADICAL APPROACH

9:10 AM  
Wirth, Denise  
SELECTIVE ELECTROPOLYMERIZATION OF ANILINE ON AN ITO ELECTRODE USING MAGNETIC NANOPARTICLES AND A VARYING MAGNETIC FIELD

9:30 AM  
BREAK

9:40 AM  
DeMier, Brettany and Kristina Scott  
THE MILD FORMATION OF N-SULFONYL IMINES USING IMINOIODINANES

10:00 AM  
Wang, Le and Teljan Ali Kizi  
ENHANCED ION CONDUCTION IN POLYMER ELECTROLYTE FILMS HAVING NANOPHASE SEPARATION AND NANOIMPRINTING

10:20 AM  
Schinnerer, Camden  
EFFECTS OF CHELATION OF FE(II) AND FE(III) BY MELANIN FILMS ON ELECTROCHEMICAL CHARACTERISTICS FOR PARKINSONISM DISEASE APPLICATIONS

CONTRIBUTED PAPERS: CLINICAL PSYCHOLOGY
Thursday, March 30, 2017  
Allen Chapman Student Union  
Level 2: Great Hall B
8:00 AM – 11:20 AM

8:00 AM  
Lau, Lily  
CLASSIFICATION ACCURACY OF PERFORMANCE VALIDITY AND SYMPTOM VALIDITY TESTS AMONG EXAMINEES FEIGNING NEUROPSYCHOLOGICAL DYSFUNCTION

8:20 AM  
Reynolds, Bradley  
IDEATIONAL FLUENCY, SENSATION SEEKING, AND ANXIETY: A RECIPE FOR BINGE DRINKING
8:40 AM  Lee, Rachel
INVESTIGATING IMPROVEMENTS FOR INTROVERSION: A FACTOR ANALYSIS STUDY

9:00 AM  Reynolds, Bradley
THE POTENTIAL FOR RISK: THE RELATIVE INFLUENCE OF DECISION-MAKING AND EXECUTIVE FUNCTIONING ON RISKY BEHAVIORS

9:20 AM  BREAK

9:40 AM  Guzman, Daniel
CONSTRUCT VALIDITY OF THE TINKER TOY TEST

10:00 AM  Ford, Bart
IMMUNE SUPPRESSION AND ACTIVATION IN MAJOR DEPRESSIVE DISORDER

10:20 AM  BREAK

10:40 AM  Cosgrove, Kelly
BEHAVIORAL ACTIVATION THERAPY IS ASSOCIATED WITH SELF-REPORTED CHANGES IN INTEROCEPTIVE PROCESSING

11:00 AM  Deville, Danielle
THE NEURAL BASIS OF INTEROCEPTIVE RECALL

**Live Mock Archaeological Excavation**
Thursday, March 30, 2017  3:30 PM – 4:30 PM
Allen Chapman Student Union  Level 1: South Covered Patio

**THURSDAY AFTERNOON, MARCH 30, 2017**

**SPECIAL TOPIC SESSION: SPECIAL TOPICS IN URBAN EDUCATION II**
Thursday, March 30, 2017  1:30 PM – 3:30 PM
Allen Chapman Student Union  Level 2: Chouteau

1:30 PM  Moore, Amy
THE EFFECT OF INSTRUCTIONAL STRATEGIES ON SCIENTIFIC ACHIEVEMENT.

1:50 PM  Mobra, TJ
THE EFFECT OF STUDENT ENGAGEMENT IN MATH/SCIENCE ACHIEVEMENT
2:10 PM  Trowhill, Kasey
THE RELATIONSHIP BETWEEN STUDENT INVOLVEMENT IN STEM RELATED EXTRACURRICULAR ACTIVITIES AND COLLEGE MAJOR/CAREER CHOICE

2:30 PM  BREAK

2:50 PM  Cano-Garcia, Rachel
THE RELATIONSHIP BETWEEN PHYSICAL ACTIVITY AND ACADEMIC PERFORMANCE

3:10 PM  Kindbom, Kelsey
THE EFFECT OF HOME LEARNING ENVIRONMENT ON VOCABULARY SKILLS

CONTRIBUTED PAPERS: BIOLOGICAL SCIENCES II
Thursday, March 30, 2017                      1:00 PM – 4:10 PM
Allen Chapman Student Union                Level 2: Alcove

1:00 PM  Secrist, Kathryn
COMPLETE GENOME ANALYSIS OF PEPPER MILD MOTTLE VIRUS IN OKLAHOMA

1:20 PM  Davalos, Nicole
THE DETECTION AND CHARACTERIZATION OF VIRAL PATHOGENS IN STRAWBERRY USING SEROLOGICAL AND NUCLEIC ACID BASED ASSAY

1:40 PM  Stuppy, Kathryn
PHYLOGENY OF PAPAYA RINGSPOT VIRUS- W ISOLATES FROM TULSA COUNTY, OKLAHOMA, COLLECTED DURING 2013 THROUGH 2015

2:00 PM  Wijayasekara, Dulanjani
CHARACTERIZATION OF MAIZE DWARF MOSAIC VIRUS FROM JOHNSONGRASS IN OKLAHOMA

2:20 PM  BREAK

2:30 PM  Kannan, Dhivya
EPICOCCUM AERIOBIOLOGY IN TULSA, OKLAHOMA

2:50 PM  Khanal, Vivek
DETECTION OF VIRUSES INFECTING CUCURBITS IN OKLAHOMA
3:10 PM  Rajbanshi, Naveen
PHYLOGENETIC ANALYSIS OF COMPLETE GENOME OF TWO WATERMELON MOSAIC VIRUS ISOLATES FROM UNITED STATES.

3:30 PM  McLoud, Josh
AIRBORNE FUNGAL DIVERSITY IN TULSA, OKLAHOMA: A TWO-YEAR STUDY USING VIABLE SAMPLING

3:50 AM  O’Neal, Megan
MONARCH WAYSTATIONS OF TULSA

FRIDAY MORNING, MARCH 31, 2017

CONTRIBUTED PAPERS: COMPUTER SCIENCE
Friday, March 31, 2017  8:00 AM – 12:00 PM
Allen Chapman Student Union  Level 2: Chouteau

8:00 AM  Boyd, Brian
EXAMINING COLLABORATION AMONG STUDENT TEAMS RELYING ON WEB APPLICATIONS TO COORDINATE SOFTWARE DEVELOPMENT

8:20 AM  Macke, William
MULTI-UAV COORDINATION

8:40 AM  Walter, Charles
DEVELOPING A MECHANISM TO STUDY CODE TRUSTWORTHINESS

9:00 AM  Arabnejad Khanouki, Marziyeh
COMPARISON OF RELIEF-F NUCLEOTIDE DIFFERENCES FOR GWAS DATA WITH APPLICATION TO BIPOLAR DISORDER

9:20 AM  BREAK

9:30 AM  Samadidana, Saeid
DETECTING CUSTOMERS’ NEEDS IN STORES BY MOTION SENSOR IOT SYSTEM

9:50 AM  Parvandeh, Saeid
PREDICTION OF ANTIBODY RESPONSE TO INFLUENZA VACCINE USING DIFFERENTIAL GENE CO-EXPRESSON NETWORKS
10:10 AM    Boyd, Brian
EVALUATING THE DIFFERENCE BETWEEN AUGMENTED AND VIRTUAL REALITY IN A LEARNING ENVIRONMENT

10:30 AM    Bolin, Jon
HUMAN-UAV COLLABORATION

10:50 AM    BREAK

11:00 AM    Walter, Charles
TOWARD PREDICTING SECURE ENVIRONMENTS FOR WEARABLE DEVICES

11:20 AM    Marshall, Allen
MITIGATING SERVICE ADVERTISEMENT ATTACKS ON THE PHYSICAL WEB

11:40 AM    Beckemeyer, Nate
STABLE CONFIGURATIONS WITH (META)PUNISHING AGENTS

CONTRIBUTED PAPERS: PETROLEUM ENGINEERING
Friday, March 31, 2017                      10:00 AM – 11:50 AM
Allen Chapman Student Union                Level 2: Alcove

10:00 AM    Goncalves Machado, Cintia
CO2 EFFECTS ON WELLBORE PRESSURE RESPONSE DURING INJECTION-FALLOFF TEST

10:20 AM    Kolla, Srinivas Swaroop
COMPUTATIONAL FLUID DYNAMICS STUDY ON THE EFFECT OF INLET MODIFICATIONS OF GLCC© COMPACT SEPARATORS

10:40 AM    Soedarmo, Auzan
VISUALIZATION STUDY OF WAX DEPOSITION: MASS TRANSFER BOUNDARY LAYER

11:00 AM    BREAK

11:10 AM    Zhong, Ruizhi
A LEAK-OFF MODEL FOR CRITICAL PERMEABILITY IN WELLBORE STRENGTHENING APPLICATIONS

11:30 AM    Kolla, Srinivas Swaroop
FLUID-STRUCTURE INTERACTION STUDY OF GLCC© INLET MODIFICATIONS
FRIDAY EVENING, MARCH 31, 2017

20th ANNUAL STUDENT RESEARCH COLLOQUIUM AWARDS BANQUET
Friday, March 31, 2017 7:00 PM – 9:00 PM
Allen Chapman Student Union Level 2: Great Hall

TUESDAY AFTERNOON, APRIL 18, 2017

CONTRIBUTED PAPERS: COLLEGE POSTER SESSION/UNIVERSITY OF OKLAHOMA-TULSA RESEARCH FORUM
Tuesday, April 18, 2017 2:00pm- 4:00pm
OU Tulsa- Founders Hall

1. Bailey, Ashley
   THE EFFECT OF THREAT OF VIOLENCE ON THE TIME TO REPORT RAPE

2. Basnett, Andrew
   CHEMOPROVENANCE OF THE WOODFORD AND CHATTANOOGA SHALES, OKLAHOMA

3. Blackwell, John
   BLOWING DUST ON HIGHWAY SAFETY: CHARACTERIZING DUST EMISSION HOT SPOTS IN THE SOUTHERN PLAINS

4. Chowdhury, Shuddha and Sharmin Jahan
   SMART PRICE TAG AND SMART RACK MANAGEMENT SYSTEM FOR FUTURE CONVENIENCE STORE

5. Corley, Ryan
   NMFTA CAN LOGGERS

6. Diehl, Brian
   SEQUENCE STRATIGRAPHIC RELATIONS OF THE FREDERICKSBURG AND WASHITA GROUPS, LOWER CRETACEOUS CARBONATE SHELF, TEXAS

7. Goolsbay, Jessie
   ANIMAL-ASSISTED THERAPY: KNOWLEDGE, ATTITUDES, BELIEFS, AND PRACTICE PATTERNS OF SPEECH-LANGUAGE PATHOLOGISTS

8. Johnson, Avery
   TRACE ELEMENT TESTS OF LAVA RELATEDNESS FOR THE CRETACEOUS ONTONG JAVA PLATEAU
9. Kernen, Julianne
   THE IMPACT OF DISFLUENCIES ON LISTENER COMPREHENSION AND
   RECALL: A SYSTEMATIC REVIEW

10. Khattab, Raneem
    INSULIN EFFECTS ON CELL METABOLISM IN CELLS LACKING THE TUMOR
    SUPPRESSOR P27KIP1

11. Loe, Elisabeth
    SUGAR METABOLISM IN CELLS LACKING THE TUMOR SUPPRESSOR P27KIP1

12. Mulligan, Ryan
    THE VALIDITY OF THE ROAD SIDE PERCEPTION TEST

13. Mulligan, Ryan
    DIAGNOSTIC, CONSTRUCT, AND ECOLOGICAL VALIDITY OF THE VERBAL
    CONCEPT ATTAINMENT TEST IN MULTIPLE SCLEROSIS

14. Parackal, Julia
    SPECIFICALLY TARGETING CELLS LACKING THE TUMOR SUPPRESSOR
    P27KIP1 USING METABOLIC INHIBITORS

15. Peelen, Avery
    THE EFFECT OF READING INSTRUCTION ON READING OUTCOMES IN DEAF
    AND HARD OF HEARING STUDENTS: A SYSTEMATIC REVIEW

16. Pohl, Aaron
    SUNSCREEN CHLORINATION ALTERS ITS CHEMICAL PROPERTIES

17. Porter, Allison
    MIDDLE-UPPER ALBIAN SAN MARCOS PLATFORM SEQUENCE
    STRATIGRAPHY, EDWARDS AND WASHITA GROUPS, TEXAS

18. Rowe, Allyson
    CYTOTOXICITY OF NOVEL NAPTHOQUINONES

19. Rubino, Mariah
    DOES VICTIM AGE IMPACT TIME TO REPORT RAPE?

20. Sosa, Jordan
    DESIGNING AND CONSTRUCTING A MULTI-FUNCTIONAL POLARIZED
    MICROSCOPE

21. Spencer, Rachel
A SYSTEMATIC REVIEW OF VOCABULARY INSTRUCTION TECHNIQUES FOR SCHOOL-AGE CHILDREN WITH COMPARISON TO CURRENT PRACTICES FOR DUAL-LANGUAGE LEARNERS IN CARTAGO, COSTA RICA

22. Stokes, Makenzie
   HOW CAN INTERVENTIONS BE USED TO ADDRESS FACTORS ASSOCIATED WITH RECIDIVISM AND REINCARCERATION RATES WITHIN THE CURRENTLY OR PREVIOUSLY INCARCERATED ADULT TBI POPULATION

23. Sullivan, Sarah
   TARGETING CELLS LACKING THE P27KIP1 TUMOR SUPPRESSOR USING METFORMIN

24. Tan, Xiao
   ISOOTOPE CHEMOSTRATIGRAPHY OF THE MIDDLE ALBIAN REGIONAL DENSE MEMBER, EDWARDS GROUP, SAN MARCOS PLATFORM, SOUTH-CENTRAL TEXAS

25. Tecle, Leah
   CULTURAL DIFFERENCES IN PERSONALITY PROFILES: IMPLICATIONS OF RELATIONALISM IN ORGANIZATIONS

26. Trewitt, Jordan
   RFID TESTBEDS TO SIMULATE GROUND LIKE CONDITIONS

27. Westbrook, Julia
   COMPARATIVE EUROPEAN ASYLUM POLICIES IN LIGHT OF THE RECENT INFLUX OF SYRIAN REFUGEES
SPECIAL TOPIC SYMPOSIA
(Listed in Chronological Order)

TOPICS IN OCCUPATIONAL HEALTH PSYCHOLOGY – WORK STRESS, RECOVERY, AND WORK-LIFE BALANCE
Monday, March 27: 9:00 AM – 10:50 AM (Great Hall B)

Organizer: Dr. Jennifer Ragsdale (Psychology)

Much research supports the individual and organizational consequences of work-related stress (see Griffin & Clarke, 2011; Kahn & Byosiere, 1992). At the individual level, stress can result in such negative health effects as fatigue, tension, musculoskeletal complaints, irritability, withdrawal, depression, and illness. As chronic stressors persist, long-term negative health outcomes may result (e.g., burnout; Meijman & Mulder, 1998). This is costly for organizations in terms of reduced performance and productivity, creation of a negative climate, and increased turnover. Therefore, it is imperative that we learn more about how to effectively manage work-related stress in order to maintain health and well-being for both individuals and organizations.

The boundaries between work and off-work time are becoming increasingly more permeable such that stress spills over from the work domain and interferes with other life domains (e.g., school, family, etc.). Sometimes this spillover interferes with our ability to “recharge our batteries” (known as recovery from work-related stress). In turn, inability to recover may negatively impact job performance. The series of studies presented in this symposium will address stress and health issues that originate from the workplace, from home, and the interaction between these domains. Specifically, these studies investigate (1) antecedents of stressful supervisor interactions at work, (2) the effectiveness of certain work-break activities, (3) stress-recovery during a weekend, (4) individual and family predictors of work and stress outcomes, and (5) work-life balance.

TEAM INTERACTIONS IN INTERDEPENDENT GAMING SIMULATIONS
Tuesday, March 28: 8:30 AM – 9:50 AM (Chouteau)

Organizer: Sylvia Luu (Industrial-Organizational Psychology)

This research is centered on the theme of teamwork, particularly within an interdependent gaming simulation task. With gamification (defined as the application of gaming elements to traditionally non-game tasks for increased task engagement) becoming a more popular concept across multiple domains, there is a growing need to understand how it affects people and teams in real-world task settings. The four studies presented in this symposium use a variety of research techniques to examine distinct aspects of team interactions and performance, within an interdependent gaming context.

Two of the four participating speakers use a qualitative research approach to study: 1) the communication patterns and 2) learning that occur within interdependent teams, during a gaming task. Specifically, these researchers examined and coded transcriptions of the verbal
communication that occurred between three team members during a 4-hour gaming task. Using participant survey data from the same study, the other two speakers use a quantitative approach to analyze the effects of 1) social networks, and 2) communication skills, knowledge sharing, and game motivation on interdependent team outcomes. Taken together, the research findings presented in this symposium provide unique insight into how teams interact, learn, and perform within an interdependent, gamified task context. These findings have potential implications to consider for team task designs that incorporate gamification techniques in classroom and work settings.

SPECIAL TOPICS IN URBAN SCHOOLS I
Tuesday, March 28: 10:50 AM – 12:10 PM (Great Hall B)

Organizer: Dr. David Brown (Urban Education)

Graduate students in the School of Urban Education’s Master of Math and Science Education and Master of Teaching Arts programs design and conduct quasi-experimental research studies within local elementary and secondary schools as their capstone degree project. Research projects require IRB approval, CITI training and permission from the school districts, principals and teachers. The proposed projects for 2017 will be presented.

APPLICATIONS OF INDUSTRIAL-ORGANIZATIONAL PSYCHOLOGY
Tuesday, March 28: 12:30 PM – 1:50 PM (Alcove)

Organizer: Dr. Anupaman Narayan (Psychology)

To survive and thrive in today’s fast and changing work environments, organizations have to understand who to recruit and how to retain its productive members. Having information on individual differences in member interests, organizational processes such as informal and formal communication networks, and changing needs (in terms of knowledge, skills, abilities and other requirements) of its members are some aspects that can help with organizational sustainability. Industrial-Organizational psychology is a field that utilizes scientific methodology to better understand the behavior of individuals working in organizational settings (Jex & Britt, 2014). However, the domain of I-O psychology stretches well beyond the physical boundaries of workplace because many of the factors that influence work behavior are not always found in the work environment. These factors include individual differences such as personality and motivation, national cultural influences, and family responsibilities. The studies presented in this symposium focus on relationship between procrastination and social loafing, emotional labor and burnout in nurses, structure and evaluation of a diversity training program, and organizational assessment of member needs in the context of diversity and multicultural issues.
CITIZENSHIP AND SERVICE IN A CHANGING WORLD
Tuesday, March 28: 3:30 PM – 4:50 PM (Alcove)

Organizer: Hope Geiger (Graduate School)

“Citizenship and Service in a Changing World” is concerned with providing a forum for TU students to discuss and promote community service projects they have been involved in within the last 12 months. The University of Tulsa has always actively encouraged involvement in the community and this symposium will provide an opportunity for students to gain public-speaking experience while discussing their preferred community service organizations or projects to a larger audience.

IDENTITY AND COMMUNITY: CONTEMPORARY ISSUES IN MUSEUM SCIENCE AND MANAGEMENT
Wednesday, March 29: 8:00 AM – 9:50 AM (Alcove)

Organizer: Molly Noah (Museum Science and Management)

This session features the work of Master of Arts students in TU’s Museum Science and Management Department. Museum Science focuses on theoretical and practical questions about the aims and purposes of museums, education, the nature of learners and learning institutions. The contributions to this special topic session represent the breadth of concerns that Museum Science and Management Studies seeks to address. The first two papers focus on museums in their communities. The latter three papers employ art historical methods to researching local museum collections.

GLOBAL SCHOLARS CAPSTONE PROJECTS
Wednesday, March 29: 8:00 AM – 12:10 PM (Great Hall B)

Organizer: Dr. Lara Foley (Center for Global Education)

Fall semester 2015, students in the Tropical Ecology course traveled to Costa Rica with Professors Glen Collier and Warren Booth to study rainforest ecology. In this symposium, students from the course present their individual field projects.

CURRENT ARCHAEOLOGICAL RESEARCH IN THE DEPARTMENT OF ANTHROPOLOGY
Thursday, March 30: 8:30 AM – 11:10 AM (Chouteau)

Organizer: Melissa Miller (Anthropology)

Anthropology is the study of humans, both past and present. It has four subfields: archaeology, the study of past cultures; cultural anthropology, the study of living cultures; biological anthropology, the study of human bodies and health; and linguistics, the study of human
language. This special topic symposium presents current research by TU anthropology students in the subfield of archaeology. These students have conducted archaeological research on three continents and multiple types of artifacts, including lithics (stone tools), ceramics, and bone. Research involves both field collection and lab experimentation and analysis. The topics covered in this symposium include American archaeology and the United States National Park System; 3D analysis of modifications on bones; stylistic diversity in Mexican ceramics; postdepositional and experimental use wear analysis on an African lithic accumulation; preliminary data on the relationship between language and tool-making; a statistical assessment of flake identification; and a microwear study on lithics used for more than one purpose. Some of these projects are merely ideas, some are completed works, and many are in between those two extremes, but all contribute to our greater understanding of human history – both where we came from and where we may be going.

**SPECIAL TOPICS IN URBAN SCHOOLS II**
**Thursday, March 30: 1:30 PM – 3:00 PM (Chouteau)**

Organizer: Dr. David Brown (Urban Education)

Graduate students in the School of Urban Education’s Master of Math and Science Education and Master of Teaching Arts programs design and conduct quasi-experimental research studies within local elementary and secondary schools as their capstone degree project. Research projects require IRB approval, CITI training and permission from the school districts, principals and teachers. The proposed projects for 2017 will be presented.
Alanagreh, Lo’ai and Mark Buchheim
DE NOVO ASSEMBLY AND TRANSCRIPTOME ANALYSIS OF HAEMATOCOCCUS PLUVIALIS

The green microalga, Haematococcus pluvialis, is a model species for the production of astaxanthin, a strong antioxidant and food colorant. Moreover, it has been proposed as a feedstock for biofuels production. The economic potential of H. pluvialis has stimulated interest in transcriptomic (i.e., gene expression) analysis. The few studies that are complete have focused on astaxanthin production. The discovery of genetic diversity among isolates of H. pluvialis served as notice that comparative genomics work is needed to fully appreciate the data from single transcriptome analyses. We performed RNA-Seq analysis to provide a comprehensive description for the transcriptome of the H. pluvialis strain, SAG 34-1m. All Illumina TruSeq libraries were deep-sequenced using the Illumina MiSeq platform and de novo assembled using the CLC Genomics Workbench. Assembly of 4.4 million reads yielded 38,029 contigs, of which 15,351 were identified as transcripts (unigenes). Nearly 63% of the 15,351 unigenes were mapped and annotated using Blast2GO. More than 67% of the unigenes showed top matches to green algal genes from Gonium (25%), Volvox (22%) or Chlamydomonas (20%). KEGG pathway analyses revealed a majority of the unigenes are homologs to genes involved in biosynthesis of antibiotics, photosynthesis and fatty acid metabolism. This is the first report of RNA-Seq analysis of H. pluvialis using Illumina MiSeq. Our ongoing comparative transcriptomic approach will increase our understanding of the economically important processes observed in this microalga and of gene expression in the green algae.

Ali-Kizi, Teljan, Lei Wang, John Ostrander, Jana Dajani, Tejaswi Makkapati, Dale Teeters, Angus A. Lamar
ENHANCED ION CONDUCTION IN POLYMER ELECTROLYTE FILMS HAVING NANOPHASE SEPARATION AND NANOIMPRINTING

Polymer electrolytes with high ionic conductivities are very essential for batteries or fuel cells. Nanofiller materials with ion conducting and nonconducting phase can be used for nanophase separation in PEO electrolyte. Making films is very complicated but essential process in order to get data for polymer electrolyte. Most of the time 4 films: 2 film for each compound were made simultaneously. Firstly, 33 mL ACN and 0.33 g PEO and special amount of the compound according to percentage were obtained. ACN was added first latter the amount of template, PEO was added while stirring because in some templates it cause clumps which would impact the formation of polymer. After adding Lithium triflate, the flask was filled with N₂ gas in order to make the film moisures. The whole mixture was stirred for 45 minutes with N₂ balloon attached to the flask. The mixture was put in evaporating dish that sizes 80-100 nM thick and kept in Argon desiccator for 2 days in order to keep away from moisture. After films were formed, one film for each template was washed 2 times with 10 mL hexane under the 50 °C heat for 10 minutes and transferred to small container to evaporate. Conductance was measured after the second wash in order to get the impedance values. These values were used to evaluate the conductivity of the film comparing to the one that was not extracted. With these numbers, more research such as refilling the films with higher conductance templates can be done.
Alnaser, Ibrahim and Michael Keller

ASSESSMENT OF BONDED REPAIR FATIGUE PERFORMANCE USING COUPON SPECIMENS

The bonded composite repair technique is extensively used to repair structurally deficient industrial equipment. One of advantage of this repair is the formability of the repair, allowing a composite repair to be used on pipe geometries that would be difficult or impractical to repair with welded metallic sleeves. Composite repairs are used to repair two broad classes of defects, leaking and non-leaking. For non-leaking repairs, the damage is typically formed by corrosion or erosion on either the exterior or interior of the pressure vessel. For external defects, the bonded composite repair will halt the corrosion process and prevent any further wall loss. However, the bonded composite repair cannot halt the erosion or corrosion process for an internal defect and the pressure equipment will continue to suffer wall loss. In this situation, this defect can become a through-wall defect. The critical difference between a leaking and non-leaking repair is in the design methodology for the repair. For non-leaking repairs, the design is based on a strength approach and the in-plane material properties of the composite dominate the repair behavior. For leaking repairs, the interface between the composite and the substrate is the driving design factor. For these repairs, a fracture-based criterion is adopted to predict failure pressure of the repair. Therefore, accurate characterization of this interface in quasi-static and fatigue is central to the design of safe repairs. In this presentation, we compare a coupon-based fatigue test to a full-scale pressure fatigue test. A width-tapered-double-cantilevered beam (WTDCB) specimen is adopted as the coupon specimen geometry. Additionally, we investigate the potential for resistance-based structural health monitoring of these repairs.

Anderson, Haley

LEADING THE WAY: A FIRST YEAR EXPERIENCE COURSE PROPOSAL

First year experience courses are designed to aid students in their transition into college life and provide them with tools for academic success. Institutions vary in their approach to the first year experience course. For some, specialized academic programs are preferred, while others take a more holistic approach. This study compares first year experience course models and success rates from the University of Tulsa with two peer institutions. Two key factors found in successful FYE programs are identity development and student leadership. In reflection of these findings, a FYE course proposal was developed. The course model features personality assessment and leadership interventions as a framework for student success and retention. The proposal includes a course outline, syllabus, proposed text, and evaluation methods.

Arabnejad, Marziyeh

COMPARISON OF RELIEF-F NUCLEOTIDE DIFFERENCES FOR GWAS DATA WITH APPLICATION TO BIPOLAR DISORDER

Bipolar disorder is a brain disorder that causes unusual shifts in mood, energy and the ability to carry out day-to-day tasks. Genetic studies of the disease have found strong inheritance pattern for the disease but have not found specific genes with individually strong effects. Thus, there are many genes that increase the susceptibility to develop BD for many individuals, but additional algorithms are needed to help identify the patterns of genes and other factors that act together to produce the illness or increase risk.

In this study, a feature selection algorithm called ReliefF is used to rank the single-nucleotide polymorphisms for the cases of bipolar disorder and normal controls in two published genome-wide association studies from the National Institute of Mental Health (NIMH) and the Wellcome Trust Case-Control Consortium (WTCCC). The ranking is done through “ReliefSeq”. We compute the distance in ReliefSeq with three metrics: genotype mismatch, allele mismatch, and Transition/Transversion. In total, nine combinations of the metrics are implemented in the analysis of 5000 SNPs.
Analysis yielded several SNPs that may have involvement in the pathophysiology of bipolar disorder. After finding the relevant genes and pathways for the high-rank SNPs, it was observed that most of the metrics combinations enriched Neuronal System and Axon-Guidance pathways in both data sets. The combinations of Ti/Tv metric performed relatively better than the other combinations in enriching the Neuronal System pathways in both data sets while most of the combinations with gm were found to be less successful in enriching the Axon-Guidance pathway.

Arnold, Bret
CONTEXTUALIZING THE EMOTIONAL LABOR AND BURNOUT OF NURSES: INDIVIDUALS, ORGANIZATIONS, AND CULTURES

As health professionals with frequent patient interactions, nurses must maintain a congenial air while managing with the intensity of their work. However, emotional labors like disingenuous surface acting can accelerate a nurse to occupational burnout. This is a state characterized by increased cynicism, emotional exhaustion, and decreased work efficacy (Maslach, 1981). Because burnout often results in turnover, reducing nurse burnout through emotional labor management has been a research focus of occupational health psychology for decades. First, researchers have identified several individual difference factors positively and negatively correlated with surface acting (Diefendorff, Croyle, & Grosserand, 2005). These are, by proxy, correlated with higher degrees of emotional labor and increased risk of burnout. Second, psychologists recognize the importance of environmental factors like social support networks that grant a space for emotional authenticity (e.g. Maslach, Leiter, & Jackson, 2012). Finally, the organizational context influences the individual just as the national context influences the organization (Hulsheger, 2011). These national contexts, as proxies for culture, ultimately moderate the effect of surface acting on emotional exhaustion by setting the expectations for nurse-patient interactions. This presentation discusses the relationship of emotional labor and burnout from three levels: individual, unit-level, and national level.

Badrinarayanan, Indreesh, Jibran Sharieff, Daniel Crunkleton, and Tyler Johannes
USING PRODUCED WATER TO GROW MICROALGAE

Produced water – also known as hydraulic fracturing fluid, is a byproduct of the oil and gas production process and is water that is naturally contained in sedimentary formations. This water has a salinity ranging from as low as 1,000 ppm to greater than 100,000 ppm of total dissolved solids (TDS) and has bicarbonate, other essential micronutrients. Treatment of produced water to comply with disposal requirements is a big concern in the oil and gas industry.

The goal of this research is to evaluate produced water as a potential growth medium for microalgae. Our preliminary lab scale studies using the microalgae species *Chlamydomonas reinhardtii*, which is known to grow in moderate saline conditions (salinity of 17,000 ppm of TDS) have shown promise. The pre-treatment of produced water was performed by means of centrifugation to remove solids along with vacuum filtration to remove suspended particles (>5 microns). Experiments were then conducted by growing algae cultures in varying proportions of the diluted, pre-treated PW (salinity of 7,500 ppm), and TAP medium - a standard medium of growth for *C. reinhardtii*. The growth kinetics in each of the cultures was monitored by the measurement of absorbance at 750 nm each day. Initial growth of algae with low concentrations of produced water was similar to TAP medium, however, higher produced water concentrations became growth limiting. These studies also indicate that the algae can thrive in produced water even without any necessity of further treatment.

The algae-based biomass grown in the produced water could be used as a feedstock to produce bio-oil through techniques such as hydrothermal liquefaction and pyrolysis, thereby providing a great economic potential. Future work will involve investigating the efficacy of produced water to grow other marine algae.
species such as *Nannochloropsis salina* and *Nannochloropsis oculata*, which have a higher tolerance to salinity (34,000 ppm).

**Bales, Charles**  
**CYBER-SECURITY MAPPING OF A RESEARCH NUCLEAR REACTOR**

This project focuses on the development of a communication network model for a nuclear research reactor. Nuclear research reactors are generally controlled by analog instrumentation and control systems with a point-to-point connection between the control or indicator gauge and the control mechanism or sensor. Modern instrumentation and control systems are built using digital components and shared access networking mediums and no longer have a direct connection between the control system and the instrumentation panel. The switch from analog to digital instrumentation and control systems must be evaluated from a cyber-security standpoint to determine how to secure these systems. This project will focus on the implementation of a system model using the networking simulator IMUNES and extraction of key operating parameters. This work is part of a DOE funded research project addressing this question. Currently an IMUNES model of the temperature monitoring system and a skeleton of the SCRAM (emergency shutdown) circuitry have been developed. This project will extend the model by adding additional control systems. The current model uses Java to control the operation of each component. Part of the research will include learning Java, discrete event simulation basics, and Java network programming. The other aspect of this project will be to identify the cyber and physical assets in the nuclear research reactor’s instrumentation and control system and to document their interconnection. This will enable the security modeling tool known as attack graphs to be generated. The design of our partner’s (Washington State University) nuclear research reactor will be used.

**Barbour, Erin**  
**THE EFFECT OF EXTRACURRICULAR PARTICIPATION ON MATH ACADEMIC PERFORMANCE**

Previous research studies have shown that participation in school-sponsored extracurricular activities, such as clubs and sports, increase test scores and GPA among students (Rees & Sabia, 2010; Wang, 2009; and Bakoban, 2015). Eccles et al. (1999) also noted that students who participated in extracurricular activities liked school more and overall had higher grades. This proposed research will be conducted in the fall, 2017, with high school students at a local public high school For this proposed study, it is hypothesized that students who participate in extracurricular activities will have higher math scores than students who do not participate in any school-sponsored extracurricular activity. It is also hypothesized that of the students who participate in extracurricular activities, those who participate in school-sponsored clubs will have higher math scores than those who participate in sports. Students will be given a survey to indicate their extracurricular activities along with a math assessment for this correlational study.

**Beckemeyer, Nathaniel, William Macke, and Sandip Sen**  
**STABLE CONFIGURATIONS WITH (META)PUNISHING AGENTS**

We consider an adaptation of Axelrod's metanorm model, where a population of agents choose between cooperating and defecting in bilateral interactions. Agents facing defection can punish the defector, but incurs an enforcement cost. To facilitate the stability of a norm of punishing defectors, Axelrod proposes the use of metanorms, where those who do not punish defectors can themselves be punished. This paper presents two approaches to study the social effects of such metanorms when agents can choose their interaction partners: (a) a theoretical study, when agent behaviors are static, showing stable social configurations, or interaction patterns, under all possible relationships between system parameters representing agent payoffs with or without defection and with or without punishment and meta-punishment,
and (b) an experimental evaluation of emergent social configurations when agents choose behaviors to maximize expected utility. We highlight distinct emergent social configurations, including anarchy, a "police" state with few cooperating agents who enforce penalties, and a particularly interesting "corrupt police" state where a single enforcer penalizes all defectors, but defects on others.

**Bell, Colleen**

**EXAMINING THE RELATIONSHIP BETWEEN LANGUAGE AND EARLY STONE TOOL PRODUCTION: PRELIMINARY BEHAVIOURAL DATA**

The goal of this study is to determine the relationship between language and the early stone tool tradition, Acheulean (hand axe). The Acheulean tradition lasted from approximately 1.7 million years ago through 100 thousand years ago and is associated with *Homo erectus* and *Homo heidelbergensis*. This technology and its relationship to language will be tested using two groups of participants; novice, and experienced flintknappers (people who make stone tools). Each participant will be fitted with a 128-lead EEG net and data will be recorded throughout the procedures. The procedural sequence will be the same for each group. They will be asked to create a hand axe in the Acheulean tradition. A separate language task will also be administered where each participant will be asked to respond each time they hear a fake word while listening to a list of both English and fake words. The flint knapping task will then be repeated with the addition of the language component. The two data sets (making stone tools with and without the additional language based task) will then be compared to see if execution falls off with the addition of the language component. This presentation reviews the preliminary behavioral data associated with this research.

**Benes, Jeremiah**

**COMBATING RADICALIZATION INTO VIOLENT EXTREMISM**

Radicalization into violent extremism (radicalization) has grown to be a common topic of media coverage and radicalization is globally recognized as a threat. This research attempts to define radicalization, examines causes and symptoms of radicalization within individuals, identifies individuals predisposed to radicalization, and analyzes past cases of radicalization to determine selectors for identifying future radicalization. This study focused on radicalization regarding the Islamic State, also known as ISIS, ISIL, or Daesh.

This research also examined societies that experience little to no radicalization, the characteristics of those societies that minimalize radicalization, and how those characteristics may be replicated to another society. The research concludes with recommendations that have the potential to minimize radicalization. These recommendations include education regarding radicalization and automated monitoring.

**Bensalah, Adam**

**MILD ARENE CHLORINATION USING ORGANIC DYES AS VISIBLE LIGHT PHOTOREDOX CATALYSTS**

This summer, our lab sought to explore safe and green synthesis methods of chlorinated arenes. Chlorinated arenes are important in multiple chemical industries as they are common synthetic building blocks for more complex molecules. The current methods for electrophilic arene chlorination are not ideal since acidic reagents and harsh reaction conditions are often required. Chlorine is not frequently found as an electrophile due to its negative charge, but the N-Cl bonds in the molecule trichloroisocyanuric Acid (TCCA) can be activated and an electrophilic chlorine ion can result. TCCA is a safe to handle, atom efficient molecule (3 N-Cl bonds to every one molecule of TCCA) and when coupled with the photocatalytic abilities of common organic dyes, chlorination of an arene- naphthalene- occurs.

Our lab spent the summer screening the reaction of TCCA and naphthalene with around 100 organic dyes that could potentially serve as photocatalysts. The reactions were run in different solvents and in different
stoichiometric ratios to optimize the reaction and, most importantly, the reactions were run with and without light to prove the hypothesis that the dyes were light-activated. We are currently expanding the scope of this research to investigate chlorinating electron-deficient arenes and exploring the light-activated nature of the reaction in more depth.

**Berrett, Chandler**

**RECONSTRUCTION ON FILM**

This project analyzes how the Era of Reconstruction has been interpreted on film and how three cinematic interpretations compare to the historical interpretation of Reconstruction at the time of each film’s release. The project primarily focuses on D. W. Griffith’s *The Birth of a Nation* (1915), Victor Fleming’s *Gone with the Wind* (1939), and Gary Ross’s *Free State of Jones* (2016), as these films, in addition to being of historic and cinematic significance, are among a limited number of films that depict Reconstruction in any meaningful way.

Popularized by William Dunning, the Dunning School interpretation of Reconstruction became the standard historical portrayal of Reconstruction in the late 19th century. Despite the Dunning School’s inaccuracies, in 1915, *The Birth of a Nation* adopted its viewpoint, popularizing this viewpoint as historical fact. Claude Bower’s 1929 book *The Tragic Era* aligned with the Dunning School and *Gone With the Wind* based its Reconstruction history on Bower. This project concludes that the immense popularity of *Gone With the Wind* helped solidify the film’s viewpoint as the history of Reconstruction. Cinematic and historical analysis of Reconstruction remained unchanged even after historians W. E. B. Du Bois, and Johnathan Hope Franklin presented historical evidence contrary to Dunning and Bower. In the 1980s, historian Eric Foner’s analysis of Reconstruction became the historical standard. Cinematic interpretation only recently mirrored history in the 2016 release *Free State of Jones*, which presents a far more accurate portrayal of Reconstruction than any prior film.

**Boccacci, Lisandro**

**INTERNATIONAL 360 CONNECT**

This research takes the current developed technologies in media, projection, and video production combined in a way that would produce a new way of experiencing and connecting people within country, state, city boarders and outside of them. The focus is on realizing the actually process of combining these technologies together which means figuring out how things need to connect in order for the project to work without necessarily spending funds on purchasing the technologies. In essence creating the blueprints and strategy. The grand design in mind is a large 360 screening experience, with surround sound and surround cameras that will capture reality and project it to other locations. For example, a small group of people could interact with another small group of people, both groups in completely separate locations, that would come together through the projections creating a seem less connection. The idea is to use force perspective to make the projections look realistic as possible in size and visualization.

Many organization including the military have been moving in this direction with producing a 360 connection with military service men and woman overseas that connected to their families at the super bowl this year. A group in Europe designed a stand-alone door way that would sit in the middle of a park where people would open the door and find someone else on the other side. But where they fail, is to keep the video projection on real scale, so that people tend to look hugely out of scale. This is what I want to look at.
Boggs, Jacqueline

COMMUNICATION SKILLS IN AN INTERDEPENDENT TEAM TASK

Teams are defined as an interdependent collection of individuals who share responsibility for specific outcomes for their organizations (Sundstrom, DeMeuse, & Futrell, 1990). Team process are defined as members' interdependent acts that convert inputs to outcomes through cognitive, verbal, and behavioral activities directed toward organizing task-work to achieve collective goals (Marks, Mathieu, & Zaccaro, 2001). Communication is a critical team process that affects team emergent properties and various team outcomes. Network linkages are the connections made when communication occurs between people (Monge & Contractor, 2001). In order for individuals to be effective communicators, they must be skilled in relaying task-relevant information to their team members. These skills have been conceptualized in linguistic research on learning by Vandergrift (1997) and reflected by code and conceptual learning strategies. Conceptual learning is learning in which the use and information about the object or word is used to ask questions or explain what the object or word does; code learning is when a word is made up for something when an individual does not know what the object is called. The intent of this project is to explore the differences between team member use of conceptual and code strategies in effective and ineffective teams.

Bolin, Jon and Sandip Sen

HUMAN-UAV COLLABORATION

Unmanned Aerial Vehicles (UAVs) have historically been controlled via remote control or autonomous commands. While these methods have proven useful, they require skill and dexterity of using the remote or the skills acquired by expert programmers. Our goal is to develop a more natural means of directing a drone's actions, akin to the forms of expression one would expect to see between a person and pet and hence accessible to almost any person without specialized training or familiarity to electronic gadgets. While there has been prior work on the topic of real-time control of UAVs by analyzing a video stream, the goal of this work is to take a step further and employ video analysis from the drone's on-board camera to allow for gesture-based control. To construct this framework, we utilize a pre-trained convolutional neural network for pose extraction, Haar cascades to identify regions of interest within the UAV's field of view, and a simple function to select an action based on the current and previous identified poses.

Bowman, Paul

3D MORPHOMETRICS OF BONE SURFACE MODIFICATIONS FROM ARCHAEOLOGICAL ASSEMBLAGES: A CURSORY INVESTIGATION

Bone surface modifications (BSM’s) are an important aspect of the taphonomic processes that form archaeological assemblages. Specifically, cut marks, gnaw marks and other agents can be indicators of everything from environmental change, microclimate, hunting and scavenging by humans and other predators from proper analysis. However, determining one bone surface modification from another can often times be problematic if not difficult at best. Being able to accurately identify and distinguish specific BSM’s is a crucial step in reconstructing and understanding the story that faunal assemblages from archaeological sites can tell.

One of the techniques that is currently being used in such analyses is the use of 3D microscopy to measure a variety of parameters in attempts to quantify variables such as surface roughness, maximum depth, opening of angle, etc. The purpose of this research is to introduce a cursory inquiry into analyzing bone surface modifications utilizing the Sensofar white light confocal 3D microscope and to assess the feasibility of measuring the surface roughness to determine if quantification and differentiation can be accomplished. Specimens that exhibit cut and gnaw marks from the zooarchaeological lab at the University of Tulsa’s Anthropology department will be examined initially and later applications to specimens from an archaeological assemblage will be considered.
Boyd, Brian and Rose F. Gamble
EXAMINING COLLABORATION AMONG STUDENT TEAMS RELYING ON WEB APPLICATIONS TO COORDINATE SOFTWARE DEVELOPMENT

Training students in software engineering should attempt to mimic industry practices. Thus, student teams develop non-trivial software products, which includes interacting with collaborative tools deployed as web applications. The interaction may be mechanistic or organic, and occur for different durations. Collaboration studies tightly control these factors, relying on manual activity logging, very specific software requirements, surveys and interviews. Since these tools allow simultaneous interaction and capture revision histories, collaboration may be more objectively measured. This paper investigates social media conversations, revision histories, and commit logs from undergraduate student teams performing software development. The objective is to examine how this form of data could be translated into collaborative activities and whether the same performance relationships are achieved in a class setting. A small pilot study shows that the translation methodology did not produce the exact relationships from other studies, but it does shed light on a team’s perception of collaborators.

Boyd, Brian
EVALUATING THE DIFFERENCE BETWEEN AUGMENTED AND VIRTUAL REALITY IN A LEARNING ENVIRONMENT

Since 2013, there has been a rapid rise of consumer devices which provide high-quality augmented reality, which places virtual objects into the user’s real world, or virtual reality, which immerses a user in an entirely computer generated world. However, despite the companies who make these devices describing their potential within a learning context, there has been a distinct lack of research to substantiate these claims. In order to test these claims, we have created an application for two major devices: the Microsoft HoloLens, which is an augmented reality device, and the HTC Vive, which is a virtual reality device. Our application is designed to test a user’s ability to recall information learned while using the devices. This presentation will discuss the creation of the application, the challenges and inherent differences between the devices, and the initial results of a pilot study which we are conducting.

Bradshaw, Amy
ORAL HISTORIES IN MUSEUMS

Oral histories tell the stories of community members and can be an effective tool in making history relevant and relatable in history museums. Oral history exhibits provide the visitor with a depth of human experience, which inanimate displays cannot. In the Fall 2016, I collected oral histories as part of a community initiative at the Tulsa Historical Society and Museum. The Museum Project was a continuation of my Summer 2016 Internship at the Tulsa Historical Society and Museum. My goal was to capture and preserve the oral history recordings of the people of Tulsa and surrounding areas. The oral histories enhance and complement the exhibitions of the Tulsa Historical Society and Museum by offering visitors with first-hand observations, recollections and reflections. My research focuses on effective methods of developing an Oral History Program and conducting oral history interviews. My findings highlight the importance of community outreach, volunteers and building a relationship with people using existing networks and relationships.
Brooks, Margaret  
APPLYING CHARACTERISTICS OF NATURAL ENVIRONMENTS TO ACADEMIC SETTINGS FOR THE IMPROVEMENT OF STUDENT HEALTH AND STUDY HABITS

Nature has a positive effect on mental and physical health. Natural environments can also enhance our ability to focus our attention. Being in the physical presence of nature has the greatest effect, but even images of nature can be beneficial to health and attention span. The positive effects of nature imagery could be substantially beneficial to student populations. Academic environments are stress intensive and students are required to focus for extended periods of time in order to succeed. Using new media technologies such as projection mapping, natural environments could be replicated indoors in areas in which students frequently visit. These areas could be classrooms, hallways, or study rooms. By reproducing characteristics of a natural environment in an indoor academic environment, students can be exposed to a simulation of nature and reap the health benefits without disrupting their regular schedules.

Cain, Tara  
DISCOVERING HIDDEN MEDIA TONES IN THE SYRIAN REFUGEE CRISIS

By preforming media framing on articles pulled from online journalistic media covering the Syrian refugee crisis on three different “action sites” (as defined below); I hope to determine what dominate tones project themselves from the articles and distinguish any patterns in the language and relate that to the overarching connotations given off by each site. I define an action site as a place that is immediately affected by the flow of Syrian Migrants into other countries. The number value assigned to the action site is how I determine the level of geographical closeness to the Syria. First level action sites would be the countries directly surrounding Syria and the countries immediately traveled to such as Jordan and Turkey. Second level action sites would be places of secondary contact such as Greece, Germany, Hungary, Croatia, England, Italy, and other European countries involved in the Refugee discussion. Third level action sites would include places further removed from the direct geographical situation but that are still involved with the discussion such as America and Canada. I would look for the tone/frame of the article- who is it being sympathetic towards, who is the target audience, where was it produced, how long is it, does it include photos, what do those photos contain. From there I can arrange the articles as units in a chart of sorts for sympathetic towards refugees or unsympathetic and look into the deeper meaning by tying it to events in the country.

Cano-Garcia, Rachel  
THE RELATIONSHIP BETWEEN PHYSICAL ACTIVITY AND ACADEMIC PERFORMANCE

This study determine whether or not students who are involved in physical activity have more success in academic performance and will also try to determine if the amount of hours spent per week on physical activity is related to academic performance. It is hypothesize that students who participate in four hours a week of physical activity will have more success in school work than student who students who commit hardly any physical activity. This study will also address the following hypotheses: 1) Students who spend more time in vigorous intensity exercises will have more success in school work than students who spend more time performing moderate or mild intensity exercises. 2) There is a difference in school performance between students’ gender and grade level with physical activity.
Carr, Austin, Jesse A. Phillips, Echo Adcock Smith, K.P. Roberts, and Erin V. Iski
USE OF SCANNING TUNNELING SPECTROSCOPY TO CHARACTERIZE DOPED ZNO NANORODS FOR SOLAR CELL APPLICATIONS

Solar energy is among the least efficient methods of generating electricity since very little of the light from the sun is actually converted by current solar panels. Higher efficiency solar cells have been made using various experimental materials, but these methods often do not scale well or are too expensive to be commercially viable. ZnO is a very promising material to use in solar cells since it is a cheap, natural, n-type semiconducting material that can be easily tailored. Conversely, the band gap of ZnO lies in the ultra violet spectrum, making it a poor candidate for light harvesting because only 3-5% of the sunlight at the Earth’s surface is UV. However, by using a hydrothermal growth method, and doping ZnO with transition metals such as cobalt, the band gap of the ZnO nanorods can be altered and shifted into the visible region, increasing the overall efficiency of the cell. Laboratory analysis conducted with scanning tunneling spectroscopy (STS) has shown that doping nanorods with cobalt can reduce the band gap of the nanorods to a range within the visible light spectrum. This technique is unique in that it is a local probe of the electronic characteristics of the sample and can be used to obtain density of states (LDOS) measurements. STS in combination with diffuse reflectance (DR) and photoluminescence (PL) can provide substantial characterization for the doped ZnO nanorods promoting their application into more efficient solar cells.

Christensen, Jean Marie
ATTACKING CATHOLIC MOTHERHOOD: PRINCESS ANNE, MARY OF MODENA AND ROYAL MOTHERHOOD IN LATE STUART ENGLAND

This project examines how Princess Anne Stuart, later Queen Anne of Great Britain (1665-1714) attacked Mary of Modena’s motherhood to present herself as the legitimate heir. In June 1688, Mary, wife of James II, gave birth to a son. Anne helped spread rumors that the queen’s pregnancy and the child’s birth was illegitimate. Anne attacked the child’s legitimacy by focusing on the royal family’s Catholicism and Mary’s uninvolved motherhood. By focusing on religion and early modern royal motherhood, this study demonstrates how Anne’s actions helped facilitate the Glorious Revolution in 1688 and guarantee her place in the succession.

Anne needed to delegitimize the pregnancy and the child, James Francis Edward, because his existence usurped her and her sister’s place in the English succession. Additionally, James II was Catholic. The idea of a Catholic succession in Protestant England was extremely dangerous. England was not only recovering from the civil wars, but also had a tumultuous religious past and a Catholic monarchy amplified fears of religious war and persecution.

This study highlights issues that remain common in Anne’s and the Glorious Revolution’s historiography. Many sources discount Anne’s role in the revolution and how her involvement demonstrated that royal woman could informally influence political events. Anne’s role also emphasized the overlap between gender, cultural, and political history. Consequently, this study presents a dynamic portrait of Anne Stuart who exercised authority as princess which allowed her to eventually become queen regnant in 1702.

Cogan, Chelsea M., Joanne L. Davis, Christopher C. Cranston, and Kristi Pruiksma
DOSE-RESPONSE THEORY IN A BRIEF PSYCHOTHERAPY FOR POST-TRAUMA NIGHTMARES: DOES SESSION FREQUENCY MATTER?

Post-trauma nightmares are frequently experienced by individuals following a traumatic event and often persist despite treatment efforts targeting posttraumatic stress disorder (PTSD) symptoms. Due to the myriad of issues associated with experiencing nightmares, such as insomnia, increased risk for suicidal ideation, and lower self-report of quality of life, it is imperative that treatments begin targeting nightmares
directly. Exposure, Relaxation, and Rescripting Therapy (ERRT) was created for individuals with and without PTSD who experience post-trauma nightmares. ERRT was designed to be implemented on a weekly basis in 90 minute sessions over the course of three weeks, however there is presently no research to indicate that weekly sessions yields the best treatment outcomes. Dose-response theory posits that each session of psychotherapy is equivalent to one dose of medication, and stringent medical research is conducted to examine the timing of doses to create the most positive treatment responses. The present study aims to examine the dose-response of ERRT by comparing individuals who attended session weekly (as prescribed) to individuals who did not attend sessions weekly (not as prescribed). These groups will be compared on changes in PTSD, nightmare severity and frequency, depression, insomnia, and sleep quality from pre to post-treatment using repeated measures ANOVAs. Results will be discussed in full and the implications of these findings for treatment of post-trauma nightmares using ERRT will be discussed during this presentation.

Cole, Hannah E., Rachel L. Micol, and Joanne Davis
AN EXPLORATION OF TREATMENT PREFERENCE FOR TRAUMA-RELATED SYMPTOMS

The majority of people experience at least one potentially traumatic event over the course of their lifetimes (Kilpatrick, Resnick, Milanak, Miller, Keyes, & Friedman, 2013). While most of these individuals will not experience long-term distress and impairment, a minority of them may go on to develop posttraumatic stress disorder (PTSD; Kilpatrick et al., 2013). A broad range of efficacious psychotherapeutic and pharmacological treatment options are available to those with PTSD. Patient preference is a key factor in selecting the most appropriate treatment and patients who are offered choices and allowed to select from them have higher completion rates and better clinical outcomes (Lindhiem, Bennett, Trentacosta, & Mclear, 2014; Swift & Callahan, 2009; Williams et al., 2016). Past studies of treatment preference have found participants typically prefer psychotherapeutic treatments over pharmacological treatments, but these studies have limitations that may restrict generalizability, such as an overrepresentation of female participants and/or focus on preference in the context of a single trauma type (Simiola, Neilson, Thompson, & Cook, 2015). The proposed study seeks to overcome some of these limitations through inclusion of two trauma types (i.e., both physical and sexual assault) and balanced representation of male and female respondents, and aims to examine the relationships between gender, trauma type, and treatment preference. This presentation will give an in-depth review of the background literature in the field of trauma treatment preference as well as an explanation of the proposed study including hypotheses, procedure, measures, and statistical analyses.

Cosgrove, Kelly, Namik Kirlic, Ashley Clausen, & Robin Aupperle
BEHAVIORAL ACTIVATION THERAPY IS ASSOCIATED WITH SELF-REPORTED CHANGES IN INTEROCEPTIVE PROCESSING.

Background: Interoceptive awareness (IA) describes one’s sensitivity to visceral activity and sensations. IA may be an important contributor to the experience of emotions and decision-making. Given that major depressive disorder (MDD) is characterized by emotional dissociation, anhedonia, and decision-making difficulties, clarifying the role of IA in MDD and whether current validated treatments modify IA could be important for informing treatment developments. Methods: Study 1 was cross-sectional and included 89 participants, including 50 with MDD and 39 healthy controls (HC). Study 2 included 18 participants with MDD who completed 10 weeks of behavioral activation. The Multidimensional Assessment of Interoceptive Awareness (MAIA) self-report measure was used to examine IA. Depression severity was measured using either the Patient-Reported Outcomes Measurement Information System Depression scale (Study 1) or the Beck Depression Inventory-II (Study 2). Independent and paired samples t-tests were used to examine differences between Study 1 MDD and HC groups and Study 2 pre- to post-treatment changes, respectively. Results: Study 1 participants with MDD exhibited lower scores on the Self-Regulation and Trusting subscales of the MAIA compared to HC. In study 2, depression severity significantly decreased...
from pre- to post-behavioral activation treatment. Scores on the MAIA Self-Regulation subscale significantly increased. Conclusion: Findings suggest that depression relates to reductions in various aspects of interoceptive awareness. Treatment for MDD, such as behavioral activation may improve IA through one’s ability to regulate their interoceptive responses. If replicated, these results could be used to inform future research examining depression treatment augmentation strategies specifically targeting IA.

Matthew D. Crall, Michael W. Keller
MICROFLUIDIC ENCAPSULATION OF NANOPARTICLE REACTANTS FOR AUTONOMIC DAMAGE DETECTION

A wide variety of functional materials are based on microcapsules, including composite materials with the ability to self-sense and self-heal damage. Microcapsules are synthesized with a reactive liquid core contained within a thin shell, and are dispersed throughout a material during fabrication. Damage propagating through the material ruptures the microcapsules, releasing the liquid contents into the fracture plane. The liquid then reacts to either bond the crack faces together, or form an easily sensed substance to highlight the damaged region. In this work, we discuss the synthesis of microcapsules for highlighting damage in composite materials. This is important because impact to composite materials often results in hidden, internal damage that greatly compromises material strength and is difficult to detect. This detection will be accomplished by using the liquid contained within the microcapsules to form magnetic nanoparticles in the damaged region. These particles can be sensed both visually and with a magnetic scanner. Conventional microencapsulation methods are unsuitable for synthesizing microcapsules for this application, because the reactants for these nanoparticles are aqueous, rather than non-polar. This requires that the microencapsulation be carried out via microfluidic techniques using a flow control device. Herein, we detail the process and the challenges of creating the flow control device, chemistry selection, and finally the progress towards synthesizing microcapsules containing the reactants for damage detection.

Sydnie Cunningham
EXAMINING CHANGES IN PERSON-ORGANIZATION FIT

The concept of “fit” is an underlying theme throughout the entirety of the industrial-organizational (I-O) psychology literature. Ensuring employees fit within their organization, their job, and with their supervisor can be daunting for employers. Likewise, adjusting to their jobs and changes in organizational culture can be daunting task for employees. Research has shown that certain individual differences can further convolute this already complicated process (e.g. Caldwell, Herold & Fedor, 2004; Kristof, 1996; Silverthorne, 2004). In light of current trends towards globalization, and the growing number of racial minorities in the American workforce, it not surprising that race is one of the individual differences that can have a profound impact on employee fit. It has been found that employees who are racial minorities can encounter a variety of fit related workplace struggles, including experiencing higher rates of workplace incivility, negatively-biased performance appraisal ratings, and procedural injustice (e.g. Heslin, Bell & Fletcher, 2012; Knight, Hebl, Foster & Mannix, 2003). While many topics concerning fit and diversity have been heavily researched in the industrial-organizational psychology arena, this proposed project attempts to shed light on a topic that has not yet been considered. We focus on a specific facet of fit, person-organization fit, and consider how do perceptions of person-organization fit change over time, particularly for minority employees?

Nicole Davalos, Dr. Akhtar Ali
THE DETECTION AND CHARACTERIZATION OF VIRAL PATHOGENS IN STRAWBERRY USING SEROLOGICAL AND NUCLEIC ACID BASED ASSAY

Strawberries have become an important cash crop in the United States. The reason beside its importance is due to the nutrition content. Strawberries contain higher antioxidant capacity and high amounts of ascorbic acid, also commonly known as vitamin C. Due to their nutritious content, Strawberries has become a
popular fruit by consumers. Because of their high demand, the importance for strawberries to be harvested and produced in large percentage yields is crucial. While strawberries been steady throughout the years, there been new reports of various diseases affecting the production of strawberries. These diseases affect the overall production and yield of the crop. Furthermore, little information is known which diseases affect production in Oklahoma and surrounding states. The objective of the study is to detect and characterize what types of viral diseases are causing infection in Oklahoma and neighboring states. Leaf samples were collected from various fields in Oklahoma, Arkansas, and Texas. Samples were tested for the presence of different plant viruses using serological and nucleic acid based detection assay. Dot-immunobinding assay (DIBA) was used to detect viral samples using eight different plant disease antisera. Samples that resulted negative underwent double stranded RNA (dsRNA) extraction. The samples will undergo reverse transcription polymerase chain reaction (RT-PCR) in order to obtain complementary DNA for sequencing.

DeMier, Brettany C., Kristina A. Scott, Megan D. Hopkins, and Angus A. Lamar*
A MECHANISTIC INVESTIGATION OF THE FORMATION OF N-SULFONYL ALDIMINES FROM ALDEHYDES AND IMINOIODINANES

In the present study, a series of experiments were designed to elucidate the reaction mechanism regarding the production of $N$-sulfonylimines from aldehydes and iminoiodinanes. $N$-Sulfonylimines are employed as valuable intermediates in the production of chiral amines, and these compounds are generally formed from condensation reactions in the presence of a strong Lewis or protic acid. Our research group has developed a visible-light-promoted alternative method for their production, and our progress towards determining the mechanism of the reaction will be presented.

DeVille¹², Danielle C., Kaiping Burrows¹, Kara L. Kerr¹², Jason A. Avery¹, Jerzy Bodurka¹³, Martin Paulus¹⁴, and W. Kyle Simmons¹⁴
THE NEURAL BASIS OF INTEROCEPTIVE RECALL

Recent theories propose that the brain’s interoceptive network continuously monitors the state of the body, associating external stimuli with their internal consequences, thereby allowing later recall of these associations to guide behavior. We examined the neural basis of interoceptive recall using a paired associates learning task. Twenty right-handed healthy adults (11 female; mean age = 30 years) completed the Interoceptive Encoding and Recall (IER) task. During the IER task, subjects were intermittently exposed to an inspiratory breathing load of varying intensity, an unconditioned aversive interoceptive stimulus, while viewing one of 3 abstract geometric symbols. As an exteroceptive control, subjects viewed 3 different geometric symbols while an aversive auditory scream played at varying volumes through headphones. Later, while undergoing fMRI scanning, subjects performed an unexpected recall task, in which they were presented with the geometric symbols they saw previously and instructed to recall intensity of the stimulus (i.e., load or scream) associated with each shape. Recall of breathing loads, relative to recall of auditory screams, resulted in activation within the dorsal mid-insula, anterior cingulate, and thalamic nuclei known to relay afferent visceral interoceptive signals from the body. Thus, simply recalling stimuli associated with a previous interoceptive challenge was sufficient to activate the brain’s interoceptive network; at the time of fMRI scanning, subjects were no longer experiencing actual interoceptive stimulation. By providing a better understanding of how the brain constructs and retrieves interoceptive associations, these findings may eventually help to shed light on the interoceptive dysfunctions reported in multiple psychiatric disorders.
Diehl, Brian
SEQUENCE STRATIGRAPHIC RELATIONS OF THE FREDERICKSBURG AND WASHITA GROUPS, LOWER CRETACEOUS CARBONATE SHELF, TEXAS

Stratigraphic interpretations of the Lower Cretaceous – c. 108-97 Ma – Fredericksburg and Washita groups on the Comanche carbonate shelf have been debated for many years. Applications of sequence stratigraphy provide an accurate method for predicting the thickness, quality, and distribution of reservoir rocks in the Fredericksburg Group. This research addresses several ongoing questions regarding carbonate sequence stratigraphy of the Fredericksburg and Washita groups and tests current stratigraphic models. The sequence boundary between the Fredericksburg and Washita groups, Albian Sequence Boundary Washita 1 (AL SB WA1), is an iron-stained, bored hardground in north Texas, and southeast Oklahoma. In the Western Interior the contact records the flooding of the North American Continent. However, southward on the San Marcos Arch near Austin, Texas, the contact has been traced at the base of the Person Formation by several published stratigraphic models. This study documents the origin of the Fredericksburg-Washita sequence boundary and tests correlations of carbonate depositional cycles. To accomplish the objectives, petrographic, isotope, and X-Ray Diffractometry data of core and outcrop sections were gathered. Results support a sequence stratigraphic interpretation that traces the Fredericksburg-Washita contact from north Texas (between the Kiamichi and Goodland formations) to south-central Texas (between the Person and Georgetown formations) as a continuous, unconformable surface.

Diep, Alexander
ANALYZING SOCIAL NETWORKS IN AN INTERDEPENDENT TEAM

Team members interact in order to meet goals and attain outcomes. Each team member can be defined as an actor that is a social entity with ties to other actors within the team. A social network is a group of actors that are tied together by one or more types of relationships. Analyzing social networks focuses on examining the relationships between actors, instead of the individual attributes of actors (Otte, 2002). Doing so can measure formal and informal relationships to understand what causes a network to function well or poorly. In the current study, three individuals comprise a team that works together to complete a task (protecting friendly space stations and destroying all enemies). The study consisted of one practice trial and three task trials. Each individual responded to surveys after each trial regarding their relationship with other two members. Analyzing networks and relationships can be used to identify knowledge flow, knowledge sharing, efficiency, and effectiveness of communication channels, and team learning among other team attributes. In this study, we intend to explore potential team processes (e.g., trust or knowledge sharing) by examining relationships between individuals to understand which processes identify effective teams compared to ineffective teams.

Dorand, M.F., Shotwell-Tabke, C., Steward, J., Davis, J. and Newman, E.
EXAMINING THE CONTEXTS OF CAMPUS SEXUAL ASSAULT AND HEALTH RISK BEHAVIORS AT THE UNIVERSITY OF TULSA

Students and faculty at the University of Tulsa and the Tulsa Institute of Trauma, Adversity, and Injustice (TITAN) conducted a study to assess the contexts of sexual assault victimization and perpetration among students at the University of Tulsa. Contextual factors include the relationship context of the assault, location, substance use, and risk of sexual assault at different times in the semester. Furthermore, the study assessed health risk behaviors (such as drug and alcohol use, self-harm, careless driving or driving under the influence, etc.) of sexual assault survivors. This presentation will use data from this anonymous online survey (with a current sample size of 292 participants) to examine incidents of and contextual factors surrounding the occurrence of the sexual assaults reported within the campus community, as well as the relationship between sexual assault and health-risk behaviors.
Elliott, Britney
TAPHONOMIC AND PALEOECOLOGICAL ANALYSIS OF SMALL MAMMAL FOSSILS FROM HAYONIM CAVE LAYER E

The objective of this study was the analysis of small animal remains recovered from Layer E of Hayonim Cave, dated to about 160,000 years and located in the Galilee of Israel. This location is known to have been occupied by Neanderthals but little else is known beyond this largely due to the lack of paleoecological reconstruction of the area. Without a paleoecological reconstruction, important information about the environment and the species interactions are unknown, which was the driving force for this research. This project consisted of three main steps: the taxonomic analysis of the remains to identify the species and skeletal element, the taphonomic analysis of the remains by examining the levels of digestion as well as breakage patterns to allow for classification of the raptor species to have ingested the animal, and lastly a paleoecological reconstruction of what the surrounding environment consisted of during this time. Reconstructing the environment surrounding Hayonim Cave through paleoecological measures will greatly help in not only understanding how the Neanderthals lived during this time and in this location, but also whether or not they co-existed with other hominid species.

Feng, Michael
GALLIUM OXIDE NANOSTRUCTURES AS CATALYSTS IN THE SYNTHESIS OF ALKYL AND ARYL CARbamates

Platform chemicals such as alkyl and aryl carbamates are commonly used items for the petroleum industry to produce products that span from pesticides to polyurethanes. However, in order to make these chemicals, catalysts with desirable structural and catalytic properties are needed. In this project, we propose the use of gallium oxide nanostructures as catalysts for the conversion of carbon dioxide to alkyl and aryl carbamates. In our lab, we synthesized nanostructures from gallium nitrate and sodium hydroxide via hydrothermal processes and tested several surfactants to measure their impact on the properties of the catalysts. Consequently, we discovered the degree to which the choice of surfactant plays in altering the structure of the gallium oxide nanowires. While all the products made consisted of β - Ga2O3, the surfactants had a profound impact on the dimensions of the product. Our results had length-to-width ratios that spanned from 7:1 to 24:1. This of course allows future experiments to change the surface area on the nanostructures which proves to be beneficial for research in catalysis. Our research will hopefully lead to more insight on the understanding of reaction mechanisms as well as the improvement of catalysts for industrial purposes.

Flonard, Michaela, Basile Tarchini, Bar Harbor, ME
TRACKING SPONTANEOUS HAIR CELL REGENERATION IN WILD-TYPE MICE

Hair cells (HCs) of the inner ear are the basis for auditory and vestibular functioning, but are easily damaged. In adult mammals, hair cells do not regrow after damage, leading to hearing loss. Recent research demonstrates regeneration of hair cells in the auditory system can occur in postnatal mice for several days after birth. Genetic background may influence regeneration capacity, so studying regeneration in several strains could create a better understanding of what genes and pathway underlying restoration. While HC regeneration has been identified in transgenic neonates, demonstrating regrowth in wild-type, non-transgenic mice required a new research protocol. I developed a protocol to distinguish between new, regenerated HCs and HC that survived injury in wildtype mice. The use of FM1-43 identified surviving HC, while Myo7, Sox2, and phalloidin further allowed distinction between old and new cells. This protocol can be extended to multiple inbred strains to allow for comparison. If there is variability across lines, then genome-wide profiling could reveal genes or pathways that affect the regeneration process.
Rose Fonseca

WORK-LIFE BALANCE: WHAT DOES IT REALLY MEAN?

Although the interest in work life balance continues to grow, the research area is plagued by the following issues: Exclusive attention to work-family issues, which ignores life experiences of people without spouses/children; Inconsistent conceptual definitions and corresponding measurement, which impedes progress in the field. The present study addresses these issues by proposing a new definition and measurement approach.

Ford, Bart

IMMUNE SUPPRESSION AND ACTIVATION IN MAJOR DEPRESSIVE DISORDER

The study of depression in the field of psychoneuroimmunology is characterized by two seemingly conflicting sets of observations. Sufferers of major depressive disorder (MDD) show signs of suppressed immunity such as reduced cellular response to mitogens in vitro and increased susceptibility to viral infection. Conversely, low grade, chronic inflammation is prevalent in MDD indicating increased activity of the innate immune system. These findings have been repeated across studies, but surprisingly few studies have measured both immune suppression and activation in the same individual. In this project, blood samples from 57 medication free volunteers with a diagnosis of MDD and 56 healthy controls were tested for biomarkers of inflammation and immunophenotyped via fluorescent cell surface staining and flow cytometry. A significant negative correlation was found between serum levels of C-reactive protein (CRP), a clinically used marker of inflammation, and the frequency of regulatory T cells (Tregs) in the MDD group ($R^2 = .15, p = .003$), but not in the healthy controls ($R^2 = .002, p = .73$). Interestingly, the MDD individuals with high CRP had Treg frequencies in the same range as the healthy controls and those with low CRP had elevated Tregs. Since Tregs function to dampen immune response by secreting anti-inflammatory cytokines and suppressing effector cells, these results could indicate that immune suppression is not co-occurring with innate immune activation within an individual. It is not clear if the two states of immune function represent different subtypes, temporal stages or severity of MDD. Replication experiments in a larger cohort are underway.

Franklin, Chance

RC AIRPLANE INSTRUMENTATION AND SIMULATION MODEL DEVELOPMENT

Vehicle autonomy is a growing field and with many uses. One particularly prospective area under development in vehicle autonomy is Unmanned Aerial Vehicles (UAVs). UAVs are being developed and implemented to carry out many tasks automatically, quickly, and efficiently that are impractical or wasteful for humans to do. With the increasing usage of UAVs, safety of both the UAVs and humans around which the UAVs operate will inevitably need to be addressed. Additionally, UAVs can serve as models of their larger, manned counterparts. Aspects of safety and efficiency developed for UAVs may make their way onto advancing the world of manned aircraft as well. The ultimate goal of this project is the development of control algorithms to increase the safety and stability of unmanned airplanes. The goal of this project is to create a stable research platform and accurate and reliable simulation environment to test autopilot algorithms developed in the future. Development of control algorithms must be safely developed and tested in simulation and also requires an understanding of flight dynamics and RC airplane operation. To ensure the accuracy of our simulations and gain the necessary understanding of flight dynamics, we configured a RC airplane for research capable of stable flight, data collection, autonomous and manual flight. Flight data captured by the airplane will be used to create accurate hardware-in-the-loop simulations in X-Plane and Matlab for the research of safe autopilot controls on vehicles capable of six degrees of freedom.
Justin G. Fuller, Loyd R. Hook, IV
RUN-TIME ASSURANCE TO AID IN CERTIFICATION OF COMPLEX SMALL AIRCRAFT AND SMALL UAS AUTOPILOTS

The Small Aircraft Revitalization Act of 2013 (SARA) requires updates to certification standards for small, manned aircraft that take advanced safety technologies into account. Similar mandates address Unmanned Aircraft Systems (UAS). The trend toward autonomous or semi-autonomous control for aircraft autopilot software presents several issues for certification, since some algorithms are nondeterministic or so complex as to make traditional certification a daunting burden to manufacturers; the associated activities can double development cost, placing new safety products beyond the financial means of many pilots. In an attempt to reduce the certification cost, the burden of ensuring proper behavior could be moved to run-time. If a simple system kept watch on the effects of an advanced autopilot system during operation, it could handle cases that were not tested \textit{a priori}. This approach has appeared in the literature with a human pilot to handle recovery cases. This idea could be improved by allowing a simple automated controller to take over when a human pilot makes a mistake. This presentation covers the general architecture of such a system, its interaction with a human pilot, and various tradeoffs involved when considering these arrangements.

Goncalves-Machado, Cintia
CO2 EFFECTS ON WELLBORE PRESSURE RESPONSE DURING INJECTION-FALLOFF TEST

Injection-falloff testing when the injected fluid is either water or carbonated water is particularly important for offshore reservoirs, which contain oil and gas with very high CO2 content. In this environment, a conventional well test as an exploratory well cannot be run because the produced gas cannot be discarded since the emission of gas with a high concentration of CO2 to the atmosphere is harmful to the environment; hence, there is a need to develop techniques for analyzing pressure data from injection-falloff tests. We developed an approximate semi-analytical solution for the wellbore pressure during carbonated water injection and falloff well test in a reservoir containing oil, where the carbon dioxide can be present at distinct concentrations in both phases, water and oil. We first determine the saturation/concentration distributions from the appropriate system of hyperbolic conservation equations by applying the Method of Characteristics. Then the pressure solution can be obtained by integrating the expression for the pressure gradient by Darcy's law, from the wellbore radius to infinity. Injecting water which contains dissolved CO2 not only avoids the negative environmental impact that occurs with a production test, but also may increase oil recovery because any dissolved CO2 in the injected water that is transferred to the oil phase decreases oil viscosity and residual oil saturation. By comparing results from our semi-analytical solution with a reservoir simulator, we have shown that our solution is highly accurate.

Goolsbay Carr, Jessie
ANIMAL-ASSISTED THERAPY: KNOWLEDGE, ATTITUDES, BELIEFS, AND PRACTICE PATTERNS OF SPEECH-LANGUAGE PATHOLOGISTS

Background: Animal-assisted therapy (AAT) is the use of an animal as a therapy tool by a health professional to help clients reach their goals. Purpose: The purpose of this study is to assess the knowledge, attitudes, beliefs, and practice patterns of speech-language pathologists in Oklahoma regarding AAT. Methods: I conducted an electronic survey of speech-language pathologists at the 2016 Oklahoma Speech-Language-Language-Hearing Association conference. The survey consisted of three sections: demographics, knowledge, and attitudes and beliefs. The demographics section assessed education, clinical experience,
practice patterns, and AAT use. The knowledge section consisted of thirteen true and false questions about the basic concepts of AAT. The attitudes and beliefs section consisted of eighteen Likert-scale questions and four multiple-choice questions that assessed participant perceptions of AAT. Results: Of the 79 that completed the survey, 97% believe that at least some of their clients could benefit from AAT, but only 20% of respondents have used AAT. On average, respondents answered 80% of the knowledge questions correctly and indicated positive perceptions of AAT in 69% of responses. Attitude toward AAT is the only factor related to AAT use. Conclusions: The results of this survey show that despite limited implementation, speech-language pathologists in Oklahoma have a good understanding of AAT and generally positive attitudes toward its use with clients with communication disorders. Results from this survey parallel the survey of occupational therapists performed by Hightower (2010). This could suggest a trend across rehab professionals’ knowledge, attitudes, beliefs, and practice patterns, including barriers to AAT implementation.

Daniel Guzman, H. Edward Fouty, Erica L. Ailes, Katelyn D. Brown, Samantha D. Lugar, and Michael R. Basso

CONSTRUCT VALIDITY OF THE TINKER TOY TEST
Objective: Lezak (1982) introduced the Tinker Toy Test (TTT) as a non-verbal measure of executive function which assesses complex planning and problem-solving. Examinees are provided 50 pieces of a tinker toy set, and are asked to build an item of their own choosing. No further directions are given. Initial research implied the instrument possessed satisfactory criterion validity, but few studies have elaborated the TTT’s merits. Accordingly, this investigation aimed to evaluate the construct validity of the TTT. Participants and Methods: 40 healthy young adults participated (30 females, 10 males). Participants completed the TTT and the Wechsler Abbreviated Scale of Intelligence – II (WASI-II). Administration of these measures was counterbalanced across participants. Convergent validity was assessed by examining the relationship between TTT scores and the Perceptual Reasoning Index from the WASI-II. Divergent validity was evaluated by the relationship between TTT scores and the Verbal Comprehension Index from the WASI-II.

Results: Because the TTT is conceptualized as a non-verbal measure of executive function, it was anticipated to correlate significantly with the non-verbal component of the WASI-II, and it was expected to not correlate with the verbal domain of the WASI-II. As expected, correlations revealed a significant correlation between the TTT and PRI ($r = .36, p = .02$) and a non-significant correlation between the TTT and VCI ($r = .25, p = .12$). Conclusions: This study supports the construct validity of the TTT. This measure correlated most strongly with non-verbal measures. This suggests that the TTT is better at examining nonverbal executive functioning and identifying right-frontal lesions.

Haunga, Steven

THE RELATIONSHIP BETWEEN DIET AND ACADEMIC ACHIEVEMENT
Previous research shows that in-class breakfast increases both math and reading achievement (Imberman & Kugler, 2012). Moreover, Aldolphus, Lawton, and Dye (2013) found that on-task behavior following breakfast indicates that children who eat breakfast are more capable to concentrate, pay attention and are more alert while at school. This proposed research will be conducted in the fall, 2017, with 4,000 students at Union High School in Tulsa, Oklahoma. It is hypothesized that students who eat breakfast will have better academic scores than students who do not eat breakfast. It is expected that students who eat breakfast are more engaged, enthusiastic about learning, and have better scores academically. Students will complete a survey asking whether they consumed breakfast, what they usually consume for breakfast every morning, and how many days a week they consume breakfast. Survey questions will be correlated with math achievement scores.
Heck, Mariah, David Miller, Dar Roberts
FINDING SPECTRAL PATTERNS IN BARK BEETLE INFESTATIONS OF THE SIERRA NATIONAL FOREST USING LANDSAT AND AVIRIS IMAGERY

Under normal circumstances, the bark beetles of the Sierra Nevada conifer forests are vital to ecosystem health; by eliminating weak trees, they allow other plants to grow in the space left behind, provide homes for various animals, and enrich the soil. However, climate change is putting these ecosystems at risk: warmer winters allow bark beetles to be active and breed year round, and the severe drought conditions currently present in California leave otherwise healthy trees unable to defend against attacks. In this study, we used Google Earth and Landsat-8 imagery of the Sierra National Forest to locate trees that had been damaged by bark beetles between the summers of 2015 and 2016. Additionally, we used an Airborne Visible/Infrared Imaging Spectrometer (AVIRIS) image from summer of 2015 to look for a difference in the spectra of consistently healthy trees compared to spectra of trees which appeared healthy in 2015 but died in 2016. We found that healthy trees were consistently brighter across the spectrum than dying trees. Comparisons using t-tests were made between elevations, slopes, aspects, and spectral indices of a form (Band 1 - Band 2)/(Band 1 + Band 2) on our AVIRIS data. While we were unable to find any specific indices which indicate beetle kills, wavelengths in the ranges of 400-500 and 2200-2500 nanometers showed the most sensitivity when the brightness difference was scaled and removed.

Alejandro Hernandez
ESTIMATING DYNAMIC CONNECTIVITY STATES IN RESTING-STATE FMRI

Functional connectivity networks in resting-state fMRI have proven to be useful in characterizing the resting brain. These networks are obtained using whole-scan connectivity data. There is evidence, however, that the brain exhibits change in connectivity over periods of a few seconds. We use dynamic connectivity networks to describe these changes. This presentation outlines a procedure for estimating dynamic connectivity networks as well as connectivity states. The connectivity networks are obtained using partial correlations of windowed time courses of average Blood Oxygen Level Dependent (BOLD) signals in distinct brain regions. The connectivity states are produced from unsupervised classification over the connectivity networks of various healthy subjects.

Valeria Herrera, Jennifer Ragsdale, PhD
FAMILY MATTERS: DO FAMILY CHARACTERISTICS IMPACT JOB-RELATED OUTCOMES?

Extant research has demonstrated the detrimental effects of work-family conflict on employee well-being (Allen, Herst, Bruck, & Sutton, 2000; Amstad, Meier, Fasel, Elfering, & Semmer, 2011). (Nohe & Meier, 2014). (Gangster & Rosen, 2013; Griffin & Clarke, 2011) and important work-related outcomes, such as lower organizational commitment, and turnover intentions (Kossek & Ozeki, 1999). However, surprisingly little attention has been directed at understanding how various family characteristics impact these relationships. The study aims to examine the relationship between non-work related variables of employees’ lives and how they affect job-related outcomes of interest to organizations.

Sarah Hicks and Luke Wagner
PASCAL: HOW REUSING IS BETTER THAN RECYCLING
Pascal is an online, multi-sided platform that enables companies to buy and sell reusable materials. The platform is targeted to companies that seek to streamline their practices by lowering material waste while adding to their bottom line. Most conventional production models are linear which forces companies to either recycle or throw away the excess of their processes. By adapting the cyclical model promoted by Pascal, companies that both buy and sell reusable materials receive added value, both socially and economically. In an international context, Pascal will become part of a larger network of online marketplaces that encourage businesses to resell their excess rather than dispose of it conventionally; thereby affecting global change. Also, by targeting small businesses at the outset, Pascal will create a grassroots movement that will be organically adopted by its members.

**Hoover, Coty**

**AN EXPERIMENTAL TEST OF RECOVERY EXPERIENCES CONTRIBUTING TO RESOURCE RESTORATION**

Research has suggested that the psychological experiences one has during off-work activities contribute to recovering from work stress; which is defined as increasing psychological resources after a stressful task in the present study. I propose that the particular activities one engages in will lead to particular recovery experiences (e.g., working out will lead to mastery experiences), thereby in turn increasing psychological resources (e.g., mastery experiences will lead to increases in occupational-efficacy). This study utilized two experimental tasks to deplete self-regulatory and occupational-efficacy resources. Participants were then randomly assigned to one of two recovery activities: a progressive muscle relaxation or a biking task. Participants’ level of resource change was then assessed in conjunction with recovery experiences. Research in this area allows for more informed recommendations for employees on how to recover adequately from work demands during work breaks.

**Hundley, Nathan, Robert P. Tett**

**A COMPETENCY-BASED TAXONOMY OF LEADERSHIP/MANAGEMENT SITUATIONS**

Contingency theory in leadership holds the value of a given leadership behavior or competency depends on the situation; nevertheless, comprehensive situational taxonomies are lacking in the field of leadership/management (L/M). The purpose of any well-developed taxonomy is to organize complex information so as to advance theory. The current study was undertaken to identify a competency-based situational taxonomy for L/M through answering the questions of: (1) Can competency-situation relevance be judged reliably? and (2) Can meaningful situation clusters be identified based on their shared L/M competency relevance? A total of 1,163 participants recruited from Amazon Mechanical Turk judged the relevance of 64 specific L/M competencies to each of 94 situational features identified from the L/M literature at the task, team, and organizational levels. The resulting 6,016 unique competency-situation pairings were separated into 96 blocks, each containing 56 to 72 pairings. Relevance judgments were collected per pairing along a 1 (completely irrelevant) to 3 (highly relevant) scale. After dropping 211 unreliable judges across all blocks, mean relevance ratings for the 64 competencies across the 94 situations were subjected to statistical clustering using principal components analysis (PCA) at two levels. First-level PCA was applied to situations in each of the three levels, plus team member personality trait standing, for a total of four analyses. Results yielded a total of 23 meaningful, correlated factors. Second-order clustering applied to the first-level factors identified four general factors: General Managerial, Positive/Cooperative, Creative Teamwork, and Political. The model holds promise as a foundation for advancing L/M theory.
Hutchins, Nathan, Dr. Loyd Hook Abstract
ACCEPTANCE, HUMAN FACTORS, AND ETHICS IN AUTONOMOUS VEHICLES

In the age of autonomous systems, specifically autonomous vehicles, people are currently in an environment where humans are interacting with these systems on a daily basis. As of now, there are no guidelines or institution of guidance for the design of these systems. The three categories of systems that are used daily are Non/Limited Autonomous, Semi-Autonomous, and Fully Autonomous vehicles, the last of which is becoming more common on the roads of today. Each of these categories have very different acceptance standards, human factors issues, and ethical problems that need solutions for both development and implementation. The TU Vehicle Autonomy and Intelligence Lab (VAIL) is currently developing research laboratories and researching these issues to build the cases for continued development into these autonomous systems, making them safer and more reliable for everyone. The work in VAIL is progressing with the development of the Electronic Car Learning and Intelligence Program Simulator (ECLIPS). Through the investigation of these issues using ECLIPS and user feedback, VAIL is on track to model the behavior and work on ethical guidelines for the development and implementation of autonomous systems. VAIL is working to investigate these questions at a fundamental level and describe the topics in a way that can make sure these technologies are in line with the progression of technology and the future of human involvement with these technologies.

Jackson, Lauren E., Jesse A. Phillips, Heather Morgan, Erin V. Iski
EXPLORING THE STABILITY OF SILVER HALIDE THIN FILMS ON AU (111)

The unexpected thermal stability and oxidative resistance of a AgCl monolayer on Au (111) has been confirmed, so experiments were carried out to determine the stability for other silver halides. This stability could lend itself to many applications in anti-corrosion and microelectronic fields. Using electrochemical scanning tunneling microscopy (EC-STM), the surfaces were characterized by surface structure and by electrochemical behavior both pre- and post-flame annealing in a hydrogen flame at 1,000 K. The data suggested that a layer of AgBr could maintain its stability in the same manner as AgCl, but that a layer of AgI did not appear to perform in the same way. Further EC studies are underway to determine the mechanism by which the silver halides adsorb on the surface. Density functional theory (DFT) is now being used in a theoretical study of the surfaces for comparison to experimental data. Chiefly, information on energetics, bonding arrangements, and electronic properties are derived from this method.

Jameson, Carter
MODELING PHARMACOKINETICS: ORAL-TRANSMUCOSAL ADMINISTRATION OF FENTANYL USING DELAY DIFFERENTIAL EQUATIONS

The purpose of this research is to examine the implementation of delay differential equations in a mathematical model of the pharmacokinetics of fentanyl lozenges. Drugs administered as lozenges lend themselves to mathematical analysis using delay because they are first absorbed in the mouth and then, after a time, are absorbed in the digestive system. This project introduces delay differential equations into simple systems to achieve the necessary dynamics. This research utilizes the pharmacologic data of Actiq® to fit a model, which is then analyzed for accuracy and robustness. The result of this research is an experimental model of fentanyl amounts in the blood, and an improved understanding of delay equations in pharmacokinetic models.
Sarah-Nicole Johnson, Rachel Micol, M.A., & Joanne Davis, Ph.D.

PTSD TRAJECTORIES: A COMPARISON OF INTENTIONAL AND UNINTENTIONAL TRAUMA

Following exposure to traumatic events, individuals may have different posttraumatic responses such as rapid recovery (resilience), chronic posttraumatic stress disorder (PTSD) symptoms, no increase in PTSD symptoms (resistance), or even delayed onset of PTSD. These differential outcomes are described as PTSD trajectories. Research has primarily focused on trauma type, namely intentional trauma (IT; e.g., assault) or unintentional trauma (UT; e.g., a natural disaster), as predictors of these PTSD trajectories. In several of these studies, IT results in more cases of delayed dysfunction and resistance, and fewer cases of resilience. Comparisons of IT and UT have been limited to the use of only one or two traumatic events within each type, and few studies examine potential moderating variables such as social support, posttraumatic growth, and shame to explain the relationship between trauma type and the trajectories. My proposed study will address these limitations. Participants will complete brief self-report survey including the PTSD Checklist for DSM-5 with Life Events Checklist for DSM-5 and Criterion A, a self-report trajectory-determination measure, and measures for social support, posttraumatic growth, and shame. For data analysis, subjects will be divided into two groups: those who endorse a UT and those who endorse an IT. Multinomial logistic regression will be used to examine the determinants of the trajectories within each group. It is hypothesized that individuals exposed to IT will report dysfunctional trajectories, unlike those who experience UT. Second, there will be significant differences between those exposed to IT and UT with regard to the moderators.

Reid Johnston

DEVELOPMENT OF A TEACHING AIDE FOR INTRODUCTORY LEVEL DIGITAL SYSTEMS DESIGN

At the University of Tulsa and other institutions there is a need for a simple platform that allows students to design and test digital systems without learning a hardware description language. This paper presents one such platform implemented with Simulink. The intuitive “drag and drop” interface provided by Simulink allows students to rapidly design simple to moderately complex digital systems by connecting a wide variety of basic or premade components. Systems can then be tested by uploading them to an Arduino, as was used in this case, or a similar ATMEGA328 based development board that has been paired with a shield that provides basic input and output. This platform was provided to a test group of students enrolled in the University of Tulsa’s Intro to Digital Systems Lab. Compared to students using the original lab equipment, students in the test group were able to work more efficiently and implement more complex systems.

Jones, Zachary

HIGH PERFORMANCE COMPUTING: CONTENT ADDRESSABLE MEMORY

Cyber Security is a large field of computer science, and attempts to prevent hacking are necessary to ensure safety of both the general population and confidential projects. One resource to do this is the attack graph, a computerized model that shows weaknesses in a network. While the attack graph is an immensely helpful diagram, it is difficult to generate, especially in a reasonable amount of time, so any speedup will possible will highly beneficial. Content Addressable Memory (CAM) is an associative memory drive that runs in parallel. Unlike typical Random Access Memory (RAM), which searches for an address and returns the data, CAM will search for an item and return the addresses for all objects that match. Since CAM searches in parallel, this is useful specifically for comparisons, as in the algorithm for generating an attack graph. If using RAM, the computer must compare the value against n items in memory, for a total of n memory operations and n comparison operations. However, since CAM searches for data in parallel, it will simultaneously compare each bit against each corresponding bit for every object in memory, returning the
addresses for all values that match in one operation. This can significantly reduce runtime for the program, effectively increasing productivity.

Kannan, Dhiyya

**EPICOCCUM AEROBIOLOGY IN TULSA, OKLAHOMA**

*Epicoccum* is an asexual fungus commonly found on leaf surfaces and decaying vegetation. The spores are usually 15 to 25 micrometers in diameter. Generally, *Epicoccum* atmospheric concentrations are low but during crop harvesting levels may increase significantly. These spores are known to be allergenic. This study used data from 2000 to 2015 to analyze long term trends in *Epicoccum* spore concentrations as well as the influence of meteorological conditions on spore levels. Airborne spores were collected with a Burkard sampler on the roof of Oliphant Hall. Once the air samples were collected, they were made into permanent slides to analyze under the microscope. The slides were analyzed with one traverse under 1000x magnification. Statistical analyses were performed on the daily concentration for the 16 years. Spearman correlations were calculated for the concentrations against the meteorological data. Analysis from the counts displayed a varying level of *Epicoccum* spores in the air. The highest concentrations were found from July to October. The highest yearly sum was in 2003 with a total of 10,556 spores and a peak concentration of 324 spores/m³. The lowest spore levels were in 2000 with a seasonal total of 2,981 and a peak concentration of 112 spores/m³. Spearman analyses indicated spore concentrations were positively correlated with the maximum, minimum, mean temperature, and dew point for each year. Concentrations were negatively correlated with precipitation and relative humidity for most years. With more analysis, a predictive model can be created for *Epicoccum* concentration.

Kaphle, Amrit, Ram Tiwari, and Parameswar Hari

**OPTICAL AND ELECTRICAL CHARACTERIZATION OF COBALT DOPED ZNO NANOPARTICLES FOR THE ENHANCEMENT OF POWER CONVERSION EFFICIENCY OF SILICON BASED SOLAR CELLS.**

Undoped and Cobalt doped (5%, 10%, and 15%) zinc oxide (ZnO) nanoparticles have been synthesized by simple precipitation method. These ZnO nanoparticles have been characterized by x-ray diffraction (XRD) method to estimate the size. The average size of ZnO nanoparticles decreases from 27 nm to 12 nm with increasing the cobalt concentration. Doped and undoped ZnO nanoparticles thin film has been deposited by spin coating technique on the Si substrate. Optical properties of cobalt doped ZnO layer have been investigated using UV- VIS spectrometer and band gap values were found to be decreasing with increasing the thickness. Photoluminescence spectra show blue shift in near band edge emission with increasing thickness. Current-Voltage (J-V) characteristic shows there is an improvement in power conversion efficiency (12 to 15%) for 138 nm thickness of ZnO layers. In addition, there is an enhancement of external quantum efficiency (EQE) with increasing ZnO nanoparticles layer. We will discuss the implications of these measurements in optimizing the power conversion efficiency of silicon based solar cells.

Karki, Anand B., Mohamed K. Fakhr

**COMPARATIVE STUDY ON THE SURVIVABILITY OF CAMPYLOBACTER JEJUNI AND CAMPYLOBACTER COLI IN VARIOUS RETAIL MEAT AND LIVER JUICES**

Higher prevalence of *Campylobacter* species in retail liver products compared to other retail meats was recently reported and was linked to several outbreaks. We hypothesize that this higher prevalence in retail liver is due to the higher survivability of *Campylobacter* in this particular food matrix. The objective of this study was to test the survivability of *C. jejuni* and *C. coli* strains previously isolated from various retail meats at low temperature (4°C) on beef liver juice (BLJ), chicken liver juice (CLJ), chicken juice (CJ), and beef juice (BJ) as food models. Meat and liver juices were prepared by thawing frozen retail meat and liver and filter sterilizing the extracted juice. Mueller Hinton Broth (MHB) was used as a control and for the
preparation of appropriate dilutions of the meat and liver juices. Full strength meat and liver juices, MHB supplemented with 5% meat and liver juices, and MHB alone were inoculated with ten *Campylobacter* strains (4 *C. jejuni* and 6 *C. coli* strains) previously isolated from retail meats in addition to the reference strain *C. jejuni* NCTC11168 and incubated at 4°C under micro-aerobic conditions for 35 days. *C. jejuni* NCTC11168 was also used to study the influence of different juices on its survival at -20°C. Survivability was determined by viable cell count of appropriate dilutions on Mueller Hinton Agar. All *Campylobacter* tested strains showed higher survival in beef liver juice (BLJ) and chicken liver juice (CLJ) compared to beef and chicken juices (BJ and CJ). Also all *Campylobacter* strains showed better survival in MHB supplemented with 5% different meat and liver juices than MHB alone. Most of the *C. jejuni* strains showed higher survivability compared to *C. coli* when grown in beef and chicken juices (BJ and CJ) but showed relatively similar survivability in beef liver and chicken liver juices (BLJ and CLJ). The meat source of the isolates did not seem to have an effect on its survivability in this particular meat source juice. All juices and supplemented MHB favored higher survival of the reference strain *C. jejuni* NCTC11168 at -20°C than MHB alone. In conclusion, higher survivability of *C. jejuni* and *C. coli* strains in beef and chicken liver juices compared to beef and chicken juices might explain the reported higher prevalence of *Campylobacter* species in retail liver samples.

**Keating, Claire**

**VISIBLE-LIGHT-PROMOTED FORMATION OF α-TERTIARY AMINES VIA A N-CENTERED RADICAL APPROACH**

The production of a N-containing quaternary center (an α-tertiary amine), a structural feature found in many bioactive compounds, presents a significant synthetic challenge. Our research group has recently developed a novel method for direct N-incorporation via a light-promoted, N-centered radical approach. Under the optimized reaction conditions, a N,N-diiodosulfonamide reactive species (formed in situ by the reaction of an iminoiodinane and I2) reacts with a tertiary alkyl halide. Our progress towards improving the efficiency, expanding the substrate scope, and probing the mechanism of the reaction will be presented.

**Kelley, Armond**

**EMBEDDED SYSTEM DEVELOPMENT FOR THE HYDROSENSE WIRELESS FLOW METER**

Water is an important resource, required by everyone. However there are areas where it is or is becoming scarce. The purpose of this research project is to develop a device that encourages water conservation. We have focused on hotels as a potential market for the device, with the option of expanding to other markets. Our device, called the HydroSense Wireless Flow Meter, is being made to allow people keep track of the amount of water they use while in the shower. This project has required the expertise available in several fields: business, mechanical engineering, chemical engineering, and electrical engineering. As an electrical engineer, I worked on programming the system that calculates the volume of water used and sends the information to a database.

**Kerr, Alison**

**STRESS AND THE MINDFUL POLICE OFFICER**

Certain jobs may be more stressful than others. Different people may also be better equipped to handle the stress of their work than others. Regardless of a person’s job, it makes sense that exposure to stressful aspects of work might lead a person to experience various negative outcomes such as adverse mental and physical symptoms. Also, dealing with excessive stress may also lead to workers feeling less satisfaction with their job. This study seeks to first identify the relationship between work experiences that cause stress (i.e., workload, organizational constraints, experienced incivility) and various negative strain outcomes (i.e., mental symptoms of strain, physical symptoms of strain, job dissatisfaction). The study further investigates how mindfulness may act as a personal resource by moderating (or lessening) the strength of
the stressor strain relationship. This research was conducted with a sample of 251 police officers and results are presented with consideration for how they might be relevant towards various other jobs and occupations which may include comparable stressful experiences.

Kerr, Alison
THE HISTORY OF PERFORMANCE FEEDBACK

At some point in our lives we all receive feedback about our performance. Whether it is experienced as a student receiving grades on assignments or as an employee facing an annual performance review, feedback is a practice with which most humans are familiar. Despite the commonplace occurrence of feedback, very few people truly have an understanding of what the purpose of feedback is or why we as humans might require it. Furthermore, those that provide feedback often have little understanding of what makes it useful or how it can be delivered most effectively. In effort to provide a foundational understanding of performance feedback and to highlight what research on feedback is still needed, this presentation offers a literature review of the history of performance feedback theory, research, and practice.

The historical journey of performance feedback began over 200 years ago in Scotland, when a man named Robert Owen sought to improve worker life by taking an innovative approach to treating his workers. Owen’s efforts provided some of the earliest published theory and research on performance feedback, but it was only the start. This presentation outlines the history of performance feedback through the primary lens of psychological theory and research. It takes the listener from 1795 to present day, highlighting interesting anecdotes and information that past research has provided, but also emphasizing how much research is still needed on this engaging and relevant topic.

Khanal, Vivek
DETECTION OF VIRUSES INFECTING CUCURBITS IN OKLAHOMA

Cucurbit crops are economically important cash crops which are grown in the United States including Oklahoma. Cucurbits are susceptible to many viruses that cause mosaic, mottling, distorting, chlorosis and necrosis symptoms on the leaves. During 2016 growing season, we surveyed eight different Counties of Oklahoma for cucurbit fields. We collected symptomatic leaf samples from cucurbits plants commercial grower’s fields in various counties in Oklahoma. A small aliquot was taken from all samples and crushed in plastic bags to extract the virus-infected sap. The extracted sap from each sample was tested serologically by Dot-immuno binding assay (DIBA) against the antisera of 10 different viruses that commonly infect cucurbits. A total of 432 samples were collected in eight counties. The samples were positive to 5 different viruses. Among the viruses, the most dominant was Papaya ringspot virus (PRSV) with an average incidence of 41.55% Followed by Watermelon mosaic virus (WMV) (40.28%), Zucchini yellow mosaic virus (ZYMV) (12.33%), Cucumber green mottle mosaic virus (CGMMV) (3.42%) and Squash mosaic virus (SqMV 2.97%).

Kindbom, Kelsey
THE EFFECT OF HOME LEARNING ENVIRONMENT ON VOCABULARY SKILLS

Research shows that students with more highly developed literacy skills come from home environments that promote literacy, regardless of their demographics (Tichnor-Wagner, Garwood, Bratsch-Hines, & Bernon-Feagans, 2016; Shick and Melzi, 2016). This presented research will occur with seniors at Edison Preparatory School or a similar Tulsa public school in the fall of 2017. It is hypothesized that all students, regardless of demographics, that come from home learning environments (HLE) that promote literacy will have better vocabulary skills than students from HLEs that do not. The quality of a home learning environment will consider the number of books in a student’s home; the number of other print reading materials at home; a
student’s exposure to online reading material; a student’s experience in shared book reading with family; a student’s access to a school or public library; and a student’s parent/guardian education levels. Students will be surveyed about these presence of these factors in their home in their childhood and at present.

Kinzer, Bryan, Todd Otanicar, Matthew Orosz, & Kirk Smith
HEAT LOSS TESTING OF CPV SOLAR ABSORBER WITH SELECTIVE SPECTRUM NANOPARTICLES

The application of spectrally selective filters for photovoltaic (PV) concentrated solar power (CSP) systems offers both a method for storing energy as heat to meet grid demand during non-sunlight hours and a tunable sub-band gap optical filter to keep the photovoltaic cell at lower temperatures, increasing efficiency and decreasing degradation. A test setup was constructed to empirically determine heat loss rates of these filters at different temperatures. The experimental setup allows for measuring the heat loss rate of various solar absorber geometries at high temperatures while maintaining an inert environment for the contained heat transfer fluid (HTF). The temperature of the HTF will be increased incrementally using an internal resistive heater with energy consumption tracked. The test will range from 100-250 °C. This experiment will test three solar absorber geometries: a rectangular cross-section, a single tube circular cross-section, and a tube-in-tube circular cross-section. The rectangular glass absorber used is part of a pilot, nanoparticle-based CSP system installed at TU. The experiment will be done for a nanoparticle-infused and nanoparticle-free HTF to examine what effects nanoparticles have on heat loss. The single tube is simpler and cheaper, while a tube-in-tube design allows the annulus between the tubes to be evacuated, limiting convective heat loss. This heat loss test will create a more accurate model of the system by indicating how different operating temperatures influence system behavior. The results will create a more accurate model of the existing CSP system and will act as a baseline to compare new geometries.

Kolla, Srinivas Swaroop
MECHANISTIC MODELING AND EXPERIMENTAL INVESTIGATION OF GAS CARRY-UNDER IN GLCC© SEPARATORS

The Gas Liquid Cylindrical Cyclone (GLCC©) Separator is an attractive alternative to conventional vessel type gravity based separators. Over the past 20 years, more than 6500 GLCC©’s have been in use by petroleum and other related industries. Optimized performance of GLCC© separators is limited by 2 undesirable phenomena namely Liquid Carry-Over (LCO) and Gas Carry-Under (GCU). Development of mechanistic models based on the complex physical phenomena will improve the predictions of phase separation and GCU in separators. This study focuses on a novel approach to measure gas entrainment in the GLCC© inlet section, as well as the gas evolution along the lower part of the GLCC©. The experimental investigations for GCU are conducted in a state of the art experimental facility for air-water flow incorporating pressure and level control configurations.

Kolla, Srinivas Swaroop
COMPUTATIONAL FLUID DYNAMICS STUDY ON THE EFFECT OF INLET MODIFICATIONS OF GLCC© COMPACT SEPARATORS

The Gas-Liquid Cylindrical Cyclone (GLCC©) is a simple, compact and low-cost separator, which provides an economically alternative to conventional gravity based separators over a wide range of applications. More than 6,500 GLCC©’s have been installed in the field to date around the world over the past 2 decades. The GLCC© inlet section design is a key parameter, which is crucial for its performance and proper operation. The flow behavior in the GLCC© body is highly dependent on the fluid velocities generated at the reduced area nozzle inlet. An earlier study (Kolla et al., 2016a) recommended design modifications to the inlet section, based on safety and structural robustness. It is important to ensure that
these proposed configuration modifications do not adversely affect the flow behavior at the inlet and the overall performance of the GLCC©. This study is carried out for a specific GLCC© field application, separating light oil, steam flooded wells in Minas, Indonesia. Computational Fluid Dynamics (CFD) is used to analyze the hydrodynamics of flow with the proposed modifications of the inlet section for GLCC© field applications.

Kolla, Srinivas Swaroop
FLUID-STRUCTURE INTERACTION STUDY OF GLCC© INLET MODIFICATIONS

The Gas-Liquid Cylindrical Cyclone (GLCC©) is a simple, compact and low-cost separator, which provides an economically attractive alternative to conventional gravity based separators over a wide range of applications. The GLCC© inlet section design is a key parameter, which is crucial for its performance and proper operation. An in-depth evaluation of specific design modifications and their effectiveness on safety and structural robustness are carried out in this study using Finite Element Analysis. Fluid-Structure Interaction (FSI) analysis is also carried out utilizing the results of Computational Fluid Dynamics (CFD) aimed at investigating the effect of fluid flow on the inlet section structural integrity. The selected design modifications are based on feasibility of GLCC© manufacturing and assembly for field applications. Different case studies incorporating sustained GLCC© internal pressure, dead weight loading, forces generated as a result of slug flow, high temperatures are evaluated and presented.

Kuehn, Scott
THE EFFECT OF THE PLACEMENT OF PHYSICAL ACTIVITY ON MATH ACHIEVEMENT

Carlson et al. (2008) demonstrated that the utilization of physical activity in schools has been shown to improve math testing competencies. Gabbard and McNaughten (1993) found physical activity improved math testing performance when the activity was longer than 30 minutes and occurred around mid-day. The proposed research will look at how the placement of a physical education class affects mathematics achievement, and will be conducted in the fall, 2017, with 400 high school sophomores at a Tulsa-area high school. It is hypothesized that students who participate in physical education (PE) class prior to their mathematics class will achieve higher grades than students whose PE class is after their math class. Additionally, students whose PE class is closer to the onset of their math class will achieve higher grades than their peers whose PE class is further in duration from the onset of their math class.

Lane, Chisum
PEDAGOGICAL TOOLS USED IN PLATO'S REPUBLIC

Plato’s Republic was used by Plato himself as a way of educating and testing his students, has served as a fundamental text within philosophic education for over two thousand years. The primary focus of this paper will be to categorize the wide variety of pedagogical tools that Plato uses within the text to educate the reader and to describe how these tools function. Within the paper, I organize these categories into three sections--engagement of readers’ preexisting knowledge, provocation via argument, and image building. Preexisting knowledge includes the use of setting, characters, and historical context, all of which would hold a certain meaning for readers in Plato’s time and for educated readers today. The second section, provocation via argument, includes readers’ response to the back and forth nature of arguments being made by multiple characters and the emotional responses of the readers to different aspects of the conversations. Image building will include the use of myths, thought experiments, and other types of image-based examples through the text. Each of these categories entails distinct experiences for the readers and is educative. Examining each category separately provides insight to Plato’s educational method and helps us to better understand this important philosophic text.
NOVEL DAMAGE DETECTION IN FIBER-REINFORCED COMPOSITE MATERIALS

The detection of damage in any mechanical component is of serious concern, especially when components are in safety-critical applications. Composites are particularly sensitive to damage and the mechanical properties of damaged parts can be seriously degraded. Impact damage is of particular concern, as delamination between layers of the composite can occur. Due to the morphology of delamination damage, it is difficult to detect visually or with the limited set of nondestructive evaluation techniques that are available for composite materials.

To address these limitations, a two-part contrast agent has been incorporated into a self-sensing composite. When damaged, superparamagnetic nanoparticles are formed in damaged regions of the self-sensing composite. Giant magnetoresistance sensors are then used to detect the nanoparticles inside the composite. This presentation discusses initial investigations into sensing hardware and contrast agent delivery methods. Using this technology, barely visible impact damage has been detected in carbon fiber and fiberglass composite panels.

INVESTIGATING THE RELATIONSHIP BETWEEN HOMEOSTATIC THREAT, ANXIETY SENSITIVITY, AND NEGATIVE VALENCE PROCESSING

Anxiety sensitivity (AS), or the fear of arousal-related body sensations, has been independently associated with negative valence during interoceptive and nociceptive stressors. We investigated associations between AS and negative valence processing during acute modulation of nociceptive and cardiorespiratory sensations in a healthy sample (N=25, mean age=26 years). Prior to testing, we administered the Anxiety Sensitivity Index-3. Interoceptive perturbation consisted of double-blinded intravenous administration of isoproterenol, a rapid beta-adrenergic agonist with a 2-minute duration of effect (1 or 2 mcg), or saline, and two inspiratory breath-hold trials (duration < 2-min). Nociceptive perturbation consisted of a cold-pressor trial (duration < 2-min). Valence ratings were collected after each trial. We predicted that AS would moderate responses to nociceptive and interoceptive threats. A linear mixed-effects model using subject as random factor evaluated the main effects of task (5 levels: saline, 1mcg, 2mcg, breath- hold, cold pressor), AS, and the task-by-AS interaction on valence. Results revealed significant main effects of AS, saline, and isoproterenol 1 mcg, reflecting elevated valence ratings across these conditions. Contrary to our hypothesis, AS interacted significantly with only isoproterenol 1 mcg, 2 mcg, and saline. During the cold-pressor task there was a strong positive relationship between AS and negative valence. However, the significant interactions indicate that the relationship was attenuated during saline and isoproterenol infusion (both 1 and 2mcg). These findings suggest that AS may moderate adrenergic threat but not suffocation or nociceptive threat. They also indicate that unpredictability (blinded isoproterenol administration) may influence the relationship between AS and negative valence processing.

CLASSIFICATION ACCURACY OF PERFORMANCE VALIDITY AND SYMPTOM VALIDITY TESTS AMONG EXAMINEES FEIGNING NEUROPSYCHOLOGICAL DYSFUNCTION

Performance validity tests (PVTs) and symptom validity tests (SVTs) are often used during neuropsychological testing. However, examinees may be coached to simulate symptoms and defeat such validity tests. Yet few studies have evaluated the effects of explicit coaching on the ability of validity tests to accurately classify examinees who simulate deficits. In this experiment, the impact of coaching was examined in neurologically normal participants. Participants attempted to feign symptoms of mild head injury. Standalone PVTs, embedded PVTs, and SVTs were administered. The standalone PVTs accurately
classified most examinees simulating head injury. Embedded PVTs and SVTs were less sensitive, especially among examinees who were test-coached. Nevertheless, some of the coached participants successfully evaded detection by the validity tests. Such finding raises concerns regarding the valid use of existing validity measures.

Lawrence, Christopher
CHALLENGING THE STANDARD: A MITOGENOMIC COMPARATIVE ANALYSIS FOR THE ORDER HEMIPTERA AND A SUBSTUDY ON THE GENOMIC ARCHITECTURE OF THE FAMILY CIMICIDAE

As the number of complete Hemipteran mitochondrial genomes grows, an assessment of the general characteristics, architecture, and evolution remains lacking. Despite this, these arthropod organellar genomes exhibit unique and interesting variation that may correspond with species-specific life-histories, thus warranting deeper investigation. In this study, we investigate mitogenomic variation of host-associated lineages of the bed bug, *Cimex Lectularius*, including representatives from both the human and bat-associated lineages found in Europe, and a human associated lineage from the United States. This is then framed within the context of variation found across the Hemipteran clades through comparison with twenty previously published complete mitochondrial genomes. Highly conserved domains were identified in all protein coding genes; however, two genes (namely, *rrnL*, *rnl1*) were found to be very divergent for many respects, notwithstanding the overall purifying selection working on those genomes. Moreover, the *rnl1* and *rrnL* genes were located in roughly the same position in Cimex Lectularius but varied in presence between and within host-associated populations of *C. Lectularius*. Surprisingly, Cimicids had the smallest genomes amongst other Hemipteran species and the highest rate of GC content and GC skew. During alignment, several sites for breakpoints were found coinciding with heteroplasmic indices. Going further, a preliminary analysis for G4 quadruplex formation found that several sites downstream and near the *rnl1/rrnL* locus may form the secondary planar structure. The loci surrounding the quadruplex forming location further exhibited evidence of a recent transposition in gene order. This transposition comprised four genes in total (*nad6*, *cob*, *trnS2*, and *nad1*) and was found in the reverse orientation in several host-associated strains, contrasting to the mitogenome closely related *Orius Niger*.

It is often far too easy to assume that natural selection works only on the organismic level. Indeed it was Darwin who proposed that small mutations were the driving force behind natural selection. Here we propose that macro mutations and structures such as transpositions, G4 quadruplex structures, mtDNA breakpoints, and deletions effectively drive host-associated lineage differentiation with Cimex Lectularius and contribute to the genomic variation prevalent within the Hemipteran clade. All things considered, the interest in Hemipterans, their vast variation, and species utilizing host-adaptation mechanisms can help to elucidate some of the questions we hold about the evolution of the mitochondria and its relation to population genetics and speciation.

Lee, Rachel
INVESTIGATING IMPROVEMENTS FOR INTROVERSION: A FACTOR ANALYSIS STUDY

Previous research has examined the feasibility of deriving subscales from the Personality Psychopathology Five (PSY-5) scales of the Minnesota Multiphasic Personality Inventory-2-Restructured Form (MMPI-2-RF). Arnau, Handel, and Archer (2005) used principal components analysis and derived three subscales from the Introversion/Low Positive Emotionality (INTR) scale from the MMPI-2: Disengagement/Anhedonia, Low Sociability, and Low Diligence/Hypomania. Combining both sociability and positive emotionality into one scale may not provide the most detailed information about examinees. This study sought to replicate the results of Arnau et al. (2005) and examine the MMPI-2-RF INTR-r scale with the goal of improving understanding of the client and feedback in assessment practice.
Participants for this study were recruited from a private Midwestern university. The sample included 1208 valid profiles in the MMPI-2 sample and 1209 valid profiles in the MMPI-2-RF sample. Both samples were approximately 73% Female and 27% male. Two and three factor models were extracted from the items of the INTR scale on the MMPI-2. The three factor solution was very similar to that reported by Arnau et al. (2005) despite using different extraction methods. A second factor analysis was conducted on the items of the INTR-r scale of the MMPI-2-RF. Two, three, four, and five factor models were extracted. Sociability and energy again emerged as factors. A third meaningful factor resembling well-being could also be extracted. However, no clear low positive emotionality factor emerged. Implications from this study include the possibility of creating INTR-r subscales that may improve interpretations of profiles and insight into client characteristics.

Lee, Seungho
DOMESTICATING GLOBAL LITERATURE AND GLOBALIZING DOMESTIC LITERATURE: WORLD CLASSICS IN KOREA
This paper argues that today’s renewed boom of world literature, despite some hopeful visions of it as opening up a “new universal field” from leading figures such as Franco Moretti and David Damrosch, still runs the risk of colonizing, homogenizing and metropolitanizing such marginal markets as Korea. Although debates on world literature have become more intense than ever, academic attention has never truly covered the world market, including Korea, which, in fact, is one of the leading markets in terms of world literature consumption. In this paper, I will discuss how marginal markets are consumed by the metropolis by, ironically, consuming metropolis-based literary commodities and examine two visible movements in the Korean literature market: (unsuccessfully) domesticating global literature and globalizing domestic literature.

In Korea, the notion of world literature has gained wide interest and sales of world literature has set its record. Such popularity is largely led by domestic major publishers such as Minumsa and Openbooks as well as global publishers like Penguin Classics. They competitively import so-called world classics, mostly consisting of ‘Western’ novels. Interestingly, the lists of world classics by these publishers are nearly identical with world classics editions in the U.S., which is suggestive of marginal markets’ lack of their own criteria. It would not be too hasty to conclude that the phenomenon of world literature in Korea is led not by the domestic-margin market and academy, but by the world-metropolis.

Li, Ruiming
MEDIA AND MASS MOVEMENT: 1960S AMERICAN HIPPIES AND CHINESE RED GUARDS

The purpose of this project is to make a comparison between two specific youth groups from the 1960s American Hippies and Chinese Red Guards. Both of these two groups are now famous, and brought far-reaching influences to ideology, culture and lifestyle of their birthplaces. From the historical point of view, the Hippies and the Red Guard are representative reflections of mass movements during the decades of the 1960s to 1970s. Given on the international situation of the Cold War, Hippies and the Red Guard belonged to two opposite countries, with different ideologies. However, they were not absolutely different from each other. In some ways, they showed many similarities in class character and some of the trend of their political thought. So on the one hand, this research is going to analyze the differences and similarities of the groups based on historical data; it will also analyze the political, cultural and personal significance of the Hippie and the Red Guard movements.

On the other hand, the project will focus on the role that media played during the Hippie and the Red Guard’s movements of the 1960s-1970s. The research is constituted through several methods: first, analyzing the relationship between the government and media during 1960s-1970s; second, discovery the factors of influence that media brought to peoples in mass movements; third, researching the causal relationship between the media and trends in popular ideology. Based on the research, the project will not
only provide a comparison of two youth groups, and their ideologies, cultures and life forms, but also support the following hypothesis: mass media played the role of shaper and guide to both countries’ mass movements.

Liu, Yingdi, Yaping Li & Sanwu Wang
MOLECULAR MODELING OF COAL SWELLING

Sequestration of CO₂ into geological formations has been suggested to mitigate the effect of the increasing of the atmospheric CO₂ concentration on global warming. Coalbeds are investigated as one of the attractive storage sites since the cost of CO₂ sequestration can be offset by the enhanced coalbed methane (ECBM) recovery. While numerous experimental studies have demonstrated that the storage of CO₂ molecules in coalbed involves both chemisorption and physisorption, the underlying mechanism for CO₂ chemisorption at the atomic-scale is not well understood. We report first-principles quantum mechanical calculations, based on density-functional theory, for the interaction between CO₂ molecule and defective coal. The calculations show that chemisorption of CO₂ in defective coal is possible. In particular, CO₂ can form chemical bonding at defects involving carbon and hydrogen vacancies and epoxy functional groups.

Loe, Elisabeth, Haley Williams, Nate Sanders, Ryan Stapf, Ahmed Alnasir, Alex Lybarger, Andrew Fix, Claire Dang, Hussain Sultan, Michael Feng, Mohammad Albenayyan, Mohammed Altammar, Gordon Abrams, Ross Durland, William Ha, Shuyu Tian
YOUTH SERVICES SOLAR CELL PHONE CHARGER PROJECT

The TU chapter of Engineers Without Borders-USA often addresses local needs in the community using engineering-based solutions. Upon contacting local homeless shelters, we found that homeless people have a variety of phones, but are only allowed to charge them at the shelter for a limited period of time. In response, our project team has designed a solar-powered charging station for cell phones on the outdoor patio of Youth Services of Tulsa, a nonprofit organization dedicated to Tulsa area adolescents and their families in difficult situations. YST also provides supportive community programs that focus on counseling, runaway and homeless youth, delinquency prevention, and youth development.

We are currently designing a charging station that will consist of 3-4 electrical ports/outlets and be powered by a solar panel mounted on an adjacent building. The finished product will be weatherproof and easy to maintain, while the use of solar energy for electricity will be a low-cost, self-sufficient, and freestanding solution to Youth Services’ shortage of electrical outlets. Our project team, consisting of students from a variety of majors, meets at least once a week to work on the project. We also have been consulting our engineering mentor and faculty advisor for further guidance, in addition to partnering with the Community Engineering Corps for this project. Although we have encountered numerous challenges, whether in recruiting an engineering mentor or designing our electrical circuit, we have ultimately gained valuable experience in applying engineering concepts to real-world situations and learning how to work as a team.

London, Alex
CONNECTING COMMUNITIES: HOW MUSEUMS CAN BRIDGE NEIGHBORHOOD RELATIONS

Museums can serve as invaluable catalysts to connect local neighborhoods that may otherwise never have been in contact with each other. Through exhibits, childhood education programs, and other events museums can initiate conversations with communities in a mutually beneficial fashion. Understating an institutions perspective, as well as the thoughts and feelings of surrounding neighborhoods is a fantastic way to revitalize a community’s overall arts and education programs. This project and subsequent presentation will explore how the upcoming Philbrook exhibit “Papel Chicano Dos” has become a stimulant
for community interaction. The exhibit, which features a selection of Chicano artwork, has allowed the Philbrook to form a relationship with neighborhoods and schools who have a strong desire for art and art education programs, yet do not have the resources or ability to provide the programs themselves. Community cooperation is necessary now more than ever, and museums can be the key piece.

Lopez, Evelin
TRICERATOPS SURGICAL DEVICE

The Triceratops surgical device was designed and built to result in better patient outcomes for gastrocnemius recession. Gastrocnemius recession is a 10 to 15-minute medical procedure in which fibers of the Achilles tendon are lengthened to treat gastrocnemius tightness. Current speculums are used to maintain the incision open, but are not anatomically tailored specifically for this application and do not to conform to this particular anatomy. The kinematics of this mechanism are specified so as to facilitate the procedure for the foot and ankle surgeon and produce improved patient outcomes. This project was conducted in close coordination with a local podiatric physician who has performed many of these surgeries. Areas addressed during the research included designing a disposable version of the device, safety, and reliability. This knowledge and best practices discovered could potentially be utilized in operating rooms everywhere and most importantly benefit patients who undergo this procedure.

Luu, Sylvia
TEAM PREDICTORS OF PERFORMANCE IN INTERDEPENDENT GAMES

The purpose of this study is to further our understanding of how gamification may affect team interactions. Specifically, this study examines team motivation, team communication skills, and team knowledge sharing as predictors of team performance in a contextualized game environment, replicating aspects of “real world” task environments. Furthermore, we examine whether or not the amount of knowledge sharing in a team affects the relationship between team performance and the other two predictors. Findings indicate that contextualized team motivation (i.e. game motivation) and team knowledge sharing positively predict team performance; however, communication skills do not. Moreover, a significant interaction between contextualized team motivation and team knowledge sharing was found – contextualized team motivation is a strong predictor of team performance for teams with low knowledge sharing; however, team motivation is less relevant to performance for teams with high knowledge sharing. An alternative interpretation of this result is that teams with low intrinsic motivation only perform well when they engage in high levels of knowledge sharing; whereas teams with high intrinsic motivation perform well regardless the knowledge sharing that occurs. These findings have implications for research and practice in terms of the design of team tasks.

Luu, Sylvia
TARGET PERCEPTIONS OF ABUSIVE SUPERVISION

Literature on abusive supervision is becoming more popular within occupational health and stress research. Thus far, research has primarily focused on supervisor traits and behaviors as predictors of abusive supervision. The current study expands this area of research by examining target and contextual characteristics as predictors of target perceptions of abusive supervision. In accordance with Bowling and Beehr’s (2006) attribution-based model of workplace harassment, we argue that daily work stressors, specifically job demands and role ambiguity, increase targets’ daily perceptions of abusive supervision. Expanding on the attribution model, we also propose that target self-efficacy and self-esteem will buffer the negative effects of work stressors, such that the negative relationship between daily work stressors and daily perceptions of abusive supervision will be weaker for individuals higher in self-efficacy and self-
esteem. We test these hypotheses using experience sampling methods and longitudinal multi-level modeling. Our findings support the positive relationship between daily job demands and daily perceptions of abusive supervision and the buffering effects of self-efficacy. These findings highlight the dynamic nature of targets’ perceptions of abusive supervision.

**Luu, Sylvia**

**INDIVIDUAL DIFFERENCES IN PERSONALITY AND GOAL-SETTING PREFERENCES**

Goal-setting theory is one of the most popular and successful theories in the work motivation literature (Locke & Latham, 2002). It specifies that work goals are most effective when they are 1) challenging, 2) specific, and 3) accepted. The way goals are set can further affect their impact – goals set with a supervisor tend to be more effective than self-set or supervisor-set goals, especially when the supervisor provides feedback on goal pursuit progress. These recommendations are intended to apply to everyone, focusing attention on overall mean effects of goal-setting on work behavior. Limited research has addressed the role of individual differences in goal-setting effects, mostly dealing with need for achievement, self-efficacy, and, more recently, goal orientation. The current study was undertaken to expand this list to include a broader array of traits, drawn from the five-factor model of personality, as predictors of goal-setting preference both overall and for the different aspects of goal-setting (e.g., highly specified goals). Results identify unique traits serving the various goal-setting preferences, offering a more comprehensive foundation for developing individualized goal-setting programs and advancing motivational theory from an individual-differences perspective.

**Lux, Adam**

**GENERAL NO-SCALE SUPERGRAVITY: THE F-SU(5) MODEL**

My research group studies the grand unification model flipped SU(5) with additional vector-like particle multiplets, or F-SU(5) for short, in the framework of General No-Scale Supergravity. In our analysis we relax the soft supersymmetry (SUSY) breaking terms, allowing the high-energy boundary conditions at the unification scale to be non-zero, thereby extending the phenomenologically viable parameter space beyond the highly constrained one-parameter version of F-SU(5). My contributions involved solving 39 non-linear coupled partial differential equations simultaneously using proprietary code on the Tandy supercomputer. I calculated around 88 million points, each of which is a set of high energy boundary conditions, and then filtered this data based on known experimental constraints. This data was then used to derive the cascade decay modes of SUSY particles. In this initial inquiry, the CMSSM SUSY breaking terms are implemented.

**Macke, William, Chad Crawford, Jonathon Bolin, Jon Hoffman, Sam Beckman, & Sandip Sen**

**MULTI-UAV COORDINATION**

Unmanned Aerial Vehicles (UAV) and Unmanned Ground Vehicles(UGV) are popular tools for autonomous, coordinated tasks due to their cost-efficiency and their programmability. Coordinated tracking and/or search of targets is a well-known problem in the multiagent and control theory communities, however agent-specialization and coordination for increased performance is a relatively untouched field. We are interested in developing robust frameworks and protocols that allow UAVs and UGVs to efficiently track/search for targets. In particular, we are interested in two application domains, where UAVs track a single moving target and coordinate to surround it, and where UGVs and UAVs coordinate to search for a large number of unmoving objects, such as garbage. We evaluate the performance of these protocols on multiple simulated and real-world trials and experiments.
Makkapati, Teja, Ahlam Alarbi, Colleen Wohlrab, William Potter, & Justin Feinstein

FLOATATION TANKS FOR STRESS REDUCTION

Many psychiatric conditions, such as anxiety and/or depression, often appear to be correlated to an individual’s ability to handle stress. Our research in collaboration with the Laureate Institute for Brain Research (LIBR) involves the use of floatation tanks. These tanks are used to help individuals improve their ability to handle stress and to promote relaxation. In the floatation tank, an individual floats in a relaxing, temperature-controlled, stress-free environment without any external stimuli. For our research, we are trying to evaluate changes in biomarkers which may monitor the effects of floatation on these individuals. Pre-floatation and post-floatation functional MRIs and the biomarkers cortisol and melatonin are being evaluated. Cortisol is a stress hormone which shows a cyclic pattern throughout the day that typically rises in the morning. Melatonin, a sleep promoting hormone, also occurs in a cyclic pattern that is typically out of phase with cortisol with a nocturnal peak. Previous studies have indicated that stress may play a role in disrupting these cycles, and it is hoped that relaxation will be able to help stabilize these cyclic patterns. This represents the first functional neuroimaging study with biomarkers exploring the stress-reducing effects of floatation.

Mancini, Michael

AN INTERSTATE COMPARISON OF INDIAN REMOVAL ERA SOCIAL STUDIES CURRICULA

The Indian Removal Era was an especially ugly chapter in American history with far-reaching consequences, and like many events in American history, its effects were not evenly distributed. In Oklahoma, the Indian Removal Era proved pivotal in the area’s pre-statehood history as the Choctaw, Chickasaw, Cherokee, Creek, and Seminole peoples were forced to move to the Indian Territory. Hypothesizing that states would place greater emphasis on events of particular importance in their own histories, this research studied eighth grade United States history classes utilizing a three-pronged approach that analyzed state-approved textbooks, state standards, and teacher surveys to look for significant interstate differentiation in any of these classroom factors. While substantial differences did not emerge in all three areas, Oklahoma demonstrated above-average curriculum for the Indian Removal Era, revealing a bright spot for Oklahoma’s oft-maligned education system and supporting the overall hypothesis of intrastate prioritization.

Mardis, Collin

SUSTAINABILITY AND THE TIME VALUE OF MONEY

This project concerns itself with the possibility of a reconciliation between the time value of money and sustainability. Of specific interest is the link between the investment horizon of stockholders and the resultant views and goals of management. This is very relevant to a global context, because it will ultimately be the time value of money that firms across the world us to approve or reject projects, so a link between this time value and sustainability, could be the catalyst for a shift in corporate practice toward more sustainable projects.

Marshall, Allen

MITIGATING SERVICE ADVERTISEMENT ATTACKS ON THE PHYSICAL WEB

Due to recent advances in Bluetooth technology, it has become practical to create location-specific Web applications and services that advertise themselves within their geographic areas of relevance. One of the major technologies used to achieve this goal is the Physical Web, which uses Bluetooth beacons to advertise URLs over limited regions. The Physical Web can provide users with a generic mobile interface to use or purchase services from Internet-enabled devices. For example, a “connected” car could interface directly with a gasoline pump or parking meter. However, the Physical Web currently provides little protection.
against the unauthorized advertising of services in locations where they are not meant to be used. Thus, an attacker could potentially mislead Physical Web users into purchasing services that are then provided to the attacker instead of the legitimate user, or engaging with services that provide information which is not useful at the user’s location. In this presentation, I discuss my research results toward thwarting this type of attack. The key outcome of my work is the augmentation of Physical Web advertisements with digitally signed endorsements proving that a service was intentionally published at a specific location by an identified party. A modified Physical Web client with GPS functionality uses these endorsements to identify the trusted publishers of Physical Web beacons at the client’s current location. By identifying beacon publishers, the modified client provides a useful step toward protecting users from malicious activity on the Physical Web.

Martinez Galicia, Marco
ANALYZING DIVERSITY OF CASAS GRANDES CERAMIC POLYCHROMES USING DIVERSITY INDICES

Casas Grandes is an archaeological tradition located in the state of Chihuahua, northwest Mexico. Around 1300AD this cultural tradition started to produce specialized material culture, at a faster rate than previously observed in the archaeological record and in larger amounts, developing rich ceramic assemblages whose main exponent is the ceramic type Ramos polychrome. This type can be found in every Casas Grandes archaeological site during the XIV century; however, other polychrome types have also be found in similar chronological contexts. To explore how diverse was this polychrome assemblage, and observe the differences between the distribution of Ramos polychrome against other polychromes, this paper proposes the use of diversity indices. Diversity indices allow us to compare quantitatively different distributions of specific sets of data, such as species or types of ceramics, at different levels of observation: from small localities, such as households, to regions. These indices borrow their methodology from Ecology, the study of living communities and their relationships to one another; assuming that complex communities tend to have greater diversity. Generally, depending on the number of polychrome types and the form of their distributions, diversity indices can indicate multiples variables behind the observed archaeological record, ranging from kinds of resource access and number of ceramic producers, to specialization and indication of mass production. Whichever results can be obtained through this method, they might contribute to the different views that exist in the archaeological community regarding the processes behind the rise of Casas Grandes around 1300AD.

Martuch, Allison
RELIGIOUS CONFLICT: EXAMINING THE EFFECTS OF POLARIZATION AND FRACTIONALIZATION

Religious identity plays a crucial role in the way groups and individuals behave and perceive morality. This paper provides a theoretical and comparative analysis of ongoing religious conflict in Nigeria and Tanzania by examining religious polarization and fractionalization in relation to democratic governance and public perception. Nigeria and Tanzania are effective case studies in examining religious conflict of their locations and differences in Muslim and Christian populations. Cingranelli -Richards (CIRI) Human Rights Data Project (2014), Pew Research Center’s Forum on Religion & Public Life (2010), and a dataset created by Montalvo and Reynal-Querol (2005) will be used for this assessment based on their relevancy to religious conflict, polarization, fractionalization, democracy, and public perception, which combines quantitative and qualitative data. The author of this paper hypothesizes that religious polarization negatively affects levels of religious conflict, contrasting with religious fractionalization. The findings of this paper support the hypothesis, indicating Nigeria’s higher level of religious conflict is correlated with its large degree of religious polarization and decreased religious fractionalization. This correlation is also observed in Tanzania, which experiences lower levels of religious conflict, with a lower degree of religious polarization and increased degree of religious fractionalization. This paper concludes religious polarization, negatively
impacts levels of democracy, resulting in higher rates of religious conflict, while religious fractionalization positively impacts democracy levels, resulting in decreased levels of religious conflict. Additional research is necessary to substantiate this conclusion further.

Mathur, Nitesh
THE SPECIAL CASES OF THE BINOMIAL THEOREM AND SQUARE NUMBER PATTERNS

The binomial theorem states that \((a+b)^n = \sum_{k=0}^{n} \binom{n}{k} a^{n-k} b^k\) and utilizes Pascal’s triangle to expand a binomial. In this research, the sums and differences like \(a^n - b^n, a^n + b^n, a^n - b^m, a^n + b^m\), and other variations were generalized. This research derives these special cases into eleven unique formulas by using Newton’s generalized Binomial Theorem. Initially, these cases were only proven to be true with respect to integers but have been expanded to numerous variations involving real and complex numbers. Furthermore, the applications of these special cases have been explored, which includes investigating various power series, providing an alternative definition to the Riemann Zeta Function, and exploring the relationship between primes and powers. Future applications include combining these special cases with the Gamma Function and Mobius Inversions, the sum of two squares problem, approximation theory, and the statistical distribution of squares. In addition, these formulas could be applied in computer science because of the close relationship between the Riemann Zeta Function, prime numbers, and cybersecurity. This presentation also includes unique patterns embedded in square numbers, which are the core foundations of understanding these formulas. One of these patterns, the sums and differences of squares, was extended to different powers using Pascal’s Triangle, which eventually turned into the Special Cases of the Binomial Theorem.

McFee, Grace
Volleyball Aerodynamics

The goal of my summer research project, titled Volleyball Aerodynamics, with Professor Thomas Cairns was to become familiar with the fairly difficult mathematics of the forces acting on objects moving through air, in particular volleyballs, and the resulting motion caused by these forces. This especially includes intuitive ideas and technical terms in the aerodynamics associated with volleyball paths such as Reynolds numbers, drag and lift coefficients, viscosity and density of air. While the original and broad research question was to find out how atmospheric conditions affect the flight path of a volleyball, I am not advanced enough to make a thoughtful contribution. With this in mind, my research focused more on the individual components and calculation of the Reynolds number. In order to continue on with this project in the future, I used this summer to build a basic understanding of the construction and execution of Matlab functions with the help of daily communication with Professor Cairns. He guided me in particular with those ideas and tools relevant to the equation of motion that is solved in Matlab to produce numerical values for the paths that volleyballs take, plus graphs thereof. The eventual goal of the continued project would be to be able to implement the wind tunnel data generously sent to us by Professor Asai from Japan, which I would only be able to participate in after gaining familiarity with the mathematical concepts and computer programs needed to analyze the results.

McLoud, Josh and Levetin, Estelle
Airborne Fungal Diversity in Tulsa, Oklahoma: A Two-Year Study Using Viable Sampling

The atmosphere contains a tremendous diversity of airborne fungal allergens; however, many unknown spores are commonly seen on nonviable spore trap air samples. To improve our understanding of the airborne spora viable air samples were collected from February 2015-2017 to identify both mycelial and yeast fungi.
A single stage viable impaction sampler was used to collect weekly air samples on the University of Tulsa campus from Feb 2015 to Feb 2017. Air samples were incubated initially for three-days and mycelial colonies were identified by microscopy, while yeast colonies were identified using phenotype and molecular methods. DNA was extracted from each street level yeast isolate and was used in a polymerase chain reaction to amplify nDNA. The yeast isolates were identified by their DNA sequence similarity to previously identified species in the NCBI database. Mycelial isolates consisted of 20 genera and non-sporulating fungi and the yeast isolates consisted of 28 taxa comprised of 13 genera. The mycelial mean concentration was 1,672 (SE±157, n=104) CFU/m³ with the most abundant genera being Cladosporium, Alternaria, and Penicillium with a frequency of 100%, 74%, and 52% respectively. We identified 7 mycelial genera and 28 yeast taxa, which are not routinely identified in nonviable samples. The most abundant and frequent yeast genera were Komagataella, Aureobasidium, and Filobasidium, which comprised 23%, 19%, and 11% of the 150 isolates respectively. Viable air sampling may be an effective supplement to spore trap sampling to determine the diversity of airborne fungi, but medium type and sampling duration are limitations.

Michalek, Brady
AN EXPLORATION INTO THE LIVES OF WORKING MOTHERS

The goal of this research project was to see how mothers manage their child-raising responsibilities while employed, and how this affects them personally. I conducted 5 in-depth interviews, 4 of which I chose to include in my study. My participants ranged in age from late-twenties to middle-aged. The interviews lasted from 40 minutes to 1 and half hours. The names of the participants, as well as the names of places and other people the interviewees mentioned, are replaced with pseudonyms. Three major themes were present throughout my participant’s interviews. The first theme was the difficulty of combining mothering and employment responsibilities, with each participant explaining how the demand of their work created tension between time with their children, and vise verse. The second theme had to do with what it means to be a good mother. This was expressed by how the participants managed their responsibilities and how they provided for their children. The final theme was the feeling of “guilt,” which was directly identified by my participants. This feeling manifested itself when they talked about how they did not completely fulfill their role as a mother. They also recognized that societal standards play a role in their feeling of guilt.

Miller, Melissa
DEFINING BESTWOOD: A DISSERTATION PROPOSAL

Bestwood is a large lithic site located just outside the town of Kathu, Northern Cape Province, South Africa. Bestwood has been identified as the Fauresmith industry, a transitional Early to Middle Stone Age industry during which advanced cultural innovations such as hafted tools developed. Bestwood has the potential to expand our understanding of this often debated but little understood lithic industry. As a large lithic accumulation, Bestwood also has the potential to inform about hominin landscape use and the early environmental impact of hominin activities; however, this information depends upon an accurate understanding of the site’s formation and use. This presentation explains a proposed project to investigate the site of Bestwood using post-depositional experimentation and analysis and use wear experimentation and analysis with a focus on answering two questions: did Bestwood form quickly or slowly, and what did hominins do there? The project is presented in a narrative that describes the process of coming up with a dissertation idea and refining it into a successful proposal.
Miller, Katherine
NAMED AND UNNAMED: FORCES OF IMPERIAL POWER OVER THE INDIVIDUAL IN OUR SISTER KILLJOY

In my paper, “Named and Unnamed: Forces of Imperial Power over the Individual in Our Sister Killjoy”, I argue that exposure to new people and experiences should not erase the core identity of the individual, at least not entirely, but in Our Sister Killjoy (1977) by Ama Ata Aidoo, a character’s identity is at war between the nation they come from and the imperial nation that has claimed them. During the age of imperialism, Western powers such as England and France sought to expand their influence beyond the boundaries of Europe to obtain resources. As resources strengthen empires, the search for resources becomes a quest for dominance. It is no longer about developing the country internally, but stretching its control beyond its primary borders to obtain global dominance. A key aspect of control resided in the labels and names attributed to the tribes who were overtaken. The students in Our Sister Killjoy that are sent to Europe to obtain a formal education become a tool of both governments who want to give the impression that relationships between Africa and Europe have healed, but they do not consider the individual feelings of those impacted by the relationship. However, colonization has never ended because the students that are sent abroad from Africa carry the effects of colonization with them and it begins with their name. The protagonist of the story is named Sissie by her village which means “Our Sister” while she also was given the name “Mary” when she was baptized. Her identity then lies either with the African community that has claimed her as their own or with Europe where Christian names carry their own source of power and control. As Sissie travels through Germany and then England, she bears witness to the destruction and manipulation of identity, particularly naming, that colonization has wrought not only on the citizens of Africa, but also those who are already European.

Miraglia, Giovanni, and Hook, Loyd
KALMAN FILTER-BASED SENSOR FUSION: COMPARISON BETWEEN TWO TECHNIQUES IN THE UAV TRACKING PROBLEM SCENARIO

Recently, technologies related to autonomous vehicles have been receiving extensive attention. To allow a vehicle to move autonomously, it must be able to perceive both the environment and its own state. To do that, the vehicle must have sensors that can measure parameters such as acceleration, air pressure, etc. The characterization of the environment and vehicle state is performed by combining data from the different sensors in a process called sensor fusion.

The aim of this project is to compare two sensor fusion techniques to establish which is more appropriate for UAV (Unmanned Ariel Vehicle) tracking systems. In our scenario, a self-localization is performed by using UWB (Ultra Wide Band) technology to measure distances from known locations and IMU sensors to measure accelerations and angular rates. Both sensor fusion techniques rely on the, commonly used, EKF (Extended Kalman Filter).

The first technique performs the data fusion in the prediction step of the EKF, while in the second one the fusion is performed in the update step. The difference between the two methodologies is that the first one uses IMU data to have a lead about the state evolution and the UWB data to correct the prediction, while in the second approach the prediction is totally based on a mathematical model and the correction is performed by using both the two datasets.

Strengths and weaknesses pointed out by this work will be considered in future work to integrate other kind of sensors with the aim of improving the system accuracy.
Prior research shows that student engagement in math and science is a contributing factor to student success in academics (Maltese and Tai, 2010; and Wang and Degol, 2014). Additionally, research shows as students get older and move from elementary, middle, to high school, engagement steadily declines, being the lowest in secondary education (Marks, 2000; National Research Council and Institute of Medicine, 2004). The proposed research will be conducted in the fall of 2017, with 1099 middle and high school students. It is expected that more than half of the students and all of the teacher will participate. It is hypothesized that students who are more engaged will make better grades in math and science. Additionally, it is hypothesized that students who make better grades will rate their overall engagement higher before taking an engagement survey than after taking it. Students will complete a questionnaire to get demographics while rating their engagement. The math and science engagement survey was created by Wang, M. T., Fredricks, J. A., Ye, F., Hofkens, T. L., & Linn, J. S. (2016).

Mol, Matthew
RESOURCE RECOVERY AS A RESULT OF RECOVERY EXPERIENCES

Psychological resources are central to many stress theories. Although many theories incorporate resources, the empirical examination of these resources within the context of work-stress recovery has been largely neglected. Current theory proposes that recovery experiences (leisure control, mastery, relaxation, detachment from work, and sleep quality) result in replenished or increase psychological resources following a stressful work period. Using a sample of 201 participants who provided data at three time points over a week’s time, the present study seeks to empirically test how weekend recovery experiences replenish a variety of resources that provide employees with the capacity to do work (e.g., self-efficacy, self-regulation, and vigor). Resources were measured on Wednesday to establish a mid-week baseline, recovery experiences were measured on Sunday, and then resources were measured again on Monday. Hypotheses proposed that weekend recovery experiences would differentially predict resource recovery. The hypotheses were tested using hierarchical regression. The results are provided and impact on both future studies and practical applications are discussed.

Moore, Caroline
CONTEMPORARY CATALAN ARTISTS AND THE SEVEN GLOBAL CHALLENGES

My presentation will analyze the Seven Global Challenges taken from the Global Scholars curriculum. The Seven Global Challenges include Population, Resources, Technology, Information, Economics, Conflict, and Governance. I will tie in my research of contemporary Catalan artists from my senior project and connect each Global Challenge to an artist’s work or concentration. My presentation will signify the importance of globalization and how Catalan artists are incorporating global themes in their work for an expanded global audience.

Moore, Amy
THE EFFECT OF INSTRUCTIONAL STRATEGIES ON SCIENTIFIC ACHIEVEMENT

The scientific method has been described as too rigid when used in high school curriculum and criticized for not giving students a true understanding of how scientists conduct themselves. Scientific inquiry has been implemented over the past few decades in many high school
classrooms to help students better understand science and how it is performed, sometimes forgoing study of the scientific method completely. This study proposes to evaluate the effectiveness of the scientific method on scientific achievement. Three biology classes will all conduct scientific inquiry. One will have the scientific method presented before inquiry, the second class will the scientific method after inquiry, and the final class will not present the scientific method at all. A pre and post-test will be given before and after the study unit to assess the effect of learning the scientific method in relation to inquiry. This work intends to be conducted in September 2017 in a ninth grade biology class.

Morgan, Heather and Fennell, Christopher
INCORPORATING THE EFFECT OF ELECTRONIC POLARIZATION IN CLASSICAL MOLECULAR SIMULATIONS OF PROTEINS

Common force fields used to computationally model proteins include Amber ff99sb, OPLS, and CHARMM27. These force fields were created based on gas-phase calculations, which do not accurately represent the liquid environment of most proteins. This study was conducted to investigate how accurately these force fields can predict protein secondary structure. Molecules of interest include N-methylacetamide (NMA) as a representation of the protein backbone, short peptides (Alanine 5, Glycine 5, and Valine 5), and proteins (Staphylococcal Nuclease variants). Separate simulations were run using GROMACS for 500 ns at 298 K for each molecule and force field. Additionally, two new force fields were created and tested after adjusting Amber ff99sb, repolarizing the force field. The Tuned Amber force field increases charges on the backbone nitrogen and carbonyl oxygen, increasing intramolecular hydrogen bonding. The Linear Dielectric Corrected (LDC) Amber force field increases charges on every backbone and side chain atom by 5%. The dielectric constant of a protein shows its polarizability, subsequently affecting hydrogen bonding and protein secondary structure. The dielectric constants were calculated for each NMA simulation and then compared to known experimental values. The common force fields greatly underestimated the dielectric constant, while the Tuned Amber and LDC Amber more closely predicted experimental results. Changing the force field greatly affected secondary structure for Alanine 5. The Tuned Amber and LDC Amber force fields stabilized Staph Nuclease, as expected, unlike than the Amber force field.

Morrison, Tyler
ALGORITHMS FOR SHUFFLING FOOT PLACEMENTS TO MAINTAIN STABILITY OF A QUADRUPED ROBOT ENGAGED IN A COOPERATIVE TASK

Last year’s presentation identified the need for a robotic system to aid in search and rescue tasks in building collapse environments and presented a system of legged quadruped robots that can cooperatively engage in grasping and manipulation as a solution. Research into methods of control of such a system has progressed. This presentation addresses a potential obstacle to the implementation of a leader-follower architecture for coordinated control of the robots by seeking to solve the problem of stabilizing an individual robot without requiring coordination between all robots engaged in the task. The problem is defined, and a few potential solutions for stable algorithms that maintain robot stability by carefully shuffling foot placements are explored and compared. Finally, the most promising algorithm is presented as well as ideas for future improvement.
Mraz, Veronica, Buchanan Briggs and Eren, Metin
PRESSURE OR PERCUSSION, WHICH ONE IS IT? AN EXPERIMENTAL AND STATISTICAL ASSESSMENT OF HOW FLAKES ARE IDENTIFIED IN THE ARCHAEOLOGICAL RECORD

The introduction of the pressure flaking technique is generally thought to have improved the ability of flintknappers producing bifaces to make smaller tools and to rejuvenate dull edges with minimal loss of stone. It signifies an important innovation in that accuracy of flake removal is maximized. Identifying stone tool production techniques in the archaeological record can inform on prehistoric economy, time budgets, shared cultural practices, and the spatiotemporal occurrence of technological innovations and adaptation. Despite the importance of pressure flaking, a method for supporting the identification of pressure flakes in the archaeological record is lacking. Here, we present a stone tool replication experiment that statistically compares flakes derived from bifacial pressure flaking and soft hammer percussion flaking. This research shows that pressure flakes are on average lighter, shorter, narrower, and thicker than soft hammer percussion flakes. Discriminant analyses indicate that pressure flakes can be correctly classified at a rate of 70 percent in a mixed sample and the findings validate the assumption that pressure flakes are less variable in form compared to soft hammer percussion flakes. Based on our results we suggest quantitatively reevaluating the presence of pressure flaking in the archaeological record.

Nassef, Anass
EROSION-CORROSION BEHAVIOR OF IRON CARBONATE PROTECTIVE LAYER IN A FLOW CONTAINING SAND OR CALCIUM CARBONATE (CACO$_3$) PARTICLES

Sweet corrosion, or carbon dioxide (CO$_2$) corrosion, of carbon steel materials is one of the most common corrosion phenomenon that occurs in the oil and gas industry. In CO$_2$ corrosion process an iron carbonate (FeCO$_3$) scale can coat the carbon steel surface. The formation of this scale is influenced by environmental conditions, such as temperature, pH, flow velocity, and concentration of species, such as ferrous (Fe$^{2+}$) and carbonate (CO$_3^{2-}$) ions. Iron carbonate scale formation is promoted when the surrounding media is at high temperature, high pH, low flow velocity, or when there is a high concentration of iron and carbonate ions. The physical morphology of the iron carbonate scale is dependent on environmental conditions and can range from thin and fluffy (soft) to thick and (hard) scale. For instance, a hard iron carbonate scale can form on a steel surface at a temperature of 200 $^\circ$F, a pH of 6.5, and a flow velocity of 9.0 ft/s (2.74 m/s). Iron carbonate scale is a protective corrosion product and can reduce corrosion rates to lower values if the scale completely covers the steel surface. However, the presence of solid particles, such as sand or calcium carbonate, in the flowing media can remove this protective layer through erosion, allowing corrosion rates to return to the high bare metal values.

The research presented investigates the performance of iron carbonate scale when eroded and eroded-corroded by calcium carbonate particles, and it compares this behavior with scale eroded and eroded-corroded by sand. The erosion of iron carbonate scale is investigated under wet and dry conditions. The erosion-corrosion of iron carbonate scale is investigated in a flow loop under submerged direct impingement flow condition. Iron carbonate scales were formed on a steel surface in a flow loop with a direct impingement configuration. Electrochemical linear polarization resistance (LPR) was used to monitor FeCO$_3$ formation during the corrosion process, caused by the flowing CO$_2$ saturated brine solution. The composition of the resulting iron carbonate scale was confirmed by X-Ray Diffraction (XRD) analysis and by Scanning Electron Microscopy (SEM). The size and shape of CaCO$_3$ particles were characterized using SEM. The velocity of the CaCO$_3$ particles, during the tests, was investigated using a Particle Image Velocimeter (PIV).

This study showed that calcium carbonate particles can cause significant erosion of the protective iron carbonate scale leading to increased corrosion rates. However, CaCO$_3$ particles caused less erosion and erosion-corrosion damage to the iron carbonate scale than sand.
Neeli, Sai and Ramsurn, Hema
SYNTHESIS AND CHARACTERIZATION OF BIOCHAR-BASED CARBON SUPPORTED METAL NANOPARTICLES

Biochar is a carbon-rich solid formed after biomass has been carbonized. It is also a residue from a number of thermochemical conversion processes whereby biomass is converted to bio-oil and/or syngas. Therefore, this material is environmental-friendly and carbon-neutral. Traditionally, biochar has been used as soil amendments for the healthy growth of plants due to its retention capability of nutrients. This investigation aims to use biochar in a different manner: as a support for metal catalysts to promote green chemistry and engineering. The biochar used in this study is obtained from hydrothermal carbonization of model compounds of biomass namely lignin, cellulose and hemicellulose. This means that high pressure and temperature water is used as a benign solvent to depolymerize the model compounds to biochar. The biochar so produced is chemically activated with 0.1 M HNO$_3$ solution resulting in activated carbon with defined micropore size distribution, high micropore volumes and large specific surface areas. Metal precursors (like iron nitrate) are then added to the biochar and dried in a convection oven at 110 °C for one week to obtain metal (iron) impregnated biochar. The dried mixture is thermally-treated in a quartz tubular reactor at 1000 °C for one hour in a nitrogen flow of 500 ml/min. These synthesized biochar based metal catalysts will then be characterized using a number of techniques including Scanning electron microscope (SEM), X-ray powder diffraction (XRD), High resolution transmission electron microscopy (HRTEM). Other metal catalysts such as platinum, gold and nickel can also be impregnated on the biochar in the same manner. Distinct XRD patterns corresponding to graphite have been obtained for the thermally treated metal-impregnated biochar, due to the conversion of the carbonaceous materials to graphite. SEM images will help not only in sizing the metal nanospheres but also in determining how the metal is supported: half embedded or completely enclosed in the porous char matrix. Based on the characterization results, these metal-impregnated biochar catalyst could be tested for a number of reactions. These supports can withstand high temperatures and can even be used for gasification reactions and upgrading bio-oil during hydrogenation reactions. There is also the possibility of using bifunctional metal/acid catalysts on the biochar nanoparticles for dehydration and hydrogenation reactions and for aqueous phase processing to produce selectively targeted alkanes from glucose. The ultimate goal is to use these green catalysts to upgrade the oxygenated biofuels by removing the oxygen through various mechanisms and hence increasing the quality and heating value of the desired product.

Nichols, William
INTRODUCING PRIORITIES INTO HYBRID ATTACK GRAPHS

With the cybersecurity of critical infrastructures becoming increasingly significant, methods for testing the security of cyber-physical systems are still under development. One promising method is hybrid attack graph (HAG) analysis. HAGs extend attack graphs to model the hybrid behavior of cyber-physical systems (CPSs). Generating these graphs is computationally intensive, as the system state space is enormous, yet many states may not be physically realizable. This introduces the concept of priorities to hybrid attack graphs, which is designed to reduce state explosion while preserving all relevant attack paths. While designed for hybrid attack graphs, priorities can be applied to traditional attack graphs as well. Other modifications to improve hybrid attack graphs will also be discussed, along with their relevance.

Nierenberg, Valerie
WOMEN’S PREGNANCY AND CHILDBIRTH EXPERIENCES

The goal of this qualitative research project was to hear about the experiences of mothers during pregnancy and childbirth. I conducted five in-depth interviews with women between the ages of 31 and 61, and the four interviews I chose to transcribe and examine in my final analysis lasted from 45 minutes to an hour.
All names and other identifiable information were replaced with pseudonyms to protect the privacy of the interviewees. I identified four major themes throughout the interviews. *Participants revealed mixed, and sometimes contradictory, feelings about their experiences as pregnant women.* Discussion of identity and bodily changes, a perceived lack of control, and physical discomfort were some of the feelings expressed. *Three of five interviewees told me about their experiences of miscarriage.* Often times, interviewees narrated their experiences in terms of what they thought the general opinion would be about their birth choices. In other words, *discourses, or ideologies, about what it means to give birth “correctly” in our society pervaded their stories and the ways in which they shared their experiences with me.* Finally, all of the *participants shared the feelings they had during the final moments of childbirth.* They told me about what made it special or worthwhile, what parts were frightening and for what reasons, what they wish they could have done or experienced differently, and more. A subtheme that emerged within this category is that of the effects of drugs and medical interventions on the experience of childbirth.

**Niki Maleki, Khashayar**

**A RELIABLE SYSTEM DESIGN FOR NONDETERMINISTIC ADAPTIVE CONTROLLERS IN SMALL UAV AUTOPILOTS**

Despite the tremendous attention Unmanned Aerial Vehicles (UAVs) have received in recent years for applications in transportation, surveillance, agriculture, and search and rescue, as well as their possible enormous economic impact, UAVs are still banned from fully autonomous commercial flights. One of the main reasons for this is the safety of the flight. Traditionally, pilots control the aircraft when complex situations emerge that even advanced autopilots are not able to manage. Artificial Intelligence based methods and Adaptive Controllers have proven themselves to be efficient in scenarios with uncertainties; however, they also introduce another concern: nondeterminism. This research endeavors to find a solution on how such algorithms can be utilized with higher reliability. Our method is based on using an adaptive model to verify the performance of a control parameter—proposed by a nondeterministic adaptive controller or an AI-based optimizer—before it is deployed on the physical platform. Furthermore, a backup mechanism is engaged to recover the drone in case of failure. A Neural Network is employed to model the aircraft, and a Genetic Algorithm is utilized to optimize the PID controller of a quadcopter. The initial experimental results from test flights indicate the feasibility of this method.

**Noah, Molly**

**COMPOSITE IDENTITIES: REPRESENTATIONS OF INDIGENEITY IN NICHOLAS GALANIN AND KC ADAMS’ WORK**

For contemporary Indigenous artists Nicholas Galanin and KC Adams, indigenous identity is not a stable construction but an insubstantial image. This paper explores how Galanin and Adams unmask the ways indigenous identity was built in the twentieth century by anthropologists, historians, and politicians in an effort to move beyond representations of purity and authenticity to make space for composite indigenous identities. Both artists take up these issues by interrogating visual and textual representations of native and non-native bodies. Galanin uses materiality and photo-editing to expose representational frameworks as a means for shaping identity, whereas Adams uses technological tools to satirically create a visual representation of an Euro-Indigenous hybrid identity. By exposing the ways in which representations of indigeneity have been based assumptions of cultural authenticity, these artists are making spaces for representations grounded in indigenous experiences.
Noah, Molly  
MODERN ART AND NATIVE FOOD: PATRICK DESJARLAIT’S DEPICTIONS OF ANISHINAABE LIFE IN THE 20TH-CENTURY  

Patrick DesJarlait, a 20th-century Anishinaabe artist, developed his signature technique during the postwar years at the Red Lake Reservation in Minnesota. While Native art scholars have explored Desjarlait’s technique in regard to the modernist avant-garde, this paper explores food as Desjarlait’s subject matter. Desjarlait painted Anishinaabe individuals preparing food with conventional Anishinaabe tools as well as mass-produced tools. Employing his innovative artistic techniques to depict scenes of modern Anishinaabe life, DesJarlait subverted expectations about Native art while affirming Anishinaabe culture as innovative and resilient.

Olson, Claire  
THE AMERICAN LIBRARY ASSOCIATION AND CENSORSHIP  

This paper examines the development of the Committee for Intellectual Freedom, a division of the American Library Association (ALA) during the WWII and early Cold War era in the United States. This time experienced increased censorship in many parts of the country, a by product of which was raised interest in the concept of intellectual freedom. The ALA, long a supporter of the freedom to read, worked extensively with schools to document challenges made by groups and individuals, raise awareness, and create tools to assist schools and libraries in their support of intellectual freedom. By examining the work of the ALA, and comparing it to US Supreme Court cases regarding censorship at the same time, we may understand the nation’s attitude toward a more educated populace.

O’Neal, Megan  
MONARCH WAYSTATIONS OF TULSA  

In my presentation, I will focus on the topic of monarch way stations, what they are, why we need them, and what they can do for our communities. I will particularly look at the completed way station at the Tulsa Zoo and examine the process of building a way station, as we build ours at the University of Tulsa. The discussion of declining monarch populations is an important indicator to the state of our natural resources, and the city of Tulsa and the University, will benefit from these way stations, by increasing the city's green spaces and recognizing the value of protecting and building ecosystems.

Orr, Tabitha  
FROM EXODUST TO DUST BOWL: THE AFRICAN AMERICAN EXPERIENCE IN OKLAHOMA 1929-1940  

Oklahoma has been romanticized to the point of inclusion in the national mythology: “Okies” migrating west epitomized by Steinbeck’s Joad family, Woody Guthrie and the image of a wandering troubadour, Dust Bowl days with jalopies heading west on Route 66, dusty winds howling across the plains pushing tumble weeds for miles, oil fields and instant fortune, as well as cowboys and Indians. Much of the ideas and images that Americans hold concerning Oklahoma arose during the Depression years of the 1930s. The national mythos surrounding this era has led to the most enduring stories about the resilience of Americans, as well as the fabled ability of anyone to pull themselves up by their proverbial bootstraps. According to the fable, Okies—white, poor, and salt of the earth—migrated out of the darkness of the prairie dust storms and into the sunshine of California, paradise on Earth. There they struggled until they worked their way into the middle class and became the Greatest Generation. What is often overlooked in these tall tales is that these historic events also involved African-Americans. Their history in the state is rich and complex, since they too occupied this space on the cusp of the sharecropping South and the wild West. I argue that the African American experience in Oklahoma during the Great Depression was just as vital to the changing face of America, and just as shaped by the region’s unique position.
Ostrander, John W., Torres, Carolyn D., and Teeter*, Dale C.
ANALYSIS OF PRESSURE INDUCED CONDUCTIVITY FOR VARIOUS LITHIUM CONTAINING CERAMICS FOR POTENTIAL APPLICATION IN SOLID STATE BATTERIES

Solid state batteries, particularly for lithium ion based architecture has been a focus of development for over 20 years. Here, we investigate commercially available ceramics: LATP (Li1.3Al0.3Ti1.7(PO4)3), LLTO (Li5 La3 Ta2O12), LLT (Li0.33 La0.55 TiO3), LAGP (Li1.5 Al 0.5 Ge1.5P3O12) and LLZO (Li7 La3 Zr2 O12) (all from Toshima Inc.) for use as a solid electrolyte in solid state batteries.

We investigate the response of conductivity versus pressure in a confined and insulated vessel utilizing AC impedance spectroscopy techniques. Samples are subjected to incrementally increasing pressure which increases surface to surface contact and minimizes grain boundaries and resistance. These analyses may be informative as a kind of transition state between loose powder, and solid annealed sample absent of grain boundary conditions.

In addition to AC impedance, we employed scanning electron microscopy to observe any changes in physical grain structure, grain boundaries, packing and overall consolidation of ceramic particulates both as received and annealed. These studies will facilitate the ceramics being used in commercial battery systems, and provide additional information about chemical and electrochemical response as grain boundary resistance changes.

Parvandeh, Saeid and McKinney, Brett
PREDICTION OF ANTIBODY RESPONSE TO INFLUENZA VACCINE USING DIFFERENTIAL GENE CO-EXPRESSION NETWORKS

Vaccination is a very effective prevention for influenza infection. However, certain individuals show a low antibody response to the vaccination, which may lead to susceptibility to infection. An important challenge in human health is to identify individuals who may not be protected from infection following influenza vaccination. We developed a multi-stage machine learning strategy to build a predictive model of vaccine response using pre-vaccination antibody levels and gene expression levels. The first step uses a nonlinear regression model to predict day-28 antibody response from pre-vaccination antibody levels. This model explains a significant amount of variation in post-vaccination response, especially for subjects with large pre-existing antibody levels. However, for individuals with low pre-vaccination antibody levels, there remains a large amount of variation in post-vaccination antibody that may be explained by differences in baseline gene expression levels. Thus, we used a gene interaction network feature selection algorithm that finds the best pairs of genes whose co-expression is associated with antibody response. We then use the ratios of these pairs as predictors in a penalized regression model of antibody response. Using publicly available data, we trained our algorithm on data from a study of individuals immunized against influenza vaccine. All individuals had pre- and post-vaccination antibody titers and pre-vaccination gene expression levels. To demonstrate the generalizability of our model, we tested the model predictions on three independent vaccine study data sets.

Pevac, Mikayla
FOOD’S CONNECTION TO MODERN WEIGHT PORTRAYAL

This research looks at how the presentation of food subsequently influences the portrayal of women’s weight in modern media. A variety of media types were analyzed (one fiction novel, one non-fiction book, one movie, one mini-series, and two New York Times articles) to answer the three questions that came to mind when researching this topic. Question #1: How has the portrayal of weight changed over time? Question #2: Why is modern society critical of individuals who are over and underweight? Question #3: With so much controversy over modern portrayals of weight, why does the media still present weight in such a way that ostracizes most of the population? Materials consulted include: The Omnivore’s Dilemma
by food-research-specialist Michael Pollan, the Netflix series *Cooked* based on Pollan’s book of the same name, the documentary *Miss Representation*, the fiction bestseller *Dietland* by Sarai Walker, and New *York Times* articles by Dan Bilefsky (“Sadiq Khan, New London Mayor, Bans Ads Promoting Unhealthy Body Image”) and Gina Kolata (“After ‘The Biggest Loser,’ Their Bodies Fought to Regain Weight”). Weight in society is a controversial issue. There is a fine line between the promotion of beauty (supermodels) and the shaming of normality (the promotion of beauty products to young people). While progress has been made (i.e. Dove commercials, advertising reform), there is still a lot of room for improvement.

**Phillips, John**  
**GENETIC DIVERSITY OF AN ENIGMATIC AQUIFER SPECIES FROM THE SOUTHEASTERN UNITED STATES, THE GEORGIA BLIND SALAMANDER, EURYCEA WALLACEI**

Groundwater-dwelling species generally have small known geographic ranges and are frequently considered species of conservation concern, although sampling is often restricted to a small number of access points into groundwater aquifers. Here, we test for patterns of genetic diversity in the Georgia Blind Salamander (*Eurycea wallacei*), a species endemic to the Floridan Aquifer of southwestern Georgia and northwestern Florida. We performed phylogenetic and population-level analyses to evaluate divergence, genetic isolation, and effective population size within *E. wallacei*. Based on mtDNA, we found two divergent lineages within this species, with no site forming a clade and a high incidence of haplotype sharing, even among distant sites. A spatial analysis of molecular variance suggested genetic groupings that were not partitioned by site, and the effective population size was greater than other known aquifer species (i.e. *Orconectes* crayfish). This result may reflect historical fragmentation and secondary admixture within the aquifer. While the subterranean and stygobitic nature of this and other species in the Floridan Aquifer warrant environmental protection of the groundwater system in which they live, the genetic diversity present within *E. wallacei* based on mtDNA indicates a relatively large population with long-term genetic sustainability.

**Pirok, John**  
**THE JOHN BIRCH SOCIETY’S CIVIL RIGHTS CONSPIRACIES**

In an era when conspiracy theories and outright non-facts are being treated as news, it is necessary to return to the history of conspiracy theories and examine one of their most notorious peddlers- the John Birch Society. This essay will use original research to examine the use of conspiracy theories and outright falsehoods by the society in order to discredit its leaders and members, and in some cases to justify violence against them. The Society’s reactions to events such as the Selma March, the Watts Riots, and the transformation of the Student Non-Violent Coordinating Committee are all detailed as examples of their attempts to discredit the movement. Finally, the essay examines the role of the media in John Birch propaganda, and how the Society attempted to sow distrust of every news source besides their own magazine, *American Opinion*. In this age of lies given as facts and official distrust of the media, this look at the tensions created by the John Birch Society is a valuable experience.

**Prebish, Lydia**  
**THE NATIONAL HISTORIC PRESERVATION ACT AND THE PIONEER AMERICA SOCIETY**

The subject of my research paper is The International Society for Landscape, Place, and Material Culture, previously known as the Pioneer America Society. This non-governmental organization was chartered in 1967 and, according to the online mission statement, defines itself as an “international, interdisciplinary, education, nonprofit organization that encourages the study and preservation of landscapes and artifacts, and document sites, structures, and objects representing history and material culture throughout the world.” My research will cover the founding of this organization, specifically determining their early goals,
initiatives (if any), and its foundation in relation to the Historic Preservation Act of 1966 and the “Urban Renewal” and “Great Society” movements at the time. My research will help reveal their early objectives through their publication known as P.A.S.T., or the Pioneer America Society Transactions, published since 1969. The research will focus on the earliest years of the society to emphasize their initial purpose and foundation. I will also utilize the National Historic Preservation Act, and other government programs for the pursuit of historic preservation during this time including the National Register of Historic Places and Preservation of Natural Beauty and the Heritage Foundation. By learning more about the political, economic, and cultural situation during the 1960s and 1970s, analyzing the founders of the Pioneer America Society, and revealing other cultural movements regarding nationwide historic preservation at the time will help determine the true roots of the Pioneer America Society and its place in American history.

Pulleyking, Spenser  
CULTURAL AND COMPUTATIONAL INTERFACING TOWARDS ANTHROPOMORPHIC ROBOTIC DEVELOPMENT

The development of anthropomorphic robotics has accelerated rapidly with the global realization of a cohesive robotics community supporting of crowd-sourced ideas, source code, and hardware packages through the Robotic Operating System (ROS) community. A partnership with the esteemed roboticist Dr. Choi at the Intelligent Robotics and Mechatronics Laboratory at Sungkyunkwan University in Suwon, South Korea capitalized on these trends to explore cooperative development of simulated computer models of anthropomorphic robotic hands. New connections between existing hardware such as the Allegro hand and UR10 industrial robotic arm were explored using usb-to-CAN devices, and novel code allowed the exploration of interfacing between these components in both the LABVIEW and Catkin computer workspace environments.

Qualls, Zachary Taylor  
ARTISTIC FORM IN THE SANDE SOCIETY OF WEST AFRICA

Artistic Form in the Sande Society of West Africa is a research paper that explores the origins of the sowei masquerade performed by the Mende and closely related ethnic groups of West Africa. The sowei is the predominant artistic and physical force that drives cultural and societal aspects of women’s roles in West Africa. Taking both the name of the head of Sande and the physical mask and masquerade, the sowei is the only dance performed by women, and for women in Africa. This research looks at the principles of duality common in West African aesthetics and shows the importance of physical and metaphysical functions intrinsic to the understanding of African arts.

Raines, Julia  
SISTER INDIA “LIKE A SISTER” CAMPAIGN

About 300 million people in India are illiterate. These people are at risk for poverty and do not have the tools necessary to adequately take care of themselves and their families. Women especially, due to lack of education, are prone to abuse and exploitation. Sister India, Ltd, is a non-profit organization that sponsors classes in various parts of India. In these classes, women learn reading and writing, mathematics and business skills, and information about health and how to protect their families from disease. The information and skills they learn in these classes give Indian women the confidence and ability to break their country’s cycle of poverty.
This presentation will go into depth about the problems Sister India is tackling in India by example of their fall 2016 fundraising campaign. The project will discuss the research that was conducted for the campaign and the design decisions that were made to create it. It will also describe how Sister India’s work relates to several of the 7 Global Challenges, including population, resources, economics, and information.

Rajbanshi, Naveen

PHYLOGENETIC ANALYSIS OF COMPLETE GENOME OF TWO WATERMELON MOSAIC VIRUS ISOLATES FROM UNITED STATES.

Watermelon mosaic virus (WMV) (genus Potyviurs, Family Potyviridae) is one of the most prevalent viruses of cucurbits worldwide, mostly reported in the Mediterranean region. WMV consists of a single stranded, positive-sense RNA genome which is approximately 10 kb in size. WMV genome is transcribed into a single polyprotein which is proteolytically cleaved into 10 functional polypeptides. WMV has been reported in all the cucurbits growing states in the USA. However, very few study on complete genome sequence of WMV is available. This work focused on the complete genome sequencing of two WMV isolates from Texas and Oklahoma. These isolates were obtained from naturally infected pumpkin fields during surveys. Both WMV isolates produced symptoms in Nicotiana benthamiana and pumpkin by mechanical inoculation in growth chamber. Nine set of primers were designed against WMV genome from available sequences in Genbank database. Complete genomes of both isolates have been sequenced using Sanger sequencing technique. Complete nucleotide and amino-acid sequences of these two isolates has been compared with the WMV sequences available in Genbank and the results will be discussed.

Rake, Nathanael, Dipayan Das, and Michael Martell

THE TU HAND

Robotic hands have captured the imagination of many filmmakers, inventors, and authors, but producing a robust, capable, and dexterous robotic hand has proved to be technically difficult. The main reason for this is the small space available in a human-sized hand. The greatest difficulty is with actuation. Traditional servomotors can be conveniently integrated into the joints of a large industrial robot, but in robotic hands, commercial motors simply will not fit, and custom micro-motors will not produce the torque required. Thus, robot hands tend to fall on one end or the other of the spectrum: fully actuated hands with as many as 22 independent actuators between the “forearm” of the robot and the palm of the hand, and “single actuator” hands that have one motor and use clever mechanical heuristics to open and close the fingers of the hand.

The TU hand seeks to apportion actuators in a manner more consistent with human anatomy, meaning that it duplicates the same sorts of finger-to-finger coupling produced by the muscles and tendons of the human hand. The human hand has one large muscle, the flexor digitorum profundus (FDP), which acts on all fingers with very little individuation. Other muscles’ actions combined with contractions of the FDP modulate the motion produced to produce some finger individuation, but coupling between the fingers is still noticeable. The TU hand does not apportion actuators finger-by-finger, but rather assigns each actuator to a basic human action of the entire hand, with each actuator potentially acting on all fingers. The reason this is mechanically possible is that the actuator torques are transmitted to the fingers through a compliant (spring-like) transmission mechanism; the actuators pull on the spring, and the spring, in turn, pulls the finger tendons. The motions produced by each actuator are added to one another by the principle
of superposition. In addition, the coupled motions of the joints within an individual finger are produced by a tendon mechanism that uses existing engineering design techniques and operates reliably, but produces the same kinematics as the extensor tendon network in the human hand. In this way, the TU hand has fewer actuators than the human hand, but can reproduce its most commonly used movements (e.g. grasping, pushing). The movements `rejected' by the removal of the actuators are exotic movements that are used less often (e.g. playing musical instruments, tying knots). This research is producing a systematic approach for the design of the finger extensor mechanism, and a compliant transmission mechanism that links the tendons of the fingers to the actuators. This has culminated in the TU Hand, a five-fingered anthropomorphic robotic hand that can grasp a variety of objects and perform certain basic manipulation operations. The hand moves all four fingers and the thumb using only two actuators housed in the forearm.

**Ramasubramanian, Vaidheeshwar**

**INVESTIGATING THE ROLE OF MOLYBDENUM DURING THE DIRECT CONVERSION OF METHANE TO LIQUIDS UNDER NON-OXIDATIVE CONDITIONS.**

Under non oxidative conditions, catalytic conversion of methane over MoO3/SiO2 catalyst has been studied using a recirculating batch reactor. The catalysts of different metal loadings were prepared by incipient wetness impregnation and sol gel method. The prepared catalysts were characterized by BET, inductively coupled plasma-mass spectroscopy (ICP-MS), Scanning electron microscopy (SEM), Thermogravimetric analysis (TGA) and X-ray diffraction (XRD). XRD analysis showed that at low Mo loadings, molybdenum was uniformly dispersed on the silica support but at higher Mo loadings crystalline α-MoO3 phase was present. Current research primarily focuses on the study of contribution of the molybdenum in methane dehydroaromatization. The reaction studies were performed at 973 K and 1023 K for 130 minutes. Benzene was the major product formed with trace amount of ethylene and ethane. A maximum of 0.9% conversion of methane with 100% selectivity of benzene was achieved. The role of Mo was studied and a mechanism was proposed. The XRD analysis of used catalysts showed the presence of β-Mo2C phase. These β-Mo2C sites were the active sites necessary for C-H bond activation and helps in the formation of ethylene which undergoes subsequent oligomerization to form aromatics.

**Raval, Dhvanit**

**INHIBITION OF CANCER CELL METABOLISM**

Unlike normal differentiated cells, cancer cells have shown the ability to neglect the TCA cycle and only perform aerobic glycolysis, meaning the cells are metabolizing glucose into lactic acid in the presence of oxygen, also known as the Warburg effect. This may seem counter-intuitive since the TCA cycle produces most of the cell's energy in the form of ATP; however, while aerobic glycolysis produces significantly less ATP, it is essential in producing macromolecules that are necessary for the cancer cell to proliferate. Research on immortalized mouse fibroblasts lacking the tumor suppressor p27kip1 suggests it controls a metabolic switch between glucose and amino acids as a carbon source. We propose that deregulating the p27 protein provides a growth advantage to tumors by maximizing nutrient uptake. Therefore, my research focuses on inhibiting cell metabolism in cells with deregulated p27 (designated -/-), while leaving the cells with p27 present (designated +/-) unharmed. In order to inhibit the metabolism of (-/-) p27 cells, it is necessary to attack both glycolysis and the TCA cycle, since they carry the ability to switch between pathways. At the end of the TCA cycle, oxygen is consumed in electron transport chain. It is proposed that manipulating oxygen levels in the cell environment will induce the switch in metabolic
pathways, thus providing more in depth knowledge on the role of the p27 protein and inhibition of cell metabolism.

Ryvers Reeder
ADJACENT MATRIX STORAGE AND EXponentiation
In cyber security, an adjacent matrix specifies what nodes within a computer system are connected to each other. This matrix reveals the number of routes from one node to another through matrix multiplication. Since all nodes with the system aren’t adjacent all together, the matrices generated are sparse matrices, matrices containing mostly zeroes. To avoid consuming data to hold zeroes, I implemented two methods, coordinate-wise storage and compressed row storage, to store the sparse matrix’s non-zero values and each value’s matrix coordinates. While the adjacent matrix initially displays the immediate routes between nodes, the adjacent matrix can be multiplied by itself to reveal routes between distant nodes. Along with storing the sparse matrix, I had to multiply the sparse matrix by itself and contain the resulting product. As the exponential power of the matrix increases, the matrix gains more non-zero values. This increases the amount of memory needed using sparse storage methods resulting with more memory required for sparse storage than using two-dimensional array storage. These results suggest that an adjacent array can be stored using sparse matrix representation; however, as the matrix increases in non-zero values through matrix multiplication, the sparse representation should not be used for holding the resulting product.

Reynolds, Bradley W., Michael R. Basso, Lily Lau, Ashley Miller, Dennis Combs, & Douglas Whiteside
IDEATIONAL FLUENCY, SENSATION SEEKING, AND ANXIETY: A RECIPE FOR BINGE DRINKING
Binge-drinking is a significant problem among young adults (National Institute of Alcohol Abuse and Alcoholism [NIAAA], 2016), and corresponds with brain damage (Crews et al., 2000), and changes in mood, attention, memory, and executive functioning (Parada et al., 2012). However, existing studies have largely neglected to address relative contributions of executive function and personality to binge-drinking behavior. The current study addressed these shortcomings in a sample of college students.

Forty-nine healthy undergraduates were administered D-KEFS Design Fluency to assess mental flexibility. Impulsive decision-making was assessed with the Iowa Gambling Task (IGT; Bechara et al., 1994). Impulsive personality was measured with the UPPS-P questionnaire (Cyders et al., 2007). The Mood and Anxiety Symptom Questionnaire (MASQ; Watson & Clark, 1991) assessed distress. Additionally, the Marlowe-Crowne Social Desirability Scale (MCSDS; Crowne & Marlowe, 1960) and Reliable Digit Span from the WAIS-IV (RDS; Greiffenstein et al., 1994) assessed response bias. Binge-drinking was defined by consumption of 5 drinks if male, or 4 drinks if female over a 3-hour period at least once in the past two months (NIAAA, 2016). General risk-taking behavior (i.e., sexual, substance use, antisocial) over the past two months was also obtained from all participants.

Reynolds, Bradley W.
THE POTENTIAL FOR RISK: THE RELATIVE INFLUENCE OF DECISION-MAKING AND EXECUTIVE FUNCTIONING ON RISKY BEHAVIORS
Risky acts (e.g., promiscuity, substance misuse, antisocial behaviors) are a salient problem among young adults. Previous research has evaluated whether personality or cognitive measures of impulsivity predict risky acts. Nonetheless, few investigations have simultaneously evaluated the relative contribution of
personality and neuropsychological aspects of impulsivity and decision-making to risky acts. Towards this end, the current investigation evaluated the relative impact of self-reported and cognitive impulsivity and executive functioning with various aspects of risky behavior.

Fifty healthy undergraduate students without neurologic disease or developmental disorder were administered the UPPS-P, a well-validated impulsivity questionnaire (Cyders et al., 2007), the Wisconsin Card Sorting Test (WCST; Grant & Berg, 1948), and the Iowa Gambling Task (Bechara et al., 1994). Response bias was assessed with the Marlowe-Crowne Social Desirability Scale (MCSDS; Crowne & Marlowe, 1960) and Reliable Digit Span (RDS; Greiffenstein, et al., 1994). Risky acts were assessed using a self-report questionnaire which concerned events during the preceding two-months.

Royes, Josh

STRUCTURE AND EVALUATION OF A DIVERSITY TRAINING PROGRAM

Cross-cultural training includes formal efforts to prepare individuals for more effective interpersonal relations and for job success when they interact extensively with individuals from cultures other than their own (Brislin & Yoshida, 1994). The scope of cross-cultural training includes not only to preparing individuals to move to another country (expatriate training) but also to prepare individuals within one's own country to deal with individuals who are from another culture. There are multiple outcomes associated with effective training. A meta-analysis on diversity training indicated that effects of diversity training can be evaluated as cognitive and behavioral outcomes of participants (Bezrukova et al., 2016). The Staff Development project is an initiative to increase staff awareness, knowledge, and skills in dealing with the increasingly large international population at the small mid-western university. This training program consists of different modules focused on different topics (e.g., communication, knowledge about key resources available to staff, pronunciation of Chinese names). This presentation will briefly cover facets of program development and data analysis methodology employed to evaluate this training program. The data used for this presentation is from the first module, An Introduction to Intercultural Communication. The data collected for this module is from a pre and posttest knowledge test, based on content provided in the module, and measures attitude reactions to the topic and module. Other than discussing the findings, we will also propose some future directions to improve the assessment of this program.

Samadidana, Saeid

DETECTING CUSTOMERS’ NEEDS IN STORES BY MOTION SENSOR IOT SYSTEM

The fact that almost each person spends at least some hours in a week for shopping and many of them cannot decide among a lot of brands or even among different models of one brand brings the need for a system that notifies shop assistants to help customers. These systems could save lots of time and satisfy customers and increase the sales. The proposed IoT system designed to help both customers and store assistants. This system includes some motion sensors in different locations of store and a central application for managing the system. All data are saved in cloud systems that are robust and secure and guarantees the availability of the system. This system sends alarm to assistant when sensors detect some motions. The more sophisticated project may use camera instead of motion sensors to detect the need for help based on the customers’ gestures and some additional face features. However, this needs more work and can be considered as the next study. A video that shows how system works has been provided. In the demo it has been shown that when system detects motions based on the information that periodically are being sent by sensors notifies the assistant.
Schinnerer, Camden
 EFFECTS OF CHELATION OF FE(II) AND FE(III) BY MELANIN FILMS ON ELECTROCHEMICAL CHARACTERISTICS FOR PARKINSONISM DISEASE APPLICATIONS

While melanin is more widely known as the compound that gives our skin color, it also plays an important role in the brain. The degradation of this neuromelanin, as it is referred to, has been correlated with onset of Parkinsonism diseases. When this occurs, the ratio of two different types of iron in the brain flips from 2:1 to 1:2. To better understand how these iron compounds interact with neuromelanin, we have generated melanin films on various electrodes. This allows us to use electrochemistry on the film for analysis without perturbing the system. By exposing the films to different concentrations and ratios of iron compounds, we have found that the mimicked neuromelanin degrades at a significantly different rate depending on the environment. This may suggest that the degradation of neuromelanin is accelerating as the iron contained within the film is released to the surrounding environment. More broadly, this result could indicate that a component of Parkinsonism diseases’ onset is due to the effects of the changing iron ratio. Currently, this research project has two active objectives: exploring how melanin film formation on the electrode changes the degradation process and how different additives to the system may be used to slow down or stop the degradation of neuromelanin. In addition to increasing understanding of Parkinsonism diseases, if this electrochemical strategy for evaluating neuromelanin is found to be representative of native systems, new research regarding therapeutic strategies for people suffering from Parkinsonism diseases can proceed at a much faster pace in comparison to current animal based experiments.

Schriewer, Luke
 STUDENT RESEARCH COLLOQUIUM RESEARCH ABSTRACT

Spherically symmetric neutron star simulations using modern, tabulated equations of state
Our current understanding of neutron stars is based almost entirely on observations of these dim, compact objects as well as simulations using equations of state (EOS) which fail to adequately describe matter under the high density, low temperature conditions inside neutron stars. To better understand the formation and evolution of these objects, we are conducting simulations of neutron star collapse using modern, tabulated EOS. Initial star solutions are created by solving the Tolman-Oppenheimer-Volkoff differential equations—which describe isotropic matter in a spherically symmetric space-time under static gravitational equilibrium—in conjunction with a tabulated EOS derived from first-principles nuclear physics theory. These star solutions are then introduced into the collapse code which initiates the collapse of the star and evolves the space-time using the Einstein field equations. Possible outcomes to the simulation include the formation of a black hole, a stable neutron star, or an explosion of the compact object. Identifying the likely outcomes and the maximum stable neutron star masses will affect our understanding of the mass distribution of neutron stars. This will affect future research on both the understanding of compact stellar objects as well as the demographics of galactic bodies.
Emily R. Schumacher  
**MORE THAN INDIANA JONES: CULTURAL RESOURCES, AMERICAN ARCHAEOLOGY, AND THE NATIONAL PARK SYSTEM**  

Archaeology is often likened to the grand adventures of Indiana Jones, full of intrigue and daring escapades all in the name of uncovering the find of the century. The archaeologist then becomes an intrepid explorer perpetually on the hunt, more at home in the field than in the classroom in which they teach. This Hollywood image is pervasive, clouding the reality of Americanist Archaeology in the eyes of the public. It is the purpose of this presentation to break the Indiana Jones stereotype, arguing that American archaeologists are scientists with the purpose of understanding the collective human past. This presentation will focus on the trajectory of American Archaeology from the 1800s to the present. Furthermore, this presentation will discuss the Americanist emphasis on maintaining and understanding cultural resources. Finally, this presentation will discuss the importance of the National Park System of the United States to archaeological research and the value of cultivating archaeological relationships with the National Park Service.

Secrist, Kathryn  
**COMPLETE GENOME ANALYSIS OF PEPPER MILD MOTTLE VIRUS COLLECTED IN OKLAHOMA**  

Pepper is a vital cash crop grown in western Oklahoma for fresh produce, seed production, and breeding. In 2014, Pepper mild mottle virus (PMMoV) was identified for the first time in the pepper fields of Oklahoma. Due to its rapid seed-borne spread and potential economic loss, it is important to study and characterize PMMoV in more detail. Over time, PMMoV has overcome L-gene mediated resistance utilized by pepper plants to control tobamovirus infection. In addition, PMMoV has found to be associated with immune response and clinical symptoms in humans, the first such report of a plant virus. So far, there is no complete genome of PMMoV available in the United States. The aim of this study is to analyze the complete genome of the PMMoV isolate found in Oklahoma. Six primer pairs amplified the complete sequence through reverse transcription polymerase chain reaction (RT-PCR). PCR products were cloned through bacterial transformation and sequenced using the Sanger method. Phylogenetic analysis and pathotype screening are currently in the works.

Thiana Sedrez  
**EXPERIMENTS AND CFD-BASED EROSION MODELING FOR GAS-SOLID FLOWS IN CYCLONES**  

Erosion is the mechanical wear in the walls of equipment by impact of particles carried in a gas or liquid flow. This phenomenon is a major problem in FCC units (fluid catalytic cracking), especially cyclones, reducing the lifetime of the equipment and causing unscheduled shutdowns, resulting in greater cost of maintenance and operation. In this study, CFD-based erosion modeling combined with experimental work was applied to a cyclone operating with FCC particles (64 µm diameter). The inlet velocities ranged from 25 to 35 m/s and the solids loading ratios from 105 to 254 g/m³, which are typical values for a regime transition between dilute and dense phases. Experimental data for the erosion rate were obtained in a test facility using a cyclone comprised of gypsum to accelerate the erosion phenomenon and make it more prominent. In addition, a flatdisk vortex stabilizer was implemented in the cyclone to evaluate the erosion reduction on the cyclone cone. The experimental results from the vortex stabilizer show erosion reduction not only occur in the cone but also at the entrance and global erosion. Numerical simulation was
performed using the Euler-Lagrange approach with the Reynolds stress model (RSM) for turbulence in the gas phase, with two-way coupling to take into account the gas-solid interaction. The erosion rate is calculated from the knowledge of the impact angle of the particle on the wall, particle velocity during an impact, particle concentration and properties of the particle and the target material (particle density, Young’s modulus, Poisson’s modulus), and it was calculated by two erosion models (DNV and Oka models). The experiments showed an increase in the erosion with the gas inlet velocity in the cyclone, notably at velocities of 30 and 35 m/s, and a decrease with the solids loading rate for the same velocities (approx. 20 and 40%, respectively). This decrease in the erosion rate is attributed to the cushioning effect promoted by inter-particle collisions. On the other hand, a comparison between the experimental data and numerical calculations conducted using the two erosion models was carried out and the results show satisfactory agreement for both models.

Seiders, Amanda
SOLVING LAPLACE’S EQUATION IN A RECTANGULAR DOMAIN USING THE BOUNDARY ELEMENT METHOD

Laplace’s equation is an elliptic partial differential equation that can be used to model steady-state heat distribution. I have written a Mathematica notebook that implements a direct boundary element method using piecewise constant elements and collocation to solve for the temperature and flux on the boundary and in the domain interior. The notebook uses mixed Dirichlet and Neumann boundary conditions. The domain is a rectangle whose side lengths can be adjusted. The number of boundary nodes can be varied (which varies the accuracy of the solution). An a posteriori error analysis is computed against Mathematica’s NDSolve command. The result is a user-friendly notebook which can be used as a template for related problems.

Shaw, Zachary
ANALYSIS OF MAGNETOHYDRODYNAMIC ALGORITHMS

The primary purpose of this research is to investigate the algorithms used to predict how matter interacts with black holes. Computer simulations are critical for connecting theory to the scarce observational data we have on black holes. We will therefore use our algorithms with arbitrarily computer-generated magnetohydrodynamic conditions in order to assess their accuracy in multiple parameter spaces. These algorithms use several different minimization techniques to invert a system on nonlinear general relativistic equations pertaining to the interactions. Several of the algorithms have already been tested extensively; however, two recently published algorithms have not been so extensively analyzed. We have now implemented these new algorithms in code to be tested. Our tests measure two key properties of each algorithm: the rate of convergence to solution and the accuracy of the resultant solution. These metrics are calculated under various extreme magnetohydrodynamic situations and we compare them to assess the overall relative performance of the algorithms. As the accuracy of these algorithms is assessed, we can choose the best algorithm to simulate various different situations in which external matter interacts with black holes. This provides increased certainty to the accuracy of black hole simulations and therefore an advancement in our capability to understand the phenomena of black holes.
Slaughter, Autumn

JOURNALISTS’ SATISFACTION WITH HOSTILE ENVIRONMENT, FIRST AID, AND SAFETY TRAINING (HEFAT)
(IRN: Approval # 17-14)

Hostile Environment, First Aid, and Safety Trainings (HEFAT) are designed to teach journalists how to protect themselves in a myriad of dangerous environments. Many news organizations require trainings as a basis for employment. These requirements both guard against liability concerns and protect journalists from a variety of dangers. However, in spite of their wide spread use, there is limited systematic research into journalists’ thoughts and reactions to HEFAT. Thus, the aim of this study is to ascertain information about the current status of HEFAT to inform future training decisions. Journalists who had completed at least one HEFAT training responded to a survey requesting information about the training and their satisfaction with training. Data collection is in process—wave one had 303 respondents, and thus far wave two has added an additional 20. This presentation will describe the study and preliminary findings.

Smith, Meg

FIGHTING DEHUMANIZATION IN THE FACE OF A GLOBAL CRISIS: RESTORING HUMANITY TO REFUGEES

The current flux of refugees across the globe has become the largest refugee crisis since World War II. Though the daily media is filled with images of refugees and their unimaginable living conditions, most of the media coverage only considers the impersonal aspects of the refugee life—such as the statistics, political chaos, or lack of material resources and shelter. However, the tendency of the general public to focus on these anonymous details easily transforms human beings into mere numbers and degrades any trace of their humanity. Very few people have thoroughly considered the more personal dimensions of the refugee crisis—those that deeply impact the human identity of the refugee and have profound emotional effects. Thus, this study aims to understand why society continues to ignore these human dimensions of the current refugee crisis, while taking into consideration the personal stories of refugees living in camps in Athens, Greece. A careful examination in the areas of psychological trauma, the particular challenges of vulnerable populations, access to medical care, the role of humanitarian organizations, and the portrayal of the media will help to more fully understand the daily struggles of refugees. Ultimately, it will become possible to better understand the difficulties faced by this vulnerable group of people who are much too often marginalized by international society.

Smith, Kirk

POLYMERIC SOLAR THERMAL COLLECTORS AND THE TRANSITION TO A CLEAN ENERGY ECONOMY

This presentation will discuss research performed on polymeric solar thermal collectors for domestic hot water heating as part of the DAAD RISE internship program in the summer of 2016. A brief overview of the technology will be followed by an explanation of the work done during the 10-week period and milestones accomplished. The second half will expand into clean energy as a developing industry and pathways for transitioning to a clean energy economy, viewed through the lenses of the different global challenges.
Soedarmo, Auzan A  
**VISUALIZATION STUDY OF WAX DEPOSITION: MASS TRANSFER BOUNDARY LAYER**

Wax deposition is a major concern in petroleum industry, particularly in offshore production facilities. Despite the importance, the phenomenon itself is still poorly understood. Consequently, existing wax deposition prediction tools are still insufficient to address this problem. This study presents a pioneering effort to visualize in situ wax deposition process in microscopic scales, in order to address this deficiency. A customized experimental setup was developed to enable this objective. The experiments were focused on the mass transfer boundary layer area which has been known as a principal factor in wax deposition process. This study validates the existence of partial wax supersaturation in the boundary layer, which has been conjectured but never proven before. The discrepancy between the actual mass transfer boundary layer thickness and the heat-mass transfer analogy (a commonly used assumption) is found to be increasing with increase in Reynolds number and decrease in temperature difference between bulk and cold interface. This qualitative conclusion is consistent with several flow loop data with same oil and relatively similar flowing conditions. This study is expected to further drive new approaches to improve wax deposition modeling by enhancing mechanistic understanding, complementing the conventional flow loop studies which are often limited in time and scalability.

Starkweather, Jared  
**INTEGRATION OF SELF-HEALING CHEMISTRY INTO DENTAL ADHESIVES**

Preliminary research shows that self-healing composites can recover some or all of a material’s properties post-fracture. We postulate that such self-healing capabilities can be integrated into dental adhesive resins to extend the life of composite-based dental restorations. In this study, we aim to synthesize a biocompatible self-healing adhesive resin and verify self-healing in simulated oral environments. We will then use the mini interfacial fracture toughness test designed by Pongprueska et al. [Journal of Dental Research, 327-33, 95 (2016)] to characterize the self-healing adhesive resin under simulated oral conditions, and compare the results to those found in conventional commercial dental adhesive resins.

Stewart, Emma  
**FOOD AND MEMORY: THE PROUST PHENOMENON**

When we remember major events and holidays, they are often associated with or characterized in terms of food. Even the memory of important people can become intimately connected with food, such as grandma’s cookie recipe which, when baked, will transport one back to her kitchen through the avenue of familiar smells and tastes. Neurobiological research has revealed that this phenomenon is no coincidence. In fact, taste and smell can create stronger and longer lasting memories than sound, sight, and touch. This research project delves into the connections between food and memory using psychological research of the brain as well as anthropological research of food practices and rituals to uncover why food creates such strong memories and, in addition, how this contributes to food’s ability to impact or construct cultural identities. The base point of the research is Proust’s novel In Search of Lost Time, as Proust was able to recognize in his writing the ability of food to inspire memories before neuroscience and psychology proved this to be true. In the novel, Proust’s narrator tastes a morsel of a madeleine cookie, and the memories that stem from its once familiar flavor are enough to fill seven volumes. Recognizing the importance of food in the context of the novel provides a unique lens through which to then apply scientific, psychological, and anthropological data that together reveals the important cultural significance of food in today’s world.
Papaya ringspot virus (PRSV; family: Potyviridae; genus: Potyvirus) is responsible for severe crop losses in both papaya (Caricaceae) and cucurbits (Cucurbitaceae) worldwide. PRSV has a single-stranded, positive RNA genome of over 10kb. Two strains of this virus, which are P and W, exist. PRSV-P has been shown to infect papaya and PRSV-W infects cucurbits. Most research has been focused on the genetic diversity of the P strain, but there is little research data involving the W strain, particularly in the USA. The only study that examines the genetic diversity of PRSV-W was conducted in the Ali lab in Oklahoma at The University of Tulsa during the 2008-2009 growing seasons. In the 2013 through 2015 growing seasons, PRSV-W infected samples were collected from growers’ fields in Tulsa County. These samples were characterized by extracting RNA of the virus, amplifying the coat protein gene by reverse transcription polymerase chain reaction (RT-PCR) using specific primers, cloning and sequencing. The resulting sequences were integrated into a maximum likelihood phylogeny, along with the previously reported PRSV isolates in 2008-2009. The sequences clustered loosely, based on geography. The phylogeny also has interesting implications when examined with the specific mutations and contributes to the understanding of PRSV-W diversity.

Suits, Craig
THE RELATIONSHIP BETWEEN SLEEP AND ACADEMIC PERFORMANCE

Prior research shows that college students who get more sleep at nighttime tend to have higher GPA’s than college students who get less sleep at night (Lowry, 2010). This proposed research will take place in the spring of 2018 at a Tulsa, Oklahoma, high school. Approximately 100 students will complete a survey consisting of information asking about how much sleep the students received each night during the school week (Monday through Friday). It is hypothesized that students who get eight or more hours of sleep each night will have higher math scores than students who get less than eight hours of sleep each night. It is expected that the more sleep a student gets, the better he or she will perform academically. Results from this study could help students plan for academic success.

Tapp, Grace, Ying Zhang, Yan Hao, Tim Wen, Laurence Florens, and Dr. Michael Washburn
THE FUTURE OF PROTEOMIC ANALYSIS AND WORLD HEALTH

Multidimensional protein identification technology (MudPIT) is a largely unbiased method for fast and high-throughput proteome analysis. It uses multidimensional liquid chromatography, tandem mass spectrometry, and database searching by the SEQUEST algorithm to detect and identify proteins. Through this futuristic proteomic technique, we can analyze the components of protein complexes. An understanding of these complexes could lead to an advancement in medicine and world health.

Thomas, Christopher
LEARNING AND GAME DESIGN

Games are said to be intrinsically motivating due to their ability to satisfy psychological needs (Przybylski et al., 2010). Thus, games act as an excellent conduit for teaching new tasks. The Dynamic Model for Gamification of Learning (DMGL) (Kim & Lee, 2015) was developed to integrate learning elements into a gamified context. Learning games motivate us through emotional stimulation, challenges, and by appealing to our natural curiosity (Malone, 1980). Additionally, the way a game presents these
features contribute to our feeling of control in a game (Malone & Lepper, 1987). However, more than these, game developers must carefully balance these motivators alongside typical constructs of a game—mechanics, dynamics, and overall aesthetic (Hunicke, LeBlanc, & Zubek, 2004). We modified the DMGL for a simulated immersive task environment. In order to overcome the increasing difficulty of the task trials, participants must learn game mechanics as well as team cooperation. The purpose of this study is to identify the specific game/task elements that are most indicative of learning and performance in a synthetic task environment.

Tiwari, Ram Chandra
STUDY OF ELECTRICAL AND THERMAL PROPERTIES OF CO-DOPED ZNO NANOPARTICLES

We investigated electrical and thermal properties of ZnO nanoparticles (NPs) prepared by precipitation method. Thin layer of ZnO NPs on Indium Tin Oxide (ITO) substrate was prepared by spin coating technique. The layer of ZnO NPs doped cobalt deposited on the substrate was annealed from 1000°C to 300°C with the variation in Cobalt doping from 0% to 15%. To observe the change in activation energy with doping, changes in impedance with temperature was observed. Cole-Cole plot showed inverse relationship between temperature and resistance of the ZnO NPs. Moreover, the resistance was found to decrease while increasing Co-doping from 0% to 15%. Graph of resistivity Vs temperature for samples with different cobalt content was used to estimate the thermal activation energy in the temperature range 1000°C to 3000°C. With the increase of doping level, the thermal activation energy was found to decrease from 85.13meV to 58.21meV. Based on the results, we will also discuss applications of cobalt doped ZnO QDs on improving conversion efficiency of solar cells.

Tochtrop, Emily
MICRO-WEAR ANALYSIS OF MULTI-PURPOSE STONE TOOLS

If a chert flake is used for multiple purposes, then it is possible to distinguish striations, edge damage, and polish patterns from each task conducted. In order to prove the accuracy of this hypothesis, an experiment was conducted using eight Edward’s chert flakes. The contact materials selected for this experiment were a piece of hard, dry oak wood and a piece of soft, deboned pork loin. A control sample was created using four flakes to only perform a series of unidirectional, longitudinal cuts. The additional four flakes were tasked with performing a series of unidirectional, longitudinal cuts first on wood, then on pork. Both before and after use each flake was examined microscopically for the appearance of wear patterns including: edge damage, striations, and polish. These microscopic analyses were conducted with low and high powered magnification. The purpose of this paper is to analysis chert flakes for microscopic wear patterns created through multiple tasks in order to determine if it is possible to distinguish striations, edge damage, and polish patterns from each task conducted. Additionally, to encourage other micro-analysts to consider the patterns of striate, polishes, and edge damages could indicate a multipurpose function rather a single function.

Tovar, Ruben
THROUGH THE EYES OF A SALAMANDER,
A TRANSCRIPTOME WIDE ANALYSIS OF OCULAR DEVELOPMENT

Comparative studies in evolutionary developmental biology have revealed otherwise enigmatic genetic mechanisms underlying divergent phenotypes. Cave adapted organisms provide an ideal platform for comparing disparate phenotypes, yet most remain understudied due in large part to their relatively inaccessible habitats. Interestingly, the central Texas Eurycea clade exhibits a continuum of karst
salamander phenotypes. The Comal blind salamander (E. tridentifera) is considered a stygobiont because it completes its life cycle in an aquatic subterranean habitat where it lives in perpetual darkness. Consequently, E. tridentifera exhibits a broad head, gracile limbs, limited pigmentation and highly reduced eyes. In contrast, the Texas salamander E. neotenes) is epigean and is endemic to surface habitats; it exhibits small robust limbs, pigmentation, and well developed eyes. Given the paucity of studies holistically identifying gene expressions responsible for divergent phenotypes, our goal is two-fold; First, to determine the genes responsible for divergent ocular phenotypes through development. Second, to identify differential expression and potentially novel candidate genes. To determine the sequence of events during development that lead to widely disparate ocular outcomes and to gain insights into the molecular mechanisms responsible, a series of developmental stages were obtained from the two species (E. neotenes and E. tridentifera). We used RNA-sequencing (RNA-seq) to compare gene expression through a developmental series between the two divergent phenotypes by identifying Gene Ontology terms. Herein, we present an ongoing transcriptomic analysis of two divergent Eurycea species. Importantly, this study provides initial insight to the genes responsible for divergent ocular phenotypes in a stygobitic tetrapod.

Trowhill, Kasey  
COMMUNITY SERVICE IN OKLAHOMA: SUMMER STEM PROGRAMS FOR MIDDLE AND HIGH SCHOOL YOUTH

Universities around the state of Oklahoma have been providing free summer STEM Academies to middle school and high school students since the year 2000. The STEM academies range in specific topics, but all provide hands-on learning in collaboration with other students. The overarching goal of these STEM academies are to create an interest, build confidence and encourage students to participate in STEM fields in the future. The majority of the STEM academies provide a residential experience for the students where they live on the university campus for the length of the program. The participants are able to meet and be taught by university professors as well as graduate and undergraduate students. This community service project will not end with this presentation or with the visitation of the many STEM academies this summer. It begins with the Technology Education and Collaborative Summer Academy held in Tulsa last summer but will take the Tulsa program and compare it to other state programs. By the end of 2017, data from over 400 summer programs will be analyzed for their role in STEM education in Oklahoma. Each STEM academies receive a limited amount of funding from the Oklahoma state regents, therefore, a cap on the number of students has been a challenge. Funding, activities, assessment and stories being told by academy goers is the topic of this community service presentation.

Trowhill, Kasey  
THE RELATIONSHIP BETWEEN STUDENT INVOLVEMENT IN STEM RELATED EXTRACURRICULAR ACTIVITIES AND COLLEGE MAJOR/CAREER CHOICE

Recent studies have shown that there is a demand for STEM jobs in the United States, as well as worldwide. To fill these jobs, more people need to be majoring in STEM fields. In 1998, the State legislature in Oklahoma created a programs for middle and high school students to help supply the STEM career demand. The Summer STEM Academy program has introduced STEM careers and opportunities to over 4000 since its conception. In 2016, one summer program, a geoscience high school academy, was evaluated and showed to be a linkage to students majoring specifically in geoscience and other STEM fields (Carrick, et al., 2016). This presentation will attempt to show similar results from not just one summer program, but from data from 16 years of Oklahoma summer STEM academies (2000-2017) in an effort to evaluate if students who attend these academies major in STEM fields in college. In addition to work done last year, a survey will be administered to summer 2017 participants to understand the relationship between student attitudes toward academy participation and college major. The entire research project will be completed by the end of the 2017 summer. This presentation will discuss past
summer academies, and will prepare the way for the data analysis that will include this coming summer’s programs.

Vissers, Hannah
EXPERIENCES OF INTERNATIONAL STUDENTS AT THE UNIVERSITY OF TULSA
The University of Tulsa prides itself on its large international student body, and this often attracts students who are considering enrolling at TU. The goal of this research project was to hear about the experiences of international students by listening to their perspectives on living in a foreign culture. I conducted five in-depth interviews with students who were at least 18 years old and who hadn’t lived in the United States before moving to TU. All interviewees’ names and names mentioned in the interviews were replaced with pseudonyms to protect the interviewees’ identities. I chose four interviews to transcribe and analyze for my final project. This included students from China, Canada, Pakistan, and Oman. Each interview lasted from 45-60 minutes. Several themes stood out across the interviews. The first involved challenges experienced by international students when interacting with American students. Each interviewee expressed a feeling of separation when they were within an American friend group. The second theme concerns differences of opinion on the US (in terms of its values and social/political/economic structure) based on cultural and geographic background. The interviewees’ experiences at TU largely depended on a comparison of their experiences from home. And lastly, a theme emerged surrounding the importance of food as part of a cultural identity. “Food from home” was a recurring topic throughout the interviews and pointed towards a place of comfort for the students while being surrounded by other foreign influences.

Waldman, Laura
LOCATABLE PLASTIC PIPE
Modern utilities pipe, commonly made from various kinds of plastics, is difficult to locate once buried. It is not uncommon for pipes to be damaged during construction, because the pipes are buried at shallow depths. Current detection methods for plastic pipe are costly, time consuming, and require trained operators. One common location method relies on a tracer wire buried alongside the pipe, but this method can fail if the wires corrode or break. Novel magnetic and conductive composite polymers are being developed to overcome these problems. Impregnating the polyethylene pipe with a conductive or magnetic material would allow the pipe to be detected with more conventional methods such as magnetic detectors. Carbon black, when mixed into the plastic, makes the plastic conductive. Another method for rendering the pipes detectable is to incorporate microcapsules filled with magnetic nanoparticles into the polymer material as it is being extruded. This presentation will cover progress to date on this research.

Walter, Charles, Rose Gamble
TOWARD PREDICTING SECURE ENVIRONMENTS FOR WEARABLE DEVICES
Wearable devices have become more common for the average consumer. As devices need to operate with low power, many devices use simplified security measures to secure the data during transmission. While Bluetooth, the primary method of communication, includes certain security measures as part of the format, they are insufficient to fully secure the connection and the data transmitted. Users must be made aware of the potential security threats to the information communicated by the wearable, as well as be empowered and engaged to protect it. In this paper, we propose a method of identifying insecure environments through crowdsourced data, allowing wearable consumers to deploy an application on their base system (e.g., a smart phone) that alerts when in the presence of a security threat. We examine two different machine learning methods for classifying the environment and interacting with the users, as well as evaluating the potential uses for both algorithms.
Walter, Charles, Rose Gamble, Gene Alarcon
DEVELOPING A MECHANISM TO STUDY CODE TRUSTWORTHINESS

When software code is acquired from a third party or version control repository, programmers assign a level of trust to the code. This trust prompts them to use the code as-is, make minor changes, or rewrite it, which can increase costs and delay deployment. This paper discusses types of degradations to code based on readability and organization expectations and how to present that code as part of a study on programmer trust. Degradations were applied to sixteen of eighteen Java classes that were labeled as acquired from reputable or unknown sources. In a pilot study, participants were asked to determine a level of trustworthiness and whether they would use the code without changes. The results of the pilot study are presented to provide a baseline for the continuance of the study to a larger set of participants and to make adjustments to the presentation environment to improve user experience.

Weber, Emily
IDENTIFICATION OF THE FREE-LIVING AMOEBA IN BRADEN PARK AND MOHAWK PARK IN TULSA, OKLAHOMA, USING MOLECULAR METHODS

A free-living amoeba found in warm freshwater throughout the world, Naegleria fowleri causes primary amoebic meningoencephalitis (PAM) in humans when inhaled through the nose. With rapid and aggressive symptoms, the human fatality rate is over 97%. Identifying the concentration of N. fowleri in lakes and other aquatic environments is crucial to educating and protecting potential swimmers. The purpose of this study is to identify N. fowleri DNA in water using molecular methods and to test the effectiveness of those molecular methods. In the first part of this study, water samples were taken from Braden Park in triplicate and spiked separately with N. fowleri, N. gruberi, and Acanthamoeba palestinensis. DNA from each spiked sample was extracted and run against Acanthamoeba and Naegleria Polymerase Chain Reaction (PCR) primers. The water spiked with A. palestinensis tested positive for that amoeba. PCR is being repeated to confirm these results. In the second part of this study, samples were collected in duplicate from water sources in Mohawk Park. One sample from each location was cultured for isolation of the amoeba. DNA will be extracted and identification will be attempted using PCR. Results to follow.

Welch, James
MARK HANNA: THE CREATOR OF EDUCATIONAL BIASED CAMPAIGNS AND THE PERPETUATION OF DOLLAROCRACY

Dollarocracy is described as the perversion of democracy by Big Money interests to sap the meaning of elections in order to gain control and strip the electorate of their voices and form a plutocracy; a government that is run by the wealthy. While many historians argue the Founding Fathers created Dollarocracy, it was Mark Hanna, a wealthy businessman of the nineteenth century, who constructed the modern day “media election complex” that allows Dollarocracy to prevail. He created this significant component by mobilizing business interests as never before to implement a political machine that educated the electorate of the Republican platform, much like the partisan education that the wealthy of today fund to ensure their candidate’s victory. Hanna successfully rallied business interests around McKinley, and convinced them to donate to his campaign. His efforts ensured that the Republican National Committee (RNC) could implement a campaign strategy that disseminated more information than William Jennings Bryan. Thus, more voters heard McKinley’s message, and may have been the only message heard by some. Biased education and monetary supplementation is a strategy used in modern day media and politics as well. For example, as opensecrets.org shows; the Fox News Anchor, Sean Hannity, extensively contributes to political campaigns and PACs. Therefore, just as Hanna had done, Hannity can express his views through a biased “news” outlet, and then take personal action to ensure that his ideologies prevail during elections.
Westbrook, Julia

COMPARATIVE EUROPEAN ASYLUM POLICIES IN LIGHT OF THE RECENT INFLUX OF SYRIAN REFUGEES

This project attempts to identify the societal or cultural factors that lead to a country’s strict or open asylum policy. My research asks the question, “why are some countries more or less tolerant of refugees?” This topic has proved to be critical in the recent and upcoming worldwide elections. I have narrowed my focus to two case studies: the welfare state of Denmark and Germany with the “open door” policy. My project remains in progress as I synthesize and analyze the qualitative data that I collected last semester. I have interviewed ten individuals representing several NGOs and nonprofits, government agencies and specialized law practices in both Denmark and Germany to serve as data for analysis. While the project is still underway, it is becoming evident that varying degrees of xenophobia, religious ideals, Islamophobia, fear in general, as well as a broad range of cultural norms and values and a country’s cultural and military history play integral roles on the society’s influence of their respective asylum policy. The role of the church as well as the role of the media also make a difference. The data I have gathered reveals a clear connection between a society’s overall tolerance and acceptance for those who are different and their levels of restrictions and limits in asylum policies. To gain a more personal understanding of the asylum and integration processes in my own community, I have volunteered with the YWCA Office of Immigrants & Refugees throughout the course of this project.

Wijayasekara, Dulanjani, Akhtar Ali

CHARACTERIZATION OF MAIZE DWARF MOSAIC VIRUS FROM JOHNSONGRASS IN OKLAHOMA

The United States of America (USA) is the largest producer of maize (Zea mays. L) by contributing 40% of the world maize production in 2010. Maize is susceptible to several virus diseases that cause severe yield lost. In USA two major maize viruses causing severe damage was reported as Maize chlorotic dwarf virus (MCDV) and Maize dwarf mosaic virus (MDMV). During the field survey in Oklahoma in 2016, Johnson grass showing yellow mottling symptoms on leaf blades were collected. A virion extraction was carried out to observe virus-like particles (VLP) using symptomatic young leaves as described before. Flexible rod shaped virion particles were observed under the transmission electron microscopy that resembles typical potyviral like particles ranging from 700 nm in length and 13-14 nm in width. Random PCR was carried out using RNA extracted from VLP preparations by random hexamers, PCR product was cloned and recombinant clones were sequenced. NCBI nucleotide blast of obtained sequences indicated that these plants were infected with MDMV. MDMV is reported to cause severe disease in maize, sorghum and Johnsongrass. It is reported that MDMV can overwinter in Johnsongrass and it can act as an alternative host for this virus. Based on our results, we report MDMV infection in Johnsongrass for the first time in Oklahoma. It is important to study the evolution of this wild strain of MDMV to understand its source of infection together with its prevalence and incidence in Johnsongrass to implement control strategies for MDMV in major economically important agricultural crops.

Willis, Giselle

RESPONSES TO ONLINE HARASSMENT

Online harassment includes everything from cyberbullying to anonymous death threats. Harassers will also target and intimidate professionals who are required to have a social media presence, such as journalists. At the societal level, these attacks can result in self-censorship, thus reducing democratic exchange of information; at the individual level, these may foster mental health problems. Currently there is little empirical evidence suggesting effective methods for addressing online harassment, and few methods for addressing in-person harassment apply to online forms. This presentation will summarize work from an ongoing literature review that is meant to determine in part the motivation of online
Win, Arthur
TEMPERATURE DEPENDENCE OF ELECTRICAL CHARACTERISTICS IN SI SINGLE-ELECTRON TRANSISTORS
With the physical limits of Moore’s Law approaching, current large-scale integration (LSI) technology faces many limitations including: increasing power consumption, cooling limitations, and scaling limitations. One possible solution for many of these issues is the single-electron transistor (SET). Due to their low power and small size, SET’s have a promising potential in future large-scale highly integrated circuits. Here, we investigate the electrical characteristics of SET’s at various temperatures and discuss its implications in the future of computation and technology.

Wirth, Denise, Gabriel LeBlanc
SELECTIVE ELECTROPOLYMERIZATION OF ANILINE ON AN ITO ELECTRODE USING MAGNETIC NANOPARTICLES AND A VARYING MAGNETIC FIELD

Electrically conducting polymers, such as polyaniline, are increasingly being used in electronic devices over conventional metals and semiconductors due to their comparable conductivities, flexibility, and greater processing ability. For various electronic applications, the conducting polymer must be spatially deposited on a substrate in a specific pattern to perform a specific task. Numerous patterning techniques have been used to deposit conducting polymers in a desired manner; however, these methods are either too complicated, not practical, or do not provide the needed resolution for the intended application. In this research, polyaniline has been deposited on a flexible ITO electrode through an oxidative electropolymerization reaction. Magnetic nanoparticles have been positioned on the electrode using various magnetic fields in order to block the deposition of polyaniline in the corresponding patterns. In the unblocked regions, polyaniline forms on the electrode through the electropolymerization reaction, whereas on the regions blocked with magnetic nanoparticles no polyaniline forms. Polyaniline patterns have been formed in this way at technologically relevant resolutions and conductivities. The pattern of conducting polymer on the electrode has been found to change depending on the magnetic field shape and strength.

Wright, Amber
TEAM INTERACTIONS IN CLASS GROUP PROJECTS

Teams are widely used in work and learning environments. The success and compatibility of a team is determined by many individual and contextual factors that contribute to a team’s effectiveness. One widely studied factor is social loafing. Social loafing is defined as the tendency for individuals to expend less effort when working collectively than when working individually (Karau & Williams, 1993; Latané, Williams, & Harkins, 1979: 681). Teams that have an individual who social loafs often face negative consequences such as less performance success and less agreeableness among team members (Simms & Nichols, 2014). Another potential factor that affects teams is individual procrastinatory behavior. Procrastination is an almost universal phenomenon affecting 80% to 95% of the college student population (O’Brien, 2002). In general procrastination is defined as postponing or delay on performing a task or decision (Milgram, Mey-Tal, & Levison, 1998). Both procrastination and social loafing are thought to be maladaptive behaviors altering a team’s potential success. Little research has been done on the connection between these two behaviors beyond one study that found academic procrastination was positively related to social loafing (Ferrari & Pychyl, 2012). The purpose of this project is to further explore the relationship between procrastination and social loafing in a team context to understand if these two behaviors are related.
Wright, David J., John Henshaw
COB CONSTRUCTION: EARTHEN BUILDING FOR SUSTAINABLE HOUSING

Earthen construction, though one of the earliest forms of human shelter, has been largely overlooked since the industrialization of housing materials. Interest in earth-based building materials has increased steadily since the 1980s, and one of the most accessible of these natural materials is cob. Cob is a mixture of sand, clay, and straw molded into a monolithic wall structure. The materials are inexpensive and plentiful with low embodied energy. The resulting structures are simple to build and have a history of safety and disaster resistance. The narrow requirements of modern building codes do not allow most forms of earthen construction, restricting the legal use of many sustainable materials like cob. This presentation outlines the work being performed at The University of Tulsa to provide quantitative evaluation of the material properties of cob. Experimental testing has provided initial data on drying rate and mechanical strength of cob test specimens. This work is in collaboration with external industry groups to incorporate the results into building best practice or building code documents for sustainable construction.

Xue, Sha, Yingdi Liu, Yaping Li, Dale Teeters, Daniel Crunkleton, and Sanwu Wang
DIFFUSION OF Li IONS IN AMORPHOUS AND CRYSTALLINE PEO3:LiCF3SO3 POLYMER ELECTROLYTES

The PEO3:LiCF3SO3 polymer electrolyte has attracted significant research due to its enhanced stability at the lithium/polymer interface of high conductivity polymer batteries. Most experimental studies have shown that amorphous PEO lithium salt electrolytes have higher conductivity than the crystalline ones. Other studies, however, have obtained opposite results. As a result, further theoretical investigations are warranted to help clarify the issue. In this work, we use density functional theory and ab initio molecular dynamics simulations to obtain the amorphous structure of PEO3:LiCF3SO3. The atomic-scale mechanism of lithium ion transport in the polymer electrolytes are investigated with the climbing nudged elastic band method. The diffusion pathways and activation energies of lithium ions in both crystalline and amorphous PEO3:LiCF3SO3 are determined. In crystalline PEO3:LiCF3SO3, the activation energy for the low-barrier diffusion pathway is approximately 1.0 eV. In the amorphous phase, the value is 0.6 eV. This result would support the experimental observation that amorphous PEO3:LiCF3SO3 has higher ionic conductivity than the crystalline phase. Simulations and calculations were performed on the supercomputer resources of the XSEDE, the NERSC, and the Tandy Supercomputing Center.

Yungbluth, Jack
ELECTROCHEMICAL CONTROL OF PHASE CHANGE PROPERTIES IN NANOPARTICLES OF SILVER SELENIDE

Phase change properties are of great significance recently because of both interests to fundamental science as well as new potential applications. In particular, how to invoke a phase transition in novel ways is an area of active research. We are looking into phase transitions in nanocrystals of silver selenide (Ag2Se). It has already been noted that the phase transition temperature of silver selenide nanoparticles is inversely related to size, and now we are investigating if the phase transition of silver selenide can be affected by electrochemistry. To accomplish this we are utilizing a unique in situ measurement technique, which allows for temperature modification, acts as an electrochemical cell, and can gather UV-Vis spectroscopy data simultaneously.
Fracture-based strengthening techniques have been used in geologically complex reservoirs to strengthen wellbores during the past two decades. These techniques efficiently reduced the cost and risks caused by lost circulation especially in the depleted sections that have narrow mud weight window (MWW). The industry experience is that wellbore strengthening works well for conventional reservoirs (e.g., sandstone formation) but not well for unconventional reservoirs (e.g., shale formation). However, no rigorous models were available so far to characterize the critical permeability. If the formation permeability is larger than the critical permeability, conventional wellbore strengthening techniques are suitable. In this paper, an analytical model is developed to find the leak-off time of fracturing fluid in the plug zone to surrounding formation after wellbore strengthening materials (WSM) plugging. The results show that the influencing factors for leak-off time are plugged fracture area, WSM plug location, fracturing fluid viscosity, differential pressure between wellbore pressure and pore pressure, formation porosity, and permeability. A case study is conducted with varying formation permeability (0.0001 md to 50 md). For permeable formation (permeability $>$1 md), the leak-off time is only a few seconds. However, the leak-off time can increase to several hours for low permeability formation (permeability $<$ 0.001 md). A critical permeability zone is identified and the results are in good agreement with gained field experience. The analytical model is a strong tool for wellbore strengthening methods selection and accurate particle size distribution (PSD) for wellbore strengthening applications.
Bailey, Ashley, Ashley N. Clausen, Rachel Micol, and Joanne Davis
THE EFFECT OF THREAT OF VIOLENCE ON THE TIME TO REPORT RAPE

Objective: The time in which sexual assault survivors report a rape negatively influences the credibility of a case. Although sexual assault research is increasing, little is known about factors that may influence the time to report a rape. Given that prior research highlights a relationship between the threat of violence (harm to the survivor or someone else) and increased psychopathology, this study explored potential differences in time to report rape between those who did and did not experience a threat of violence.

Method: Participants included 442 female rape survivors ages 18-89 (mean age=29.7, SD=10.9) who completed a Sexual Assault Nurse Examiner (SANE) exam. This exam listed whether a victim was threatened with violence during the assault. Age, time to report the rape, and threat of violence were assessed via self-report. Age was explored as a possible covariate. Independent samples t-tests were used to investigate potential between group differences in time to report a rape.

RESULTS: Age was not related to time to report rape (r=0.06, p=0.214) and not included as a covariate. Results suggest that time to report a rape was not different between females who did (mean time to report=21.4 hours, SD=28.27) and did not (mean time to report=23.9, SD=27.7) experience a threat of violence (t(440)=0.933, p=0.351).

DISCUSSION: Results provide initial evidence that factors other than threat of violence (e.g., social support) may influence the time it takes to report a sexual assault, highlighting the need for future research in this area.

Basnett, Andrew and Dennis Kerr
CHEMOPROVENANCE OF THE WOODFORD AND CHATTANOOGA SHALES, OKLAHOMA

Upper Devonian to lower Mississippian Chattanooga and Woodford mudrocks are evaluated in terms of major and trace element concentrations to evaluate the hypothesis of a Laurentian cratonic interior provenance. An alternative provenance might include Acadian/Taconic terranes adjacent to southern midcontinent sector of southern Laurentia. In addition, chemostratigraphic correlations are being considered from exposures along the flanks of Ozark uplift to exposures in the Ardmore area, which are some 175 mi. (282 km.) apart. Samples of terrigenous mudrocks are selected from quarry exposures to minimize chemical weathering alterations.

This study uses a complete set of major elements and up to 32 trace elements and 8 REE from ICP-MS and INAA analysis; previous studies have used a more limited number of elements from XRF analysis. Total organic carbon (TOC) is compared to redox sensitive trace metals with positive correlations indicating element enrichment from marine waters and not necessarily from weathering of provenance terranes. Chemical Index of Alteration (CIA) is assessed against the paleogeographic location (20°S) with values expected for paleoclimates of this latitude, indicating local first cycle sources vs. higher values suggesting far sources of lower latitude and/or recycled sedimentary sources. Various incompatible to compatible element ratios are compared to established petrochemical sources. REE element spider diagrams, and LREE/HREE and Eu-anomaly is also consider for constraining provenance.

Although research is progress at this time, it is expected that results will have significant impact on understanding Devonian-Mississippian fine textured sediment dispersal across the southern margin of Laurentia for an important petroleum unconventional resource.
Blackwell, John, Junran Li, Rarek Kandakji (Texas Tech University), Joe Collins (University of Texas, El Paso), Jeff Lee (Texas Tech University), and Thomas Gill (University of Texas, El Paso)

**BLOWING DUST ON HIGHWAY SAFETY: CHARACTERIZING AND MODELING OF DUST EMISSION HOT SPOTS IN THE SOUTHERN PLAINS**

Blowing dust and highway safety have become increasingly prevalent problems concerning human safety and welfare. Two factors precipitate wind-blown dust accidents: sudden loss of visibility, and loss of traction due to soil particles on the road surface. The project, using remote sensing and in situ measurements of surface and subsurface characteristics, will identify the location of dust emission “hotspots” and associated geomorphic features within the southwest region and panhandle (New Mexico, Texas, and Oklahoma), identify the land use associated with these hot spots, measure the volumetric moisture percentage of the potential hot spot, measure the vegetation, gap, and canopy height of vegetation to calculate the threshold shear velocity (TSV) of each potential hot spot model the results using a new software: DUSTRAN-A GIS-based Dust Dispersion Modeling System. These results will provide land managers, policy makers, and highway authorities’ critical information when making timely and informed potentially life-saving decisions and modifications. Decisions relevant in the southwest region, panhandle, and potentially world, wherever blowing dust is a hazard to highway safety.

Chowdhurry, Shuddha and Sharmin Jahan

**SMART PRICE TAG AND SMART RACK MANAGEMENT SYSTEM FOR FUTURE CONVENIENCE STORE**

The Internet of Things(IoT) presents an enormous amount of opportunity for retailers to develop a vastly improved ecosystem that connects physical and digital worlds, allowing bidirectional, real-time interaction with consumers both inside and outside of the store. Future convenient stores will be smart, intelligent and it will improve customer experience in various ways. Not only it will save valuable time for the users, but it will also significantly improve user experience too. Since the number of IOT connected devices is increasing at an alarming rate, we want to develop low-cost but efficient and intelligent IOT systems which we can easily integrate into the real world. Current price tags which are attached and displayed with the products are static, and they do not keep track with the real-time supply and demand. They do not perform analysis of users' behavior and make decisions based on users' previous purchases. Our Smart Rack Management System will notify the retailers when the rack is empty so that retailers can fill the rack immediately. In the future, these types of smart price tags and smart rack system will be ubiquitous in convenience and retail stores to significantly improve a user’s purchasing experience and in-store experience. Smart price tags will provide discounts to customers and motivate them to buy more products. Additionally, it will update the price in real time so that real-time market data can be used to calculate the latest price.

Coleman, Jonathan, Jesse Issaacs-Boyett, Brady Mayfield, and Nathan Reisner

**The Effect of Sugar-Free Energy Drink on Adolescent Pain Induced by an Ischemic Method**

Energy drinks are consumed with the intent of improving performance at increasing rates. Current literature shows mixed results for the effect of energy drinks on subject pain tolerance. Energy drinks effect on youth is not well researched. Twelve to fifteen year olds were tested. Using a double blind study, subjects were administered a sugar-free energy drink (3 mg caffeine/kg body mass) or a placebo (equal volume). Subjects had eight hours of sleep, no food for eight hours, and no caffeine for twelve hours prior to testing. Sixty minutes after the treatment, muscle fatigue was induced with fifty percent of maximum effort for two minutes using a dynamometer. Fresh oxygen was prevented from reaching the forearm by applying a blood pressure cuff to the upper arm during pain assessment. A self-assessed six-point linear pain intensity scale.
was used to determine pain level. The subject identified the pain level every thirty seconds for two minutes following the inflation of the cuff. Results were analyzed using the within-subjects t-test method.

**Corley, Ryan**

**NMFTA CAN LOGGERS**

Currently we have a grant with The National Motor Freight Traffic Association to design and produce 100 low cost CAN loggers. We have designed a simple compact device and each will record data from semi-trucks around the country. The goal of this project is to create a database of typical driving data for heavy trucks. In the future we can use this data to develop a system to scan for anomalies that could be malicious attacks on a heavy truck’s CAN network. While being responsible for every step of designing the hardware and software, this project has offered numerous educational opportunities. These devices are fully capable of logging at 100% busload, with a maximum data capacity of nearly 32GB. Each device has been through a strenuous quality control project as they under no circumstance can affect the productivity of the truck that each unit is installed on. These devices are truly a step in the right direction towards understanding and learning about how each of the on board computers interacts with those around them, and offer potential insight into how to properly care for a mobile network such as the Heavy Truck’s CAN network.

**Brian Diehl**

**SEQUENCE STRATIGRAPHIC RELATIONS OF THE FREDERICKSBURG AND WASHITA GROUPS, LOWER CRETACEOUS CARBONATE SHELF, TEXAS**

Stratigraphic interpretations of the Lower Cretaceous – c. 108-97 Ma – Fredericksburg and Washita groups on the Comanche carbonate shelf have been debated for many years. Applications of sequence stratigraphy provide an accurate method for predicting the thickness, quality, and distribution of reservoir rocks in the Fredericksburg Group. This research addresses several ongoing questions regarding carbonate sequence stratigraphy of the Fredericksburg and Washita groups and tests current stratigraphic models. The sequence boundary between the Fredericksburg and Washita groups, Albian Sequence Boundary Washita 1 (AL SB WA1), is an iron-stained, bored hardground in north Texas, and southeast Oklahoma. In the Western Interior the contact records the flooding of the North American Continent. However, southward on the San Marcos Arch near Austin, Texas, the contact has been traced at the base of the Person Formation by several published stratigraphic models. This study documents the origin of the Fredericksburg-Washita sequence boundary and tests correlations of carbonate depositional cycles. To accomplish the objectives, petrographic, isotope, and X-Ray Diffractometry data of core and outcrop sections were gathered. Results support a sequence stratigraphic interpretation that traces the Fredericksburg-Washita contact from north Texas (between the Kiamichi and Goodland formations) to south-central Texas (between the Person and Georgetown formations) as a continuous, unconformable surface.

**Carr, Jessie Goolsbay**

**ANIMAL-ASSISTED THERAPY: KNOWLEDGE, ATTITUDES, BELIEFS, AND PRACTICE PATTERNS OF SPEECH-LANGUAGE PATHOLOGISTS**

Background: Animal-assisted therapy (AAT) is the use of an animal as a therapy tool by a health professional to help clients reach their goals. Purpose: The purpose of this study is to assess the knowledge, attitudes, beliefs, and practice patterns of speech-language pathologists in Oklahoma regarding AAT. Methods: I conducted an electronic survey of speech-language pathologists at the 2016 Oklahoma Speech-Language-Hearing Association conference. The survey consisted of three sections: demographics, knowledge, and attitudes and beliefs. The demographics section assessed education, clinical experience, practice patterns, and AAT use. The knowledge section consisted of thirteen true and false questions about the basic concepts of AAT. The attitudes and beliefs section consisted of eighteen Likert-scale questions and four multiple-choice questions that assessed participant perceptions of AAT. Results: Of the 79 that
completed the survey, 97% believe that at least some of their clients could benefit from AAT, but only 20% of respondents have used AAT. On average, respondents answered 80% of the knowledge questions correctly and indicated positive perceptions of AAT in 69% of responses. Attitude toward AAT is the only factor related to AAT use. Conclusions: The results of this survey show that despite limited implementation, speech-language pathologists in Oklahoma have a good understanding of AAT and generally positive attitudes toward its use with clients with communication disorders. Results from this survey parallel the survey of occupational therapists performed by Hightower (2010). This could suggest a trend across rehab professionals’ knowledge, attitudes, beliefs, and practice patterns, including barriers to AAT implementation.

Johnson, Avery
TRAC ELE MENT TESTS OF LAVA RELATEDNESS FOR THE CRETACEOUS ONTONG JAVA PLATEAU

The Ontong Java Plateau is a large, submarine outpouring of basalt situated in the equatorial western Pacific Ocean. The plateau, Earth’s largest igneous province, covers about 2.0 x 10^6 km^2 and is covered with 200 to 1400 meters of sediment. It was formed rather rapidly, with the main emplacement of lava being about 120 million years ago. The Ocean Drilling Program (ODP) has made 10 drill holes to study the area. Remarkably, fresh basalt glass is preserved in most holes and provides excellent material for precise analysis of lava compositions. Published geochemical data from whole rocks from these holes indicate that the basaltic chemistry is fairly similar across the plateau. Geochemical similarity could indicate derivation of widely separated lavas from the same eruption (most related) to simply being from a similar mantle source (least related). In this study, I use trace element compositions of natural basalt glasses (which are much more precise than whole rock analyses), measured by laser ablation inductively coupled plasma mass spectrometry (LA-ICPMS), to test the relatedness of lavas from widely separated drill holes. Elements such as barium, niobium, and the rare earth elements and their ratios do not change with fractional crystallization, but are highly characteristic of mantle source composition. Therefore, these elements are used to determine whether lavas from separate drill holes came from the same eruption, or the same magma chamber, or represent melts of different mantle sources. For lavas that can be related by fractional crystallization, trace elements such as nickel and chromium that partition strongly into crystal phases are used to determine how much fractional crystallization occurred. Data will be presented to compare and determine potential relationships of lavas from different holes.

Kernen, Julianne
THE IMPACT OF DISFLUENCIES ON LISTENER RECALL AND COMPREHENSION: A SYSTEMATIC REVIEW

Disfluencies have inherent characteristics that might cause a disruption in listener recall and comprehension. These characteristics suggest that disfluencies are hurtful, or a disadvantage, to comprehension and recall; however, the predictive processing hypothesis, attentional-orienting hypothesis, and the temporal delay hypothesis suggest otherwise. These hypotheses suggest that disfluencies may be helpful to listeners. The purpose of this study is to determine how disfluencies in speech affect listener recall and comprehension. A systematic search was conducted using five databases, designated search terms, and set inclusion and exclusion criteria. The search yielded 423 total articles. After removal of duplicates, a title review, and a full text review with two reviewers, the search yielded 11 total articles with a moderate agreement value (k=0.55). The studies included were either randomized control studies or repeated measure designs. Six studies focused on comprehension, one focused on recall, and four focused on both skills. Results were analyzed for stuttering-like and non-stuttering-like disfluencies based on the assessment methods used. The disfluencies addressed in this study include: interjections, silent pauses,
prolongations, repetitions, and revisions. Findings suggest that disfluencies in most sentence structures have no effect on listener comprehension. However, recall skills of listeners are improved in the presence of silent pauses and interjections while repetitions and non-linguistic interjections hinder listener recall. Results do not reveal a specific cause for the disfluency advantage, but evidence suggests that the advantage may be due to the extra time, predictive features, or attention orienting characteristics associated with disfluencies.

Khattab, Raneem
INSULIN EFFECTS ON CELL METABOLISM IN CELLS LACKING THE TUMOR SUPPRESSOR P27KIP1

A novel role was recently identified for the tumor suppressor p27kip1 (p27) in cancer cell metabolism. Previous work used cells lacking p27 to show that its deregulation allows cancer cells to switch to amino acids as a carbon source when glucose levels are low. Because insulin is a well-known regulator of glucose metabolism, our goal was to evaluate insulin effects on cells with and without p27. We varied cell nutrients (ie their carbon source) in the presence of different insulin concentrations. Effects on cell metabolism were determined by measuring ATP levels using CellTiterGlo™, a luciferase-based assay in which ATP levels correlate with light produced and measured using a luminometer. Metabolic pathways being utilized were identified using the metabolic inhibitors 2-deoxy-glucose (which inhibits glycolysis) and rotenone (which inhibits the electron transport chain). Consistent with previous results suggesting the absence of p27 alters cell metabolism, we found that cells lacking p27 respond differently to insulin stimulation.

Loe, Elisabeth
SUGAR METABOLISM IN CELLS LACKING THE TUMOR SUPPRESSOR P27KIP1

Cancer cells display altered metabolic pathways to maintain sufficient ATP production while conserving carbon for the biomass production needed for cell proliferation (Warburg effect). We have investigated this phenomenon in mouse fibroblast cells with and without the tumor suppressor gene p27kip1, which is commonly deregulated in aggressive human cancers. Cells with and without p27kip1 were cultivated in a base minimal media lacking all carbon sources. Various sugars such as glucose, galactose, lactose, sucrose, and fructose were then added, and the effects on ATP production and viability were evaluated. Cell viability was measured using a resazurin-based fluorescent assay in which living cells convert resazurin to the fluorescent resorufin, which can be measured using a plate reader. The rate of cell metabolism (as indicated by ATP levels) was determined using the Cell Titer-Glo assayTM, a luciferase-based assay in which ATP levels correlate with light output. The amount of light emitted was measured using a luminometer. Results indicate that glucose is the preferred carbon source for ATP production in both cell types. The metabolic inhibitors 2-deoxyglucose and rotenone were employed to identify the metabolic pathways being utilized.

Mulligan, Ryan D., Irani Farzin, Shivde Geeta, Kumar Krishna, and Michael Basso
THE VALIDITY OF THE ROAD SIGN PERCEPTION TEST

Effort, the measurement of an individual’s investment in performing a given task compared to the individual’s natural performance, is widely applicable in the fields of criminal justice, psychological assessment, and medical diagnostics. Suboptimal effort or deceptive effort can tarnish the results and interpretation of a test administration. The Medical Symptom Validity Test is widely accepted as a gold standard instrument for suboptimal effort detection. A new test, the Road Sign Perception Test, could be an important contribution to the field of neuropsychology and, possibly, effort testing. The RSPT is a speeded visual perception test with variable times for presentation of visual road sign stimuli. The present study used an undergraduate sample screened for treated psychological or psychiatric disorders, treated medical conditions, substance dependence or abuse that was not in remission for the past 6 months, and experience with electroconvulsive therapy. They were administered the RSPT as well as the MSVT.
Performance on this new test (RSPT) was correlated MSVT. All participants obtained near perfect or perfect scores on the MSVT indicating good effort. Thus, given this lack of variability of scores, no significant positive correlations were found between the MSVT and the RSPT scales and subscales. A significant negative correlation was found between Delayed Recognition subtest on the MSVT and the Easy Item sub-score on the RSPT, but not with the Hard Item sub-score. The RSPT Easy and Hard Items mean scores differed significantly, which could inform patterns for detection of suboptimal effort in future studies. Additional data are provided on the RSPT in a healthy undergraduate sample for possible comparisons with future studies. Limitations of the current study and future directions for examining variability in effort are discussed.

Mulligan, Ryan, Basso R. Michael, Lau Lily, Whiteside Douglas, and Combs Dennis

DIAGNOSTIC, CONSTRUCT, AND ECOLOGICAL VALIDITY OF THE VERBAL CONCEPT ATTAINMENT TEST IN MULTIPLE SCLEROSIS

Objective: As many as 65% of people with multiple sclerosis (MS) have clinically significant cognitive impairment, and most of these people demonstrate executive dysfunction. Most research concerning executive dysfunction in MS has focused upon measures that ignore speed of information processing or psychomotor responses. Rather, most MS-related research has focused upon measures such as the Wisconsin Card Sorting Test (WCST), an index without speed demands. Nonetheless, the WCST focuses upon non-verbal concept formation to the exclusion of verbal conceptual reasoning. The Verbal Concept Attainment Task (VCAT: Bornstein & Leason, 1985) has demonstrated construct validity as an executive function measure in people infected with HIV and in people with focal brain lesions, but its validity among people with MS is unknown. The current study evaluated the VCAT’s diagnostic and construct validity in people with MS.

Participants and Methods: A comprehensive neuropsychological battery was administered to a total of 30 healthy individuals and 117 people with MS. Based on existing norms, they were classified as impaired or unimpaired, resulting in 21 people with MS categorized as impaired and 96 MS patients and 30 healthy people as unimpaired.

Results: VCAT scores were used to predict impairment in a receiver operating classification (ROC) analyses which captured 83% of the area under the curve. The optimal cut score of 18 on the VCAT yielded 77% sensitivity, 76% specificity, classification accuracy of 76%, a Youden Index of .52, positive predictive power of 36% and negative predictive power of 95%. This cut score fell at the 5th%ile of the healthy group. Regarding construct validity, the VCAT significantly correlated with the Wechsler Test of Adult Reading Standard Score (r=.357, p<.0005), Digit Span Age Corrected Scaled Score (r=.241, p=.005), WCST Percent Perseverative errors (r=-.309, p<.0005) and Percent Conceptual Level Response, (r=.368, p<.0005), Boston Naming Test (r=.362, p<.0005), California Verbal Learning Test-2 Total Recall (r=.367, p<.0005), Paced Auditory Serial Addition Task Total Correct (r=.281, p=.001), DKEFS Category Switching Total Switching Accuracy Scaled Score (r=.229, p=.007), Multilingual Aphasia Examination Token Test Total Raw Score (r=.174, p=.042), Symbol Digit Modalities Test Oral total correct (r=.288, p=.001), Verbal Fluency Total Correct Raw (r=.331, p<.0005), and it failed to correlate significantly with measures of sensory or motor function. The VCAT showed marginal correlations with the Chicago Multiscale Depression Inventory (CMDI) total score (r=-.174, p=.029). However, the VCAT achieved correlations with self-report measures of cognitive dysfunction (Mental Health Inventory, Perceived Deficits Questionnaire) and functional outcomes (Environmental Status Scale, Incapacity Status Scale, SF-36) that generally exceeded the other measures in the neuropsychological battery (all p’s<.001).

Conclusions: The data establish an optimal VCAT cutoff score for establishing neuropsychological impairment in people with MS. They further demonstrate that the VCAT possesses effective diagnostic and construct validity. Compared to other neuropsychological measures, the VCAT corresponded most highly with measures of functional outcomes and disability, implying that it possesses keen ecological validity. As such, these data argue for the inclusion of the VCAT in research and clinical practice involving people with MS.
Parackal, Julia and Sheaff Robert
SPECIFICALLY TARGETING CELLS LACKING THE TUMOR SURPRESSOR P27KIP1 USING METABOLIC INHIBITORS

P27 is a well-known cell cycle inhibitor that is deregulated in many types of aggressive cancers. Most tumor suppressor proteins are mutated at the gene level. However, p27 is deregulated at the protein level, making it a viable target for therapeutic intervention. Recent evidence suggests a novel role for p27 in metabolism. Using cells with and without p27, it was found that the absence of p27 allowed cells to switch to glutamine as a carbon source under low glucose conditions. It was hypothesized that this ability would provide a growth advantage during early tumor development when glucose is scarce. To confirm this hypothesis, the effects of metabolic inhibitors on cancer cell metabolism (ATP levels) will be evaluated and compared to the results to a control cell line lacking the p27 protein. 2-deoxy-glucose, (2DG), an analogue of glucose, was used to mimic low glucose conditions, while rotenone was used to inhibit the electron transport chain. ATP levels were measured using a luciferase-based assay (Cell-Titer GloTM). This assay lysis the cells and generates luminescence proportional to the ATP concentration, which can be measured with a photoluminometer (Glomax). Results indicate that cells containing p27 are very sensitive to 2DG, consistent with dependence on glycolysis. In contrast, cells lacking p27 were relatively insensitive to 2DG, suggesting they were able to switch to alternative carbon sources like glutamine. This hypothesis was confirmed by showing that in the presence of 2DG, cells lacking p27 become very sensitive to rotenone.

Peelen, Avery
THE EFFECT OF READING INSTRUCTION ON READING OUTCOMES IN DEAF AND HARD OF HEARING STUDENTS: A SYSTEMATIC REVIEW

Most profoundly deaf children lag significantly behind their hearing peers in reading development, and little research has been done to develop evidence-based practices for the deaf population. The purpose of this study was to determine how phonic skill-based approaches versus whole language approaches to reading instruction affect reading outcomes in elementary school students who are deaf and hard of hearing. I conducted a search of the literature for empirical evidence using a predetermined set of search terms in multiple databases. I removed duplicates and screened titles, and then I reviewed abstracts. Finally, two reviewers independently evaluated the full-text articles based on the eligibility criteria. All the studies included for synthesis were phonic or direct instruction approaches to reading instruction. No studies on the effects of whole language met eligibility criteria. All included studies showed positive effects on one or multiple reading outcomes. The reading outcomes represented were phonemic awareness, phonological decoding, reading fluency, and comprehension. Based on the information found in this systematic review, using a phonic approach to reading instruction with students who are deaf and hard of hearing could be appropriate. However, because no studies assessing the effects of whole language approaches met eligibility criteria and no studies compared phonic approaches to whole language approaches, it cannot be concluded that phonic approaches are more effective with deaf and hard of hearing students than whole language approaches.
Chemical sunscreens are commonly used to protect skin by reflecting or absorbing harmful ultra-violet radiation. Properties of the active ingredients, however, can be altered by chemical interaction with molecules in the environment. Previous research indicated that sunscreen active ingredients can react with chlorine under conditions similar to those found in swimming pools, which could influence their protective capabilities. Various commercial sunscreens were therefore allowed to react with hypochlorous acid followed by analysis of UV absorption using a UV/Vis spectrophotometer. While in most cases chlorination compromised UV absorption, one sample actually showed enhanced activity. This sample contained 1.0% avobenzone, 8.0% octocrylene and 3.5% oxybenzone. Current efforts are focused on chlorinating the individual active ingredients and determining which modified species leads to better UV absorption.

Porter, Allison
MIDDLE-UPPER ALBIAN SAN MARCOS PLATFORM SEQUENCE STRATIGRAPHY, EDWARDS AND WASHITA GROUPS, TEXAS

The controversy about the position and origin of the sequence stratigraphic contact between the older Fredericksburg and younger Washita groups on the Lower Cretaceous Texas Comanche Shelf and San Marcos Platform is clarified by new petrographic, biostratigraphic, and geochemical analyses. Previous studies proposed facies change between the Washita and Fredericksburg groups based on lithologic changes in both core and outcrop. However, new fossil records and geochemistry indicate that the contact is unconformable. Rudist, coral, calcareous algae, and other shallow marine fossils increase in abundance and fragment size upwards through the shoaling up Person Formation. The overlying Georgetown Formation contains glauconite, indicating slow deposition, broken up grains of various deeper shelf mollusks, planktic foraminifers, and echinoderms, which indicate flooding and drowning of the older Person rather than a facies relationship. In addition, in outcrop, a set of three iron-stained bored surfaces lead up to the Person/Georgetown contact. Geochemical isotopic data directly below the contact indicate subaerial exposure of Person formation top based on the extremely negative nature of the Carbon isotopes. Similar isotopic signatures are at the major Fredericksburg-Washita contact in the nearby Selma core. After careful sampling of the Stone Crossing outcrop and Selma core, thin section petrography, biostratigraphy, and carbon and oxygen data indicate subaerial exposure of top Person and abrupt change in carbonate facies at the Fredericksberg-Washita contact. Therefore, the Fredericksburg-Washita contact is a major sequence boundary and not a facies change.

Rowe, Allyson, O. John-Paul, John C. DiCesare, and Robert J. Sheaff
CYTOTOXICITY OF NOVEL NAPTHOQUINONES

The previously synthesized napthoquinone abduct 12,13-Dihydro-N-methyl-6,11,13-trioxo-5H-benzo[4,5]cyclohepta[1,2-b]naphthalen-5,12-imine (known as TU100) showed promise as a potential chemotherapeutic agent. Four new derivatives with unique structure and functional groups have been generated to further characterize biological activity and enhance therapeutic potential of TU100. Cellular cytotoxicity was evaluated by incubating different concentrations of the compounds with various mammalian cell lines, then measuring cell viability using a resazurin-based fluorescent assay. As expected, altering TU100 functional groups had significant effects on induction of cell death. To further characterize these differences, the time dependency of compound cytotoxicity and their effects on cell morphology was evaluated. An analysis of compound effects on ATP production suggested that altering TU100 functional groups altered their biological targets, which may explain the differences in cellular cytotoxicity.
Rubino, Mariah, Chelsea M. Cogan, Rachel L. Micol, & Joanne L. Davis

DOES VICTIM AGE IMPACT TIME TO REPORT RAPE?

On average, more than 320,000 Americans become victims of rape every year. Victims come from every age group, race, and socioeconomic background, and how long a victim takes to report their rape to law enforcement can vary widely. While research has examined the demographics of rape survivors, little is known about potential causes of taking a longer time to report a rape, such as the age of the victim. This is an important area to examine due to different barriers individuals at different ages may experience when trying to report. Victims who take longer to report their assault often face increased skepticism from legal officials. The Time to Report Rape in a Community Sample study has collected data from roughly 1000 reports of rape from 2008 to 2012 in Tulsa. For the purposes of the present study, only individuals who reported their assaults and had both assault and exam time listed were included in the analyses (n = 722). Victim ages were examined both on a continuum (M = 26.35 SD = 11.91) and separated into four groups. Preliminary evidence suggests that age (either grouped or on a continuum) of the rape victim does not impact the time to report rape. The reasons the age of the survivor may not impact how long it takes to report will be explored in greater detail in the presentation. These findings demonstrate that individuals of all ages are reporting these incidents, even if he/she takes longer to report the assault.

Sosa, Jordan D.

DESIGNING AND CONSTRUCTING A MULTI-FUNCTIONAL POLARIZED MICROSCOPE

There is a recent interest in crystalline materials with ferroic properties because they may allow for more efficient data storage or solar energy harvesting. However, many of these materials are birefringent and have properties only viewable on the nanoscale, so a very specified microscope is needed to see through the birefringent effect, and apply Kerr microscopy to see magnetic or electric polarization, as well as see with high resolution and magnification. Kohler illumination was used to achieve resolution down to hundreds of nanometers. To see into even birefringent materials, meaning light moves differently depending on the light orientation, polarized microscopy became a part of the microscope, using polarizers and waveplates. The Kerr microscopy will be achieved through viewing the material in varied temperatures, pressure, magnetic fields, applied currents, or applying a photovoltaic effect. Pump-probe microscopy will also be used to measure reflective properties of these materials. In the future, this microscope will help find a possible way to manipulate the electric or magnetic polarizations (the ferroic properties) or possibly domain walls that form from crystalline properties. These materials are interesting because they are metals, but polarize under certain conditions which this microscope will explore.

Spencer, Rachel

A SYSTEMATIC REVIEW OF VOCABULARY INSTRUCTION TECHNIQUES FOR SCHOOL-AGE CHILDREN WITH COMPARISON TO CURRENT PRACTICES FOR DUAL-LANGUAGE LEARNERS IN CARTAGO, COSTA RICA

The purpose of this paper is: (1) to determine what evidence-based techniques exist for vocabulary instruction in school-aged children and (2) to analyze how evidence-based techniques for vocabulary instruction are implemented in third and sixth grade English classrooms in a dual-language school in Cartago, Costa Rica. A systematic review of the literature to identify evidence-based techniques for vocabulary instruction in L1 and L2 of English was conducted to create a comprehensive list of strategies with empirical support. A qualitative study was then conducted of vocabulary instruction in a Spanish speaking school within a Spanish-speaking country with explicit English vocabulary instruction. Information was collected through observation of English grammar and oral English classrooms, collection of questionnaires completed by English-speaking teachers in the school, and collection of artifacts in Cartago, Costa Rica. This information was analyzed in light of the compiled list of evidence-based techniques for vocabulary instruction to gain a better understanding of vocabulary instruction in Costa Rica.
The implications of this study are significant in multiple disciplines. Educators and speech pathologists can reference the comprehensive list of evidence-based vocabulary intervention techniques to guide their clinical practice. Professionals can apply these interventions when they work with all school-aged children. Furthermore, this study allows professionals to have a better understanding of how Dual Language Learners learn English in a Spanish-speaking environment.

Stokes, Makenzie
How can interventions be used to address factors associated with recidivism and reincarceration rates within the currently or previously incarcerated adult TBI population

Within the US prison population there are approximately 25-80% of incarcerated individuals at any given time who report having experienced at least one traumatic brain injury (TBI) event within their lifetime. Considering this large percentage of these individuals as well as the potentially long-term deficits that can result from a TBI, the need for interest in interventions to address this subset of the prison population would likely contribute to the overall reduction in the increasingly high recidivism and reincarceration rates in the US.

Because of the general lack of evidence associated with the subset of the prison population that suffer from TBI-related symptoms/deficits, it is not possible to make conclusive statements about the types of programs and how they can affect the larger prison population or the recidivism and reincarceration rates in the US. Nonetheless, there was some evidence to support the effectiveness of programs that shed any therapeutic light on the large percentage of individuals within the prison population that have TBI-related symptoms/deficits. There is a need for future research in order to address the reduction of the general prison population as well as recidivism and reincarceration rates.

Sullivan, Sarah, Dr. Robert Sheaff, and Raneem Khattab
Targeting Cells Lacking the p27kip1 Tumor Suppressor Using Metformin

Previous work has shown that cells lacking the tumor suppressing protein P27kip1 are able to switch to amino acids as a carbon source when glucose levels are low, and that a combination of rotenone, an electron transport chain inhibitor, and 2-deoxy-glucose, a glycolysis inhibitor, produces a synergistic effect in the cells without P27kip1. However Rotenone is toxic to humans and cannot be used in clinical settings, so we are exploring the use of metformin as an alternative treatment. Metformin has shown electron transport chain inhibition, and previous studies has indicated that metformin inhibits the electron transport chain at the same point as rotenone. We used the commercial assays CellTiter Glo and CellTiter Blue, to measure the effects of various rotenone and metformin concentrations on cell lines with and without P27kip1. We hope to use this information to develop a combination drug treatment that can differentially target tumor cells with downregulated P27.

Tan, Xiao and Robert W. Scott
ISOTOPE CHEMOSTRATIGRAPHY OF THE MIDDLE ALBIAN REGIONAL DENSE MEMBER, EDWARDS GROUP, SAN MARCOS PLATFORM, SOUTH-CENTRAL TEXAS

The Lower Cretaceous Edwards Group in Central Texas on the San Marcos Arch is the main aquifer of the region. In the subsurface, it also is an important hydrocarbon reservoir. The Edwards Group is divided into two limestone intervals by a marly limestone called the Regional Dense member (RDM). The RDM is a thin, widely traceable, argillaceous and bioturbated limestone that is readily recognized from well logs. Accurate correlation of the RDM determines reservoir geometry and areal extent. Two correlation hypotheses prevailed. The RDM is correlated with an algal boundstone in the subsurface Stuart City Limestone, which makes the RDM the same age as the middle Albian Fredericksburg Group (Waite et al, 2007). In contrast, Rose (1972) correlated the RDM with the upper Albian Kiamichi Formation Washita
Group. A detailed study of the Regional Dense member tests both interpretations by means of biostratigraphy and chemostratigraphy. X-Ray Diffraction analysis characterizes the mineralogy of RDM. Stable isotope analyses of δ13C and δ18O tests two possible origins of the contacts of the RDM as subaerial or submarine. Updip across the Balcones Fault system, The Fredericksburg Group correlates with the Edwards Group. A Fredericksburg flooding contact will be tested in order to correlate it with the RDM. If the Fredericksburg contact correlates with the base of the RDM, then both groups are part of the same long-term cycle. But if the Fredericksburg contact is older than the RDM as previously proposed, then both groups are composed of two long-term cycles.

Tecle, Leah and Heather Hayes
CULTURAL DIFFERENCES IN PERSONALITY PROFILES: IMPLICATIONS OF RELATIONALISM IN ORGANIZATIONS

In the current study, cultural differences in socially-relevant personality profiles were explored by further differentiating countries within the well-established individualist-collectivist dichotomy to include a relationalism component – namely, the hierarchical nature of relationships, emotional expressiveness, and interpersonal sensitivity. Implications for organizations, such as leadership and interpersonal transactions across cultures, are discussed.

Trewitt, Jordan
RFID Testbeds to Stimulate ground like conditions

In order to evaluate the viability of Radio Frequency Identification (RFID) technology installed on buried pipes, a test bed for rapid testing and development of RFID antennas and systems needs to be created. Within the underground signals fields, researchers bury the sensors and antennas, which can be messy, time consuming and is harder to isolate in RF free environments. Therefore an alternative is proposed with loaded dielectric foam blocks. These blocks can then be configured to simulate ground like conditions. Varying volume percentages of TiO2 within these foam blocks vary the dielectric constant linearly. In order to verify the dielectric constant and losses from the TiO2, a probe resonates at varying frequencies according to effective dielectric constants. To further develop the test bed, a software defined radio (SDR) and power amplifiers connected to wideband and directional antennas are then installed in conjunction with the dielectric foam blocks to evaluate RFID and ground penetrating radar (GPR) over a wide range of frequencies and pulse signatures. To check on radar profiles and power requirements, RFID antennas and pipes are installed between layers of the dielectric blocks. RFID antennas in these types of dielectric environments need to have high enough bandwidths because of the varying soil conditions. Because the soil dissipates power quickly, these antennas need to have a large enough aperture sizes and gains. These antennas are matched to RFID integrated chips (ICs) in order to reduce power losses that can hinder power up operation of the IC.

Westbrook, Julia
COMPARATIVE EUROPEAN ASYLUM POLICIES IN LIGHT OF THE RECENT INFLUX OF SYRIAN REFUGEES

This project attempts to identify the societal or cultural factors that lead to a country’s strict or open asylum policy. My research asks the question, “why are some countries more or less tolerant of refugees?” This topic has proved to be critical in the recent and upcoming worldwide elections. I have narrowed my focus to two case studies: the welfare state of Denmark and Germany with the “open door” policy. My project remains in progress as I synthesize and analyze the qualitative data that I collected last semester. I have interviewed ten individuals representing several NGOs and nonprofits, government agencies and specialized law practices in both Denmark and Germany to serve as data for analysis. While the project is still underway, it is becoming evident that varying degrees of xenophobia, religious ideals, Islamophobia,
fear in general, as well as a broad range of cultural norms and values and a country’s cultural and military history play integral roles on the society’s influence of their respective asylum policy. The role of the church as well as the role of the media also make a difference. The data I have gathered reveals a clear connection between a society’s overall tolerance and acceptance for those who are different and their levels of restrictions and limits in asylum policies. To gain a more personal understanding of the asylum and integration processes in my own community, I have volunteered with the YWCA Office of Immigrants & Refugees throughout the course of this project.