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Welcome to the 2018 Joint Meeting of the 21st Annual TU Student Research Colloquium and the 16th 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.
2018 SPONSORS:
Office of Research & Sponsored Programs
Graduate School
College of Law
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
Office of Student Affairs

2018 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
Ryley Johnson, Student Representative
Soroor Karimi, Student Representative
Alison Kerr, Student Representative
Melissa Miller Student Representative
Spenser Pulleyking, Student Representative
Leena Subhan Neyaz, Student Representative
Ebrima Tunkara, Student Representative

2018 COLLOQUIUM ARTWORK PROVIDED BY:

Maria Donnelly
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 21st 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...

2018 OU-TULSA RESEARCH FORUM COMMITTEE:
  Kent Teague, Ph.D., Assistant Vice President for Research, Forum Chair
  Krista Kezbers, PhD
  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 2018 OU-Tulsa Research Forum will be held at the OU-Tulsa Schusterman Learning Center at 41st & Yale on Wednesday, 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.
GENERAL INFORMATION

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

Days and hours are:

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<td>Friday, April 6</td>
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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.
THEODOROS ZARAFAS

THE TWENTY-FIRST ANNUAL STUDENT RESEARCH COLLOQUIUM

CONFERENCE AT A GLANCE

THE ODYSSEY OF GRADUATE SCHOOL: TOOLS AND TECHNIQUES FOR NAVIGATING THE PROCESS -
WEDNESDAY, APRIL 4, 2018 (Alcove) ................................................................. 11:30 AM – 1:00 PM

SPECIAL TOPIC SYMPOSIA -

MONDAY, APRIL 2, 2018
- Special Topics in Education (Great Hall B) .................................................. 9:00 AM – 11:40 AM
- TU Research Connect (Chouteau C) ............................................................. 10:00 AM – 11:50 AM

TUESDAY, APRIL 3, 2018
- From Back Rooms and Beyond-Topics in Anthropology, Archaeology, and Museums (Great Hall B) 11:00 AM – 4:30 PM

WEDNESDAY, APRIL 4, 2018
- Global Scholars Capstone Projects Part I (Great Hall B) 8:00 AM – 10:40 AM
- Identifying Work Place Factors to Maintain Employee and Organizational Well-Being (Chouteau) 8:00 AM – 9:20 AM
- The State of TU-NION An Examination of Sexual Assault and Interpersonal Violence (Alcove) 8:30 AM – 9:50 AM
- Science and Practice of Industrial Organizational Psychology (Chouteau) 9:30 AM – 11:20 AM
- Global Scholars Capstone Projects Part II (Great Hall B) 1:40 PM – 5:00 PM

FRIDAY, APRIL 6, 2018
- Applications of Industrial –Organizational Psychology (Chouteau) 9:00 AM – 10:50 AM
- Citizenship and Service in a Changing World (Alcove) 2:20 PM – 3:40 PM

GENERAL CONTRIBUTED SESSIONS –

MONDAY, APRIL 2, 2018
- Biological Sciences I (Alcove) 9:40 AM – 12:00 PM
- Computer Science (Chouteau) 1:00 PM – 3:40 PM
- Electrical Engineering (Alcove) 2:20 PM – 4:00 PM

TUESDAY, APRIL 3, 2018
- General Sciences (Alcove) 8:40 AM – 10:40 AM
- General Humanities I (Chouteau) 8:30 AM – 10:30 AM
- English Language and Literature (Great Hall B) 9:20 AM – 10:40 AM
- Computer Science II (Chouteau) 1:40 PM – 4:20 PM
- Physics and Engineering Physics (Alcove) 1:00 PM – 4:00 PM

WEDNESDAY, APRIL 5, 2018
- Biological Sciences II (Chouteau) 1:00 PM – 3:20 PM
- Sociology (Alcove) 1:20 PM – 2:40 PM

THURSDAY, APRIL 5, 2018
- Chemistry I (Chouteau) 8:40 AM – 11:40 AM
- Chemical Engineering, Petroleum Engineering, and Energy Business (Chouteau) 1:00 PM – 3:00 PM
- Clinical Psychology I (Alcove) 1:40 PM – 3:40 PM
- General Humanities II (Chouteau) 1:20 PM – 3:20 PM

FRIDAY, APRIL 6, 2018
- Mechanical Engineering (Great Hall B) 8:00 AM-11:00 AM
- Clinical Psychology II (Chouteau) 11:00 AM – 12:20 PM
- General Health Sciences (Alcove) 2:20 PM – 4:40 PM
- Chemistry II (Great Hall B) 1:40 PM – 5:00 PM

WEDNESDAY, APRIL 18, 2018
- College Poster Session (OU-Tulsa Schusterman Campus, Founders Hall) 2:00 PM – 4:00 PM

RESEARCH AWARDS BANQUET -
TUESDAY, APRIL 10, 2018 (Great Hall A) .......................................................... 7:00 PM – 9:00 PM
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<td>Wolf</td>
<td>Rachel</td>
<td>Thursday, April 5</td>
<td>3:00 PM--3:20 PM</td>
<td>Great Hall B</td>
</tr>
<tr>
<td>Woolman</td>
<td>Chris</td>
<td>Monday, April 2</td>
<td>3:40 PM--4:00 PM</td>
<td>Alcove</td>
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<td>Wright</td>
<td>Amber</td>
<td>Friday, April 6</td>
<td>10:10 AM--10:30 AM</td>
<td>Chouteau</td>
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<td>Yoder</td>
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<td>Wednesday, April 4</td>
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<td>Yoder</td>
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<td>Friday, April 6</td>
<td>3:00 PM--3:20 PM</td>
<td>Alcove</td>
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</table>
2018 ANNUAL STUDENT RESEARCH COLLOQUIUM
ORAL PRESENTATION
JUDGING CRITERIA

<table>
<thead>
<tr>
<th>SPEAKER/PRESENTER:</th>
<th>BENCHMARK</th>
<th>DEVELOPMENTAL</th>
<th>MILESTONE</th>
<th>CAPSTONE</th>
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<tr>
<td>TITLE OF PRESENTATION:</td>
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<td>SESSION:</td>
<td>TIME:</td>
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</table>

20 minute oral presentation (includes 3 - 5 minute question period).

**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** ___________________________
# 2018 Community Service Symposium

## Judging Criteria

**Speaker/Presenter:**

**Title of Presentation:**

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

### 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 student showed the mutual impact on both student and service project alike.

- **Vocalization, Delivery, and Poise:** 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.

---

**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)*

**Judge’s Name (print):**

**Signature:**

**Total:**
# Judging Form

**POSTER # / TITLE (BRIEF)**

**PRESENTER**

<table>
<thead>
<tr>
<th>Score</th>
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<td>5</td>
<td>EXCELLENT</td>
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**CHOOSE EITHER IN-FIELD JUDGE OR OUT-FIELD JUDGE**

**IN-FIELD (If you feel knowledgeable about the subject)**

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<thead>
<tr>
<th>Quality</th>
<th>Score</th>
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<tr>
<td>1</td>
<td>The research supported and/or answered the objectives presented.</td>
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<tr>
<td>2</td>
<td>The methodology or procedure was appropriate for the research presented.</td>
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<td>3</td>
<td>The appropriate methods of analysis or interpretation were used.</td>
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<td>4</td>
<td>The poster indicated an understanding of the benefit of the research.</td>
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<tr>
<td>5</td>
<td>The poster explained the results well.</td>
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<tr>
<td></td>
<td>Responses to questions were knowledgeable and adequate. May award a “0” if the presenter was not present.</td>
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**TOTAL SCORE _____**

**OUT-FIELD (If you do not feel knowledgeable about the subject)**

<table>
<thead>
<tr>
<th>Quality</th>
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<tr>
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**TOTAL SCORE _____**

**COMMENTS**

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MONDAY MORNING, APRIL 2, 2018

SPECIAL TOPIC SESSION: SPECIAL TOPICS IN EDUCATION
Monday, April 2                 9:00 AM – 11:40 AM
Allen Chapman Student Union               Level 2: Great Hall B

9:00 AM          Barbour, Erin
      THE EFFECT OF EXTRACURRICULAR PARTICIPATION ON MATH ACADEMIC PERFORMANCE

9:20 AM          Kuehn, Scott
      THE EFFECT OF THE PLACEMENT OF PHYSICAL ACTIVITY ON MATH ACHIEVEMENT

9:40 AM          McAfee, Kelsey
      THE EFFECT OF HOME LEARNING ENVIRONMENT ON READING ACHIEVEMENT

10:00 AM        Rutherford, Kasey
      THE RELATIONSHIP BETWEEN STUDENT INVOLVEMENT IN OKLAHOMA STEM ACADEMIES AND COLLEGE MAJOR/CAREER CHOICE

10:20 AM        BREAK

10:40 AM        Mobra, Tyler
      THE EFFECT OF STUDENT ENGAGEMENT IN MATH/SCIENCE ACHIEVEMENT

11:00 AM        Suits, Craig
      THE RELATIONSHIP BETWEEN SLEEP AND ACADEMIC PERFORMANCE

11:20 AM        Haunga, Steven
      THE RELATIONSHIP BETWEEN DIET AND ACADEMIC PERFORMANCE

SPECIAL TOPIC SESSION: TU RESEARCH CONNECT
Monday, April 2                 10:00 AM – 11:50 AM
Allen Chapman Student Union               Level 2: Chouteau

10:00 AM        Keynote Speaker – Dr. Phil Pienkos, National Renewable Energy Laboratory

10:20 AM        Casual Meet and Greet

10:30 AM        Neeli, Sai Teja
      SYNTHESIS AND FORMATION MECHANISM OF IRON NANOPARTICLES IN GRAPHITIZED CARBON MATRIX USING BIOCHAR FROM BIOMASS MODEL COMPOUNDS AS A SUPPORT
10:50 AM Kundu, Rahul
SYNTHESIS OF GRAPHENE FROM BIOCHAR

11:10 AM Badrinarayanan, Indreesh and Sharieff, Jibran
USING PRODUCED WATER TO GROW MICROALGAE

11:30 AM Li, Xiangpeng
GROWTH KINETICS AND NUTRIENT COMPOSITION ANALYSIS FOR
CHLAMYDOMONAS REINHARDTII GROWN UNDER LED LIGHT SOURCE

CONTRIBUTED PAPERS: BIOLOGICAL SCIENCE I
Monday, April 2
9:40 AM – 12:00 PM
Allen Chapman Student Union

9:40 AM Rajbanshi, Naveen
STUDY OF NATURAL EVOLUTION IN WATERMELON MOSAIC VIRUS

10:00 AM Wijayasekara, Dulanjani
CHARACTERIZATION OF MAIZE DWARF MOSAIC VIRUS FROM JOHNSONGRASS IN
OKLAHOMA

10:20 AM Davalos, Nicole
DETECTION OF VIRUSES IN STRAWBERRY CROPS

10:40 AM BREAK

11:00 AM Khanal, Vivek
SURVEY AND MOLECULAR CHARACTERIZATION OF VIRUSES INFECTING
CUCURBITS IN OKLAHOMA

11:20 AM Mokhtari, Samira
DETECTING MYCOVIRUSES IN FUSARIUM SPECIES

11:40 PM Secrist, Kathryn
THE MOLECULAR CHARACTERIZATION OF THE PEPPER MILD MOTTLE VIRUS
ISOLATE FROM OKLAHOMA

MONDAY AFTERNOON, APRIL 2, 2018

CONTRIBUTED PAPERS: COMPUTER SCIENCE I
Monday, 2 April
1:00 PM – 3:40 PM
Allen Chapman Student Union

1:00 PM Riley, Ian
EMPLOYING THE SI NETWORK MODEL TO EVALUATE NETWORK PROPAGATION
IN BLUETOOTH MANETS BREAK
1:20 PM          He, Xinchi
PRIVACY ASSURED HEALTH INSURANCE CLAIM PROCESSING USING BLOCKCHAIN

1:40 PM          Marshall, Allen
ENABLING CONTEXT-AWARENESS AND RICH SERVICE INTERACTION FOR MOBILE APPS USING THE PHYSICAL WEB

2:00 PM          Seiders, Amanda
ENERGY SPECTRUM OF TWO COLD TRAPPED ATOMS IN D-DIMENSIONAL SPACE

2:20 PM          BREAK

2:40 PM          Chowdhury, Shuddha and Jahan, Sharmin
ASPECTS OF DATA ANALYSIS TO EVALUATE BRAIN WAVE DATA FOR FURTHER RESEARCH USES

3:00 PM          Chowdhury, Shuddha
TOWARD INCREASING COLLABORATION AWARENESS IN SOFTWARE ENGINEERING TEAMS

3:20 PM          Jahan, Sharmin
EMBEDDING VERIFICATION CONCERNS IN SELF-ADAPTIVE SYSTEM CODE

CONTRIBUTED PAPERS: ELECTRICAL ENGINEERING
Monday, 2 April                                  2:20 PM – 4:00 PM
Allen Chapman Student Union                Level 2: Alcove

2:20 PM          Luttenberg, Shane
OPTICAL ERROR CORRECTION

2:40 PM          Nichols, Will
AUTOMATIC GENERATION OF ATTACK SCRIPTS FROM ATTACK GRAPHS

3:00 PM          Reeder, Ryvers
STORING AND MULTIPLYING AN ATTACK GRAPH’S ADJACENCY MATRIX

3:20 PM          Trewitt, Jordan
TIME DELAY TAGS FOR COMMERCIAL GROUND PENETRATING RADARS

3:40 PM          Woolman, Chris
HYDROSENSE
CONTRIBUTED PAPERS: GENERAL SCIENCES
Tuesday, April 3                         8:40 AM – 10:40 AM
Allen Chapman Student Union             Level 2: Alcove

8:40 AM  Lyons, Madeline
THE EFFICACY OF THE FUNCTIONAL MOVEMENT SCREEN AS A PREDICTOR OF INJURY IN COLLEGIATE ATHLETES

9:00 AM  Hernandez, Alejandro
USING THE TRACY-WIDOM DISTRIBUTION TO IDENTIFY SUBNETWORKS IN RESTING-STATE FMRI DATA

9:20 AM  Mathur, Nitesh
FINITENESS OF RELATIVE EQUILIBRIA PROBLEM THROUGH A COMBINATORIAL PERSPECTIVE

9:40 AM  BREAK

10:00 AM Marti, Nicklos
SEQUENCE STRATIGRAPHY OF THE BOGGY FORMATION IN THE SANS BOIS MOUNTAINS, SOUTHEAST OKLAHOMA

10:20 AM Wang, Guan
POST-FIRE SPATIAL DISTRIBUTION AND SOURCES OF SOIL CARBON AT A GRASSLAND-SHRUBLAND TRANSITION ZONE IN THE SOUTHWESTERN US

CONTRIBUTED PAPERS: GENERAL HUMANITIES I
Tuesday, April 3                         8:30 AM – 10:30 AM
Allen Chapman Student Union             Level 2: Chouteau

8:30 AM  Hegdale, DC
MATERNAL HEALTH CARE ISN’T HEALTHY

8:50 AM  Lynch, Connor
MEMES: 21ST CENTURY COLLAGE

9:10 AM  Martinson, Freya
“INCORPORATED INTO CHRIST”: THE EARLY CHRISTIAN BAPTISMAL BELIEF, RITUAL, AND IMAGERY AT DURA-EUROPOS

9:30 AM  BREAK

9:50 AM  Berrett, Chandler
PRIVATE PRISONS IN OKLAHOMA

10:10 AM Seaver, Tori
DEPICTIONS IN STORYTELLING ABOUT MUSIC
CONTRIBUTED PAPERS: ENGLISH LANGUAGE AND LITERATURE
Tuesday, April 3, 2018 9:20 AM – 10:40 AM
Allen Chapman Student Union Level 2: Great Hall B

9:20 AM  Lee, Seungho
AN ISLAND AS A HOME: NEW POSSIBILITIES OF HOME, COMMUNITY, AND NATION IN SAM SELVON’S AN ISLAND IS A WORLD

9:40 AM  Corbaz, Bryan
IDENTITY AND INTERSECTIONS: SEXUAL IDENTITY FORMATION IN LGBT YOUTH

10:00 AM  Habig, Stewart
EXCAVATING MELVIN TOLSON’S CURATED ARCHIVES

10:20 AM  Hurlock, Al
EVOLUTIONARY PSYCHOLOGY ON THE WORLD WAR II HOME FRONT

SPECIAL TOPIC SESSION: FROM BACK ROOMS AND BEYOND – CURRENT TOPICS IN ANTHROPOLOGY, ARCHAEOLOGY, AND MUSEUMS – PT I
Tuesday, April 3 10:40 AM – 12:30 PM
Allen Chapman Student Union Level 2: Great Hall B

10:40 AM  Tochtrop, Emily
THE JOY OF COOKING WITH STONE TOOLS: USE-WEAR ANALYSIS OF MULTI-FUNCTIONAL TOOLS

11:00 PM  Miller, Melissa
THE INVENTION OF BESTWOOD: ENVIRONMENTAL MODIFICATION AND TECHNOLOGICAL INNOVATION IN THE FAURESMITH OF SOUTHERN AFRICA

11:20 PM  Mraz, Veronica
HOT BIFACES: AN EXAMINATION OF FLAKING PROPERTIES FROM HEATED AND UNHEATED BIFACES

11:40 PM  BREAK

11:50 PM  Bowman, Paul
USING SURFACE METROLOGY TO RESOLVE EQUIFINALITY IN BONE SURFACE MODIFICATIONS IN ARCHAEOLOGICAL SITES

12:10 PM  Schumacher, Emily R.
THE LITTLE ICE AGE AND DIET: A COMPARISON BETWEEN EUROPE AND EASTERN NORTH AMERICA
TUESDAY AFTERNOON, APRIL 3, 2018

SPECIAL TOPIC SESSION: FROM BACK ROOMS AND BEYOND – CURRENT TOPICS IN ANTHROPOLOGY, ARCHAEOLOGY, AND MUSEUMS – PT II
Tuesday, April 3 1:20 PM – 4:30 PM
Allen Chapman Student Union Level 2: Great Hall B

1:20 PM  Basco, Victor
PROCESSES OF FORENSIC FACIAL RECONSTRUCTION

1:40 PM  Caselman, Emily; Hammill, Emily; and Williams, Angela
THE KRAVIS DISCOVERY CENTER: EVALUATION TO BENCHMARK SUCCESS AND DISCOVER FURTHER OPPORTUNITY FOR THE REDESIGNED KDC

2:00 PM  Edwards, Skylar
ART THERAPY: CREATING ALONGSIDE PEOPLE WITH DEMENTIA

2:20 PM  Spjut, Ellica
THINKING OUTSIDE THE BOX: DEATH IN A HETEROGENEOUS SOCIETY

3:00 PM  BREAK

3:10 PM  Palmeter, Nicole
THE LEGACY OF SLAVERY: HEALTH IN THE POST-EMANCIPATION SOUTH

3:30 PM  Schumacher, Emily R.
ACADEMICS AND EMPIRE: THE PAST, PRESENT, AND FUTURE OF HUMAN REMAINS WITHIN MUSEUM COLLECTIONS

3:50 PM  Qualls, Zachary
WOVEN RESILIENCE: CHEROKEE BASKETRY IN THE AMERICAN SOUTHEAST AND ITS 20TH CENTURY TRANSFORMATION

4:10 PM  Caselman, Emily
RECREATION AND PRESERVATION: ALLOWING ACCESS TO THE PAST WHILE ENSURING THERE’S A FUTURE

CONTRIBUTED PAPERS: COMPUTER SCIENCE II
Tuesday, April 3 1:40 PM – 4:20 PM
Allen Chapman Student Union Level 2: Chouteau

1:40 PM  Nanda Kumar, Rachna and Macke, Will
SWARMING AS LEARNED BEHAVIOR IN PREY ANIMALS

2:00 PM  Nanda Kumar, Rachna
EFFECTS OF PARITY, SYMPATHY AND RECIPROCITY ON PROMOTING COOPERATION IN SOCIAL NETWORKS
2:20 PM  Taylor, Samuel
PREDICTIVE LEARNING FOR SIMULATED UAVS IN A DYNAMIC AND ADVERSARIAL ENVIRONMENT

2:40 PM  Luczak, Brian
A SURVEY AND EVALUATIONS OF HISTOGRAM-BASED STATISTICS IN ALIGNMENT-FREE SEQUENCE COMPARISON

3:00 PM  BREAK

3:20 PM  Dees, Adam
EFFECTS OF PERFORMANCE VARIATIONS, EXPECTATIONS AND COMMUNICATIONS ON REPUTATION ACCURACY

3:40 PM  James, Ben
MESHCLUST: AN INTELLIGENT TOOL FOR CLUSTERING DNA SEQUENCES

4:00 PM  Reyes, Zachary
ANNOTATING THE GENOME WITH MACHINE LEARNING

CONTRIBUTED PAPERS: PHYSICS AND ENGINEERING PHYSICS
Tuesday, April 3 1:00 PM – 4:00 PM
Allen Chapman Student Union  Level 2: Alcove

1:00 PM  Lamichhane, Pralhad
STUDIES OF MORPHOLOGICAL, ELECTRICAL, AND OPTICAL PROPERTIES OF Mn DOPED ZNO NANORODS AND THE FABRICATION OF ZNO/GAN LIGHT EMITTING DIODE

1:20 PM  Vargas, Preston
ECONOMICAL SYNTHESIS OF INORGANIC LEAD HALIDE PEROVSKITNES FOR OPTOELECTRONIC APPLICATIONS

1:40 PM  Burleson, Jennifer
INFLUENCE OF SURFACE MORPHOLOGY ON THE CONTACT ANGLE OF ZINC OXIDE NANOCONTRUCTURES

2:00 PM  Bont, August and Vargas, Preston
BLUE EMISSION FROM CSPBBR3 QUANTUM DOTS FOR LIGHT-EMITTING DIODES

2:20 PM  BREAK

2:40 PM  Douglas, Lindsay
OPTIMIZED APPLICATION OF AQUEOUS POLYMER ONTO A SUBSTRATE

3:00 PM  Adhikari, Gopi Chandra
GREEN-INFRARED COLOR TUNING USING LOW COST ORGANOLED MIXED HALIDE PEROVSKITES FOR OPTOELECTRONIC APPLICATIONS
3:20 PM  Kaphle, Amrit
NUMERICAL ANALYSIS OF ZNO/CUO HETEROJUNCTION SOLAR CELL USING AFOR-HET SIMULATION

3:40 PM  Neupane, Ganga Raj
STRUCTURAL, OPTICAL AND ELECTRICAL PROPERTIES OF FE DOPED ZNO NANOPARTICLES

WEDNESDAY MORNING, APRIL 4, 2018

SPECIAL TOPICS SESSION: GLOBAL SCHOLARS CAPSTONE PROJECTS – PART I
Wednesday, April 4, 2018  8:00 AM – 10:40 AM
Allen Chapman Student Union  Level 2: Great Hall B

Economics and Finance:
8:00 AM  Nunez, Jaime
THE (U.S.) POLITICS OF FINANCIAL REGULATION: WHY HAS IT BEEN SO DIFFICULT TO IMPLEMENT EFFECTIVE REGULATORY OVERSIGHT NEEDED TO PREVENT ANOTHER FINANCIAL CRISIS

8:20 AM  Kerwin, Thomas
ZEDES AND THEIR IMPLICATIONS FOR THE FUTURE OF HONDURAS

8:40 AM  Amsler, Jerry
THE ECONOMICS OF CRYPTOCURRENCIES

9:00 AM  Stiehler, Andrew
MICROFINANCING: DOES IT HELP THE IMPOVERISHED AND LEAD TO INNOVATION?

9:20 AM  BREAK

Social Focus:
9:40 AM  Cook, Madeline
BARRIERS: BURMESE REFUGEES LIVING IN TULSA, OKLAHOMA

10:00 AM  Limbrick, Barabrae
THE SOCIAL INJUSTICES OF THE INDULGENT COMMODITY: CACAO

10:20 AM  Burris, Tori
THE DISABILITY DISCUSSION DISCONNECT
SPECIAL TOPICS SESSION: IDENTIFYING WORK PLACE FACTORS TO MAINTAIN EMPLOYEE AND ORGANIZATIONAL WELL-BEING
Wednesday, April 4, 2018                  8:00 AM – 9:20 AM
Allen Chapman Student Union           Level 2: Chouteau

8:00 AM          Herrera, Valeria
GOAL-SETTING THEORY: THE USE OF ATTENTION FAILURES IN MEASURING TASK PERSISTENCE

8:20 AM          Hockensmith, Kirby
DEVELOPING A MEASURE OF IDENTITY EXPRESSION IN THE WORKPLACE

8:40 AM          Chen, Catherine
THE RELATIONSHIP BETWEEN SOCIAL MEDIA USE DURING WORK BREAK, THE ROLE OF AFFECT AND PRODUCTIVITY

9:00 AM          Ayres, Thomas
EMPLOYEE RECOVERY: WHAT ROLE DO LEADERS PLAY?

SPECIAL TOPICS SESSION: THE STATE OF TU-NION – AN EXAMINATION OF SEXUAL ASSAULT AND INTERPERSONAL VIOLENCE AT THE UNIVERSITY OF TULSA
Wednesday, April 4, 2018                  8:30 AM – 9:50 AM
Allen Chapman Student Union             Level 2: Alcove

8:30 AM          Cogan, Chelsea
A BRIEF OVERVIEW OF THE CAMPUS CLIMATE SURVEY AND EXECUTIVE SUMMARY

8:50 AM          LaPlant, Jessica
A CORRELATIONAL STUDY OF SEXUAL ASSAULT, INSTITUTIONAL BETRAYAL, AND GENDER RELATED EXPERIENCES

9:10 AM          Andrew, Shianne
THE CONSEQUENCES OF DRUG-FACILITATED/INCAPACITATED RAPE: A UNIQUE THREAT TO MENTAL HEALTH?

9:30 AM          Phillips, Savannah
AN EXPLORATION OF THE RELATIONSHIP BETWEEN SEXUAL ASSAULT PREVENTION PROGRAMMING AT THE UNIVERSITY OF TULSA AND STUDENT PERCEPTION OF CAMPUS RESPONSE TO SEXUAL VIOLENCE
SPECIAL TOPICS SESSION: SCIENCE AND PRACTICE OF INDUSTRIAL-ORGANIZATIONAL PSYCHOLOGY
Wednesday, April 4, 2018                  9:30 AM – 11:20 AM
Allen Chapman Student Union           Level 2: Chouteau

9:30 AM   Ayres, Thomas
EMERGING LEADERS WITHIN INTERDEPENDENT TEAMS: A QUALITATIVE APPROACH

9:50 AM   Boggs, Jacqueline
TEAM LEADERSHIP, LEARNING, AND PERFORMANCE: A LITERATURE REVIEW

10:10 AM  Break

10:20 AM  Thomas, Christopher
DISCLOSURE AT WORK: A LITERATURE REVIEW

10:40 AM  Barber, Samantha
PERSONALITY AND MOTIVATION IN THE ATHLETIC CONTEXT: A LITERATURE REVIEW

11:00 AM  Trabucco, Eva
SIMILARITIES AND DIFFERENCES BETWEEN COACHES AND CAPTAINS IN AN ATHLETIC TEAM

WEDNESDAY AFTERNOON, APRIL 4, 2018

SPECIAL TOPICS SESSION: GLOBAL SCHOLARS CAPSTONE PROJECTS – PART II
Wednesday, April 4, 2018                     1:40 PM – 5:00 PM
Allen Chapman Student Union       Level 2: Great Hall B

Social Focus Ctd:
1:40 PM  Marino, Abbey
SOCIAL ENTREPRENEURSHIP IN THE AGE OF GLOBALIZATION

Sciences:
2:00 PM  Easley, Hannah
CHARACTERIZATION OF THE MICROBIOME WITHIN HUMAN POPULATIONS OF CIMEX LECTULARIUS

2:20 PM  Rodriguez, Rob
BHUTAN: AN INTERNATIONAL LEADER IN ENVIRONMENTAL CONSERVATION

2:40 PM  Schinnerer, Camden
DEVELOPMENT OF A NOVEL METHOD TO RAPIDLY TEST THERAPEUTIC DRUGS FOR PARKINSONISM DISEASES AND ITS IMPLICATIONS FOR GLOBAL, AGING POPULATIONS
3:00 PM  Ryan Starkweather
CRASHING THE COMMUNIST PARTY: XI JINPING’S EFFECTS ON THE INSTITUTIONALIZATION OF AUTHORITY IN CHINA

3:20 PM BREAK

Politics and Culture:
3:40 PM  JD Wessinger
INTERCULTURAL EXCHANGES THROUGH FOOD

4:00 PM  Alex Reinert
PUTIN'S RUSSIA: STRONGMAN, STRONG STATE?

4:20 PM  Tai Igarashi
A CLOSER LOOK ON T.S. ELIOT - A GLOBAL WASTE LAND

4:40 PM  Nate Beckemeyer and Se Yeon Kim
MIGRATION PREDICTIONS FROM ECONOMIC DATA WITH MULTI-AGENT SYSTEMS

CONTRIBUTED PAPERS: BIOLOGICAL SCIENCES II

Wednesday, April 4, 2018  1:00 PM – 3:20 PM
Allen Chapman Student Union  Level 2: Chouteau

1:00 PM  Nicholas Ledbetter
TERRESTRIAL CONSTRAINT ON LIMB EVOLUTION IN SALAMANDERS

1:20 PM  Alex Hess
ISOPOD SYSTEMATICS AND BIOGEOGRAPHY

1:40 PM  Amera Elsayed
A NEW SPECIES OF HAEMATOCOCCUS FROM TULSA, OK

2:00 PM BREAK

2:20 PM  Anand Bahadur Karki
AEROTOLERANT CAMPYLOBACTER COLI AND CAMPYLOBACTER JEJUNI STRAINS IN RETAIL LIVER AND MEAT PRODUCTS

2:40 PM  Leena Subhan Neyaz
COMPLETE GENOME SEQUENCES OF TWO PLASMID-BEARING STAPHYLOCOCCUS AUREUS STRAINS ISOLATED FROM RETAIL LIVER

3:00 PM  Josh McLoud
AIRBORNE RHODOTORULA CONCENTRATIONS AND ASSOCIATED METEOROLOGICAL VARIABLES IN TULSA, OKLAHOMA
CONTRIBUTED PAPERS: SOCIOLOGY
Wednesday, April 4, 2018 1:20 PM – 2:40 PM
Allen Chapman Student Union Level 2: Alcove

1:20 PM Yoder, Colleen
REACHING AND SERVING UNDERSERVED POPULATIONS IN TULSA, OKLAHOMA

1:40 PM Rouw, Anna
EXPERIENCES OF TATOO ARTISTS

2:00 PM Haynes, Maureen
“STRUGGLE SILENTLY WITH A SMILE”: THE EXPERIENCES OF OKLAHOMA PUBLIC SCHOOL TEACHERS

2:20 PM Vissers, Hannah and Rosales, Daniela
EXPERIENCES OF UNDOCUMENTED LATINX IMMIGRANTS AND ADULT CHILDREN OF UNDOCUMENTED LATINX IMMIGRANTS

THURSDAY MORNING, APRIL 5, 2018

CONTRIBUTED PAPERS: CHEMISTRY I
Thursday, April 5 8:40 AM – 11:40 AM
Allen Chapman Student Union Level 2: Chouteau

8:40 AM Brown, Roxanne
OPTIMIZATION OF REACTION CONDITIONS FOR A VISIBLE-LIGHT PHOTOCATALYZED BROMINATION OF ARENES USING AN ORGANIC DYE

9:00 AM Schroeder, Lucas
CHARACTERIZING ORGANIC DYE CATALYZED AMINATION UNDER VISIBLE-LIGHT PHOTOCATALYTIC CONDITIONS

9:20 AM Sutterfield, Bethany
THE EFFECT OF DIFFERENT CONCENTRATIONS OF METAL IONS ON THE DEGRADATION OF DOPAMINE IN RELATION TO PARKINSON’S DISEASE

9:40 AM Su, Jacob
PHOTOCATALYTIC CHLORINATION OF ARENES USING ORGANIC DYES

10:00 AM BREAK

10:20 AM Beffa, Alex
EXPERIMENTAL AND COMPUTATIONAL ANALYSIS OF ACTIVATION PARAMETERS FOR NON-ENZYMATIC HYDROLYSIS OF L-ARGININE ETHYL ESTER AT VARIOUS PH VALUES

10:40 AM Hopkins, Megan
FORMATION OF N-SULFONYL IMINES USING A LIGHT-PROMOTED, N-CENTERED RADICAL IMINOIODINANE/I2 SYSTEM
11:00 AM  Wirth, Denise  
**ELECTROCHEMICAL DEPOSITION OF IRON SULFIDES AND IRON HYDROXIDES: MIMICKING HYDROTHERMAL VENT SYSTEMS RELEVANT TO ORIGIN OF LIFE STUDIES**

11:20 AM  Refai, Fares  
**ORGANIC DYE, VISIBLE-LIGHT PHOTOCATALYTIC IMIDATION OF ARENES USING N-HALO REAGENTS**

**THURSDAY AFTERNOON, APRIL 5, 2018**

**CONTRIBUTED PAPERS: CHEMICAL ENGINEERING, PETROLEUM ENGINEERING, AND ENERGY BUSINESS**

Thursday, April 5  
1:00 PM – 3:00 PM  
Allen Chapman Student Union  
Level 2: Chouteau

1:00 PM  Williams, Henry; Williams, Haley; and Loe, Elisabeth  
**SOLAR PANEL CELL PHONE CHARGERS**

1:20 PM  Slavens, Shelyn  
**CHLAMYDOMONAS REINHARDTII GENE MODIFICATION USING CRISPR/CAS9**

1:40 PM  Ramasubramanian, Vaidheeshwar  
**METHANE DEHYDROAROMATIZATION - A STUDY ON REACTION MECHANISM**

2:00 PM  BREAK

2:20 PM  Soedarmo, Auzan  
**A SIMPLIFIED MODEL FOR STEADY-STATE PSEUDO-SLUG FLOW**

2:40 PM  Lemma, Tsebaot  
**ETHIOPIA'S GLOBAL ENERGY MASTER PLAN**

**CONTRIBUTED PAPERS: CLINICAL PSYCHOLOGY I**

Thursday, April 5  
1:40 PM – 3:40 PM  
Allen Chapman Student Union  
Level 2: Alcove

1:40 PM  Hoffmeister, Jordan  
**RELIABILITY AND VALIDITY OF THE PERCEIVED DEFICITS QUESTIONNAIRE IN MULTIPLE SCLEROSIS**

2:00 PM  Lau, Lily  
**ACCURACY OF TOMM SUPPLEMENTARY INDICES AMONG TEST COACHED SIMULATORS**
2:20 PM  Mulligan, Ryan  
CLASSIFICATION ACCURACY OF THE WORD MEMORY TEST GENUINE MEMORY IMPAIRMENT INDEX

2:40 PM  BREAK

3:00 PM  Guzman, Daniel  
PREVALENCE AND PREDICTION OF PVT FAILURE IN A RESEARCH SAMPLE OF MS PATIENTS

3:20 PM  Reynolds, Bradley  
THE EMOTIONAL GAMBLER: NEGATIVE AFFECT PREDICTS CONTINUED PREFERENCE FOR PUNISHING CHOICES

CONTRIBUTED PAPERS: GENERAL HUMANITIES II  
Thursday, April 5  
1:20 PM – 3:20 PM  
Allen Chapman Student Union  
Level 2: Great Hall B

1:20 PM  Noland, Andrew  
INHERITING THEIR REVOLUTIONS: INTERPRETING GREATNESS FOR THE MODERN WORLD

1:40 PM  Wiseley, Carlie  
INFORMATION LITERACY FOR TEENS IN A MID-SIZED PUBLIC LIBRARY

2:00 PM  Lee, Megan  
HUMANS EXTENDED: THE ETHICS AND POWER BEHIND TECHNOLOGICAL EXTENSIONS OF HUMANITY

2:20 PM  BREAK

2:40 PM  Brown, Audrey  
"FOLLOWERS"

3:00 PM  Wolf, Rachel  
WEAPONIZING CULTURE: HOW THE CULTURE BEHIND RUSSIAN HYBRID WARFARE SOWS AND PREDICTS FOREIGN REGIME INSTABILITY

FRIDAY MORNING, APRIL 6, 2018

CONTRIBUTED PAPERS: MECHANICAL ENGINEERING  
Friday, April 6  
8:00 AM – 11:00 AM  
Allen Chapman Student Union  
Level 2: Great Hall B

8:00 AM  Williams, Braeden  
DESIGNING COMPLEX COMPLIANT UNDERACTUATED ROBOTIC HAND MECHANISMS IN CONFINED SPACE
8:20 AM  Feroz, Keyani  
SOLAERO

8:40 AM  Hernandez, Alyssa and Tran, Emily  
A MODIFIED MELODICA FOR CHILDREN WITH SPECIAL NEEDS

9:00 AM  BREAK

9:10 AM  Nassef, Anass  
INHIBITED EROSION-CORROSION WITH CALCIUM CARBONATE PARTICLES VERSUS SAND

9:30 AM  Laney, Samuel  
CHARACTERIZATION OF COMPOSITE DAMAGE USING MAGNETIC NANOPARTICLES

9:50 AM  Waldman, Laura  
MECHANICAL BEHAVIOR OF ELECTROMAGNETICALLY DETECTABLE POLYETHYLENE

10:10 AM  BREAK

10:20 AM  Kolla, Srinivas Swaroop  
GAS CARRY-UNDER IN GLCC© FOR SEPARATED AND RECOMBINED OUTLET CONFIGURATIONS

10:40 AM  Kolla, Srinivas Swaroop  
EFFECT OF LIQUID LEVEL ON GAS CARRY-UNDER INGLCC COMPACT SEPARATORS

SPECIAL TOPICS SESSION: APPLICATIONS OF INDUSTRIAL-ORGANIZATIONAL PSYCHOLOGY
Friday, April 6  
9:00 AM – 10:50 AM  
Allen Chapman Student Union  
Level 2: Chouteau

9:00 AM  Diep, Alexander  
EVALUATION OF SELF-REGULATED TRAINING IN AN INTERDEPENDENT TEAM TASK

9:20 AM  Royes, Josh  
KIRKPATRICK MODEL OF TRAINING EVALUATION: AN EXAMINATION OF MODEL REDUNDANCY

9:40 AM  BREAK

9:50 AM  Luu, Sylvia  
EXAMINING THE SELF-DETERMINATION THEORY OF MOTIVATION
10:10 AM   Wright, Amber
          PREDICTORS OF SOCIAL LOAFING IN TEAMS

10:30 AM   Arnold, Bret
          CROSS NATIONAL EXPLORATION OF NURSE BURNOUT

CONTRIBUTED PAPERS: CLINICAL PSYCHOLOGY II
Friday, April 6   11:00 AM – 12:20 PM
Allen Chapman Student Union   Level 2: Alcove

11:00 AM   Hellman, Natalie
          EMOTIONAL MODULATION OF PAIN AND SPINAL NOCICEPTION IN SEXUAL
          ASSAULT SURVIVORS

11:20 AM   Lee, Jenny
          EXAMINING THE ROLE OF INSTITUTIONAL BETRAYAL AMONG VICTIMS OF
          INTIMATE PARTNER VIOLENCE

11:40 AM   Pearson, Meredith
          NEEDS ASSESSMENT OF BURMESE REFUGEES IN JENKS PUBLIC SCHOOLS

12:00 PM   Cole, Hannah
          TREATMENT PREFERENCE FOR TRAUMA-RELATED SYMPTOMS: PRELIMINARY
          RESULTS

FRIDAY AFTERNOON, APRIL 6, 2018

CONTRIBUTED PAPERS: GENERAL HEALTH SCIENCES
Friday, April 6   2:00 PM – 4:40 PM
Allen Chapman Student Union   Level 2: Alcove

2:00 PM   Ford, Bart
          DOES MAJOR DEPRESSIVE DISORDER ACCELERATE BRAIN AGING?

2:20 PM   Cosgrove, Kelly
          SYSTEMIC INFLAMMATION IS ASSOCIATED WITH STRONGER COUPLING
          BETWEEN STRIATUM ACTIVITY AND FOOD PLEASANTNESS RATINGS IN
          DEPRESSION WITH APPETITE LOSS

2:40 PM   Payne, Janelle
          RELATIONSHIP BETWEEN SEVERITY AND SUBTYPES OF CHILDHOOD TRAUMA
          AND BRAIN MORPHOLOGY IN ADULTS

3:00 PM   Lapidus, Rachel
          RESPONSES TO INTEROCEPTIVE AND NOCICEPTIVE HOMEOSTATIC
          PERTURBATIONS IN EATING DISORDERS
3:20 PM  BREAK

3:40 PM  Lignieres, Austin
PERCEPTUAL RESPONSES TO ENDOGENOUS AND EXOGENOUS CARDIORESPIRATORY STIMULATION

4:00 PM  Kibler, Emily
IMPLEMENTING AAC SYSTEMS IN SCHOOLS WITH LIMITED RESOURCES: A CASE STUDY AND SYSTEMATIC REVIEW

4:20 PM  Farish, Brian
LISTENER PERCEPTIONS OF FOREIGNNESS AND ACCENT ATTRIBUTION IN A CASE OF FOREIGN ACCENT SYNDROME

CONTRIBUTED PAPERS: CHEMISTRY II
Friday, April 6  1:40 PM – 5:00 PM
Allen Chapman Student Union  Level 2: Great Hall B

1:40 PM  Baldwin, Matthew
USING NANOPARTICLE-BASED SPECTRAL FILTER TO IMPROVE THE EFFICACY OF SOLAR SYSTEMS

2:00 PM  Mesneir, Alexander
SURFACE ENGINEERING OF NANOSTRUCTURED ELECTRODES AND ELECTROLYTES FOR SOLID-STATE BATTERY APPLICATIONS

2:20 PM  Saleh, Ayah
METABOLIC RESPONSE OF CELLS LACKING THE TUMOR SUPPRESSOR P27KIP1 TO LOW OXYGEN LEVELS

2:40 PM  Rowe, Allyson
ACTIVITY OF NOVEL NAPTHOQUINONE DERIVATIVES ON DIAGNOSTIC ASSAY ENZYMES

3:00 PM  BREAK

3:10 PM  Hmeluk, Natalie
DEVELOPMENT OF NOVEL CHEMOTHERAPEUTIC AGENTS VIA THE MAILLARD REACTION

3:30 PM  Thomas, Dana
DIFFERENTIAL OXYGEN USAGE IN CELLS LACKING THE TUMOR SUPPRESSOR P27KIP1

3:50 PM  Harville, Lauren
THE THERMAL STABILITY OF SILVER HALIDE THIN FILMS ON AU(111)

4:10 PM  BREAK
4:20 PM   Gress, Elizabeth
ELECTROCHEMICAL ATTACHMENT OF AN ALLYL GROUP ONTO PIPERIDINE ANALOGUE

4:40 PM   Baljak, Irene
AMINO ACIDS ON METALS: CHIRAL ASSEMBLY AND DYNAMIC RESTRUCTURING OF METAL SURFACES

SPECIAL TOPICS SESSION: CITIZENSHIP AND SERVICE IN A CHANGING WORLD
Friday, April 6 2:20 PM – 3:40 PM
Allen Chapman Student Union Level 2: Alcove

2:20 PM   Ort, Jeremiah
GREEN SYNTHESIS OF CARBAMATES OVER GA2O3

2:40 PM   Rosli, Redza
EWB-TU BOLIVIA SANITATION PROJECT

3:00 PM   Lowry, Megan and Remy
THE IMPACT OF SERVICE DOGS

3:20 PM   Yoder, Colleen
REACHING AND SERVING UNDERSERVED POPULATIONS IN TULSA, OKLAHOMA
SPECIAL TOPIC SYMPOSIA
(Listed in Chronological Order)

SPECIAL TOPICS IN EDUCATION
Monday, April 2: 9:00 AM – 11:40 AM (Great Hall B)

Organizer: Dr. David Brown (Education)

The 2018 graduates of the School of Education’s graduate programs in the MSMSE and MTA programs will discuss current educational research studies conducted for their Master’s capstone projects. Topics include student engagement, assessment and health as related to achievement, and the relationship between different forms of involvement in extracurricular activities as related to achievement. All studies are qualitative in nature, with some mixed methods.

TU RESEARCH CONNECT
Monday, April 2: 10:00 AM – 11:50 AM (Chouteau)

Organizer: Pedro Amorim (Chemical Engineering)

The Russell School of Chemical Engineering and the Graduate School Office invites you to participate in the 1st TU Research Connect, event that will happen within the University of Tulsa 21st Research Colloquium. This event has the objective of showcasing the ongoing projects within the Russell School of Chemical Engineering and invited students from other engineering departments to national laboratories and companies’ personnel. The University of Tulsa research projects in Chemical Engineering and invited disciplines intersects well with what many of companies and national laboratories throughout the country are working on.

Dr. Philip Pienkos, strategic project lead from the National Renewable Energy Lab (NREL) will open this event and present about the work done at NREL in algae biomass conversion. In addition to that, he will also explain the pathways to start a career at NREL (from internships to full time positions).

The major areas that will be discussed include (bio)energy and bioengineering. The greatest motivations on all the presentations are how the subject covered have the potential to contribute with the advancement of science and the creation of new technology while presenting sustainable pathways. The topics go from growing algae in space to transforming methane in liquid fuels.

TU Research connect aims to grant opportunities to students to present their projects to a public that is familiar and works constantly with the student’s research area. In addition to that, it will create networking opportunities between the University of Tulsa students and national laboratories and companies’ personnel. Moreover, jobs and internships opportunities, based on the national laboratories and companies’ interests, for both domestic and international students may arise from this event. And finally, this symposium will enable the creation of partnerships/collaboration opportunities of research projects among the University of Tulsa faculty members and students with national laboratories.
FROM BACK ROOMS AND BEYOND: CURRENT TOPICS IN ANTHROPOLOGY, ARCHAEOLOGY, AND MUSEUMS  
Tuesday, April 3: 11:00 AM – 4:30 PM (Great Hall B)

Organizer: Emily Schumacher (Anthropology)

What does it mean to be human? Is it the ability to adapt environments and technology to our will? Is it the power to transform a barren landscape into a fruitful garden or fashion solid rock into a precise implement for hunting? The capacity for creative expression through painting, sculpture, and basket weaving? Our penchant for elaborate rites and rituals surrounding the death and burial of our loved ones? Perhaps it is the ability to think in the abstract, or our fascination with symbols? And maybe, what it means to be human is an amalgamation of the behaviors that we act out on a daily basis. As humans, we are particularly interested in our own species. We pursue, through the clues (both buried and evident) in the world around us, increased understanding of our ancestors and ourselves. We seek knowledge of and through physical and artistic expression. And we strive to preserve memory, giving life to the past by telling the stories otherwise left untold.

This fascination with humanity and the desire to better understand it in all its aspects is a hallmark of the fields of Anthropology, Archaeology, and Museum Science. Though each is unique in its emphasis and utilizes various methodologies, these three fields collectively aim to understand and preserve what it means to be human. This special topic session is an interdisciplinary effort in examining humanity and human cultural expressions across time and space through discussion of current topics within anthropological, archaeological, and museological research. Presentations will explore innovative methods for interpreting the archaeological and osteological records, delve into the world of museums and museum programming, and discuss resilience through the lens of Cherokee baskets. Other presentations will examine mortuary practices within American culture, shed light on the health and mortality of formerly enslaved populations, and elucidate the issue of preservation verses recreation within the world of cultural resources.

IDENTIFYING WORK PLACE FACTORS TO MAINTAIN EMPLOYEE AND ORGANIZATIONAL WELL-BEING  
Wednesday, April 4: 8:00 AM – 9:20 AM (Chouteau)

Organizer: Rose Fonseca (Industrial-Organizational 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 the organization 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.

There are plenty of factors that can influence why employees experience work-related stress. The series of studies presented in this symposium will address workplace factors that impact the health and well-being of employees (e.g., recovery) and the organization (i.e., performance). Specifically, these studies investigate (1) identity expression in the workplace, (2) leadership style, (3) work breaks, and (4) motivational attributes as they related to both individual and organizational outcomes.
THE STATE OF TU-NION: AN EXAMINATION OF SEXUAL ASSAULT AND INTERPERSONAL VIOLENCE AT THE UNIVERSITY OF TULSA
Wednesday, April 4: 8:30 AM – 9:50 AM (Alcove)

Organizer: Chelsea Cogan (Clinical Psychology)

Sexual violence and interpersonal violence are pervasive campus issues at universities and colleges across the country. At the University of Tulsa, a campus climate survey is disseminated twice a year to collect information about the rates of this on our campus. In addition to collecting information about the rates of violence on our campus, the survey collects data such as mental health outcomes, level of institutional betrayal, information about substance use, concerns about campus safety more broadly, and information about how students view TU’s capacity to address complaints of violence appropriately when they occur. From this survey, an executive summary is compiled, which provides an overview of the information collected from the survey and includes next steps TU may want to consider in terms of programming. While this executive summary is available to all students and faculty, it is typically only sent directly to leadership at TU. This special topic symposium includes presentations that will review the campus climate survey executive summary more broadly, as well as projects which will utilize the data to answer questions not included in the executive summary. The presentations will combine data with feasible recommendations to address sexual and interpersonal violence on campus. These are issues that impact every person at TU and this special topic symposium aims to inform and involve students in what is happening on our campus.

SCIENCE AND PRACTICE OF INDUSTRIAL ORGANIZATIONAL PSYCHOLOGY
Wednesday, April 4: 9:30 AM – 11:20 AM (Chouteau)

Organizer: Dr. Anupama Narayan (Psychology)

Industrial-Organizational psychology is a field that utilizes scientific methodology to better understand the behavior of individuals working in organizational settings (Jex & Britt, 2014). The papers presented in this symposium focus on scientific literature on various topics of IO psychology (such as motivation and leadership) in different contexts (such as athletics and student teams) and consolidate some key findings. Presenters will also provide practical applications and relevance of those findings.

GLOBAL SCHOLARS CAPSTONE PROJECTS
Wednesday, April 4: 8:00 AM – 10:40 AM, 1:40 PM – 5:00 PM (Great Hall B)

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

Students in the TU Global Scholars Program are required to complete a capstone project connecting work in their major field of study to the Global Scholars curriculum. Because Global Scholars is an interdisciplinary program, student project topics will vary considerably. What will connect the presentations in this symposium is that students will speak to the global applications or implications of the work they have done. In this year’s symposium, students will present on a variety of topics including U.S. Financial Regulation, Social Injustice, Chinese Politics, and more.
APPLICATIONS IN INDUSTRIAL-ORGANIZATIONAL PSYCHOLOGY
Friday, April 6: 9:00 AM – 10:50 AM (Chouteau)

Organizer: Dr. Anupama 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 exploring the construct of motivational traits, individual differences and social loafing, burnout in nurses across cultures, and evaluating training in different contexts.

CITIZENSHIP AND SERVICE IN A CHANGING WORLD
Friday, April 6: 2:20 – 3:40 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.
SUBMITTED PRESENTATION (ORAL) ABSTRACTS

Adhikari, Gopi Chandra; Vargas Preston; Zhu, Peifen; and Zhu, Hongyang
GREEN-INFRARED COLOR TUNING USING LOW COST ORGANOLEAD MIXED HALIDE PEROVSKITES FOR OPTOELECTRONIC APPLICATIONS

Recently, organometal halide (MAPbX$_3$, MA-CH$_3$NH$_3$, X -halide) perovskite semiconductors have emerged as a highly efficient and band gap tunable nanomaterials to be used in optoelectronic devices such as light-emitting diodes (LEDs), solar cells, and photodetectors. Here, we introduce and demonstrate a cheap and facile solution-based synthesis process of methylamine lead mixed halide (MAPbBr$_x$I$_{1-x}$, $0 \leq x \leq 1$) perovskites at room temperature. We prudently control the peak position of emission spectra from green to infrared (IR) by changing the molar ratio of Br to I ions. The growth mechanism, optical and structural properties of these compounds were studied in detail. Hence, we were able to fabricate low cost, bright luminescence, and stable bromide-iodide based perovskites that emit light across the significant portion of the visible spectrum.

Amsler, Jerry
THE ECONOMICS OF CRYPTOCURRENCIES

Bitcoin and other cryptocurrencies have become very popular within the last year as they have increased in value. The digital currency reached a peak in value on December 16th, 2018 at $19,000 for 1 bitcoin and is still very valuable at $9000 per bitcoin today. Cryptocurrencies are changing the economic landscape around us and will continue to do so as more people buy into the non-regulated digital commodity. My presentation will connect the new technological and economic changes that cryptocurrency provides to some of the Global Challenges discussed in the Global Scholars courses. I will mostly relate it to the Economies challenge. My presentation will look at how cryptocurrencies will play in the globalization and the increasing interdependencies of the global markets and how digital currencies will help, or hinder, the emerging BRIC economies (Brazil, Russia, India, China). Also, I will further explain what blockchain is and how it works, along with relating it back to topics from the Technology and Security challenges.

Andrew, Shianne; Cogan, Chelsea; and Davis, Joanne
THE CONSEQUENCES OF DRUG-FACILITATED/INCAPACITATED RAPE: A UNIQUE THREAT TO MENTAL HEALTH?

Sexual assault is commonly categorized into three types: attempted rape, forcible rape, and drug-facilitated/incapacitated sexual assault (DFSA). A limited number of studies have examined differences between these types of assaults with mixed findings regarding the subsequent risk for PTSD. As few studies have directly examined the link between assault type and PTSD level, we aim to conduct an exploratory study using data from the campus climate survey at the University of Tulsa to determine whether there is a difference in levels among groups. This will contribute to the literature through demonstrating whether or not statistical differences exist in the rates of PTSD between assault types. Additionally, research suggests that individuals who experience DFSA are at higher risk of developing substance use issues. To this end, we will also examine substance use among the groups and hypothesize that individuals who have experienced DFSA will report a higher average number of drinks per week, a higher number of alcoholic beverages consumed in the past month, and a higher amount of negative consequences related to substance use than individuals in the remaining two categories. To analyze and compare differences in PTSD levels, average number of drinks, and number of alcoholic beverages within the past month, a series of one-way ANOVAs will be conducted. Additionally, we will conduct a MANOVA to examine differences in negative consequences associated with substance use among the three groups. Results will inform future programming choices and resource needs for students and assault victims at The University of Tulsa.
Arnold, Bret and Narayan, Anupama
A CROSS NATIONAL EXPLORATION OF NURSE BURNOUT

Research publications on burnout in the medical industry rapidly increased in response to the American nurse shortage. In response the United States’ nurse shortage, a flourish of psychological research has targeted causes burnout and turnover in hopes to improve employee well-being, reduce job strain, and ultimately retain employees. These research programs have generated numerous interventions with varying success (i.e., Ruotsalainen, Verbeek, Marine, & Serra, 2015; Awa, Plaumann, & Walter, 2010) but the degree to which these interventions are internationally transferable remains unclear. Indeed, a research-supported US intervention (Grandey, 2003) applied in China yielded increased burnout symptoms in the Chinese sample (Allen, Diefendorff, & Ma, 2014). It appears that culture-related variables may moderate the burnout relationships well-studied in American samples. This study was partially funded by a University of Tulsa student grant to examine how the relationships of the burnout mediate model (Leiter & Maslach, 2009) differ between Indian and American hospital nurses. Respondents from both countries completed self-report surveys to measure burnout-related constructs that exist within the worker and the workplace. A better understanding of these relationships will help researchers identify the limits of generalizability for American research, and guide practitioners in finding targets for intervention that will most effectively reduce burnout and turnover of nurses in other cultures.

Ayres, Thomas
EMPLOYEE RECOVERY: WHAT ROLE DO LEADERS PLAY?

Recovery, a process described as psychologically unwinding in the face of strain or other job related stressors (Sonnentag, Venz, & Casper, 2017). High job stressors and demands, such as situational constraints, have been linked most directly to inhibiting this recovery process and experience (Nägel, Sonnentag, & Kuhnel, 2015). Leaders can be a source of stress and producer of job demands. However, less is known about how leadership may also impact the recovery process. The aim of the proposed research is to investigate how different leadership behaviors, styles, and values help or hinder employees’ recovery from work stress, and in turn, impact their job performance and well-being. This presentation will provide an overview of the theoretical basis for integrating leadership into the stress-recovery process and propose a methodological approach for investigating this research question. Practical implications and future directions will be suggested.

Ayres, Thomas
EMERGING LEADERS WITHIN INTERDEPENDENT TEAMS: A QUALITATIVE APPROACH

The effect of leadership on performance has long been a focus of many Industrial-Organizational Psychologists. Within the study of leadership the behaviorist perspective looks at leader behaviors as either “task-oriented” or “people-oriented” (Judge, Piccoli, & Illies, 2004). The present study is concerned with evaluating emergent leader behavior through the degree that individuals begin to engage in specific observable behaviors in response. Emergent leadership has been described as a leader who rises informally within a group through completing leader-like duties and behaviors (Cogliser, Gardner, Gavin, & Broberg, 2012). Behavior such as solution focused communication has been shown to influence others solution focused communication and decreased disruptive behaviors that both lead to increased performance (Lehmann-Willenbrock, Meincke, Rowold, & Kauffeld, 2015). Additionally, training leadership functions that include strategy clarification, coordination and situation clarification also have been shown to increase team effectiveness (Santos, Caetano, & Tavares, 2015). Through integrating these findings and the general behaviorist view of task versus people oriented leader behavior, a coding scheme has been developed to evaluate emerging leaders with-in interdependent teams and performance. The focus of this presentation is on the creation of the coding schema and the future direction of the project.

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

Produced water – also known as hydraulic fracking 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. The goal of our
research is to evaluate produced water as a potential growth medium for microalgae. Our preliminary lab scale studies with the microalgae species Chlamydomonas reinhardtii, Dunaliela sp. and Nannochloropsis salina, which are known to grow in saline conditions have shown promise. 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 and a standard growth medium specific to each species. The growth performance 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 the standard growth 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 biofuels.

Baldwin, Matthew; Tunkara, Ebrima; and Roberts, Kenneth
USING NANOPARTICLE-BASED SPECTRAL FILTER TO IMPROVE THE EFFICACY OF SOLAR SYSTEMS

Efficiency of Photovoltaic (PV) cells are limited by the conversion of photons to electrons inside a PV cell, but also by the amount of radiation from the solar spectrum a PV cell is able to convert to electricity. The light absorption range in PV cells is mostly narrow, thus solar radiations outside the range are mostly lost to the environment through reflections. For e.g., the UV, Visible and NIR radiations are not utilisable by a silicon PV cell. Therefore, if these non-bandgap energies could also be absorbed and converted into thermal energy, then that thermal energy could be used to produce additional electricity through applications such as in steam turbines. One of the approaches in cogenerating electricity and disparchable thermal fraction is by integrating a thin solar filtering layer in hybrid PV systems. The filter for a silicon cell in a hybrid solar system should consists of NIR and UV-Vis absorbing nanoparticles such as Indium Tin Oxide (ITO) and Gold respectively to effectively filter off the non-bandgap radiation from the solar spectrum. The absorption efficiency of these nanoparticles depend on concentration, size, dopant concentration, etc. ITO and Au nanoparticles were synthesized, suspended in a heat transfer fluid and heated to 300°C (proposed working temperature of a hybrid solar system). The optical properties of the before and after heating samples were monitored using IR and UV spectrometer, result from which showed direct correlation between light absorption and temperature. The observed enhancements in the optical properties are attributed to the redistribution of tin in ITO, and breakage of large clusters in Au nanoparticles.

Baljak, Irene; Phillips, Jesse; and Iski, Erin
AMINO ACIDS ON METALS: CHIRAL ASSEMBLY AND DYNAMIC RESTRUCTURING OF METAL SURFACES

The focus of this research is the imaging of amino acid assemblies on metal surfaces. To do this, scanning tunneling microscopy (STM), which allows for molecularly resolved images, was used. The STM not only works in air, but can also be combined with electrochemistry to function in a liquid and under potential control (EC-STM). Specifically, the project focused on observing isoleucine, a nonpolar, essential amino acid with an uncharged side chain, on an atomically flat gold (Au(111)) surface. Importantly, because the imaging can take place in a liquid environment, it is possible to study these molecular assemblies under conditions that are physiologically relevant. The results from the study indicated that isoleucine assisted in the formation of metal islands on the gold surface, which correlates well with a recent Ultra-High Vacuum STM (UHV STM) study. This observation led to the hypothesis that the Au surface is directly involved in the molecular assembly process. In the future, our lab plans to extend the research to a different metal and to amended molecular structures of isoleucine to help determine which side groups play a role in the isoleucine-Au interactions. Furthermore, the effects of temperature on the molecular-substrate interactions will also be studied. This research aims to bring more clarity on the role of metal surfaces in the origins of life, to provide a better understanding of amino acid structure and biosynthesis, and to help in providing tools for the development of new biocatalysts, biosensors, and materials.
Barber, Samantha
PERSONALITY AND MOTIVATION IN THE ATHLETIC CONTEXT: A LITERATURE REVIEW

The increasingly competitive nature of athletics combined with the rising profitability of exceptional athletic performance, means that being able to predict and influence athletic performance is correspondingly profitable. While measuring physiological capabilities can provide some indication of future performance, accounting for the psychological components of athletics could be equally beneficial. This paper uses a number of different psychological research studies focusing on personality from a variety of athletic environments to evaluate which personality traits might indicate a propensity for exceptional athletic performance. It also aggregates several psychological studies on sports and motivation across several settings with diverse groups of subjects in an effort to appraise the distinction between successful and less successful athletic performance. The studies on personality suggest that higher levels of agreeableness, conscientiousness, emotional stability, extraversion, and hardiness are possessed by more successful athletes, generally speaking. Results from motivation-focused studies suggest differences in contextual factors that help understand success in individual and team sport settings.

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

Previous research studies showed 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. It was 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 was 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 were given a survey to indicate their participation in extracurricular activities as well as their overall math grades. Results from this study will help schools to justify an increase in extracurricular activity opportunities for students in order to increase math grades.

Basco, Victor
PROCESSES OF FORENSIC FACIAL RECONSTRUCTION

Forensic Facial Reconstruction (FFR) has proven useful in forensic legal cases when the remains of a victim are unidentifiable. Though there is a small margin of error, FFR proves to be moderately helpful to legal organizations such as the police. FFR is also relevant in a historical and archaeological sense. When the remains of a person (historical or ancient) are discovered, their face is almost never there. If there are no paintings of this individual, then FFR is the only way to see what they may have looked like. In my research of FFR, I will be using neither forensic nor historical remains. However, I will be giving back the lost faces of those people who reside in our lab, also giving them back a bit of humanity that they lost when they arrived here.

1. CT Scans of a skull from BoneClones will be used to reconstruct the face twice using the combination/Manchester method; once using the arithmetical mean, and once using the shorth. The shorth is the arithmetical mean compressed to the densest 50%.
2. The reconstructed face will then be compared to photos of the actual face, provided by BoneClones. The more accurate central tendency indicator will be determined and applied to the TU Harwell Collection.
3. 3D mesh computer models of the skulls currently housed in the TU Harwell Hall Paleoanthropology and Human Osteology Collection will be created.
4. The faces will be reconstructed using the combination/Manchester method using the previously determined central tendency indicator of greater reliability.
Beckemeyer, Nate
MIGRATION PREDICTIONS FROM ECONOMIC DATA USING MULTI-AGENT SYSTEMS

This work uses a probabilistic multi-agent systems approach to predict migration from economic data. Agents internalize a probability of migration, weighted by certain economic conditions, such as GDP/capita and unemployment percentage, and other data. Their parameters are trained from historical economic and migration data and used to predict migration values in the distant past or future (to avoid predicting near-constant level of migration). This work presents a novel method to predict future global migration patterns from economic data, providing meaningful information to policymakers and population projectionists. The limitations in this work include a lack of finely granulated migration data.

Beffa, Alessio
EXPERIMENTAL AND COMPUTATIONAL ANALYSIS OF ACTIVATION PARAMETERS FOR NON-ENZYMATIC HYDROLYSIS OF L-ARGININE ETHYL ESTER AT VARIOUS pH VALUES

L-Arginine ethyl ester (LAEE) is a nutritional supplement available as a substitute to l-arginine for athletes looking to improve endurance or performance. It is hypothesized that there is a higher efficacy associated with LAEE due to an assumed higher bioavailability and stability in physiological environments, though this is not confirmed in the scientific literature. The hydrolysis of LAEE into l-arginine and ethanol is a pH dependent reaction that occurs readily at physiological pH values. However, the mechanism is not well understood. Thus, a study was undertaken to examine the activation parameters associated with the hydrolysis at three different pH values. The parameters were determined first through experimental analysis using H1-NMR and then theoretically through computational modeling. A comparison of the theoretical and experimental results is the subject of this presentation.

Berrett, Chandler
PRIVATE PRISONS IN OKLAHOMA

This project analyzes Oklahoma’s complex and flawed prison industrial complex, particularly the state’s reliance on privately owned correctional facilities. Greatly influenced by the “tough-on-crime” policies of the Nixon, Regan, Bush, and Clinton administrations, Oklahoma’s private prisons have become a hot bed for a variety of problems that infringe upon the rights and safety of prisoners and guards. Incentivized by a per-inmate business model, Oklahoma’s private prisons and the companies who control them, CoreCivic and GEO Group, discourage reform and encourage recidivism. As a result, Oklahoma has become first in the nation for incarcerating women and third for incarcerating men. To keep their prisons full, CoreCivic and GEO Group engage in lobbying at both the state and federal levels, influencing politicians like past Oklahoma governor Frank Keating and present Oklahoma Governor Mary Fallin to support harsh criminal justice legislation that targets minority communities. All this results in more incarcerations for menial non-violent crimes, thus expanding the state’s inmate population, as well as these companies’ profits. Oklahoma and its taxpayers do not see such a return on their investment. Private prisons have become increasingly more expensive for the state, while continuously being rocked by human rights violations. Private prisons do not help the average Oklahoman, they do not save the state money, and they infringe upon the rights and safety of their inmates and staff. In fact, Oklahoma’s private correctional facilities are more expensive and dangerous than ever.

Bont, August and Vargas, Preston
BLEU EMISSION FROM CsPbBr3 QUANTUM DOTS FOR LIGHT-EMITTING DIODES

CsPbBr3 quantum dots were synthesized with Cesium-Oleate and Lead-Bromide to form the compound desired. The size and luminescent properties of the crystal structure is dependent of the temperature of the growth. The different samples were tested in the photoluminescence machine to determine their excitation and emission spectra. Select samples were imaged with a SEM to determine their size and structure. Further, samples were tested under an XRD machine to study the physical structure of the quantum dots. The results indicated that there is a positive correlation between the temperature of growth and peak emission wavelength. This data can be used to help improve the efficiency of LEDs.
Bowman, Paul
USING SURFACE METROLOGY TO RESOLVE EQUIFINALITY IN BONE SURFACE MODIFICATIONS IN ARCHAEOLOGICAL SITES

Understanding the niche of early Homo can be a difficult task. One of the main components of early Homo niche is their mode of subsistence. One of the methods for interpreting their resource procurement is the study of bone surface modifications (BSM’s), more specifically cut marks and hammer stone marks. Being able to identify and distinguish cut marks from other taphonomic processes is ambiguous and has focused on SEM, light microscopy and profile attributes. A relatively new method within archaeology being used to study BSM’s is surface metrology. Although microscopic analysis of cut marks, gnaw marks, abrasion, and others is not new, it has largely been subjective; surface metrology makes use of white light confocal microscopy to analyze surfaces using ISO roughness variables. Here I present data from an experimental bison butchery used to develop a model to describe surface metrology parameters of cutmarked bones. This model will be applied to the early Pleistocene site of ‘Ubeidiya, Israel.

Brown, Audrey
“FOLLOWER”

Social media networks such as Facebook and Twitter have retooled verbiage in our everyday lives with little realization from society; words such as “likes” or “friends” have taken on new connotations and meanings that were not assumed before. But I suggest one word has been altered slightly differently than others - “follower.” As I researched the distinctions in the use of “follower,” I found the more prevalent applications of the word to be: the concept of one person sharing ideals with someone of political power or a running candidate; the religious notion of being a follower of a certain system of beliefs; a more threatening definition, with the idea of someone stalking, or following, another person; and, most relatedly, this internet based meaning where one person is subscribing to another’s social media content. The abounding amount of social media platforms in society today has led the term “follower” to manifest into an entirely new meaning. However, I have found that in this shift, “follower’s” origins of religious allegiance, political devotion, and even criminal intent, remain a strong pulse to the understanding of the word.

Brown, Roxanne and Lamar, Angus
OPTIMIZATION OF REACTION CONDITIONS FOR A VISIBLE_LIGHT PHOTOCATALYZED BROMINATION OF ARENES USING AN ORGANIC DYE

Bromoarenes are valuable intermediates in the synthesis of numerous complex molecules. They are traditionally used as substrates in metal-mediated cross-coupling chemistry by directly brominating acidic or oxidizing agents. This traditional synthesis however, can be potentially dangerous and/or corrosive. Instead of using molecule bromine such as N-bromosuccinimide or other anionic bromides as an electrophilic “Br” species, our research group has developed an alternative method to amplify the electrophilicity of B-bromosuccinimide (NBS) under non-acidic conditions. Our new approach is not only inexpensive, but also uses a visible-light-promoted alternative that makes it more safe and environmental friendly. Our progress toward the discovery of an organic dye photo catalyst for use with NBS and the subsequent optimization of reaction conditions with regard to arene bromination will be presented.

Burleson, Jennifer
INFLUENCE OF SURFACE MORPHOLOGY ON THE CONTACT ANGLE OF ZINC OXIDE NANOSTRUCTURES

Modifying surfaces to have different surface energies and therefore different contact angles is desirable when fabricating superhydrophilic or superhydrophobic surfaces. Previous studies seem to indicate that the surface roughness has strong influence on the contact angle. This study investigates the effects that different surface morphologies of doped (Cobalt) and undoped ZnO nanorods grown on glass or silicon have on the contact angle. Measured contact angles of numerous samples range from around 30 degrees up to 145 degrees. The 0.1 M ZnO nanostructures on seeded glass resulted in a contact angle
of 136.7 degrees with an RMS value of 0.0173 microns for the surface roughness. In contrast, the 5% Cobalt doped ZnO nanostructures on seeded Silicon resulted in a contact angle of 142.7 degrees with an RMS value of 0.4698 microns for the surface roughness. Preliminary results indicate that the surface roughness, measured by an AFM, can be correlated to the contact angle measurements. A confocal microscope was also used to examine surface properties. The surface morphologies were changed by introducing Cobalt Nitrate doping and varying the molarities of the precursor solution along with the use of seeded or unseeded substrates. The nanostructures were fabricated via chemical bath deposition. We will further investigate the relationship between surface roughness and contact angle by fabricating samples of wide morphologies and using AFM and a confocal microscope to characterize the surface roughness. By measuring water droplet contact angles, we can establish a model for the variation of the surface roughness with morphological changes.

Burris, Tori
THE DISABILITY DISCUSSION DISCONNECT

Through a documentary film, summer job, minor, and backpacking across Europe and Northern Africa, I had the opportunity to gather film, photos, and observational journals documenting my experience discovering disability, discussion, and the discomfort with disability in western culture. I propose to present a discussion surrounding the importance of exploring subjects we are ignorant about or make us uncomfortable. Through my personal journey explaining the importance of combining lived-experience, academic interest, and global awareness I propose a more succinct process for exploring the topics we sometimes have the most trouble understanding. Utilizing the seven global challenges to dig deeper into applying an understanding of all of factors that have shaped our concept of disability and how it functions within different Western cultures. The application of this process can be utilized when exploring a number of other timely topics such as gender issues, racial tension, LGBTQ+ rights, and other marginalized groups.

Caselman, Emily; Moore-Hammill, Emily; and Williams, Angela
THE KRAVIS DISCOVERY CENTER: EVALUATION TO BENCHMARK SUCCESS AND DISCOVER FURTHER OPPORTUNITY FOR THE REDESIGNED KDC

In July of 2017, the Thomas Gilcrease Institute of American History and Art installed updates to the Kravis Discovery Center (KDC). The goal of the KDC update was to create a more interactive learning experience for visitors. The purpose of this project was to evaluate these updates and determine if the original objective is being met. Prior to beginning the evaluation, the evaluation team was in contact with the exhibit designers in order to discuss the primary objectives of the evaluation. These objectives include the value that the visitors apply to their experience, the effectiveness of the tablets, user engagement, and any additional features that visitors may want on the tablets and the exhibit components. This presentation briefly discusses the methodology by which the Center was evaluated and the raw data collected, then focuses on the analysis of the data, and recommendations for the Center based on the data collected.

Caselman, Emily
RECREATION AND PRESERVATION: ALLOWING ACCESS TO THE PAST WHILE ENSURING THERE’S A FUTURE

Some of the most popular tourist destinations in the world are centered on archaeological sites. Thousands of people flood these locations every year, hoping to get a glimpse of the past up close and personal. But this glimpse does not always come without a price: on their quest for unforgettable experiences, people often put aside their concern for the preservation of sites. A tourist dropped a camera on a 1500 year old skull at Actun Tunichil Muknal cave in 2012, the rock art in Utah’s National Forrest was vandalized in 2015, and a Navajo structure was recently dismantled in Bear’s Ears National Monument and used as firewood. The damage caused to these sites and artifacts is irreversible, whether intended or not. Going forward, recreation and preservation must go hand in hand. This presentation discusses possible ways in which recreational opportunities can be provided while still ensuring sites’ integrity and preservation. Specific examples are drawn from current sites within North America and Mesoamerica which already implement creative and engaging techniques.
Chen, Catherine
THE RELATIONSHIP BETWEEN SOCIAL MEDIA USE DURING WORK BREAK, THE ROLE OF AFFECT AND PRODUCTIVITY

In this article, I will review previous literature and explore the relationship between social media use during work break, how that may influence work affect, and thus impact productivity. I hypothesized that using social media during work break would have negative impact on productivity and this effect would be moderated by affect. Using social media during work break may invoke negative feelings. People tend to portray their best life on social media. When you check your social media and compare your life with the life that people select to show on social media, you tend to feel more anxious and jealous. The potential distressed caused by using social media may have a negative impact on your work productivity. I will propose the method and statistics that can be used for this study, but no data will be collected for the current research. Hypothetically, I will recruit 90 participants who are enrolled in an introductory psychology class at a private university in the United States. All participants will be expected to come at two time points. During the first time, they will be asked to perform some simple tasks on the computer for 10 minutes. After that, they will be given 10 minutes to take a break and check their social media. They will resume their tasks after the break. During the second time, the routine will be the same, but they will not be allowed to check their social media during the 10-minute break. The participants will be asked to complete an emotion questionnaire upon the completion of their sessions each time. The productivity of the second half will be recorded based on how many tasks they complete, and analyzed with the affect using regression model. Sample t-tests will be conducted on affect and productivity between two time points.

Chowdhury, Shuddha and Sharmin, Jahan
ASPECTS OF DATA ANALYSIS TO EVALUATE BRAIN WAVE DATA FOR FURTHER RESEARCH USES

We present our study of publicly available brainwave dataset and make some comparison with MUSE data output. Muse is a tool which gives accurate, real-time feedback on what’s happening in user's brain when they meditate. For this research, we will use Temple University’s publicly available EEG Corpus freely available brainwave data to see if comparing this dataset with MUSE data output is sufficient enough to carry on further human study research. This dataset consists of 12,000 patients’ 16-channel EEG data and it is taken from Temple University hospital repository. We will use the MUSE on ourselves to understand how it works so that we can see how closely the data it produces matches the publicly available data. Muse is a portable and wireless 4-channel EEG headband and we will use various data analysis techniques such as predictive analytics to compare Muse data with the publicly available data to check if we can find any similar interesting patterns or not or correlation analysis to correlate various attributes and characteristics. The potential of this preliminary study is that if we can find some similar properties in both cases then we can extend our research on a broader scale which can involve further human studies toward developing an activity recommendation system. This can recommend users’ various activities to improve his mental well-being such as improving focus, calming the mind, elevating mode based on the preliminary data analysis.

Cogan, Chelsea; Jenny, Lee; and Joanne, Davis
A BRIEF OVERVIEW OF THE CAMPUS CLIMATE SURVEY AND EXECUTIVE SUMMARY

Sexual assault and interpersonal violence occur on campuses across the nation at higher rates than most assume. Due to the nature of these types of violence, assaults on campus often go unreported, leading administrators to believe violence is not occurring on their campus. In 2014, the University of Tulsa began examining the rates of sexual and interpersonal violence on campus using the campus climate survey. This survey is sent out at the beginning of each semester and is an opportunity for students at TU to voice their opinions on their perception of the campus climate in regards to sexual and interpersonal violence as well as disclose any experiences of their own. From this survey, an executive summary is constructed with a wealth of information regarding these rates on campus as well as a number of other factors. Additionally, the executive summary includes suggestions for TU to assist in developing programming to appropriately respond to sexual and interpersonal violence on campus. The executive summary is typically sent out to administrators and interested faculty members, and is also available for students to view. This presentation will briefly cover the campus climate survey data from the academic year 2017-2018 and will highlight components of the executive summary.
Cole, Hannah; Jim, Scholl; and Joanne, Davis
TREATMENT PREFERENCE FOR TRAUMA-RELATED SYMPTOMS: PRELIMINARY RESULTS

A broad range of efficacious psychotherapeutic and pharmacological treatment options are available to individuals diagnosed with posttraumatic stress disorder [PTSD]. Client preference is a key factor in selecting the most appropriate treatment and clients 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). A broad understanding of client preference also allows clinicians to more effectively allocate their limited resources toward treatments that clients are more likely to choose and engage in. 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 present study extends previous findings by examining multiple trauma types in a mixed gender sample. Further, it explores the relationships between gender, trauma type, and treatment preference. Preliminary findings indicate that the majority of participants endorsed a preference for a combination treatment of psychotherapy and pharmacotherapy. Additionally, results indicated that neither gender nor trauma type significantly predicted treatment preference, which suggests that treatment preference may be stable across these client characteristics. Thus, an increased emphasis on combination treatments for trauma-related symptoms may be in the interest of both clients and clinicians.

Cook, Madeline and Foley, Lara
BARRIERS: BURMESE REFUGEES IN TULSA, OKLAHOMA

There are more than 6,000 Burmese refugees living in Tulsa, Oklahoma, and the vast majority of people living in Tulsa have no idea that this population exists. In this project, I will reveal previously unseen research about a seemingly unknown community: the Evangelical Christian group of Zomi refugees, from the Chin State in Burma, who are now living in Tulsa. I aim to raise awareness about the Zomi refugees in Tulsa and to reveal what impacts a host community’s lack of awareness can have on a displaced community. Through semi-structured interviews with Burmese refugees, the agency in charge of resettlement in Northeastern Oklahoma, Catholic Charities, and other local authorities on the Burmese population in Tulsa, I will reveal new insights into this community. By learning more about the people who live among us, and the challenges met by refugees when resettled, host populations can work to diminish the barriers that many refugees face when trying to rebuild their lives abroad.

Corbaz, Bryan and Latham, Sean
IDENTITY AND INTERSECTIONS: SEXUAL IDENTITY FORMATION IN LGBT YOUTH

The topic of this year’s research seminar sponsored by the Oklahoma Center for the Humanities focused on Homelands. In this vein, this study examined the effect of homelessness on sexual identity formation in LGBT youth. The home and family are often considered as being important if not essential parts to identity formation in young people. In the lack of these elements of home and family, these needs are provided for LGBT individuals in the forms of gay clubs or bars as well as popular media. This study examined the history of terms such as homosexual versus heterosexual as well as that of gay spaces in early 20th century New York. In addition, the study focused on the prevalence of drag culture dating from this period following its evolution to today, as well as the impact that drag has on LGBT youth. Finally, a brief examination of the intersection of certain identities such as race and class with sexual identity will be discussed.
Cosgrove, Kelly; Burrows, Kaiping; Kerr, Kara; Teague, Kent; Drevets, Wayne; Bodurka, Jerzy; and Simmons, Kyle
SYSTEMIC INFLAMMATION IS ASSOCIATED WITH STRONGER COUPLING BETWEEN STRIATUM ACTIVITY AND FOOD PLEASANTNESS RATINGS IN DEPRESSION WITH APPETITE LOSS.

Background: Depression-related appetite changes are indicative of underlying inflammatory, metabolic, endocrine, and neural differences among distinct subtypes of major depressive disorder (MDD). For example, Penninx and colleagues (e.g. Lamers, 2013) have shown that depression accompanied by increased appetite is associated with heightened systemic inflammation, and Simmons and colleagues (2016) have observed differential reward-circuit activity to food cues in depressed subjects with increased and decreased appetite. It remains unclear however, how inflammation in specific depression subtypes might alter activity of neural systems that select when, what, and how much to eat. To address this question, we examined how C-Reactive Protein (CRP) levels affect the relationship between brain activity and subjects’ predictions about how pleasant it would be to eat specific foods.

Methods: 64 unmedicated participants (33 healthy control (HC), 17 MDD with decreased appetite, and 14 MDD with increased appetite) provided a blood assay for CRP and completed a food pleasantness rating fMRI task. Groups were matched for age, and the MDD subgroups did not differ in depression severity or anxiety. Imaging data was analyzed using amplitude modulation regressors to account for subjects’ unique ratings of food pleasantness.

Results: MDD participants with appetite loss provided lower food pleasantness ratings than MDD participants with increased appetite (p < 0.05). Additionally, in MDD participants with appetite loss, higher CRP was associated with stronger coupling between food pleasantness ratings and activity of the ventral striatum.

Conclusions: Systemic inflammation alters the coupling between striatum activity and food pleasantness inferences in depressed subjects with appetite loss.

Davalos, Nicole and Ali, Akhtar
DETECTION OF VIRUSES IN STRAWBERRY CROPS

Strawberries are one of the most important cash crops in the United States. Because of its high antioxidant and ascorbic acid quantity, strawberries became a popular fruit for consumers. Its high demand makes it crucial to produce more strawberries. In 2015, 56,140 acres of strawberries were harvested that resulted $25.9 billion in sales and $2.4 billion in revenue. While strawberry production has been steady throughout the years, there are a number of diseases affecting the production of strawberries. These diseases affect the overall growth and yield of the crop. Few information exist about the certain diseases affecting commercial fields in various states. In this study, strawberry samples were taken from various strawberries fields located in four states to determine which diseases affect strawberries. Samples were used in Dot-immunobinding assay (DIBA) and total RNA extraction to detect which diseases are infecting strawberries. Eight viruses were tested by DIBA and the results showed a higher percent of infection. RNA was extracted and sequenced by Illumina sequencing. Results showed the presence of new viral pathogens in samples collected in Oklahoma.

Dees, Adam and Sen, Sandip
EFFECTS OF PERFORMANCE VARIATIONS, EXPECTATIONS AND COMMUNICATIONS ON REPUTATION ACCURACY

By and large, most of what we know about the world around us is given to us by our interactions with other people. As a result, an understanding how information is transmitted, distorted, and aggregated between persons is to be highly valued. However due to the sheer complexity that is information transfer between people, it is far more feasible to study a model commonly investigated in the field of multiagent systems: social networks. These ‘social networks’ are a particular kind of mathematical graph of people and connections, represented by vertices and edges respectively. In this system, members of this graph are either evaluators or the single resource they are evaluating, with connections placed between members to show mutual correspondence. As the model progresses, measurements of average opinion, standard deviation of opinion, and accuracy of judgment are taken. To best simulate the reality of social dynamics, the social network structures are topologically generated in a procedural manner to be similar to structures found in online communities. As well, a medley of uncertainty, inconsistency, and errors in judgment are applied to get a more realistic picture of how reputation spreads between those havens of cognitive biases and fallibility we call human beings. Experiments have shown a consistent
tendency toward equilibriums of opinion, how those farther from a resource may end up judging it more accurately, and the ability to analytically predict final mean valuations despite high levels of imposed inaccuracies.

Diep, Alexander and Narayan, Anupama
EVALUATION OF SELF-REGULATED TRAINING IN AN INTERDEPENDENT TEAM TASK

Training employees and knowledge sharing between employees are important for organizations to remain competitive. Organizations are increasingly relying on delivering training through online methods that cost less and give greater freedom to employees to decide when and where to undergo training. Online training sometimes relies on learners to self-regulate learning, where the learner is responsible for doing the training independently and this should be considered when organizations consider using online training. This is because self-regulated learning has poorer performance outcomes when training is unsupervised and when instructors are not guiding learners. Team training has been shown to have similar effects on performance as normal training. Both types of training can focus on acquisition of knowledge, skills, and cognitions, which affects task performance. Prior experience can provide some knowledge and skills before an employee has learned a new task. The current study assesses whether self-regulated learning teams can successfully train themselves and whether increased knowledge sharing during training will lead to improved performance in a team task involving three people. Results show that teams that successfully completed the practice trial of the team task had significantly more knowledge than teams that were unsuccessful. The discussion details the differences between the knowledge of successful teams compared to the knowledge of unsuccessful teams and how knowledge is related to performance outcomes.

Douglas, Lindsay and Holmstrom, Scott
THE EFFECTS OF SUBSTRATE TEMPERATURE AND AMBIENT RELATIVE HUMIDITY ON THE FINAL SHAPE OF EVAPORATED DROPLETS OF AN AQUEOUS POLYMER SOLUTION

When a drop of aqueous polymer solution dries on a solid substrate, the polymer is deposited in a coffee-ring shape on the surface of the substrate. This coffee-ring effect is due to the relatively high evaporation rate at the pinned three-phase contact line of the droplet that causes the aqueous polymer solution to move outward from the center of the drop in order to replenish the evaporated solvent at the edge. Decreasing the evaporation rate at the edge of the droplet can slow the outward flow of the fluid which then decreases the coffee-ring effect, thereby creating a more uniform polymer film on the substrate. This study has investigated the effects of varying substrate temperatures and ambient relative humidities on the final shape of an evaporated polymer droplet on a glass substrate. We have found that for different concentrations of the aqueous polymer solution, a decrease in substrate temperature or an increase in ambient relative humidity is associated with a decrease in the coffee-ring effect and a more uniform polymer deposition. When the ambient relative humidity reaches 100%, the coffee-ring effect is almost eliminated. Moreover, higher concentration of the solute helps to deposit a thicker and more uniform polymer.

Easly, Hannah; Foley, Lara; and Booth, Warren
CHARACTERIZATION OF THE PATHOGENIC MICROBIOME WITHIN HUMAN POPULATIONS OF THE BED BUG, CIMEX LECTULARIUS

The global resurgence of the bed bug over the last twenty years coupled with its hematophagous (blood feeding) nature, has raised concerns as to its ability to transmit human disease-associated pathogens. While studies have dismissed their ability to transmit some diseases, more recent studies have suggested that this might not be representative for all diseases. For example, the deposition of disease agents in their feces such as the hepatitis B virus, the causative agent of trench fever, and Chagas disease, suggest that mechanical transmission may be possible if these then come into contact with humans. With the advent of Next-Generation Sequencing (NGS), it is now possible to survey individual bed bugs for the diversity of human-associated pathogens that they harbor. Here, using NGS data coupled with bioinformatic tools, we characterized the pathogenic microbes that exist within eleven bed bugs sampled across three distinct populations. We identified multiple bacteria associated with several human diseases, including; Staphylococcus aureus (MRSA and other skin infections), Escherichia coli (food poisoning), Serratia fonticola (skin and soft tissue infections), and Legionella pneumophila
Legionnaire’s disease). These results suggest the bed bug may represent a potential vector for common human pathogens and provides further evidence of the persistence of pathogenic microbes within the bed bug microbiome.

Edwards, Skylar and Pickering, Bob
ART THERAPY: CREATING ALONGSIDE PEOPLE WITH DEMENTIA

Introduction
Art Museums are intimate spaces for the exhibition and interpretation of aesthetics by the general public. As institutions within the public domain, they are under specific obligations to the surrounding community. Included in these obligations are federal requirements under the Americans with Disabilities Act, (ADA). These requirements allow for artistic experiences to be available to as wide a range of audiences as possible. Within art museums, it is the responsibility of the educators to follow these standards of accessibility. Employing new concepts, museum educators are now using therapeutic techniques to design programs that cater to people with disabilities. Among the people that would benefit from these focused programs are people with Dementia. The Philbrook Museum of Art, in Tulsa, Oklahoma, recently launched a program for patients living with Dementia and their caregivers titled Art Focus: Memories in the Making. This transformative program allows people with Dementia to discuss and create art within an environment where mental health does not impose restrictive behaviors.

Background
With an impairment to memory, sociality, and motivation, Dementia is a disease that affects daily functions. It is a gradual condition, commonly followed by Alzheimer’s disease, with different levels of functionality, and will typically require assistive living arrangements. Dementia is a condition that is commonly diagnosed to elderly members of the community. The average lifespan is increasing, and therefore, Dementia is becoming more common. It is estimated that the number of individuals with a form of this disease will rise to 16 million by 2050. Although this is a progressive disease, without a cure, Art Focus at Philbrook aims to enhance the quality of life of Dementia patients, over time. Quality of life includes patients’ ability to care for themselves physically, make active decisions and engage in daily social interactions. To achieve this result, the program is designed to fit the needs of senior citizens who are not ambulatory, but enjoy art viewing and making activities. Although Dementia is not preventable, behavioral lifestyle changes can be made through therapeutic strategies. Holding senior programs in a museum is a way to allow people with Dementia to expand their learning capacity and improve development. Present society does not always make it easy for seniors, particularly seniors with Dementia, to continue to learn and grow outside of an assisted living facility. This is why therapeutic and accessible programming is so essential within a museum.

Partnerships
Art Focus is made possible by a partnership between the Philbrook Museum of Art, the local Alzheimer’s Association and other neighboring institutions. The Alzheimer’s Association is a health organization that supports Alzheimer’s care and research. Funded as a non-profit organization, the Alzheimer’s Association has a mission to “eliminate Alzheimer’s disease through contemporary research; to enhance care for all who are affected; and to reduce the risk of future occurrence.”

Elsayed, Amera; Portman, Richard; and Buchheim, Mark
A NEW SPECIES OF HAEMATOCOCCUS FROM TULSA, OK (USA)

Haematococcus is a green algal genus of biflagellate unicells that is adapted to ephemeral pools. As a result of recent investigations, both morphological and molecular evidence found that there are more than one species of Haematococcus. The number of species in the genus has now increased from one to three (H. lacusris, H. rubens, H. rubicundus). Furthermore, the recent molecular data demonstrated that additional lineages of Haematococcus remain to be characterized. One of the uncharacterized lineages that required further consideration was an alga isolated in Tulsa in the spring of 2013. This putative isolate of Haematococcus was grown in Volvox medium for microscopical and molecular analysis. Results from light microscopy confirmed that the isolate bears the key features of Haematococcus (periplasmic space and akinete formation). Cells for transmission electron microscopy were fixed in glutaraldehyde and postfixed in OsO4. Fixed cells were dehydrated in a graded acetone series, infiltrated, and embedded using Spurr’s resin. Examination of thin sections
revealed pyrenoid ultrastructure that was distinct from other *Haematococcus* isolates. Sequences from nuclear ribosomal (18S, 26S, ITS2) and plastid *rbcL* genes were compared with the international database of green algal sequences. The molecular data supported the conclusion that the Tulsa isolate is closely allied with members of the genus *Haematococcus* and *Ettlia*. The ITS2 data, which show the greatest amount of nucleotide diversity, robustly support an alliance with *Ettlia*. Overall, the more conserved 18S, 26S rRNA and *rbcL* data suggest that the Tulsa isolate is more closely related to other *Haematococcus* isolates.

**Farish, Brian; Davis, Lori; and Wilson, Laura**

**LISTENER PERCEPTIONS OF FOREIGNNESS AND ACCENT ATTRIBUTION IN A CASE OF FOREIGN ACCENT SYNDROME**

*Purpose:* The purpose of this paper is to examine how listeners perceive foreignness, precision, and speaker origin in the speech of a speaker with neurogenic foreign accent syndrome, as compared to an unimpaired native speaker, an unimpaired foreign speaker, and a native speaker with ataxic dysarthria.

*Method:* Listeners with and without experience in speech-language pathology rated degree of foreignness and precision of speech sounds of a speaker with neurogenic foreign accent syndrome as compared to (a) a native unimpaired speaker, (b) an unimpaired authentically foreign speaker, and (c) a native speaker with ataxic dysarthria. Listeners also attributed national origin to each speaker and rated their level of confidence in this attribution.

*Results:* Listeners rated a native speaker with foreign accent syndrome as less foreign than an actually foreign speaker. They agreed less and were less accurate when attributing national origin to a speaker with foreign accent syndrome, and were less confident in their attributions. Unexpectedly, listeners were equally as unsure when attributing origin to a native speaker with ataxic dysarthria as they were when attributing origin to a native speaker with foreign accent syndrome. Additionally, listeners were less accurate in their origin attributions and agreed less when rating the speech of a native speaker with ataxic dysarthria, but to a lesser extent than when rating the speech of a native speaker with foreign accent syndrome.

*Conclusions:* The findings suggest that, while foreign accent syndrome is perceptually unique in comparison to real foreign accents and other motor speech disorders, listeners are not universally able to discern a clear difference between foreign accents and disordered speech. To some extent, these results rebut the idea that foreign accent syndrome is the only motor speech disorder in which the speaker is perceived as foreign.

**Ford, Bart; Simmons, Kyle; and Savitz, Jonathan**

**DOES MAJOR DEPRESSIVE DISORDER ACCELERATE BRAIN AGING?**

Normal aging is associated with structural changes to the brain that include region specific declines in gray matter volume. It has been suggested that major depressive disorder (MDD) accelerates the biological aging process by evidence of reduced immune function and premature cognitive decline. It is not known if MDD is associated with accelerated age-related gray matter loss and whether this correlates with other signs of advanced aging. Machine learning techniques have been used to make individual predictions of brain age based on structural magnetic resonance imaging (sMRI) and found that individuals with neurological disorders such as Alzheimer’s disease and schizophrenia have brains that appear prematurely aged compared to healthy controls. Here, we apply a radial support vector machine, trained on 480 healthy volunteers (mean age = 30.3±10.4, range: 13-60), to sMRI data from 103 individuals with major depressive disorder (MDD, mean age = 37.8±10.9, range: 19-62) to determine if MDD is associated with premature brain aging. Results are pending.
Gress, Elizabeth and Hussaini, Syed  
ELECTROCHEMICAL ATTACHMENT OF AN ALLYL GROUP ONTO PIPERIDINE ANALOGUE

Piperidine (Fig. 1) is a 6-membered ring consisting of five carbons and a nitrogen. It is present as part of a compound in many drugs such as Lobeline, a smoking cessation agent. Therefore, it is important to be able to selectively attach various organic groups onto the piperidine in various spots.

We attempted to electrochemically attach an allyl group onto a piperidine analogue to create a valuable synthetic intermediate in drug production (Fig. 2). This compound is traditionally made using a multi-step synthesis using transition metals. Electrochemistry provides a more direct, efficient, and scalable reaction. To do this we converted commercially attained 2-piperidinecarboxylic acid 1 to an appropriate starting material 3 using literature methods (Scheme 1).

1,3,5-trimethoxybenzene is then electrochemically attached to the 5-position of the piperidine as a leaving group, creating 4. The trimethoxybenzene group reduces the oxidation potential of the molecule, allowing for easier electrochemistry. It then acts as a leaving group in the presence of electricity, allowing the allyl group to replace it, creating the product.

Guzman, D.; Basso, Michael; Lau, Lily; Whiteside, Douglas; and Combs, Dennis  
PREVALENCE AND PREDICTION OF PVT FAILURE IN A RESEARCH SAMPLE OF MS PATIENTS

Objective: In clinical settings significant numbers of examinees exaggerate neuropsychological dysfunction (Mittenberg et al., 2002). Little research exists concerning the prevalence of exaggeration in research settings or in people with multiple sclerosis (MS). Bigler (2014) stated that performance validity test (PVT) failure is more frequent when symptoms such as fatigue and pain are prevalent, and these symptoms occur often in MS. The current study investigated the prevalence of
invalid performance among people with MS in a research context, and the impact of fatigue, depression, and pain upon PVTs.

Participants and Methods: 98 MS patients and 49 controls were recruited as part of an NIH-funded study concerning neuropsychological function. They were notified that their test results would be de-identified and embargoed from clinical records or providers. All completed a neuropsychological battery and measures of symptom severity, and the Word Memory Test (WMT), CVLT-II Forced Choice, and Reliable Digit Span (RDS) served as PVTs.

Results: Patients were classified as impaired or unimpaired based on the neuropsychological battery (30 impaired and 68 unimpaired). Failure of two or more PVTs was used to classify non-credible performance. Although 13 patients failed the WMT, only nine failed two or more PVTs, whereas one control subject failed two or more PVTs. PVTs failed to correlate with depression, fatigue, pain, or motor impairment. In a logistic regression, no variable predicted PVT failure status.

Conclusions: Using a conservative criterion, few MS patients or control subjects in a research setting failed two or more PVTs, but approximately 13.2% of MS patients and 4% of control subjects failed the WMT. Non-credible effort is a slight but viable threat to internal validity of MS research. Moreover, PVT performance is not associated with MS-related symptoms of depression, fatigue, pain, or motor impairment. Thus, PVT failure likely reflects poor effort uniquely.

Habig, Stewart and Jenkins, Grant
EXCAVATING MELVIN TOLSON’S CURATED ARCHIVES

This presentation uses archival material from the Melvin Tolson Papers, held at the Library of Congress, to argue that Tolson’s politicized social and racial views surface in his epic Harlem Gallery through the use of jazz aesthetics. Tolson’s poem is often viewed by critics as his attempt to rewrite the epic form to include African and African American history, resulting in a heteroglossic satire of epic poetry. What is often lost by critics is Tolson’s incorporation of blues, jazz, and other African American folklores as an attempt to elevate popular jazz music to a cultural mode worthy of inclusion in his “Harlem Gallery.” His use of jazz poetics in an epic form is a political attempt to undermine cultural attitudes held by black and white cultural elitists. This argument is supported by Tolson’s handwritten notes, marginalia, and ephemeral scribbles, which expose his political views on race, social structure, and jazz while providing a more intimate look at the issues percolating in Tolson’s consciousness as he composed his final work. Several images will be displayed throughout the presentation, both to support Tolson’s politicized poetics and to demonstrate how archival research shaped the composition of my own dissertation chapter on Tolson. To this end, the importance of these primary materials unearthed in Tolson’s archive have proved paramount to constructing an original argument revolving around Tolson’s use of jazz rhythms and characters that subvert a conventional literary form that previously excluded black African and American writers, along with African American cultural production.

Harville, Lauren and Eski, Erin
THE THERMAL STABILITY OF SILVER HALIDE THIN FILMS ON AU(111)

Previous studies have shown that underpotential deposition (UPD) can be used to apply a thermally stable monolayer of silver atoms on a Au(111) surface from a saturated solution of silver chloride. This layer was applied at one specific potential and characterized using electrochemical scanning tunneling microscopy (EC-STM) and cyclic voltammetry (CV). However, it has been found that silver halides have two distinct UPD potentials at which a monolayer can be deposited on Au. The two specific UPD potentials correspond to two different chemical reactions, one in which the silver halide exists as a solvated ionic species and one in which the silver halide exists as a formula unit. Studies on the UPD of a silver chloride formula unit have shown that the atomically-thin, Ag film is thermally stable up to 1,000K, but no study has been performed to determine the stability of a thin film deposited from the solvated, bare ionic species. Current studies will investigate the stability of a Ag layer formed from a solvated silver ion using UPD on a Au (111) crystal through the use of EC-STM and CV. Additionally, the thermal stability of other silver halides, such as AgBr and AgI, will be explored and characterized using the same techniques.
Haunga, Stephen and Brown, David
THE RELATIONSHIP BETWEEN DIET AND ACADEMIC PERFORMANCE

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 research was conducted this spring, 2018, with approximately 100-200 adolescent students of the freshman academy at Nathan Hale 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. Later, it was expected that students who eat breakfast are more engaged, enthusiastic about learning, and have better scores academically. Students completed a survey that asks whether they consumed breakfast, what they usually consume for breakfast every morning, and how many days a week do they actually consume breakfast. Based on the answers from the surveys and their current GPA, analysis of this given data will show the results, that students who eat breakfast will have better academic scores than students who do not eat breakfast.

Haynes, Maureen and Chase, Susan
“STRUGGLE SILENTLY WITH A SMILE:” THE EXPERIENCES OF OKLAHOMA PUBLIC SCHOOL TEACHERS

This study used in-depth interviews to gather the personal narratives and experiences of Oklahoma public school teachers about their day-to-day lives and struggles in and out of the classroom. Previous research suggests that teachers’ talk about their identity is central to the beliefs and practices that guide their engagement in and out of the classroom. Thus the interviews with teachers were transcribed and analyzed for common themes. Findings include a number of these, including the construction of the school power structure as either a roadblock or facilitator, the portrayal of teaching as a collaborative and professional environment, great strife around need for resources, genuine care shown for students, and feelings of lack of respect and representation. The teachers interviewed experienced their jobs not just as professional but also personal, making the pervasive issues in Oklahoma all the more affecting. Thus this research helps us to understand the complex identities that teachers construct in their narratives around the problems and triumphs they have faced in their chosen profession. Amidst a budget and policy crisis in public education in Oklahoma, this research provides a much-needed discussion of public school teachers in Oklahoma as individuals with their own revealing experiences.

He, Xinchi; Sarra, Alqahtani; and Rose, Gamble
PRIVACY ASSURED HEALTH INSURANCE CLAIM PROCESSING USING BLOCKCHAIN

According to HIPAA, the medical insurance claiming process is carried by healthcare providers, insurance companies, and clearinghouses. The clearinghouse is the central party that coordinates the medical insurance claims in between providers and insurance companies. As centralized communication hubs, clearinghouses may maliciously or unintentionally cause conflict of interest issues such as PHI (Protected Health Information) leakage between insurance companies. For instance, a patient transaction covered by multiple health insurance plans may produce a conflict of interest threat if the clearinghouse is not implemented properly or has malicious intent. In this work, we propose a distributed solution to mitigate the risk of data leakage between competitors in Healthcare sector. Blockchain is a lower-level technology to ensure transaction integrity and anonymity of cryptocurrencies by using distributed immutable ledgers. The ledgers keep encrypted records and authenticate transactions with consensus algorithms, such as Proof of Work (PoW) and Practical Byzantine Fault Tolerance (PBFT). Our solution enhances the patients’ privacy protection through developing a HIPAA compliance middleware service framework for the medical insurance claiming process in a decentralized manner utilizing the blockchain technology. We first use the blockchain ledger to store patients’ EHR (Electronic Health Records) then apply the Chinese Wall model to control the flow of these records between the providers and insurance companies. Finally, we utilize smart contracts within the blockchain to maintain the HIPAA privacy requirements.
Hegdale, Danielle
MATERNAL HEALTH CARE ISN'T HEALTHY

Maternal mortality rates in the United States are worse than nearly every developed country in the world, including France, Germany, Greece, Israel, Kuwait, Poland, and several former Russian countries. The typical steady improvement most countries have experienced for many years stopped for the US about twenty years ago. Root causes involve battles between “regular” doctors and midwives over control of women’s reproductive health started in the mid nineteenth century and continues to the present day. It will consider how factors such as health care availability, malpractice insurance, obstetric interventions—including c-sections and labor induction—and legal attempts to restrict the practice of midwifery have played a key role in rising maternal mortality rates. And it will explore how mothers and women’s rights advocates have fought to gain greater autonomy for women during pregnancy and childbirth and a stronger voice in decisions that affect their reproductive health.

Hellman, Natalie
EMOTIONAL MODULATION OF PAIN AND SPINAL NOCICEPTION IN SEXUAL ASSAULT SURVIVORS

Objective: Sexual assault (SA) is associated with an increased risk for chronic pain and affective distress. Given that emotional processes modulate pain (e.g., negative emotions enhance pain, positive emotions inhibit pain), increased pain risk in SA survivors could stem from a disruption of emotional modulation processes. Methods: A well-validated affective picture-viewing paradigm was used to study emotional modulation of pain in 33 healthy, pain-free SA survivors and a control group of 33 healthy, pain-free individuals with no reported history of SA (matched on age, sex, race, and number of non-SA traumas). Unpleasant (mutilation), neutral, and pleasant (erotic) pictures were presented while painful electrocutaneous stimulations were delivered at the ankle. Pain intensity ratings and nociceptive flexion reflex magnitudes (NFR; a physiologic measure of spinal nociception) were recorded in response to electric stimuli. Multilevel models were used to analyze the data with Group (SA vs. no-SA) and Content (mutilation, neutral, erotica) as IVs. Results: Both groups demonstrated similar emotional modulation of pain \[F_{Group \times Content}(F(2,646.52)=0.44, p=.65)\], but a main effect of group \[F_{Group}(1,65.42)=4.24, p=.043\] indicated the SA group experienced more overall pain from electric stimuli (hyperalgesia). A significant Group X Content interaction for NFR \[F_{ContentSimpleEffect}(2,684.55)=12.43, p<.001\] indicated that emotional modulation of NFR was present for the no-SA group \[F_{ContentSimpleEffect}(2,683.38)=1.71, p=.18\]. Conclusions: These findings suggest SA survivors have difficulty emotionally engaging brain-to-spinal cord mechanisms to modulate spinal nociception. A disruption of descending inhibition plus hyperalgesia could contribute to comorbidity between sexual trauma and chronic pain.

Helmerich, Sunday and Narayan, Anupama
FAULTLINES IN TEAM CONTEXT: A LITERATURE REVIEW

Teams in organizations have become more diverse in terms of their demographic composition over the years and will continue to become more diverse in years to come (Triandis, Kurowski, & Gelfand, 1994). The structure of diversity in teams has been conceptualized as group faultlines. Group faultlines are “hypothetical dividing lines that may split a group into subgroups based on one or more attributes” (Murnighan & Lau, 1998). These attributes include gender, race, age, status, physical stature such as height and weight. Faultlines reflect the diversity structure of a team, potentially dividing the group into subgroups. If characteristics are highly correlated, faultlines become stronger, increasing the likelihood that subgroups will develop (e.g., Dreachslin et al. 2000; Pelled et al. 1999). The adverse effects of group faultlines have been persistently and extensively documented across various types of teams including experimental groups, project teams, and top management teams (Thatcher & Patel, 2012). However, there are some remedies for these negative consequences, including cross-cutting subgroup membership (Homan, et.al., 2008) and developing between-subgroup network ties, such as friendship (Ren, Gray and Harrison, 2014) which can mitigate the detrimental effects of strong group faultlines. Thus, the purpose of this presentation is to consolidate literature on team diversity, specifically focusing on faultlines in team context.
Hernandez, Alyssa; Tran, Emily; and Eiland, Kayla
A MODIFIED MELODICA FOR CHILDREN WITH SPECIAL NEEDS

Music is an important part of the education and development of young children, including those with special needs. For this project, an off-the-shelf melodica musical instrument was modified for use by special-needs children up to the age of six. In the process, we learned how essential the interior structure of the melodica is and how the air system works. Our major modifications included replacing the mouthpiece air supply with a foot or hand-operated bellows that inflates a balloon through a check valve, reduced number of keys from 37 to six, and developed a set of interchangeable keys. Replacing the mouthpiece eliminated the exchange of germs and does not require interior cleaning of the melodica. The bellows allows for the children and or therapists to supply air into the balloon. The reduction of keys was meant for simplicity and allowed for more focus on a set of notes. The interchangeable keys feature different letters, numbers, shapes, and colors to facilitate learning, for example, by following patterns of letters or colors via templates we developed for the device. The keys can also be seen as a puzzle. Throughout the development, we made sure all components were fixed to an easily transported platform. The instrument can now be used by children with a variety of physical and development disabilities to enhance their senses and motor skills and to stimulate enjoyable learning while at the same time creating their own music. Preliminary testing with children at the Little Light House school and elsewhere has been positive, and work is ongoing on a next-generation prototype based on feedback from the children and their therapists.

Hernandez, Alejandro
USING THE TRACY-WIDOM DISTRIBUTION TO IDENTIFY SUBNETWORKS IN RESTING-STATE FMRI DATA

The human brain exhibits varying patterns of neural activity during rest. Multiple brain systems work together to form patterns of neural activation that can be used to identify networks of the brain. Analysis of this data can highlight differences across neurotypical and diseased subjects that can lead to better understanding of the brain. An important aspect of data analysis is identification of prominent subnetworks. A significant issue is that different networks across the brain differ in size and scope and cannot be directly compared to one another. The Tracy-Widom distribution is a probability distribution that represents the value of the largest eigenvalue of the correlation matrix of a random matrix. Networks of varying sizes can be compared to a null model using this distribution. It does this by normalizing the largest eigenvalue of a functional connectivity matrix of a network to account for network size. This allows for the use of standard statistical techniques to identify prominent subnetworks in resting-state fMRI data.

Herrera, Valeria and Ragsdale, Jen
GOAL-SETTING THEORY: THE USE OF ATTENTION FAILURES IN MEASURING TASK PERSISTENCE

Studies have determined if an individual persisted in completing a task by observing prolonged engagement (e.g., Singer, Korinek, Jarvis, McColskey, & Candeletti, 1981; Sideris & Kaplan, 2011) or performance (e.g., Bouffard-Bouchard, 1989), but have failed to be innovative in measuring task persistence. The potential for measuring task persistence has not been explored within motivation literature. The present proposal aims to identify how motivational attributes of goals can alter task persistence, as operationalized with attention failures, and subsequently, performance. Participants assigned to two different groups would complete a variety of measures and a task. Students in the “self-set difficult and specific goal” are expected to outperform those in the “assigned specific and difficult goal” group, as well as experience higher task persistence, as shown by less instances of mind-wandering. Amount of mind-wandering is also predicted to mediate the relationship between the goal and performance, as shown by different operationalizations of task persistence.

Hess, Alexander and Bonett, Ron
ISOPOD SYSTEMATICS AND BIOGEOGRAPHY

Understanding the distribution and connectivity of groundwater and its relationship to surface flow is critical for resource management and conservation. As dispersal of freshwater organisms are limited by hydrological networks, the geographic and evolutionary history of aquatic organisms can provide new insights into the associated hydrological systems. This is
particularly useful in the study of groundwater, where connectivity is not necessarily correlated with surface relief and can change with fluctuating water tables. Due to their abundance, aquatic life history, and the ease of distinction between surface and subterranean species, isopods present a potentially powerful tool for assessing hydrological hypotheses. The geographic genetic distribution of isopod diversity will likely mirror connectivity and discontinuity within the region under study. This study uses genomic data to reconstruct an evolutionary history of native isopods and examine patterns of dispersal across physiogeographic regions and between surface and subterranean habitats. Our analyses have supported repeated colonization events from the Ouachita Mountains to the Ozark Plateau. The evolutionary history of the group suggests multiple transitions to the surface from groundwater habitats, an extraordinarily rare pattern that is the opposite of that observed in previous studies of cave adapted organisms.

Hmeluk, Natalie and Sheaff, Robert
DEVELOPMENT OF NOVEL CHEMOTHERAPEUTIC AGENTS VIA THE MAILLARD REACTION

In cancer treatment, the primary goal is to preferentially destroy cancerous cells without extensively damaging normal tissue. Current efforts focus on identifying unique cellular defects that can be targeted to achieve this goal. P27kip1 (p27) is a tumor suppressor protein commonly deregulated in aggressive cancers. The Sheaff lab recently discovered that p27 deregulation provides cancer cells with a growth advantage by altering nutrient metabolic pathways. In early stages of tumor development, cancer cells lack a steady blood supply and hence a steady supply of glucose. We found that cells without p27 switch to amino acids as a carbon source, allowing tumor growth. This switch can be observed by treating p27 -/- cells with the glucose analog 2-deoxy-glucose (2DG). The pathway can then be targeted with rotenone, a well-known inhibitor of complex 1 of the electron transport chain. This drug combination has a potential to specifically target cells lacking p27, and could potentially develop into a novel therapeutic approach for these type of aggressive cancers. However, rotenone is extremely toxic to humans, so our goal was to identify a different metabolic inhibitor that will selectively target p27-/- cells in conjunction with 2DG. Our approach was to modify various amino acids with reducing sugars via the Maillard reaction, then evaluate their ability to specifically target p27-/- cells. Results indicate that products generated in the Maillard reaction may specifically target cells lacking p27, and thus represent potential novel source of therapeutic agents.

Hockensmith, Kirby
DEVELOPING A MEASURE OF IDENTITY EXPRESSION IN THE WORKPLACE

The concept of identity – how people define themselves through their characteristics, feelings, behaviors, images, roles, and social status -- has been a widely discussed topic in the field of psychology, but direct applications of this research to practical issues within the field are lacking. Therefore, the aim of the present study is to examine how identity expression in the workplace can impact various job-related attitudes and outcomes. Identity expression, how people show the outside world who they truly are, has not been examined within the context of work. This is important because organizations vary in the extent to which they encourage identification with the organization or enable individual identity expression. When employees’ preferences don’t align with the organization’s policies or norms, employees may be come dissatisfied and eventually leave the organization. This study fills a gap in the identity literature by developing a self-report scale to measure three facets of identity expression in the workplace: Actual Identity Expression (AIE), Ability to Express Identity (AbEI), and Willingness to Express Identity (WEI). Initial validation of this scale is described using data from a sample comprised of MTurk workers (N = 246). Results with evidence of initial construct validity will be presented, including correlational and regression analyses with various job outcomes and attitudes. Possible next steps for future research in this area of study will also be presented.

Hoffmeister, Jordan and Basso, Michael
RELIABILITY AND VALIDITY OF THE PERCEIVED DEFICITS QUESTIONNAIRE IN MULTIPLE SCLEROSIS

Cognitive dysfunction affects approximately 66% of individuals diagnosed with multiple sclerosis (MS). Because of the relative inaccessibility of neuropsychological assessment services, self-report measures of cognitive dysfunction have been proposed as an inexpensive means of screening for impairment. The Perceived Deficits Questionnaire
(PDQ) is a 20-item questionnaire referring to MS-related subjective complaints of cognitive dysfunction. Little research has evaluated its relationship with objective neuropsychological function. Participants were 97 individuals diagnosed with MS, and 43 healthy people. All participants were given a comprehensive neuropsychological battery which included domains measuring prospective and retrospective memory, attention, and planning. Participants completed the PDQ and the Chicago Multiscale Depression Inventory (CMDI). The PDQ achieved satisfactory reliability (alpha=.95). Nonetheless, after employing correction for Type I error, it achieved nonsignificant to weak relationships across neuropsychological domains, with correlations ranging from -.06 to -.31. In contrast, the CMDI achieved significant correlations with all PDQ measures, and these ranged from .27 to .63. Although the PDQ possessed excellent reliability, it failed to correlate consistently with objective indicators of neuropsychological performance. Rather, the PDQ correlated significantly and consistently with self-reported emotional distress. This is consistent with extant research which shows the PDQ tends to correspond with malaise and distress (cf. Strober et al., 2016). Regardless, the PDQ is a poor substitute for neuropsychological assessment in determining cognitive status in people with MS.

Holt, Jacqueline and Narayan, Anupama
TEAM LEADERSHIP, LEARNING, AND PERFORMANCE: A LITERATURE REVIEW

Leadership is about providing guidance and direction as well as creating a culture where people are empowered and inspired by a common purpose (DuBois, Hanlon, Koch, Nyatuga, & Kerr, 2015). Research in teams has explored the relationship between different leadership styles and team learning, which can be encouraged by leadership that facilitates creativity and individual learning (Raes et al., 2013). We use Cohen and Bailey’s (1997) definition of a team as “a collection of individuals who are interdependent in their tasks, who share responsibility for their outcomes, who see themselves and who are seen by others as an intact social entity embedded in one or more larger social systems” (p. 241). Despite large literatures on both leadership and teams dynamics, there is still a paucity of clarity in how leaders manage teams effectively (Lord, Day, Zaccaro, Avolio, & Eagly, 2017). One way in which leaders affect team performance is by facilitating team learning. There has been research to support the idea that team learning is crucial to becoming an effective team (Decuyper et al. 2010; Kozlowski and Bell 2008; Sessa and London 2008). While this subject is new, there has been evidence that leadership is positively related to team performance (Edmonds, 1999, & Hirst et al., 2004). We seek to look deeper in this literature and gain a better understanding of the factors related to team leadership, learning, and team performance.

Hopkins, Megan and Angus, Lamar
FORMATION OF N-SULFONYL IMINES USING A LIGHT-PROMOTED, N-CENTERED RADICAL IMINOIODIANE/I2 SYSTM

The formation of N-sulfonyl imines from a variety of aldehyde substrates through reaction with iminoiodinanes (PhI=NZ) and I$_2$ under mild conditions has been developed. The reaction is proposed to proceed via a light-promoted, N-centered radical pathway utilizing an N, N-diiodosulfonamide reactive species. This method not only provides a new pathway to synthesize activated imines from a range of aryl aldehydes, but also can be applied to production of deactivated imines from acid-sensitive aldehyde substrates.

Hurlock, Grant
EVOLUTIONARY PSYCHOLOGY ON THE WORLD WAR II HOME FRONT

The quest for individual and national well-being at the heart of much World-War-II-era literature involves a goods-based calculus grounded in a conception of human nature as described by evolutionary psychology. Prominent among a basic set of natural goods needed for human happiness are freedom and self-determination. The need for these goods emerges from our species’s possession of conceptual intelligence based on language. In a time of national conscription, each individual needs to balance the diminution of personal freedom against the loss of national freedom that would come as a result of military defeat in the world war. A major phenomenon I investigate in the literature of World War II is how various authors manage this balancing act for their protagonists and others in their works. This investigation constitutes the backbone of my research, but there are other interesting aspects of human nature exposed by evolutionary psychology that I also explore. Three of these are our storytelling instinct, our twin instincts for social cooperation and competition (operating both
interpersonally and internationally), and our innate altruistic instinct to act in the interest of our larger gene pool and not just our individual genetic lines.

Igarashi, Taisei and Foley, Lara
A CLOSER LOOK ON T.S. ELIOT - A GLOBAL WASTE LAND

For my Senior Project, I am writing a creative adaptation on T.S. Eliot’s life. T.S. Eliot is considered to be one of the most essential and influential writers of the 20th century. Especially, his canonical work, The Waste Land, is considered my some to be the best poem of the century. Through The Waste Land, I will investigate the Global Challenges of conflict, economics, government, and information. The Waste Land was written mostly about World War 1 and its after effects, so I will talk about the conflict aspect through the war. For economics, I will take excerpts from the poem as well as how the war affected the nation of Great Britain. Consequently, the conversation about war will bring me to discussions about government. As for information, I will not only talk about the war, but the role that Eliot played in the dissipation of information.

Jahan, Sharmin; Marshall, Allen; and Gamble, Rose
EMBEDDING VERIFICATION CONCERNS IN SELF-ADAPTIVE SYSTEM CODE

For a self-adaptive system, adaptive plans deployed at runtime should comply with critical requirements. The ability to assess plans is especially useful when the system operates for long periods without intervention. Dynamic compliance reverification consumes enormous resources that may not be available. Plus, in many cases, re-verification of all requirements is unnecessary because the adaptive plan does not impact the associated state variables. If a plan can be configured dynamically from predefined parts, one method is to pre-check all possible plan combinations to determine if compliance could be violated. Unfortunately, this approach disallows runtime formulation of new functionality or new functionality integrations for self-adaptation. Thus, these new products will not be fully vetted prior to system deployment. However, if the deployed system has been verified to comply with critical requirements, then a verification process exists for each requirement. We present our approach that focuses on allowing the system to dynamically determine the potential for an adaptive plan to inhibit repeatability of the prior verification processes. If a verification process, such as a proof or certification, cannot be reused, there is a risk that requirement compliance can be violated. Our objective is to abstract verification concerns from the verification process and embed them as checkpoints within the code to provide a form of verification awareness. The checkpoints collect values as an adaptive plan is simulated, which are mined and visualized using ProM to determine the plan’s potential for limiting the reuse of the verification process.

James, Ben; Luczak, Brian; and Girgis, Hani
MESHCLUST: AN INTELLIGENT TOOL FOR CLUSTERING DNA SEQUENCES

Sequence clustering is a fundamental step in analyzing DNA sequences. Widely-used software tools for sequence clustering utilize greedy approaches that are not guaranteed to produce the best results. These tools are sensitive to one parameter that determines the similarity among sequences in a cluster. Often times, a biologist may not know the exact sequence similarity. Therefore, clusters produced by these tools do not likely match the real clusters comprising the data if the provided parameter is inaccurate. To overcome this limitation, we adapted the mean shift algorithm, an unsupervised machine-learning algorithm, which has been used successfully thousands of times in fields such as image processing and computer vision. The theory behind the mean shift algorithm, unlike the greedy approaches, guarantees convergence to the modes, e.g. cluster centers. Here we describe the first application of the mean shift algorithm to clustering DNA sequences. MeShClust is one of few applications of the mean shift algorithm in bioinformatics. Further, we applied supervised machine learning to predict the identity score produced by global alignment using alignment-free methods. We demonstrate MeShClust’s ability to cluster DNA sequences with high accuracy even when the sequence similarity parameter provided by the user is not very accurate.
Kaphle, Amrit
NUMERICAL ANALYSIS OF ZnO/CuO HETEROJUNCTION SOLAR CELL USING AFOR-HET SIMULATION

In this study, we will present an AFOR-HET numerical simulation for Zinc oxide (ZnO)/copper oxide (CuO) heterojunction solar cells and discuss simulation parameters. The influence of window (ZnO) /active (CuO) layer heterostructures with different thickness and crystallinity on the solar cell performance were investigated and compared with the experimental results. In the ideal cases without defects, it is found that a ZnO (200nm)/CuO (2μm) hetero-junction solar cell shows a conversion efficiency of 15.49%, fill factor of 78.25%, open circuit voltage of 0.92 V, and a current density of 21.65 mA/cm². The effect of defects and interface states are then considered for more realistic cases as there exist many defects (oxygen vacancies or interstitials) in the films, and a large number of interface states are due to the lattice mismatch of the two materials used. All defects and interface states in the solar cell layers, hetero-junction interfaces and metal/semiconductor contacts are found unfavorable to the solar cell performances. If the defect concentration in the active CuO layer is compatible to the acceptor concentration of $1 \times 10^{16}$ cm$^{-3}$, the cell efficiency would be reduced dramatically to 5%. The simulation also shows that the interface states have a detrimental effect on the performance if its carrier density is higher than $1 \times 10^{12}$ cm$^{-2}$. Nevertheless, it was found that by increasing doping concentration in p-n junctions, the interface state effect can be minimized significantly.

Karki, Anand; Oakey, Clark; Mar, Kaitlin; and Fakhr, Mohamed
AEROTOLERANT CAMPYLOBACTER COLI AND CAMPYLOBACTER JEJUNI STRAINS IN RETAIL LIVER AND MEAT PRODUCTS

Despite being microaerophilic, aerotolerance capability of some Campylobacter isolates was reported which might increase survival and transmission of those strains in foods during stressful processing and storage conditions. In this study, screening for aerotolerance was performed for 167 Campylobacter isolates (76 C. jejuni and 91 C. coli) from retail chicken meat, chicken livers, chicken gizzards, turkey, pork and beef liver samples. About 41% of the total Campylobacter isolates were found to be aerotolerant (viable after 12 hrs under aerobic incubation) whereas 22% were hyperaerotolerant (viable after 24 hrs under aerobic incubation). A higher prevalence of aerotolerant strains (70%) was found among C. coli isolates when compared to the C. jejuni ones (6%). All C. coli isolates from chicken gizzards, pork samples and 78.9% (45/57) of chicken liver isolates were aerotolerant. Comparative genomics of few Whole Genome sequenced (WGS) isolates showed some genomic differences among C. jejuni and C. coli strains related to oxidative stress response. PCR screening showed the presence of catalase like protein gene in 75% (68/91) of all screened C. coli strains, but absent in all tested C. jejuni strains. About 83% (29/35) of the hyperaerotolerant C. coli strains harbor catalase like protein however presence of catalase like protein might not be related to aerotolerance. In conclusion, higher aerotolerant Campylobacter strains (especially C. coli) are prevalent among those isolated from various retail meat and liver products. Identified other putative regulators and genomic differences might play role in oxidative stress response mechanism but further investigation is needed.

Kerwin, Thomas
THE IMPLICATIONS OF FREE TRADE ZONES FOR THE FUTURE OF HONDURAS

This presentation will focus on Honduran ZEDEs (in English, “Zones for Employment and Economic Development”) and their implications for the future of Honduras, its economy, and its people. The official purpose of ZEDEs (free trade zones similar to Hong Kong and Singapore) is to encourage foreign investment and generate employment as a result of fewer barriers to business, with the intention of improving the overall economy and the wellbeing of Hondurans. However, ZEDEs are controversial and were initially been ruled unconstitutional by the Honduran Supreme Court in 2011 before being permitted in 2013. The controversy stems from the fact that the ZEDEs would exist largely outside of the jurisdiction of the Honduran state, as the zones (and the corporations that hold interests in them) would have the power to create and control their own political, judicial, and administrative systems. Additionally, the zones are controversial because, in order to create them, many poor and indigenous Hondurans have been forcibly removed from their homes and land. In general, the strong influence of foreigners in the creation and implementation of ZEDEs has led many Hondurans to draw parallels between this idea and the neocolonial influence of the United Fruit Company in Central America during the 20th century. In this
presentation, I will analyze ZEDEs in the context of Honduras’ complex history of economic development, corruption, and conflict, and discuss the potential ramifications of their implementation for the future development of Honduras.

Keyani, Feroz and Otanicar, Todd

ON SUN TESTING OF SOLAERO CTJ CELLS

Our Research was about testing the efficiency of Solero CTJ cells under high concentrations of light using existing primary optics but replacing thermal collection with PV. First, our team designed and built a parabolic trough that will focus the light on the CPV which will have SolAero CTJ cells integrated in it. The prototype receiver will then be installed on an A-Z tracker platform for on-Sun demonstration (performed on-sun at TU’s north campus) with characterization of cell performance. During the summer, the focal point of the research was to design the best model. I conducted studies regarding the design if the secondary optics. The parabolic trough consists of a primary mirror, that is used concentrate solar rays on the cells. At, the focal point of the primary mirror, a secondary mirror was installed to focus the max number of solar rays at the CPV. SolTrace, a software that can be used to trace the solar rays, was used to test various design of the secondary optic. The purpose to SolTrace was to decide what design would allow the max number of rays to hit the CPV. First, I collected data on what percent of rays would be placed on the CPV, if the height of the CPV was changed. Initially, with the focal point being 1.7 meters from the primary optic, the design included the CPV to be 1.5 meters from the primary optic. I changed the height, moved it up and down, and the percent of rays coming in contact with the CPV did not change much. Secondly, I added homogenizers to the CPV. The purpose of the homogenizers is to trap the solar rays and increase the percentage the of solar rays hitting the CPV. Furthermore, I changed the heights of the homogenizers and collected data on that. Also, The design of the secondary optic was changed to a T-shape mirror and then data was collected on what percent of the solar rays come in contact with the CPV. Finally, The T-shape design was chosen because the percent of solar rays was above 80%. The parabolic trough was built during the fall of 2017 and now data is being collected on the cells.

Khanal, Vivek and Ali, Akhtar

SURVEY AND MOLECULAR CHARACTERIZATION OF VIRUSES INFECTION CUCURBITS IN OKLAHOMA

Cucurbit are economically important cash crops grown extensively in southern United States including Oklahoma. Cucurbits are susceptible to more than 59 different viruses that cause mosaic, mottling, distorting, necrotic and chlorotic symptoms on leaves and fruits. During 2016 and 2017 growing seasons we surveyed eight different counties of Oklahoma and collected symptomatic cucurbit leaves from commercial growers’ field. A small aliquot was taken from all samples and crushed in plastic bags to extract virus infected sap. All samples were tested serologically by Dot-immunobinding assay (DIBA) against the antisera of 10 different viruses. A total of 730 leaf samples were collected from 38 fields and were positive to 6 viruses. Among them Papaya ringspot virus (PRSV) was most prevalent (49.41%) followed by Watermelon mosaic virus (33.58%), Zucchini yellow mosaic virus (11.29%), Cucumber green mottle mosaic virus (2.20%), Squash mosaic virus (2.20%) and Cucurbit aphid borne yellows virus (1.61%). CABYV was reported for the first time in Oklahoma during this study. Complementary DNA (cDNA) has been synthesized from selected samples from which sequencing is in progress for molecular characterization of these viruses.

Kibler, Emily

IMPLEMENTING AAC SYSTEMS IN SCHOOLS WITH LIMITED RESOURCES: A CASE STUDY AND SYSTEMATIC REVIEW

Background / Case Study: Fiji is a nation comprised of 300 islands located in the South Pacific with a population of around 800,000 people from a mixture of ethnic backgrounds (Hopf & McLeod, 2015). The case study of Nadi Special School motivates an investigation to examine how a school with limited resources can implement AAC systems with children who have a communication deficit. Methods: A systematic review of evidence was conducted regarding augmentative and alternative communication with schoolage children in low-resource environments using the following databases: Academic Search Complete, PubMed, CINAHL, and ERIC. The collected articles were then screened by the researcher to determine
eligibility and evaluated for quality. **Results:** Two articles were included. Their study was a pre-test post-test experiment without a control group study design (Bunning et al., 2014; Gonna et al., 2012). Findings suggest that at home AAC interventions using low tech / low resource AAC systems are effective in improving a child’s communication according to caregiver perceptions as well as improving the caregiver’s experience according to self-report (Bunning et al., 2014; Gonna et al., 2012). **Conclusion:** This experiment needs to be conducted in other low-resource environments. It could be replicated in Fiji as a way to overcome some of the country’s barriers to implementing an AAC system effectively such as lack of access to professionals, lack of family education, and lack of costly AAC systems. Future research should focus on providing an evidence base surrounding low-resource AAC systems and finding ways to reduce barriers.

**Kolla, Srinivas; Mohan, Ram; and Shoham, Ovadia**  
**EFFECT OF LIQUID LEVEL ON GAS CARRY-UNDER IN GLCC COMPACT SEPARATORS**

Gas Carry-Under (GCU) is one of the two undesirable phenomena that occurs in the GLCC© (Gas-Liquid Cylindrical Cyclone) separators when it operates outside the Operational Envelope (OPEN). Initial studies have shown that maintaining liquid level below the inlet of the GLCC© under control configuration affects the GCU in GLCC©. Also, it has been hypothesized that effective formation of vortex that is formed in the lower part of the GLCC©, or a stable gas core enhances the separation of gas entrained in the liquid. However, there has not been a systematic study on the effect of liquid level and the stability of the vortex on the GCU. This detailed and extensive experimental study attempts to fill that gap, investigating the effect of different liquid levels maintained below the inlet on the GCU. These studies are performed under the NOC (Normal operating Conditions) below the OPEN for liquid carry-over using control configuration to maintain the liquid level in the GLCC©. This study focuses on measuring the cumulative GCU in the liquid leg of the GLCC© over a period of time. The experimental investigations for GCU are conducted in a state of the art experimental facility for air-water and air-oil flow incorporating pressure and level control configurations. The experiments were carried out using a 3” diameter GLCC© equipped with gas trap sections to measure simultaneously the GCU in the liquid leg of the GLCC©. The equilibrium liquid level is controlled at 4 different settings starting at 6” below the GLCC© inlet and increasing to 2 feet below the inlet. It has been observed that the liquid level has tremendous effect on the complex swirling flow behavior in the lower part of the GLCC© and vortex stability, which in turn affects the GCU in the liquid leg of the GLCC©. Also, it has been noted that the liquid level has a significant effect on the Gas Void-Fraction in the liquid leg of the GLCC©, which is a critical parameter for multiphase pump operations.

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

As schools look to cut programs to meet the budgetary constraints of decreased funding, physical education (PE) is an oft-targeted program, despite promising academic outcome benefits and impacts on cognitive processes. Carlson et al. (2008), Welk et al. (2010), and Van Dusen et al. (2015) all demonstrated that the utilization of physical activity in schools can improve math achievement, while Gabbard and McNaughten (1993) found improved math testing performance with physical activity longer than 30 minutes and occurring around mid-day. Davis et al. (2012) was also able to find a dose response benefit between exercise and executive function, which is the set of mental skills that help humans complete tasks, such as learning or classwork related tasks. This research looked at how the placement of PE affects mathematics achievement, and was conducted during the 2017 fall semester with 500 high school freshmen at an Illinois high school. It was hypothesized that students who participated in PE prior to their mathematics class, rather than after, would achieve at higher levels. It was additionally hypothesized that a closer time gap between the PE and mathematics class would have a greater effect than a larger gap, assuming PE precedes the mathematics class. This presentation will discuss the results from the study and the impact of the results on public schooling.

**Kundu, Rahul and Ramsurn, Hema**  
**SYNTHESIS OF GRAPHENE FROM BIOCHAR**

Graphene, “the wonder material” was discovered in 2004. It consists of one atom thick carbon atoms which is 100 times stronger than steel and conducts electricity. Its potential applications of graphene include membranes for water purification,
composites and coatings, in batteries for energy storage, microprocessors, sensors etc. Even though graphene has a huge potential, production costs limits its use. In this research, we use biochar, a solid carbon-rich material produced from biomass model compounds (cellulose, hemicellulose and lignin) produced by hydrothermal carbonization, as the raw material. Here, hydrothermal carbonization was carried out at a temperature and pressure of 300 °C and 9.0 MPa respectively. The biochar was further treated with 0.1 N HNO₃ in a total reflux column for 8-12 hours to remove any soluble alkali and alkaline earth metal ions and bio-crude residues. The biochar was grinded (<0.17 mm) and uniformly distributed over copper and iron foils and heated to a temperature of 800 °C and 1000 °C for 2 hours in a quartz tube with constant N₂ flow. The uniqueness of this approach is that it doesn’t require chemical vapor deposition or plasma reactors routinely used to deposit graphene on metal foils. Our reactor is a simple quartz tube heated in a furnace. The role of H₂ was also studied by mixing it with the N₂ gas (1:3 vol. basis). The metal foils were analyzed by Scanning Electron Microscope (SEM), X-Ray Photoelectron spectroscopy (XPS), and Raman spectroscopy and graphene was observed on the foils.

Lamichhane, Pralhad
STUDIES OF MORPHOLOGICAL, ELECTRICAL, AND OPTICAL PROPERTIES OF MN DOPED ZNO NANORODS AND FABRICATION OF ZNO/ GAN LIGHT EMITTING DIODE

We studied the effect of manganese (Mn) doping on ZnO nanorods’ structural, optical, and electrical properties for the fabrication of Light Emitting Diode (LEDs). Mn doped ZnO NRs were successfully grown in the laboratory at low temperatures (93°C) using a chemical bath deposition process doped with the different (5-20wt %) concentration of Mn. Scanning electron microscopy (SEM) studies showed that the diameter of 0.1 molar ZnO NRs vary from 512 nm (0% Mn) to 231 nm (20% Mn). It was also observed that the diameter of the NRs increased (91 nm for 0.025M - 960 nm for 0.175M) with increasing the molarity of the precursor solution. X-ray diffraction (XRD) results revealed a decrease in intensity of diffraction peaks but no change in lattice parameters with the doping of Mn. Photoluminescence and absorbance, both showed a red shift of the near band edge (NBE) peak for 5% and 10% Mn but, a blue shift was found in higher percentages of Mn. The variation of band gap was measured from 3.21eV to 3.12eV.

Current-Voltage (I-V) characteristic studies revealed the diode behavior of the LEDs with a diode ideality factor as 3.5. Electroluminescence (EL) measurements showed the emission of green light (525 nm wavelength) at 4.5 volts of DC current, and the EL intensity increased with increasing forward bias. The yellowish emission (562 nm wavelength) was also observed when the seed layer of the ZnO was made by spin coating of Zinc Acetate instead of sputtering by Zn metal target.

Laney, Samuel and Keller, Michael
CHARACTERIZATION OF COMPOSITE DAMAGE USING MAGNETIC NANOPARTICLES

Fiber-reinforced composite materials are well known for their high strength and stiffness coupled with relatively low weight. These high strength-to-weight ratios are especially useful in industries like aerospace where minimizing component weight is critical. However, damage to composite materials is difficult and costly to detect. This challenge is compounded by the brittle nature of composites that tends to cause damage to propagate quickly. The combination of the damage sensitivity and the challenges associated with damage detection can lead to conservative designs that are heavier and costlier than necessary. In the current work, a technique for highlighting barely visible impact damage with nanoparticles formed in-situ is described. This method provides several benefits over traditional ultrasonic methods including requiring only one sided access, improved scanning speeds, and lower cost. While magnetic damage detection provides certain advantages, the magnetic signatures of nanoparticle-based magnetic regions are relatively complex and can be difficult to interpret. Here the damage detection resolution and characteristics of such a scanning system are explored. The spatial resolution of the device and correlation of the response to the actual damage will be discussed.

Lapidus, Rachel; Puhl, Maria; Kupilicki, Rayus; Simmons, Kyle; Feinstein, Justin; and Khalsa, Sahib
RESPONSES TO INTEROCEPTIVE AND NOCICEPTIVE HOMEOSTATIC PERTURBATIONS IN EATING DISORDERS

Individuals with Anorexia Nervosa (AN) often report heightened discomfort with interoceptive sensations. Although research in homeostatic perturbations in eating disorders is becoming more common, findings on nociceptive sensation are
mixed, no studies have looked at dyspnea and pain in the same individuals, and no studies have used inspiratory breath holding to examine dyspnea perturbation. The present study therefore examined whether individuals with a current or prior AN show differences in the responses to acute modulation of nociceptive or dyspnea sensations across the levels of symptom, behavioral, and physiological responding. Weight-restored AN subjects were identified by structured clinical interview. The AN sample included 29 participants who were individually matched on age, sex, and BMI to a healthy comparison (HC) sample, and a mood/anxiety (MAX) comparison sample. Nociceptive perturbation consisted of a cold-pressor test (2-minute maximum duration). Dyspnea perturbation consisted an inspiratory breath-holding test (2-minute maximum duration). Physiological waveforms, behavioral observations, and self-report stress, unpleasantness, and sensation intensity ratings were collected during each test. Compared to HC and MAX, we predict that AN participants will demonstrate aberrant symptom and behavioral level responding, but will not display differences in physiological responding. This will support that pathology in sensory integration in AN occurs at the level of the central nervous system. While this study is the first to examine nociceptive and dyspnea processing in individuals with AN, further studies are required to determine whether differences in responding are due to temperament factors of those with AN, or are ‘scars’ from a past starvation state.

LaPlant, Jessica; Lee, Jenny; and Davis, Joanne
A CORRELATIONAL STUDY OF SEXUAL ASSAULT, INSTITUTIONAL BETRAYAL, AND GENDER RELATED EXPERIENCES

Sexual assault is a problem that is pervasive on university campuses across the United States (Fisher, Cullen, & Turner, 2000). Instances of sexual assault are often accompanied by tangentially negative experiences. These experiences can include institutional betrayal, which itself is associated with higher rates of post traumatic stress disorder, depressive symptoms, anxiety levels, and other negative outcomes (Monteith, et al. 2016; Parnitzke, Smith, & Freyd 2013). Likewise, negative gender related experiences, such as receiving a negative comment based on gender or being told a sexist joke, and instances of secondary victimization can also exacerbate negative symptoms associated with sexual assault (Campbell & Raja, 2005; Chapleau, Oswald, & Russell 2008). Using a survey from the University of Tulsa that asked college-age students about their history with sexual assault and related experiences, this study examines the correlation between assault that occurred while the student was at the University of Tulsa and their feelings of institutional betrayal, as well as negative gender related experiences. The aim of this study is to better understand the attitudes on campus towards sexual assault survivors, both as an institution (particularly in areas that could potentially provide resources to survivors) and within the student body.

Lau, Lily; Basso, Michael; Mulligan, Ryan; Whiteside, Douglas; and Combs, Dennis
ACCURACY OF TOMM SUPPLEMENTARY INDICES AMONG TEST COACHED SIMULATORS

Objective: Sensitivity and specificity of the TOMM and WMT in detecting non-credible effort are relatively well established. To elaborate upon its utility, investigators have generated indices from the TOMM which examine the errors on the first 10 items of Trial 1 (TOMMe10) and the consistency of recall across its three recall trials, namely the Albany Consistency Index (ACI) and Invalid Forgetting Frequency Index (IFFI). The TOMMe10 and consistency indices seem to possess acceptable classification accuracy, with some indications that the latter manifest better sensitivity than the TOMM recall trials (Buddin et al., 2014). Yet, little research has compared their classification accuracy to TOMM and WMT recall scores. In this experiment, neurologically normal participants were coached to feign mild TBI symptoms and evade detection by performance validity tests. Participants and Methods: Participants were neurologically-normal university students who were assigned to one of three simulation groups (each n = 20). The groups received either superficial information about symptoms of head injury, comprehensive information concerning symptoms of head injury, or comprehensive symptom information and strategies to evade detection by PVTs. A control group (n = 20) was instructed to provide their optimal effort. The TOMM and WMT were administered. Results: The TOMM ACI and IFFI indices achieved the best classification accuracy, with 91-95% of simulators being identified. The TOMM and WMT Recall Tests successfully identified 78-88% and 83-93% of simulators, respectively. The TOMMe10 yielded the least effective detection (66%). With increasing levels of provided information, the sensitivity of the measures greatly diminished.
Conclusions: Compared to the TOMMe10 and TOMM and WMT recall scores, The TOMM consistency indices possessed the greatest utility in classifying examinees simulating symptoms of head injury. Such findings should provide clinicians with confidence to employ these measures when evaluating performance validity.

Ledbetter, Nicholas

TERRESTRIAL CONSTRAINT ON LIMB EVOLUTION IN SALAMANDERS

The tetrapod limb has been a landmark system in evolutionary biology for decades. Exceptional diversity exists in both form and function among many groups of vertebrates. A widespread example is the independent evolution of snake-like body form coinciding with body elongation and limb reduction in multiple groups of lizards, snakes, and salamanders. Salamanders in particular exhibit differences in adult ecology (terrestrial versus aquatic), and snake-like body form has only arisen in those with aquatic adults. Here, we use phylogenetic comparative methods to test whether salamander adult ecology is correlated with limb reduction. We further test if the pattern of covariance between body elongation and limb reduction changes after a shift in ecology. We find that salamanders with aquatic adults have shorter limbs, fewer digits, and increases in the rate of limb evolution. Additionally, they evolve stronger negative correlations between elongation and limb parameters. This study highlights the constraint imposed by terrestriality on functional locomotor traits.

Lee, Jenny

EXAMINING THE ROLE OF INSTITUTIONAL BETRAYAL AMONG VICTIMS OF INTIMATE PARTNER VIOLENCE

In the United States, it has been noted that about 20% of couples from the general population have experienced intimate partner violence (IPV). Noteworthy, research has found that a majority of individuals, irrespective of gender, experienced their first IPV victimization between the ages of 18 to 24. Indeed, researchers have found that college students’ experiences of IPV are comparable if not higher than that of the general population. IPV victimization also places individuals at a much higher risk for developing psychological disorders. In addition, when IPV experiences occur on college campuses, there a variety of institutional factors that may impact the outcome of the traumatic event for the victim. The present study seeks to examine whether institutional betrayal moderates the relationship between IPV and different psychological outcomes (i.e., depression, posttraumatic stress, anxiety). The study examined survey responses from a sample of undergraduate students attending a Midwestern University. Survey measures consisted of questions pertaining to relationship and dating experiences, institutional betrayal, depressive symptoms, anxiety symptoms, and posttraumatic stress symptoms. Strengths and limitations of the study will be discussed as well as implications of the potential findings.

Lee, Seungho

AN ISLAND AS A HOME: NEW POSSIBILITIES OF HOME, COMMUNITY, AND NATION IN SAM SELVON’S AN ISLAND IS A WORLD

This paper will examine the ways in which Sam Selvon explores the question of home, community, and nation in his most ambitious yet widely neglected novel, *An Island Is A World* (1955). Traditionally, at least in the Western world, the idea of home appears to be inextricably associated with the physical place of ‘land’ as the word, ‘homeland’ might suggest. One’s homeland is believed to be a territory (etymologically rooted in Latin word, terra, which means land) where people can settle and live in, create a community, and draw a border so as to distinguish itself from the surrounding others. It is generally believed to be a land where people’s lives and identities are rooted. However, the recent study of Oceanic Studies opens up a new possibility of thinking about home, a new idea of home that might not be necessarily a land. Significantly, John R. Gillis notes that the geographical division of land and sea began to take shape only in the late eighteenth century which coincides with the rise of nationalism in Europe. Before the late eighteenth century, land and sea were deemed as continuous rather than separate. To account for the significance of the oceanic space in people’s geographical, and psychological understanding of the world and themselves, Gillis takes an example of Polynesia by saying that “[t]he inhabitants of precolonial Polynesia saw themselves as inhabiting a sea of islands, connected rather than divided by water and thus more like an aqueous continent” (Gillis 21). Gillis’s argument that the notion of home as a land is not necessarily inherent, and that it is rather a cultural construct primarily invented by Europeans at the time of modernity, provides a way to explore
literary works produced by writers from the Caribbean, the space that bears many geographical similarities to Polynesia as it is surrounded, and even dominated by the very presence of the ocean. It would not be too far-fetched to assume that the Caribbean’s notion of home is closely linked to the space of ocean as much as of land. This paper will follow the thread of this conjecture by closely reading Sam Selvon’s *An Island is A World*, in which the question of home and community and the relationship between the local/nation and the global/internation are thoroughly explored.

Lee, Megan
HUMANS EXTENDED: THE ETHICS AND POWER BEHIND TECHNOLOGICAL EXTENSIONS OF HUMANITY

As humans have evolved over time so has technology, and with this technology, humans have sought ways to extend themselves beyond their physical bodies. Examples of such extensions include writing, cameras, prosthetics, selfie sticks, and a myriad of other common technologies. Behind these technologies, however, is a debate as to how technologies influence human abilities and who really has the power behind these extensions. Is the individual all-powerful, or is there someone else behind the extended power with ultimate control? This paper seeks to observe and explain not only how humans extend themselves historically and contemporarily, but it also seeks to articulate the power behind these extensions and the ethics and consequences of these changing technologies using literature, video, and case studies. Not only does this paper seek to answer these questions, but it demonstrates the lesson as well through an accompanying YouTube video.

Lemma, Tsebaot
ETHIOPIA’S GLOBAL ENERGY MASTER PLAN

The oral presentation delivers a concise outline of the overall strategic plan for Energy development in Ethiopia. This analytical presentation is a continuation from my internship in the Ministry of Energy at the end of 2017. As one of the fastest growing developing countries in the world, Ethiopia faces an increase demand for energy. To meet this demand, this research will present an opportunity for innovative technical and business solutions for the international community. These solutions will target the comprehensive energy challenges that Ethiopia faces in the strategic plan. The strategic plan for Ethiopian Electricity generation was authorized by the Ethiopian government to understand the scope of present and future energy production. The focus of this study includes the following areas:
- Hydro-electric power Energy
- Wind Energy
- Solar Energy
- Geothermal Energy
- Biomass resource Energy

The purpose of this study was to highlight the economic and strategic potential for Ethiopia’s position in International Energy arena today with a vision for the future. This plan will emphasis the potential opportunities for public sector investors. Additionally, the research shows Ethiopia’s unique geographical position and abundant natural resource that gives the country a powerful role to change the face of Africa’s presence in the Global Energy market.

Li, Xiangpeng and Johannes, Tyler
GROWTH KINETICS AND NUTRIENT COMPOSTITION ANALYSIS FOR CHLAMYDOMONAS REINHARDTII GROWN UNDER LED LIGHT SOURCE

Establishing a sustainable food supply is one of the limiting factors for the long-range space travel. Algae have been considered as a potential food source for astronauts based on their high growth rate and rich nutrient compositions. In order to maximize algal biomass production, a new method involving up- and down-conversion of photons is being investigated as a possible means of enhancing biomass productivity. This work focuses on the determination of the optimal culturing conditions, including the light wavelength and culturing temperature. The algae strain *Chlamydomonas reinhardtii* was grown in batch culture in a constant temperature shaker, in which LED lights were installed as light source. Growth kinetics and nutrient composition were analyzed. At 30°C, algae grown under red and blue light showed higher biomass concentration, and under blue light showed higher biomass productivity. As the temperature increased from 24°C to 32°C,
the maximum specific growth rate increased as well. The maximum biomass concentration reached the peak at 28°C, and the maximum productivity reached a maximum at 30°C. Protein content was found higher at the exponential phase, while lipid and carbohydrate content were higher at the late stationary phase. Algae grown under red light produced the most fatty acids compared to other light sources tested. No significant difference was found for protein and carbohydrate content under different light sources. There was a significant increase of lipid content with temperature, but no overall relationship between percentage of protein, carbohydrate and temperature.

Lignieres, Austin; Puhl, Maria; Lapidus, Rachel; Feinstein, Justin; Paulus, Martin; and Khalsa, Sahib
PERCEPTUAL RESPONSES TO ENDOGENOUS AND EXOGENOUS CARDIORESPIRATORY STIMULATION

Background: Panic anxiety is characterized by heightened cardiorespiratory sensations, but the manner in which these sensations are discriminated is poorly understood. Here we evaluated influence of endogenous (those originating within the body) and exogenous (those originating from an external source) cardiorespiratory stimulations on perceptual experience in humans.

Methods: 24 healthy individuals received infusions of either saline, or isoproterenol (0.5 and 2 µg during a functional magnetic resonance imaging session. Isoproterenol induces heightened cardiorespiratory sensations similar to adrenaline. Participants concurrently rated the intensity of cardiorespiratory sensations by rotating a dial, and provided ratings of cardiac/respiration intensity and anxiety after each infusion.

Results: We observed significant heart rate differences between the baseline and preparatory time intervals across doses (p < 0.05), suggesting that participants endogenously generated transiently increased heart rates prior to infusion delivery. We also observed significant dose related differences between the baseline and peak sensation time intervals for the 0.5 and 2.0 µg doses (p < 0.001), consistent with responses to exogenous modulation. Furthermore, cardiorespiratory intensity ratings during the peak response period tended to correlate with anxiety ratings.

Conclusions: This study demonstrated that healthy individuals mount both endogenous and exogenous cardiorespiratory responses during a paradigm involving sympathetic modulation. Further analysis is warranted to examine the influence of anxiety expression on these responses in healthy and clinical populations (such as individuals with anxiety disorders).

Limbrick, Barbarae
THE SOCIAL INJUSTICES OF THE INDULGENT COMMODITY: CACAO

Through many centuries, chocolate has been used as a dessert amongst all. Over time, it has become a commodity that is a staple in every grocery store and home. Although there are many producers and vendors of chocolate making high revenues and profits from the chocolate, there is always a cost. This report discusses the disadvantages and advantages of being a farmer of chocolate. It also discusses the treatment of these farmers, along with the effects it has on their respective communities.

Lowry, Megan
THE IMPACT OF SERVICE DOGS ON THEIR HANDLERS

The purpose of this research was to study the impact of service dogs on their handlers. I used in-depth interviews to gather the personal narratives of four disabled American veterans and one search and rescue volunteer. I was interested in hearing the details of their need for a service dog, including their reasons for choosing certain breeds; type of service(s) provided by the dog; aids, wellness pre- and post-service dog; and assistance they received. I wanted to see if these accounts would reveal factors that led men and women to decide to use a service dog or to use technological and medicinal aids. The interviews were transcribed and analyzed for themes; the findings were:

- The Bond that Heals: Service Dogs and their Handlers
  All five interviews showed how the handlers have healed in various ways and how each dog takes great care of the handler.
- Mental Health: Stress Management, Eating Disorder, Reduction of PTSD Symptoms, and Minimal Emotional Numbing
The stories that came out during each interview varied in terms of traumas experienced, but all interviewees described specifics of how their mental health had changed. Four handlers stated that they rely on their dogs more than they do the VA treatments available, and that they have found their dogs to be more helpful than the prescriptions the VA prescribed (one interviewee was not a veteran).

- **Physical Health of the Handler**
  Each handler expressed that their physical health has been positively impacted by their dogs.

- **Outlook on Life with a Service Dog: New Found Confidence**
  The interviewees shared a new-found confidence in that they have found new ways of coping; all are happier with their lives than they were before getting a service dog.

- **How Training Affected Interpersonal and Inter-relational Skills**
  This particular theme was apparent in all the interviews but was implicit rather than explicit.

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Luczak, Brian; James, Benjamin; and Girgis, Hani
A SURVEY AND EVALUATIONS OF HISTOGRAM-BASED STATISTICS IN ALIGNMENT-FREE SEQUENCE COMPARISON

“Since the dawn of the bioinformatics field, sequence alignment scores have been the main method for comparing sequences. However, alignment algorithms are quadratic, requiring long execution time. As alternatives, scientists have developed tens of alignment-free statistics for measuring the similarity between two sequences. We surveyed tens of alignment-free k-mer statistics. Additionally, we evaluated 33 statistics and multiplicative combinations between the statistics and/or their squares. These statistics are calculated on two k-mer histograms representing two sequences. Our evaluations using global alignment scores revealed that the majority of the statistics are sensitive and capable of finding similar sequences to a query sequence. Therefore, any of these statistics can filter out dissimilar sequences quickly. Further, we observed that multiplicative combinations of the statistics are highly correlated with the identity score. Furthermore, combinations involving sequence length difference or Earth Mover’s distance, which takes the length difference into account, are always among the highest correlated paired statistics with identity scores. Similarly, paired statistics including length difference or Earth Mover’s distance are among the best performers in finding the K-closest sequences. Interestingly, similar performance can be obtained using histograms of shorter words, resulting in reducing the memory requirement and increasing the speed remarkably. Moreover, we found that simple single statistics are sufficient for processing next-generation sequencing reads and for applications relying on local alignment. Finally, we measured the time requirement of each statistic. The survey and the evaluations will help scientists with identifying efficient alternatives to the costly alignment algorithm, saving thousands of computational hours.”

1  Brian B Luczak, Benjamin T James, Hani Z Girgis; A survey and evaluations of histogram-based statistics in alignment-free sequence comparison, Briefings in Bioinformatics, , bbx161, https://doi.org/10.1093/bib/bbx161

Luttenberg, Shane and LoPresti, Peter
OPTICAL ERROR CORRECTION

In free-space laser communication, problems occur when the receiver does not have a direct line of sight to the transmitter. In other words, the receiver cannot “see” the transmitter. The problem commonly occurs when the transmitter and/or receiver move through space, which disrupts the alignment between them. For typical optical wireless systems mounted on buildings or ships, mechanical systems limit movement and adjust the pointing direction of the transmitter and receiver toward each other. In a mobile scenario, such as inter-satellite communication or communication between airplanes and the ground, mechanical systems do not work well due to their size, weight, and power consumption. To solve this issue, the solution I worked on created a low bit-rate communication between the transmitter and receiver, outside of the main data stream, that provided real-time feedback on the misalignment. At the transmitter, a motion sensor will detect light from either a low power optical signal (such as an LED) or the backward transmission coming from the receiver node. The data from this motion sensor fed back to the receiver. The motion sensor contained optical detectors and the electronics needed to power and read data from the detectors. Based on this data, the receiver moved to a position where it has a direct line of sight to the transmitter. This involved designing and building circuits that implement the required electronics and allow combination with the optical components of the transmitter and receiver.
Luu, Sylvia and Narayan, Anupama
EXAMINING THE SELF-DETERMINATION THEORY OF MOTIVATION

Motivation is commonly understood to be the driving force behind actions. This research focuses specifically on one theory of motivation – Self-Determination Theory. Self-Determination Theory (SDT) is a macrotheory of motivation, which holds the assumption that individuals have an inherent drive for psychological growth and development (Ryan & Deci, 2002). As a macrotheory, SDT is composed of several different constructs, which are expected to relate to each other as well as other outcomes associated with motivation. This study empirically tests the theoretical relationships proposed between constructs within SDT (e.g., Deci & Ryan, 2000).

Researchers have found support for several constructs within SDT predicting work and life outcomes (e.g., Baard, Deci, & Ryan, 2004; Kasser & Ryan, 1996) and there has been empirical support for relationships between some aspects of SDT (e.g., Baard et al., 2004). However, empirical research on the relationships between the aspects of SDT, as a whole, is lacking. Thus, this research contributes to the literature by empirically testing multiple theoretical relationships proposed within SDT. The hope is that this research will better inform workplace applications of SDT and incentivize further empirical tests of the SDT framework.

Lynch, Connor
MEMES: 21ST CENTURY COLLAGE

Memes are ubiquitous in our overwhelmingly fast paced internet world. There are many different styles, and memes rise and fall in popularity with disconcerting speed. Many memes are straightforward humor consisting of analogies, metaphors, social or political commentary, or other jokes of some sort. Others, however, appear to be exercises in absurdity: endlessly self-referential and stitched together from hopelessly obscure heterogeneous bits of culture, not seeming to make any effort to make meaning. While these bits of internet content are often dismissed as little more than nonsense, I assert that memes from both aforementioned camps are important indices of contemporary culture, and in fact, art.

In this presentation I will analyze the memes and meme culture in various genres of the latter camp of memes mentioned before, including the genres of deep fried memes, YouTube poop, and other self-referential instances. I intend to discuss what memes are and are not, and place memes in the context of art history in order show that they follow in the tradition of collage and found object art that originated with Cubism and Dada. I argue that in their current state, memes embody a postmodern disillusionment with late capitalism. I will also explore the relationship between digital art and memes. While memes are inherently digital presences, I argue that they are not in fact digital art, and do not follow in the digital art tradition. This prompts the question of what this digital medium entails for analysis outside of a digital art context; a question I will address.

Lyons, Madeline
THE EFFICACY OF THE FUNCTIONAL MOVEMENT SCREEN AS A PREDICTOR OF INJURY IN COLLEGIATE ATHLETES

Introduction: Many have suggested that the Functional Movement Screen (FMS) may provide practitioners the ability to identify athletes most at risk for injury. The purpose of the study was to determine if there was evidence in the literature that the FMS could be used to predict injury risk in collegiate athletes. Statement of Methods: We systematically searched MEDLINE, EBSCO and PubMed databases for articles published from January 2007-July 2017. Six studies met the inclusion criteria. We conducted several unweighted random-effects model meta-analyses with an odds ratio as the effects metric to determine the odds of injury based on a FMS criterion score. Finally, we calculated the positive and negative likelihood ratios (+LR, -LR) to determine the utility of the FMS as a diagnostic test. Summary of Results: The odds of injury were not significantly greater for collegiate athletes with FMS scores ≤14 (OR=2.15, 95% CI=0.89-5.20, p=0.091). However, using sex as a moderator, the odds of injury were 4 times greater for females scoring ≤14 (OR=4.12, 95% CI=1.29-13.22, p=0.017). The positive likelihood ratio related to the diagnostic value of the FMS for females was 2.23 (95% CI=2.02-2.46), while the negative likelihood ratio was 0.72 (95% CI=0.68-0.75). Statement of Conclusions: Although the findings indicate that female collegiate athletes scoring ≤14 have greater odds of injury than females scoring >14, the observed +LR
and –LR values suggest that using a FMS cutoff score of ≤14 is of little or no value in making sound clinical decisions about an athlete’s future injury status.

Marino, Abbey
SOCIAL ENTREPRENEURSHIP IN THE AGE OF GLOBALIZATION

Urban development specialists cite social entrepreneurship as one of the most sustainable ways to encourage local involvement in the economy, efficiently allocate resources, and engage individuals with their communities. The Mine, a fellowship powered by the George Kaiser Family Foundation, The Lobeck Taylor Family Foundation and the University of Oklahoma Ronnie K. Irani Center for the Creation of Economic Wealth, serves as a catalyst for social innovation in Tulsa. As a Mine fellow, I have been working with the entrepreneur of Jujuu, a curated gift box service that connects locally-produced, socially responsible makers with consumers in order to create a community of meaningful consumerism.

Marshall, Allen; He, Xinchi; and Gamble, Rose
ENABLING CONTEXT-AWARENESS AND RICH SERVICE INTERACTION FOR MOBILE APPS USING THE PHYSICAL WEB

With greater automation of everyday tasks in the near future, an increased number of cyber physical systems will provide services at dedicated locations. As a result, the utility of mobile computing devices will likely benefit from the ability to opportunistically discover nearby cyber physical systems and their properties. One technology that is well suited for such applications is the Physical Web, where Bluetooth beacons advertise location-based services to nearby mobile devices. Augmenting the Physical Web with Semantic Web concepts yields service advertisements that can be understood by machines. The potential exists for multiple beacons from different publishers to be at the same location and provide related datasets to offer a richer and more customizable service. However, the existing work in this area considers each beacon to represent a distinct service. To address this issue and others, we propose the creation of a cloud-based service, which we call the MPWeb, to aggregate machine-readable context information on behalf of mobile devices. The MPWeb requires security features to protect clients from false information, as well as scalability features to ensure that many clients can use the service simultaneously. In this talk, I will illustrate the potential benefits of the MPWeb using a motivating example in which two distinct parties want to provide cooperative services associated with a single cyber physical system. I will report on the challenges and progress so far in creating a prototype of the MPWeb, and discuss strategies to test whether the service is secure and scalable.

Marti, Nicklos
SEQUENCE STRATIGRAPHY OF THE BOGGY FORMATION IN THE SANS BOIS MOUNTAINS, SOUTHEAST OKLAHOMA

The Boggy Formation (Middle Pennsylvanian) has long produced hydrocarbons throughout northeastern Oklahoma, but the formation occurs at the surface in isolated synclinal folds across southeast Oklahoma. Braided fluvial facies are dominant at the base of the formation throughout Oklahoma, and the interest in this area comes from the change to more basinward facies, observed in the Sans Bois Mountains. This study characterizes the sequence stratigraphy of the formation in the Sans Bois Mountains through the use of measured sections, gamma ray outcrop logs, geochemical analysis, and Google Earth image analysis.

A total of 13 samples were collected for geochemical analysis using ICP-MS and INAA to determine if the geochemistry of Boggy mudrocks reflects an influence of sequence boundaries, as well as if a difference in provenance exists between units of different sequences. Deposits of the Boggy Formation were not expected to follow the accepted sequence stratigraphic model due to hypothesized variable accommodation space of the Arkoma Basin as it was being filled. The sequence stratigraphic findings of this study in the Boggy Formation can be traced to adjacent areas where the units occur in the subsurface, it will provide insight to geologic settings exhibiting similar variable accommodation, and can be utilized economically in subsurface settings for oil and gas exploration of the mid-continent.
**Martinson, Freya**

**“INCORPORATED INTO CHRIST”: EARLY CHRISTIAN BAPTISMAL BELIEF, RITUAL, AND IMAGERY AT DURA-EUROPOS**

The house church at Dura-Europos dating from the third-century is the oldest discovered Christian building. A separate room, believed to have served as a baptistery for the Christian congregation, abuts the otherwise standard ancient house. Along the baptistery’s walls is a program of frescoes depicting several parables and miracles from the public ministry of Jesus of Nazareth as well as the Israeli hero and king, David, with the Philistine Goliath. Scholars from various disciplines have studied and attempted to understand the house church, its baptistery, and panel frescoes since its discovery in the mid-20th century.

My paper will build on past scholarship to place Dura-Europos’ fresco panels within their larger contemporary ritual, visual, and cultural context. It will consider the imagery and the rituals alongside initiation spaces and practices of other religious or social organizations, drawing out the theological implications of similarities and differences. It will also consider the baptismal imagery and ritual within the context of the catechumen’s process of initiation. How would they have understood baptism in general and experienced it specifically at Dura-Europos? It will consider the neophyte’s initiation as bodily and gendered, and explore how the ritual and panel imagery would have signified differently for the female and male catechumen. I will particularly examine the image of the processing virgins, and explore the sources and later development of a marital understanding of baptism and its representation in late antique and early medieval imagery.

**Mathur, Nitesh**

**FINITENESS OF RELATIVE EQUILIBRIA PROBLEM THROUGH A COMBINATORIAL PERSPECTIVE**

In 1998, Stephen Smale, a renowned topologist and field medalist, published “Problems for the Next Century” and one of these problems was to explore the “Finiteness of number of relative equilibria in celestial mechanics.” Dr. O’Neil has been working on a variation of this open question—“Finiteness of symmetric relative equilibria of point vortices.” In this research, combinatorial techniques were employed to gain insight into this broader problem. One of the main strategies was to generate Mathematica code that would efficiently generate solutions to systems of symmetric relative equilibria equations for $n$ vortices. The code was then modified to be interpreted in the Affine and Projective Space respectively. Throughout the process, point vortices were visualized, combinatorial patterns in solutions were interpreted, and overall proof strategy was discussed. Furthermore in 1999, Gareth Roberts published “A continuum of relative equilibria in the five-body problem” by showing that if negative point masses were considered, it is possible for a continuum to exist. Using this paper, we experimented for other continuums by varying the strength of vortex circulations and the number of point vortices. Although a continuum is yet to be found, several strategies were generated for future use.

**McAfee, Kelsey**

**THE EFFECT OF HOME LEARNING ENVIRONMENT ON READING ACHIEVEMENT**

Research shows that students with more highly developed literacy skills come from home environments that promote literacy, regardless of their demographics (Tichnor Wagner, Garwood, BratschHines, & Bernon-Feagans, 2016; Shick and Melzi, 2016). This proposed research will use the PIRLS (Progress in International Reading Literacy Study) 2001 International Database, an comparative assessment that measures learning in reading of four grade students (PIRLS 2011). It is hypothesized that all students, regardless of demographics, that come from home learning environments (HLE) that promote literacy will have better reading skills than students from HLEs that do not. The quality of a home learning environment will consider the items on the PIRLS 2011 Student Questionnaire.

**McLoud, Josh and Levetin, Estelle**

**AIRBORNE RHODOTORULA CONCENTRATIONS AND ASSOCIATED METEOROLOGICAL VARIABLES IN TULSA, OKLAHOMA**

*Rhodotorula*, an allergenic yeast genus, was previously identified from viable air samples; however, the daily exposure to this allergen is not known. This study characterizes the frequency, concentration, and meteorological variables associated
with airborne *Rhodotorula*. Burkard 7-day spore trap air samples were collected in Tulsa, Oklahoma during 2015. DNA was extracted from daily samples and quantified with a TaqMan *Rhodotorula* assay. The daily concentrations (cells per cubic meter) of *Rhodotorula* were calculated using a standard curve of known yeast cell concentrations. *Rhodotorula* concentrations and meteorological variables were analyzed by multiple regression to identify which independent variables explained a significant amount of the variation in the dependent variable. Quantitative PCR indicated that *Rhodotorula* occurred in the Tulsa atmosphere on 55% of the days in 2015. There were 62 days with a concentration of 1 cell/m³ and 140 days >1 cell/m³. The frequency of *Rhodotorula* in winter, spring, summer, and autumn was 66%, 41%, 73%, and 29%, respectively. The average daily concentration was 4 cells/m³ with a range from 0 to 715 cells/m³. The seasonal average daily concentrations were 3, 3, 8, and 2 cells/m³ for winter, spring, summer, and autumn, respectively. The two significant predictors identified in the multiple regression model ($R^2=.03$, $F(4,360)=3.87$, $p=.004$) were average relative humidity ($\beta=-.11$, $p=.04$) and soil moisture at 25 cm ($\beta=-.14$, $p=.009$). *Rhodotorula* occurs frequently in daily air samples typically at low concentrations and is associated with relative humidity and soil moisture. More work is needed to determine the environmental exposure to other airborne yeasts.

Mesnier, Alexander and Teeters, Dale
SURFACE ENGINEERING OF NANOSTRUCTURED ELECTRODES AND ELECTROLYTES FOR SOLID-STATE BATTERY APPLICATIONS

Incorporating nanotechnology processes into the lithium ion battery system has helped enhance the performance of several lithium ion battery chemistries. Nanostructuring a lithium ion battery’s anode and cathode allows for vastly increased electrode surface area available for the battery system, thereby reducing the impact of interfacial impedance. High surface area nanostructured electrodes can be produced by using an RF magnetron sputter coater to deposit the electrode material onto a nanoporous Anodized Aluminum Oxide (AAO) membrane with nanopores of 200 nm in diameter. This research uses a nanostructured SnO₂ anode against a bulk LiCoO₂ cathode and a polyethylene-oxide (PEO) based solid polymer electrolyte. The electrolyte is similarly nanostructured by confining it in the nanopores of an AAO membrane. By melting a film of the electrolyte onto an AAO membrane under vacuum, the polymer is forced into the AAO nanopores, forming a nanocomposite electrolyte membrane. The confinement of the electrolyte increases its ionic conductivity to levels comparable to liquid electrolytes.

A functioning room-temperature solid-state lithium ion cell has been developed using the nanostructured SnO₂ anode, LiCoO₂ cathode, and PEO nanocomposite electrode. The cell was investigated using galvanostatic cell cycling and scanning electron microscopy (SEM). The cell achieved a specific discharge capacity of 125 mAh/g (89% of theoretical capacity) and a capacity retention of 20% after 20 cycles.

Meuser, Paul; Kumar, Rachna; Macke, William; and Sen, Sandip
SWARMING AS LEARNED BEHAVIOR IN PREY ANIMALS

Swarming is a common behavior in a variety of prey animals. One advantage of swarming is that the movement of prey animals in a swarm can confuse potential predators by making individual prey animals harder to identify. While swarming requires a substantial amount of coordination between animals, many prey species exhibit swarming behaviors without any apparent communication between individuals. This research is motivated by a model of predator-prey coevolution that demonstrates the evolution of prey swarming without communication to benefit from predator confusion. Our research uses a radically different reinforcement learning approach, which does not require the shared knowledge necessary for evolutionary learning over generations of a population of individuals, to determine if individual prey animals can independently learn swarming behaviors during their lifetime. We experiment with a variety of environmental input to determine under what conditions prey groups learn swarming behaviors.
Miller, Melissa
THE INVENTION OF BESTWOOD: ENVIRONMENTAL MODIFICATION AND TECHNOLOGICAL INNOVATION IN THE FAURESMITH OF SOUTHERN AFRICA

Environmental modification and technological innovation are hallmarks of modern human behavior, allowing our species to spread worldwide—but where and why did these behaviors begin? How long have humans manipulated the environment, and to what degree? This presentation describes doctoral research exploring these questions within a transitional South African lithic industry. Transitional lithic industries inform researchers about technological innovation during significant periods of human evolution. The Fauresmith, an Early Stone Age (ESA) to Middle Stone Age (MSA) transitional industry in South Africa, is characterized by the appearance of blades and composite tools alongside continuing traditions of large cutting tools and coincides with the evolution of advanced Homo species during the Middle Pleistocene. The doctoral research described here investigates the development and purpose of the Fauresmith at a site called Bestwood in Northern Cape, South Africa, using experimental and analytical techniques including post-depositional and microwear analyses. This presentation describes the research background and goals of this work, reports preliminary experimental results, and discusses what this project can tell us about the history of environmental modification and technological innovation by humans.

Mobra, Tyler
THE EFFECT OF STUDENT ENGAGEMENT IN MATH/SCIENCE ACHIEVEMENT

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 research conducted in the fall of 2017 resulted in 166 middle and high school student participants. Students completed a questionnaire to get demographics followed by a math and science engagement survey created by Wang, Fredricks, Ye, Hofkens, and Linn (2016). It shows that students who are more engaged have higher achievement in math and science than less engaged students.

Mokhtari, Samira and Ali, Akhtar
DETECTING MYCOVIRUSES IN FUSARIUM SPECIES

Mycoviruses (fungal viruses) are genetically divided into four groups; first, Double-stranded RNA (dsRNA), second, Positive-sense single-stranded RNA (+ssRNA), third, Negative-sense single-stranded RNA (-ssRNA), fourth, Single-stranded DNA (ssDNA). The genome of most of dsRNA mycoviruses have been identified and been classified into five families. Usually most of mycoviruses do not show symptoms in fungus; however they might have the hypovirulance effect, which is reducing the virulence of plant pathogenic fungi and therefore there is no need for fungicide. Fusarium species are one of the most important plant pathogens. Fusarium species produce mycotoxin and may infect and damage cereal crops by decreasing yield. There are few mycoviruses that has been detected in F. graminearum and genome sequences for at least seven of them has been published. The mycoviruses in Fusarium species are called Fusarium graminearum virus 1-4. In this study, we are screening a Fusarium species for mycoviruses. So far, the fungus has been grown on the media and experiments are underway to extract dsRNA. The results of these experiments will be presented and discussed.

Mraz, Veronica
HOT BIFACES: AN EXAMINATION OF FLAKING PROPERTIES FROM HEATED AND UNHEATED BIFACES

Archaeologists have long recognized that prehistoric people altered their lithic raw material by heating it either for social preference (color and texture change) and/or for altering the knapping properties of the cherts. Heat treatment experiments by archaeologists started in the 1960s, and since then there have been numerous experiments involving the heat treatment of cherts, jaspers, obsidian, silcretes, etc. Many of these studies attempted to ascertain what happens to cherts subjected to thermal alteration. While each of these experiments has provided something new to our understanding
of thermal alteration of chert, there are still some fundamental gaps in our understanding of this process. There has been difficulty in the past with creating a standard method for quantifying the results of these tests, often describing the changes as “improving knappability” or “making knapping easier” but what exactly these subjective terms mean is unclear. The purpose of my research is to reduce subjectivity by quantifying the effects of heat-treatment and thus better understand why prehistoric groups engaged in the practice. In this paper I examine one aspect of this research looking specifically at the changes in flake characteristics from heated and un-heated biface.

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

CLASSIFICATION ACCURACY OF THE WORD MEMORY TEST GENUINE MEMORY IMPAIRMENT INDEX

Objective: The Word Memory Test (WMT; Green, 2003) assesses non-credible effort. To mitigate risk of false positives, Green (2003) derived the Genuine Memory Impairment Profile (GMIP), and asserted that severely impaired people are most likely to manifest this profile. The present study evaluated the classification accuracy of the GMIP in a group of healthy individuals coached to simulate mild traumatic brain injury (mTBI) related memory impairment on the WMT.

Participants and Methods: Eighty healthy individuals participated. One group was provided superficial information concerning mTBI symptoms (naïve simulators), another was provided extensive information concerning symptoms (sophisticated simulators), and a third group was provided extensive symptom information and tactics to evade detection by PVTs (test-coached). An honest responding group was directed to give their best performance. All participants were given a neuropsychological battery that included the WMT.

Results: GMIP profiles were calculated according to Green (2003). All of the control group was correctly identified as having normal memory. Within the test coached group, 90% exceeded WMT cutoffs, but only 5.6% of these manifested the GMIP profile. Among the sophisticated and naïve groups 95% and 100% exceeded WMT cutoffs for invalid performance, respectively. Of those who exceeded WMT cutoffs, 26.3% and 60% manifested the GMIP profile, respectively. A chi-square test showed that GMIP was observed far more often in the test-coached simulator group than in the naïve simulator group.

Conclusions: Nearly all of the simulators were accurately classified as exerting non-credible effort, and test-coaching diminished sensitivity only modestly. Nonetheless, occurrence of the GMIP profile was significantly different between groups. Of those who failed the WMT, the test-coached group was least likely to show the GMIP profile (5.6%), whereas the naïve simulators were most likely to display the GMIP (60%). This implies that the GMIP is apt to falsely identify individuals as having genuine memory impairment, especially if a naïve or unsophisticated effort to exert poor effort is made. Use of the GMIP should be scrutinized carefully and used cautiously. In addition, the GMIP falsely identified more individuals in the naïve group than in either of the other faking groups. The test-coached group had the least number of individuals incorrectly identified by the GMIP. This implies that the GMIP incorrectly manifests most often in groups that exhibit more uninformed and severe exaggeration. This challenges the utility of the GMIP. Future studies should evaluate the classification accuracy of the GMIP with a sample of both individuals with memory impairment and individuals who are asked to fake memory impairment. A comparison of the two groups would further evaluate whether the GMIP should or should not be used.

Nanda Kumar, Rachna; Crawford, Chad; and Sen, Sandip

RESISTING EXPLOITATION THROUGH REWIRING IN SOCIAL NETWORKS: HOW PARITY, SYMPATHY AND RECIPROCITY CAN INCREASE SOCIAL WELFARE

We are interested in understanding how socially desirable traits like sympathy, reciprocity and fairness can survive in environments that include aggressive and exploitative agents. Social scientists have long observed and theorized about ingrained motivational factors as explanations for departures from self-seeking behaviors by human subjects. Some of these factors, namely reciprocity, have also been studied extensively in the context of agent systems as tools for promoting cooperation and improving social welfare in stable societies. In this paper, we evaluate how other factors like sympathy and parity can be gainfully used by agents to seek out cooperation possibilities while avoiding exploitation traps in more dynamic societies. We evaluate the relative effectiveness of agents influenced by different social considerations when they can choose who to interact with in their environment. Such rewiring of social networks not only allows apparently vulnerable agents to
avoid exploitation but also allows them to form gainful coalitions to leverage mutually beneficial cooperation, thereby significantly improving social welfare.

Nassef, Anass and Keller, Michael
INHIBITED EROSION-CORROSION WITH CALCIUM CARBONATE PARTICLES VERSUS SAND

Erosion-corrosion deterioration of carbon steel in the presence of solid particulates is a major issue in oil and gas production. Erosion can significantly influence corrosion by negatively interfering with corrosion mitigation systems such as when a protective corrosion scale or an inhibitor film is stripped away through solid particle erosion. The combined effect of erosion and corrosion can lead to high corrosion rates, surface pitting, and, ultimately, material failure. In CO2 corrosion, under certain environmental conditions, which are typically high pH, temperature above 180 to 200°F (82 to 93°C) and low flow velocity, an iron carbonate protective layer forms on the steel surface. This corrosion product can reduce corrosion rates to lower values, if it completely covers steel surface. The presence of solid particles, however, such as sand or calcium carbonate can strip away the iron carbonate layer, thereby increasing corrosion to bare metal corrosion rates. In such a case, chemical inhibitors are usually employed in order to minimize material loss. Corrosion inhibitors, however, are also influenced by flows containing particulates. Solid particles such as sand and calcium carbonate can reduce inhibitor efficiency by adsorption of inhibitor to the particle surface and by stripping inhibitor from the steel surface.

The effects of sand erosion on the efficiency of corrosion inhibitors have been studied for scale-forming and non-scale-forming environments. However, a large percentage of oil and gas is produced from carbonate reservoirs where calcium carbonate (CaCO3) particles can enter into the flow of produced gas and oil. Currently, little is known about the erosive effects of CaCO3 particles on erosion-corrosion of steel in iron carbonate scale forming environments. This paper describes an experimental investigation directed at understanding the influence of CaCO3 particles on inhibitor effectiveness by comparing the performance of an imidazoline-based inhibitor in a flow containing CaCO3 particles with the inhibitor performance for a flow containing sand particles. Erosion-corrosion experiments were performed using flow loop set up with a direct impingement configuration in an iron carbonate scale forming environment. Electrochemical linear polarization resistance and weight loss methods were utilized to experimentally characterize erosion-corrosion rates for both types of solid particles. The composition of the iron carbonate scale was verified by X-Ray diffraction analysis and by scanning electron microscopy.

Neeli, Sai Teja and Ramsurn, Hema
SYNTHESIS AND FORMATION MECHANISM OF IRON NANOPARTICLES IN GRAPHITIZED CARBON MATRIX USING BIOCHAR FROM BIOMASS MODEL COMPOUNDS AS A SUPPORT

Biochar, a carbon-rich valuable by-product obtained from the hydrothermal carbonization of biomass model compounds (cellulose, hemicellulose and lignin), was utilized as a support for synthesis of carbon encapsulated iron nanoparticles (CEINP) to promote green chemistry and engineering. Core-shell structures consisting of dark metal cores ranging from 40 to 80 nm and a light matrix with graphitic structure appeared in the CEINP. Rietveld refinement analysis applied to the X-ray diffraction (XRD) patterns of cellulose and hemicellulose biochar revealed similar phase compositions (graphite, α-Fe, Fe3C, CFe15.1 and CFe21.2). Interestingly, poorly ordered graphite phase was detected in the XRD diffractogram of CEINP from lignin biochar and HRTEM images have also shown the presence of disordered graphitic layers encapsulating the iron nanoparticles. CEINP from cellulose and hemicellulose on the other hand showed distinct graphite (crystalline) phases. Nitrogen physisorption measurements showed that the graphitization induced by iron nanoparticles introduced mesopores into the carbon matrix of CEINP from cellulose and hemicellulose biochar while CEINP from lignin biochar retained microporous structure due to low graphitization. Based on the characterization results, a detailed dissolution-precipitation mechanism is discussed in the context of bulk iron-carbon equilibrium phase diagram to explain the formation of different phases observed in the CEINP.
Neupane, Ganga Raj
STRUCTURAL, OPTICAL AND ELECTRICAL PROPERTIES OF Fe- DOPED ZnO NANOPARTICLES

In this work, 0.01M concentration undoped and Fe-doped (5%, 10%, 15%) ZnO nanoparticles were synthesized via a hydrothermal precipitation method. Structural properties of pure ZnO and Fe-doped ZnO nanoparticles were studied by means of X-ray diffraction spectroscopy (XRD) and Transmission electron microscopy (TEM). XRD results show the existence of wurtzite structure in all samples. TEM studies of nanoparticles show the formation of nanoparticles ranges in diameter from 9.52 nm to 55.9nm. Optical properties of all samples were studied by means of photoluminescence (PL) and UV-absorption spectra. Photoluminescence studies shows a blue shift in near band absorption as the iron concentration increases from 0 to 15%. UV-VIS absorption measurement shows a systematic increase in band gap from 3.32 eV to 3.37 eV as the iron concentration increases from 0% to 15%. Electrical transport properties were analyzed by Cole-Cole plot using impedance spectroscopy. Cole-Cole plot of all samples were modeled by equivalent RC circuit and the spectrum reveals that the resistance of samples increases as the concentration increases from 2906 Ω to 6752.1 Ω.

Nichols, Will and Hawrylak, Peter
AUTOMATIC GENERATION OF ATTACK SCRIPTS FROM ATTACK GRAPHS

While attack graphs are valuable tools for security analysis, their testing and validation is a time-consuming process. Once validated, the attack graph can be used to generate testing scripts or use-cases for system security testing and validation. Furthermore, simply identifying states where a system is critically compromised can also be lengthy and tedious. Since this process is algorithmic, it can be automated. The automation process can extend to not only identifying the paths to reach a compromised state, but also to generate a script (attack scenario) which can be used to validate the results of the attack graph. This validation system can be further improved by automating the analysis of the result of running this script. These capabilities simplify the system security testing and system validation.

Noland, Andrew and Dutton, Denise
INHERITING THEIR REVOLUTIONS: INTERPRETING GREATNESS FOR THE MODERN WORLD

The objective of this project is to reshape the fundamental understanding of the term “greatness” when both academia and public society discuss leadership. The neoliberal age has shifted the conception of public leadership to a model similar to Napoleon I: self-interested, ambitious, and talented rule based exclusively on merit. Napoleon’s stories distill an image of not just Napoleon the historical conqueror and political genius, but Napoleon the selfish, egotistical man; through this lens, this project shows that these are too interwoven to dismiss the latter as irrelevant to a more tempting imagining of the “Little Corsican”. Lincoln’s stories display the extraordinary features of not just the American Political Science Association’s highest ranked president, but also paint a rich portrait of a deeply empathetic, yet flawed human. In short, while the two were animated by the same impulse of ambition, Napoleon fell victim and continued to feed an insatiable hubris that led the downfall of his nation and himself; Lincoln, while certainly not perfect, remained grounded in a unique humility and self-restraint informed by his compassion. The latter must be remembered and re-centered to the heart of democratic society to once again return to language of the common good.

This paper hopes to one day serve as chapters in a larger book project. For the sake of brevity and clarity, Napoleon’s “chapter” is divided into three stories; the first is on the 18th of Brumaire, the second is about the Treaty of Tilsit, and the third is about the mysterious eight-hour meeting with Metternich before the emperor’s defeat at Dresden. Lincoln’s chapter is divided into three stories as well; the first is on the Second Inaugural Address, the second on the Lyceum Speech, and the third on the famous published letter to Horace Greeley of 1862. Through the comparing and contrasting of their unique yet similar reigns, this excerpt of a larger project will hopefully illuminate a new direction that political and historical discourse should take when discussing greatness.
Nunez, Jaime
THE (U.S) POLITICS OF FINANCIAL REGULATION
WHY HAS IT BEEN SO DIFFICULT TO IMPLEMENT EFFECTIVE REGULATORY OVERSIGHT NEEDED TO PREVENT ANOTHER FINANCIAL CRISIS?

This paper explores, investigates, and explains why it has been difficult to implement the regulatory oversight needed to prevent another financial crisis similar to the one precipitated by the housing bubble of 2007-2008. The first half of the paper identifies the root cause of the financial crisis and explains the measures that have been proposed to prevent future crises. It explains how the unregulated and out-of-control use of financial instruments, such as collateralized-debt-obligations (CDOs), helped fuel the rapid expansion of the housing market and its eventual collapse leading to the financial crisis. It introduces the regulatory measures, known as the Dodd-Frank Regulatory Act, intended to prevent future repetitions of the crisis. The second half of the paper examines the forces that are at play in preventing a smooth implementation of the Dodd-Frank regulation. It explains the vast, cumbersome and unwieldy process that is in place to define and implement rules and regulations. It examines how different political, corporative, and social forces interact on the issue of financial regulation and exposes which ones are effective or ineffective in advancing their causes and interests. It concludes that because of the large scope of the task, the conflicting interests of all parties involved, and the changing/evolving nature of financial systems and technologies, it is likely that current financial regulation will not prevent future crises.

Ort, Jeremiah; Shah, Javishk; and Carreon, Maria
GREEN SYNTHESIS OF CARBAMATES OVER GA2O3

The development of superior performance catalytic properties requires novel materials with tunable morphologies and textural properties displaying distinctive structural, adsorption and catalytic properties than those of conventional materials. Gallium oxide can be rationally engineered into crystalline porous materials which combine highly desirable properties, such as controlled morphology, uniform micropores, high surface areas with exceptional chemical and thermal stability, making it ideal candidate for catalytic applications. Apart from these advantages, gallium oxide mesostructures are appealing materials to be employed as catalysts for CO2 conversion to carbamates due to: 1) the presence of Lewis acid sites, and 2) moderate CO2 uptakes. An ideal catalyst for the conversion of CO2 to alkyl or aryl carbamates should have both Lewis acid sites and exhibits affinity to CO2. The proposed research aims at developing gallium oxide mesostructures with tunable structural, morphological and textural properties for the catalytic synthesis of alkyl and aryl carbamates from CO2. When successful, this work may potentially result in the viable conversion of carbon dioxide into platform chemicals (alkyl and aryl carbamates) used in the chemical industry for the synthesis of pesticides, fungicides, polyurethanes and drug intermediates in pharmaceutical industry.

Palmeter, Nicole
THE LEGACY OF SLAVERY: HEALTH IN THE POST-EMANCIPATION SOUTH

The institution of slavery had immediate and long-term effects on the enslaved African and African-American people sold in the United States from the Caribbean and Africa. Poor nutrition, a harsh environment, and abuse presumably would lead to higher mortality rates and lower life expectancies into post-emancipation and beyond. In my research I compared mortuary data from the ‘white’ only Laurel Grove North Cemetery and the ‘black’ only Laurel Grove South Cemetery, both located in Savannah, Georgia. Through the comparisons of the interment records from 1869 to 1886, the results indicated that although the African and African American community experienced a higher mortality rate than European Americans, they did show an increase in life expectancy.
RELATIONSHIP BETWEEN SEVERITY AND SUBTYPES OF CHILDHOOD TRAUMA AND BRAIN MORPHOLOGY IN ADULTS

Background: Childhood trauma has been reported to relate to differences in brain morphology within the hippocampus, frontal medial and lateral regions, amygdala, anterior cingulate cortex and insula. Using a large adult sample controlled for mental health diagnosis, we examined the unique impact of childhood trauma on regional gray matter (GM) that may be distinct from psychopathology.

Methods: A large data base of individuals (n=577) who have completed magnetic resonance imaging and the Childhood Trauma Questionnaire (CTQ) were examined. Autosegmentation of regional GM volume was completed using FreeSurfer (version 5.3.0), controlling for total GM volume. Elastic net machine learning (with cross-validation) was conducted to identify regions for which GM volume related to CTQ severity. Analyses of variance were used to compare region of interest gray matter volumes for subjects condoning severe levels of one (and only one) trauma subtype, including sexual abuse, emotional/physical abuse and emotional/physical neglect.

Results: Elastic net analyses revealed that the right inferior portion of the circular sulcus of the insula accounted for unique variance in CTQ severity. When examining trauma subtype, the medial orbitofrontal cortex showed significant differences between the groups, characterized by both sexual abuse and emotional/physical abuse groups having lower GM volume than the emotional/physical neglect group.

Discussion: Using a machine learning approach, we assessed the differential impact of childhood trauma subtypes on GM volume. Results suggest CTQ severity is uniquely associated with higher GM volume within the mid posterior insula, and that sexual and physical/emotional trauma have more of an effect than neglect on the OFC.

NEEDS ASSESSMENT OF BURMESE REFUGEES IN JENKS PUBLIC SCHOOLS

Ethnic and political conflict have been present in Burma for over a century, and when the new military junta dictatorship seized control, these conflicts worsened, resulting in the present refugee crisis. As of 2016, approximately one million Burmese natives have been displaced (Fike & Androff, 2016). For an already war-torn and traumatized people, international resettlement has resulted in significant challenges for Burmese children and their parents integrating into the American school system, such as cultural and language differences, resulting in barriers to education. The present study was conducted in a Midwestern public school system that has approximately 1,000 Burmese refugee students. Researchers sought to investigate whether unmet needs exist among the Burmese students and their parents. Semi-structured interviews were conducted with 9 students’ primary caregivers from elementary, intermediate, and high schools. Questions pertained to benefits and challenges of relocating to the United States, nature of relationships with school staff, barriers to education and community services, and other needs that could be better met by the school. An interpretive phenomenological approach was used to analyze qualitative interview data.

AN EXPLORATION OF THE RELATIONSHIP BETWEEN SEXUAL ASSAULT PREVENTION PROGRAMMING AT THE UNIVERSITY OF TULSA AND STUDENT PERCEPTION OF CAMPUS RESPONSE TO SEXUAL VIOLENCE

This study aims to explore the relationship between attending an interpersonal violence prevention training and the degree to which participants believe the University of Tulsa will appropriately respond to the sexual assault. The University of Tulsa has recently implemented an Office of Violence Prevention and Education to strengthen sexual assault prevention programs on campus. As a part of this program, the University of Tulsa distributes a campus climate survey at the beginning of each semester that investigates numerous factors such as prevalence rates of sexual violence, awareness of and access to resources, thoughts about interpersonal violence, and perception of preventative and response efforts by the university. This study will utilize the 2017-2018 academic year data, with at least 152 TU students participating in interpersonal violence prevention training on campus according to fall 2017 data. Individuals who reported completing this training were asked follow-up questions regarding the helpfulness of the training. This study hypothesizes that individuals who attended a
training and rated the training as more helpful would be more likely to view the University’s response to a sexual assault favorably as compared to those who rated the training as not helpful. A series of one-way ANOVAs will be conducted to determine differences between variables related to campus responsiveness, such as the university taking the report seriously or will support the person making the report. These findings will be reviewed in depth within this presentation. The presentation will also include recommendations on future sexual assault prevention programming based upon the results.

Qualls, Zachary

WOVEN RESILIENCE: CHEROKEE BASKETRY IN THE AMERICAN SOUTHEAST AND ITS 20TH CENTURY TRANSFORMATION

“Woven Resilience: Cherokee Basketry in the American Southeast and Its 20th Century Transformation” explores the materiality of Cherokee basketry in the American Southeast and Oklahoma. Discussion includes pre and post contact functions, the transformation of form and material in the 19th century, and the resilience of basketry traditions in the 20th century. The culmination of historical and ecological changes shed light on the remarkable adaptability of the Cherokee people and the continued evolution of this artistic form.

Rajbanshi, Naveen and Ali, Akhtar

STUDY OF NATURAL EVOLUTION OF WATERMELON MOSAIC VIRUS

Watermelon mosaic virus (WMV) is one of the most prevalent viruses of cucurbits in the United States. Due to the presence of RNA as genetic material, WMV generates a pool of new strains. Therefore, it is very important to monitor the genetic structure of the virus before developing any control strategy. In this study, 156 leaf samples were collected from the symptomatic cucurbit plants for four years (2014-2017) in Tulsa County, Oklahoma. Out of the 156 samples, 61 samples were positive to WMV by RT –PCR using WMV specific CP primers. Out of 61, 37 positive samples (isolates) were randomly selected to sequence the 849 nucleotide long coat protein (CP) gene of WMV. For each isolate, complete 849 bases of CP gene was sequenced by Sanger sequencing method. The CP gene sequence of three to five clones of each isolates were used to determine a consensus sequence for that isolate. The highest mutation frequency was observed in isolate OK4.2015. At least, 58 synonymous mutations and 8 non-synonymous mutations were found in the CP gene. Maximum likelihood tree was constructed based on the CP sequences of all 37 isolates collected in four years. Isolates did not make any year specific cluster but there were two distinct clusters for two haplotypes. Based on our results, the mutation rates among the clones of the same isolates was found to be consistent among different isolates. The isolates from four different growing seasons did not show any major divergence in nucleotide sequences. We found two major haplotypes circulating in Tulsa County. All the isolates belong to either one of these haplotypes. It can be assumed that these haplotypes out of all quasi-species survived negative selection pressure.

Ramasubramanian, Vaidheeshwar; Ramsurn, Hema; and Price, Geoffrey

METHANE DEHYDROAROMATIZATION – A STUDY ON REACTION MECHANISM

Extensive research is being done on methane dehydroaromatization (MDA) over Mo supported catalysts not only because of the potential for economic and energy benefits but also because the mechanism of the reaction is still being unraveled. To understand the contribution of molybdenum to the MDA process, this research has been done to study the catalytic conversion of methane over Mo loaded on an inert support (silica) and Mo on acidic support (HZSM-5). The catalytic activity of all the catalysts were studied at 973 K and 1023 K in a batch recirculating reactor. Temperature programmed reduction, carburization, coke removal followed by reduction and carburization in microbalance explained the nature of molybdenum species present in the catalyst. H2 pretreatment at 1023 K prior to methane activation has significantly improved the catalyst activity and reduced the induction time on benzene formation. The XRD analysis of used catalysts revealed that the MoO3 species were converted to β-Mo2C phase. Based on studies using Mo/SiO2 catalysts, benzene was formed even in absence of acidic zeolite sites. Reactions of ethylene in the presence of pure silica, HZSM-5 and in a blank reactor were also studied. Results revealed that conversion of ethylene to aromatics was similar in case of the blank reactor and silica but the conversion enhanced significantly in the presence of HZSM-5. Thus, it is believed that molybdenum carbide sites act as active sites for C-H bond activation and ethylene formation. Ethylene by itself can undergo subsequent oligomerization to form benzene at 973 K and above.
Reeder, Ryvers
STORING AND MULTIPLYING AN ATTACK GRAPH'S ADJACENCY MATRIX

Attack graphs are a tool used in cyber security for predicting and analyzing possible cyberattacks. Its adjacency matrix details the adjacent connections of each node within the system; however, increasing the exponential power of this matrix reveals paths of distant nodes. Using this analysis, potential attack paths can be mapped. Due to the thousands of nodes stored within the matrix, storage and multiplication methods are needed to reduce the memory and time expended on using the adjacency matrix. For storage, not all nodes are adjacent to one another, so the matrix is sparse, or comprised of mostly zeroes. To reduce the storage and time needed to process them, sparse matrix storage methods such as compressed row storage can be implemented to contain only non-zero elements. For multiplying the adjacency matrix, matrix multiplication algorithms can reduce the amount of multiplication, such as Strassen’s algorithm, or reduce the communication. PETSc, a toolkit, contains methods for sparse matrix storage formats and multiplying matrices. To further reduce the processing time, PETSc allows MPI communication to divide the workload among processors. By using these methods and PETSc, the efficiency for processing the adjacency matrix can be improved to reduce the response time for mapping potential cyber-attack paths.

Refai, Fares
ORGANIC DYE, VISIBLE-LIGHT PHOTOCATALYTIC IMIDATION OF ARENES USING N-HALO REAGENTS

The production of aromatic amines is an essential process for the chemical, agriculture, and pharmaceutical industries which respectively manufacture advanced organic materials, agrochemicals, and synthetic drugs. Typically, aromatic amines are produced using methods involving extreme conditions and/or prefunctionalization; however, many systems have been recently developed as mild, light-promoted alternatives to transition metal catalyzed methods of arene functionalization. These alternative systems operate through a nitrogen-centered radical approach and often require the synthesis of a nitrogen-centered radical precursor, an expensive transition-metal photocatalyst, and a radical initiator. The Lamar Research Group has discovered a method to create aromatic amines that is inexpensive, atom-economic, and reacts under mild conditions. This method involves an imidation reaction that utilizes a commercially available reagent which reacts under visible-light to incorporate carbon-nitrogen bonds to arenes via an organic dye photocatalyst. Ultimately, this alternative process could be widely used by major industries to minimize the costs of producing compounds containing aromatic amines which would eventually result in cheaper and more widely available products for consumers.

Reinert, Alexander
PUTIN’S RUSSIA: STRONGMAN, STRONG STATE?

Since attaining the presidency in 2000, Vladimir Putin has radically transformed the Russian state in his image. Domestic reforms have reshaped the internal power structure of Russia as Putin contrives to leave his personal imprint on Russian state development. I seek to analyze these reforms and determine their comprehensive impact on Russian state capacity as well as to discuss their implications for future Russian policy.

Reyes, Zachary
ANNOTATING THE GENOME WITH MACHINE LEARNING

Although every cell in a eukaryotic organism contains the DNA for the entire system, only certain regions are expressed as genes. The exact biological components that dictate whether a region is expressed or not is currently unknown to scientists. Current research has suggested that the organization of histone modifications on histone tails could be the key to solving this problem. A strong correlation discovered between modifications and functional genomic elements is the cause of this popular so-called “Histone Code Hypothesis”. The discovery of an identifiable histone code that indicates how certain genomic regions will function would be revolutionary to the field of epigenetics. Such a model would dramatically shorten the time needed to annotate functional elements in the genome. Additionally, great advancements in procedures like cellular regeneration would occur.
Unfortunately, the number of histone modification combinations in the genome are too vast for a human researcher to study alone. Machine learning algorithms, however, have strong pattern-finding capabilities, making them well suited for this problem. In my research I have implemented a supervised machine learning algorithm that distinguishes across three functional genomic region classes and background regions. Currently, my algorithm possesses an accuracy upwards of 80% for 3 of these four classes for our testing data. I have also extensively read the literature surrounding my field, and am planning on utilizing the new knowledge I learned to improve my work.

Reynolds, Bradley
THE EMOTIONAL GAMBLER: NEGATIVE AFFECT PREDICTS CONTINUED PREFERENCE FOR PUNISHING CHOICES

Introduction
The Iowa Gambling Task (IGT; Bechara et al., 1994) is a measure of risky decision-making. Despite its popularity, the IGT’s traditional scoring metrics have been criticized (Gansler et al., 2011). For example, the IGT has evidenced questionable construct and criterion validity, particularly among healthy adults (Steingroever et al., 2013; Suhr & Hammers, 2010). Investigators have considered individual decks rather than composite scores in exploring decision-making constructs (Caroselli et al., 2006). The present study sought to clarify which personality and cognitive variables might be associated with each.

Methods
The IGT was administered to 54 healthy undergraduate students. Individual deck preference was calculated across halves of the task (i.e., Trials 51 to 100 – Trials 1 to 50). Affect was assessed using the PANAS (Watson et al. 1988), while trait impulsivity was explored with the UPPS-P (Cyders et al., 2007). Concept formation was evaluated using the Wisconsin Card Sorting Test (Grant & Berg, 1948). The WAIS-IV Digit Span subtest was also provided to assess working memory (Wechsler, 2008).

Results
Multiple regression analyses were conducted evaluating IGT deck preference. Tolerances were > .65. Across all four decks, only Deck A was significant. Controlling for Type-I error, higher negative affect ($p < .001, r = .49$) and lower working memory ($p = .001, r = -.39$) accounted for substantial variance in Deck A preference over task halves.

Conclusions
The current findings reemphasize the convoluted nature of traditional IGT metrics (i.e., individual decks). Specifically, we observed that IGT decks are not equivalent when compared across theoretically-associated constructs.

Riley, Ian and Gamble, Rose
EMPLOYING THE SI NETWORK MODEL TO EVALUATE NETWORK PROPAGATION IN BLUETOOTH MANETS

In any network application, devices must reliably send information to and receive information from other devices on the network. This reliability has proven to be challenging with Bluetooth mobile ad-hoc networks, or MANETs, because the topology of the network can change unpredictably. To provide reliable network propagation, applications must account for the geophysical constraints unique to Bluetooth MANETs, factors such as the geolocation of the devices in the network, limited communication range, and discovery latency. This has led to the development of communication protocols to overcome these challenges. However, no protocol can guarantee reliable network propagation across all network conditions.

In this paper, we define a SI model that can predict the network coverage of a Bluetooth MANET with predefined network conditions. The SI model is a weighted, fully-connected, directed graph which contains edge probabilities which represent the likelihood of two devices sharing a message. We construct a virtual simulation which emulates the behavior of a Bluetooth MANET by simulating the discovery processes of the devices, their connection behavior, and their physical movement within a predefined space. The SI model and the simulation are compared across a variety of scenarios, each with their own unique set of initial conditions. The results of this presentation show that a SI model can be used to accurately predict the asymptotic percent network coverage of a Bluetooth MANET and that it can model network conditions that would be infeasible to measure with a physical or virtual simulation.
Tucked away in the Himalayan mountain range, the small Kingdom of Bhutan is full of surprises. “Gross Domestic Happiness,” an inseverable relationship between religion and government, and status as the world’s only negative carbon emissions country make Bhutan not only extremely unique, but also an international leader in environmental conservation. In this study, Bhutan’s environmental conservation prowess is examined via floral and faunal biodiversity assessments in both thinned and un-thinned homogenous stands of blue pine (*Pinus wallichiana*). We predicted that both floral and faunal diversity would be greater in the thinned stands than the un-stands as more sunlight could reach the ground to permit plant growth and animals could more easily traverse the terrain. Ecological techniques such as camera trapping and species assessment plots were employed to perform thorough comparison between the stand types over the course of a week in June 2016. Species richness, trap night success, and the Simpson and Shannon indices all were measurements used to assess the overall biodiversity in each stand type. Higher species richness, trap night success, and values from the statistical indices were obtained in the thinned stand, thus supporting our prediction that floral and faunal diversity would be greater in the thinned stands. As blue pine timber is a readily used commodity in Bhutan, this study aims to show that Bhutan’s timber industry is not an environmental detriment. A discussion of Bhutan as an exemplary role model the world should learn from regarding environmental conservation is also proposed.

Rosli, Redza; Ford, Laura; Kerst, Bradford; Gross, Donald; Adesoro, Donovan; and Wang, Lei

**EWB-TU BOLIVIA SANITATION PROJECT**

This is an international project within the student run organization of Engineers Without Borders – University of Tulsa. The goal of this project is to provide a sanitation system for a rural community in Bolivia called Machacamarca-Micacuni. This is a long-term project that is project to last at least five years and is now in its second phase of implementation. During Thanksgiving break, the group travelled to Bolivia and to the community on an assessment trip to get to know the community and collect data for a future implementation trip. The data collected included a survey conducted on the families and understanding their needs, water testing, percolation testing and community mapping. The data from the survey verified that sanitation was the biggest issue in the community. Given the survey data, the group has decided to implement latrines and showers for the upcoming implementation trip. The group is working towards a possible implementation trip next Thanksgiving break and is currently in the process of designing and filling in the required paperwork needed prior to travel. The chapter is also actively fundraising by asking for donations, applying for grants and putting on a fundraiser in April. This project was also recently recognized in a Tulsa World article that specifically discusses the past assessment trip. The project has so far been very successful but is still in its preliminary stages.

Rouw, Anna

**EXPERIENCES OF TATTOO ARTISTS**

This study uses qualitative methods, including five in-depth interviews, to gather the personal narratives of local tattoo artists regarding their experiences within the profession. The interviews lasted approximately one-hour each and were transcribed and analyzed for themes. These themes include 1) Changing social perceptions of tattoos, 2) Tattooing as a profession, 3) Tattooing as an art form, 4) Tension within the tattoo community, and 5) Tattooing as meaningful work. Theme 1 analyzes the growing social acceptance of tattoos as no longer taboo or unprofessional. Theme 2 analyzes the increased legitimacy of the tattooing profession, as demonstrated through state licensing, training practices, and increased income. Theme 3 analyzes the self-perception of tattoo artists as fine artists, as demonstrated through portfolios and emphasis on artistry skills. Theme 4 analyzes a tension within the tattooing field, typically between older and younger tattoo artists, regarding the self-perception of the profession. While the younger tattoo artists consider their work closer in nature to fine art, the older tattoo artists view their work as a provided service. And finally Theme 5 explores the meaningfulness of tattooing as a form of therapy for clients, an outlet for self-expression, and what tattoo artists were "meant to do." These findings are important in helping to understand the complexities of this profession. Tattooing is an especially interesting profession because it has undergone dramatic changes in legality and social perception.
Rowe, Allyson; John-Paul, Alao; DiCesare, John; and Sheaff, Robert

ACTIVITY OF NOVEL NAPTHOQUINONE DERIVATIVES ON DIAGNOSTIC ASSAY ENZYMES

The novel napthoquinone adduct 12,13-Dihydro-N-methyl-6,11,13-trioxo-5H-benzo[4,5]cyclohepta[1,2-b]napthalen-5,12-imine (known as TU100) showed potential in preliminary chemotherapeutic agent studies. Since then, five derivatives have been synthesized with varying functional group changes. The cytotoxicity and general cellular effects of these derivatives have been a source of study, but the original TU100 molecule was shown to inhibit the common diagnostic Cell-Titer Glo luciferase assay. This assay measures the luminescent product of a luciferase-ATP reaction as an indirect measurement of cellular ATP levels. It is widely used as a simple diagnostic tool for general cytotoxicity. It was found that some, but not all of the derivatives also inhibit the assay reaction. The derivatives were compared to TU100 in the luciferase assay system in order to more fully understand their biological mechanism of action, and to determine further experimental procedures that may be used to characterize these compounds.

Royes, Josh

PREDICTION OF THE FIRST THREE STEPS IN THE KIRKPATRICK MODEL: AN EXAMINATION OF MODEL REDUNDANCY

The Kirkpatrick Model (1954) of training evaluation is one of the most used training evaluation models. There are several reasons why this may be the case. One possible explanation is the simplicity and intuitiveness of the model. The model consists of four levels: reactions, learning, behavior transfer, and results. It is believed that as you move through the levels, the data becomes both harder to collect, but also more beneficial. Another possible explanation on why the Kirkpatrick model is so widely used, is because it has received much attention from articles, popular media, and practitioners. There are also many researchers that oppose the Kirkpatrick model (e.g., Reio, Rocco, Smith, & Chang, 2017). These criticisms often target the same simplicity that the promoters boast, as well as the fact that the four levels are positively inter-correlated, so many practitioners get away with just measuring the first one or two levels.

The current project is going to be an examination of which sort of variables predict the variable corresponding with the first three levels of the Kirkpatrick Model (Kirkpatrick, 1954). This project utilizes an actual training evaluation dataset to attempt to show the redundancies inherent within the Kirkpatrick Model, mirroring some criticisms of earlier reviews (e.g., Reio et al., 2017).

Rutherford, Kasey

THE RELATIONSHIP BETWEEN STUDENT INVOLVEMENT IN OKLAHOMA STEM ACADEMIES AND COLLEGE MAJOR/CAREER CHOICE

Recent studies have shown that there is a demand for STEM jobs in the United States, as well as world-wide. To fill these jobs, more people need to be majoring in STEM fields. In 1998, the State legislature in Oklahoma created a program 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 8,000 secondary students 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 study has identified similar results from not just one summer program data, but from 16 years of Oklahoma summer STEM academies (2000-2017). The correlation results between students who attended the STEM academies and the variables; college major/degree, grade point average (GPA), received financial aid, and high school attended, will be discussed during the presentation.

Saleh, Ayah

METABOLIC RESPONSE OF CELLS LACKING THE TUMOR SUPPRESSOR P27KIP1 TO LOW OXYGEN LEVELS

All cancer cells exhibit inappropriate cell proliferation. P27, an anti-mitogenic tumor-suppressor that blocks cell cycle progression, contributes to suppressing this cell proliferation. Although cancer cells rarely exhibit a mutated or deleted p27 gene, the p27 protein is commonly disrupted in aggressive cancers, suggesting that p27 might play a novel role required in
cancer cell proliferation. Previous work in our lab has shown that p27 functions in cancer cell metabolism: cells lacking the p27 protein exhibit altered cell metabolism, switching from using glucose to the amino acid glutamine when glucose levels drop. This suggests that cancers with deregulated p27 can switch to using amino acids as a carbon source when lacking glucose, providing a growth advantage. Conversely, a common issue in most tumors is hypoxia (lack of oxygen). If oxygen levels are depleted in cells lacking p27, can they adapt to their environment by switching back to glycolysis? We addressed this question by comparing effects of oxygen depletion on metabolism in cells with and without p27. The main method of oxygen depletion was to seal the cell culture container off from the environment to gradually reduce oxygen levels. At various times, effects on ATP production and viability were evaluated. Metabolic inhibitors were employed to identify metabolic pathways being utilized. These results will contribute to our understanding of how disrupting p27 contributes to tumor development, and may lead to development of novel therapeutic intervention strategies to target these aggressive cancers.

Schinnerer, Camden
DEVELOPMENT OF A NOVEL METHOD TO RAPIDLY TEST THERAPEUTIC DRUGS FOR PARKINSONISM DISEASES AND ITS IMPLICATIONS FOR GLOBAL, AGING POPULATIONS

As the degeneration of neuromelanin in the brain has been linked to Parkinsonism Diseases, long-term cyclic voltammetry experiments of melanin films uniquely model what is believed to occur in the brain of patients suffering from Parkinsonism. This method of drug testing has the potential to impact drug research as it reduces associated costs and time for experiments. This method has a large potential global benefit, especially in regards to aging populations.

Schroeder, Lucas; Purser, Gordon; and Lamar, Angus
CHARACTERIZING ORGANIC DYE CATALYZED AMINATION UNDER VISIBLE-LIGHT PHOTOCATALYTIC CONDITIONS

The introduction of nitrogen functionalities to complex molecules is an important step in the synthesis of many pharmaceuticals. These reactions have typically been catalyzed by expensive transition-metal catalysts. Our research group has been exploring using more readily available organic dyes to catalyze these aminations under visible-light photocatalytic conditions. Our proposed mechanism involves the formation of an intermediate nitrogen-centered radical (NCR) through the breaking of a nitrogen-halogen (N-X) bond. In an effort to gain further mechanistic insight into the NCR formation, bond dissociation energies of commonly employed electrophilic N-X reagents were calculated by solving isodesmic reactions utilizing density functional B3LYP 6-311++G(2df,2p) energy calculations. Bond dissociation energies for chloro-, bromo, and iodo- reagents were then compared. Our research group has also recently developed a novel method of N- incorporation using a light-promoted, NCR pathway involving an intermediate N,N-diodosulfonamide reactive species. The N,N-diodosulfonamide species, produced in situ from an iminoiodinane reagent (PhI=NZ) and I₂, is characterized by having relatively weak N-I bonds leading to the production of two distinct NCRs. The N-I bond dissociation energies of a variety of different N,N-dihalosulfonamides were calculated to further explore the mechanism of this pathway.

Schumacher, Emily
THE LITTLE ICE AGE AND HUMAN DIET: A COMPARISON BETWEEN EUROPE AND EASTERN NORTH AMERICA

Climate change is a story as old as time, though the concept today represents a point of contention amongst laymen and scholars alike. Ever present in the discussion of climate change are the effects, if any, upon humanity. This is particularly poignant as modern climate variability leads to higher summer temperatures, stronger hurricanes, and harsher winters—all of which directly impact the lives, health, and diets of people.

It is the connection between human diet and climate change that is the topic of this presentation; more specifically, this presentation examines the Little Ice Age (LIA) and its impact on human diet in Europe and eastern North America. It is posited that the Little Ice Age, the period from the sixteenth through the mid-nineteenth century characterized by increased climatic variability and notable increases in glaciation in much of the northern hemisphere, impacted the diets of human populations in Europe and eastern North America. Through an examination of published data derived from human skeletal
remains and stable isotope analyses combined with historical and archaeological information about dietary habits, foodstuffs, and harvests, this presentation aims to a) determine if the Little Ice Age affected the diets of Europeans, b) determine if the Little Ice Age affected the diets of the inhabitants of eastern North America, c) compare the effects of the Little Ice Age on diet between the European and eastern North American populations, and d) increase the understanding of the relationship between human diet and climate change.

Schumacher, Emily  
ACADEMICS AND EMPIRE: THE PAST, PRESENT, AND FUTURE OF HUMAN REMAINS WITHIN MUSEUMS

People have a tendency to collect whatever piques their interest, buying (and quite often stealing) those items that catch their eyes regardless of any potential cultural or personal significance. Human remains—especially those of indigenous peoples—represent a particularly macabre category of collectibles that ultimately wound up in private collections, universities, schools of medicine, and museums the world over as items for scientific study and display. Whether the collecting of these materials was ethically sound or not was never a question.

Today, collecting and/or possessing human remains falls under more ambiguous territory. Debates rage within the academic community as to the legality and ethics of collecting, possessing, and conducting research upon human remains. Should museums continue to collect human remains going forward? How should museums reconcile past collections practices with their missions going forward? This presentation examines the past and present of human remains within primarily American and British museum collections, focusing heavily on the transformations in museum practices concerning human remains. Finally, this presentation offers a glance at what the future may hold for human remains as museums seek to reconcile the past, their missions, and the desires of descendant communities.

Seaver, Tori  
DEPICTIONS IN STORYTELLING ABOUT MUSIC

This paper is an exploration of an important but little-studied aspect of everyday communication called “depictions.” These are forms of communication in which people depict what they are talking about using either their own body or other physical props. In this paper I will focus on three common forms of depiction: direct quotation, manual gestures, and facial portrayals. Using a set of interviews that I have conducted with persons telling stories about music, I will examine how depictions correlate with the stories that people tell. This research is an attempt to take one step towards understanding the role of depictions in speech by cataloguing their role in spoken narratives. In future work, I will use these findings to further investigate the purpose of depictions in everyday speech.

Secrist, Kathryn and Ali, Akhtar  
THE MOLECULAR CHARACTERIZATION OF THE PEPPER MILD MOTTLE VIRUS ISOLATE FROM OKLAHOMA

_Capsicum_ species are important cash crops produced in the United States for fresh produce, seed production, and breeding. _Pepper mild mottle virus_ (PMMoV) (Genus _Tobamovirus_) infects pepper crops worldwide, causing severe deformities in both the plant and fruit and results in significant economic loss. The viral genome contains four, non-overlapping, open reading frames that encode a viral replicase, readthrough, movement, and coat protein. PMMoV was isolated in the commercial pepper fields of Oklahoma for the first time in 2014. The purpose of this study was to sequence the complete genome of the PMMoV isolate found in Oklahoma to provide the first sequence available from the U.S., determine the origin of the Oklahoma isolate, and to characterize its pathotype. Total RNA was isolated from infected plants to use it for reverse transcription polymerase chain reaction (RT-PCR). PCR products were purified and cloned into competent _E. coli_ cells for Sanger sequencing. Sequences were aligned, and phylogenetic methods were used to determine PMMoV-OK origin and pathotype. The complete genome was successfully sequenced, with the closest identity to the PMMoV-S strain from Spain harboring the P1,2 pathotype.
Seiders, Amanda

ENERGY SPECTRUM OF TWO COLD TRAPPED ATOMS IN D-DIMENSIONAL SPACE

Previously we derived an energy functional for two interacting atoms in a harmonic oscillator trapping potential in arbitrary spatial dimension. An energy functional gives the total energy of a system and a pseudopotential is used to simplify complex systems. We used the generalized Fermi pseudopotential for the interatomic interaction, which is parameterized by the scattering length, $a$, and dimension, $d$. We solved the $d$-dimensional Schrödinger equation to derive the energy functional, which is parameterized by $a$ and $d$, including non-integer dimensions.

In the current study, we investigate numerical solutions of the trapped interaction energy spectra for different dimensions and interaction strengths. We will study the energy spectrum for integer and non-integer dimensions and compare the exact numerical solutions with an analytical perturbation solution.

Slavens, Shelyn

CHLAMYDOMONAS REINHARDTII GENE MODIFICATION USING CRISPR/CAS9

The unicellular green algae *Chlamydomonas reinhardtii* is considered a model organism for many cellular processes, including photosynthesis and cell cycle regulation. The genome of this species has been widely studied and gene modification for the improvement of biotechnological applications is emerging. One relatively new gene modification tool is the system of clustered regularly interspaced short palindromic repeats (CRISPR) and the CRISPR associated protein 9 (Cas9). CRISPR/Cas9 has been become popular due to improved specificity, simplicity, and versatility compared to other gene modification systems. The Cas9 protein is a RNA-guided DNA nuclease isolated from *Streptococcus pyogenes*, which acts in an adaptive immune response to silence viral nucleic acids. A few studies have shown successful use of the CRISPR/Cas9 system for targeted gene editing in *C. reinhardtii*. These studies looked at removing portions of the *C. reinhardtii* genome that serve specific functions, such as chlorophyll and protein production. Specifically, the Cas9 protein and a gene specific single guide RNA (sgRNA) are co-transformed along with bacterial plasmid into *C. reinhardtii* using electroporation. The bacterial plasmid contains a gene conferring antibiotic resistance, which is used to select the transformed cells. For example, successful gene targeting using CRISPR/Cas9 for the knock-out of the *ChlM* (chlorophyll biosynthesis) gene resulted in colonies that were yellow, instead of green, in color.

Soedarmo, Auzan

A SIMPLIFIED MODEL FOR STEADY-STATE PSEUDO-SLUG FLOW

Pseudo-slug flow is widely encountered in petroleum production systems, such as in upward inclined pipelines and deviated wells with liquid loading issues. This study presents a simple model to predict the design parameters of pressure gradient and liquid holdup, which is currently unavailable.

The modeling approach relies on the fact that pseudo-slug structure involves a continuous gas passage despite of apparent intermittency as a whole. Consequently, pseudo-slug flow is treated as a segregated flow with very large waves rather than a conventional slug unit cell. A new approach combining drift-flux and two-fluid models is proposed in this study. This method eliminates the need to arbitrarily prescribe the interfacial friction factor correlations for pseudo-slug, which would conceivably differ from those of stratified/ wavy/ roll-waves flow reported in literature. A new closure relationship is needed for pseudo-slug flow drift-flux coefficients, which are easily derivable from experimental data in literature. The proposed model does not produce multiple solutions and requires minimum iterative procedure. Pseudo-slug flow experimental data are collected from literature for benchmarking purpose. The accuracy of pressure gradient and holdup predictions of the proposed model is better than two state-of-the-art multiphase flow simulators, which treat pseudo-slug as slug flow. The values of interfacial friction factor naturally emerge in the calculation instead of being arbitrarily prescribed by a closure relationship. These calculated values exhibit sensible physical relations with pseudo-slug characteristics observed experimentally. The closure relationships for drift-flux coefficients remain to be improved in the future as more pseudo-slug experimental data become available.
Spjut, Ellica
THINKING OUTSIDE THE BOX: DEATH IN A HETEROGENEOUS SOCIETY

The United States of America is often treated as an exceptional case of social behavior, primarily as a melting pot of cultures and practices. However, American death and burial are surprisingly uniform given the supposed degree of cultural heterogeneity. Modern Americans reflect their views of death in their mortuary practices; shifts in these practices reflect changes in the cultural understanding of death. From an archaeological perspective, much of what is done in modern American burial is traceable because we leave behind records of our actions and intentions. Separated from this record, however, these actions are obscured. In this research, I take a more modern ethnographic approach in understanding contemporary American mortuary practices by establishing historical context and then considering how future archaeology is helped and hindered by current practices.

Starkweather, Ryan
CRASHING THE COMMUNIST PARTY: XI JINPING'S EFFECTS ON THE INSTITUTIONALIZATION OF AUTHORITY IN CHINA

Xi Jinping has broken the norms established by past leadership to institutionalize and decentralize power and authority in China. By comparing the history of Chinese leadership to Xi Jinping’s tenure in office, this research aims to outline how Xi is returning to centralized individual leadership. This study begins with Chairman Mao as an example of authority based on an individual rather than a position, then examines the success of Deng Xiaoping to normalize both authority and succession, and ends with the contrast between Hu Jintao’s ten years in office and the first six years of Xi Jinping’s leadership. In addition, this study will explore the potential motivations towards Xi’s reversal of the trend towards institutionalized power through analyzing current policies related to information, urbanization, and questions of the legitimacy of government.

Stiehler, Andrew
MICROFINANCING: DOES IT HELP THE IMPOVERISHED AND LEAD TO INNOVATION?

The modern term of microfinancing or microloans can be traced back to the 1970s when Muhammed Yunus began by providing small loans to impoverished people. Since the modern-day movements of microloans, the industry has grown rapidly. The 2000’s has seen the industry explode to providing these loans all over the world from highly impoverished nations, small businesses, and individuals that might not be able to get a loan from typical banks. Microloans were mostly funded by non-profit organizations who provided these loans and did not charge much if any interest rates on the loans. The non-profit organizations either took collateral or charged low-interest rates on the loans.

In the 2000’s more for-profit organizations began to be intrigued by the microfinancing industry. Microloans offered these institutions the ability to offer small loans with high-interest rates as the majority of the individuals had no other way of receiving a loan. These new types of loans can be seen as targeting the individuals for a profit goal only instead of bettering the individual and helping lead to innovation.

I will be researching the recent changes in the microfinance industry and seeing if these loans are actually helping those that they are supposed to. In addition to this, I will be speaking on the success rate, payback percentage, motives of lenders, and if the industry should be more regulated to protect the individuals.

Su, Jacob; Rogers, David; Espinosa, Tomas; and Lamar, Angus
CHLORINATION OF HETEROARENES UNDER NON-ACIDIC, VISIBLE-LIGHT PHOTOREDOX CATALYTIC CONDITIONS

Chlorination of arenes and heteroarenes is a synthetically valuable transformation for the production of end-targets and intermediates in pharmaceuticals, agrochemicals, and advanced materials. Our research group has recently discovered a mild, atom-economical method for chlorinating substrates that traditionally require harsh reaction conditions using a visible-light-promoted photocatalytic approach. It involves the use of organic dyes to generate a nitrogen radical increasing the
electrophilicity of the adjacent chlorine. In the present study, the reactivity of a variety of deactivated arenes as well as heteroarenes have been investigated, and our progress towards the scope of reaction will be presented.

Subhan Neyaz, Leena and Fakhr, Mohamed
COMPLETE GENOME SEQUENCES OF TWO PLASMID-BEARING STAPHYLOCOCCUS AUREUS STRAINS ISOLATED FROM RETAIL LIVER

Staphylococcus aureus is considered a major concern in the meat industry due to their ability to grow and produce enterotoxins, the causative agent of Staphylococcal food poisoning, despite the intervention technologies applied for ensuring the microbiological safety of meat. Recent studies proposed that the survival of foodborne pathogens in the production chain is likely due to acquiring certain genes enabling them to survive, which carried by the main chromosome or plasmids. There is currently no clear understanding of how the presence of plasmids is linked to S. aureus ability to adapt, survive and grow in meat processing conditions. Such information can have a crucial impact in many applications in food safety. The aim of this study was to use Next Generation Sequencing to sequence the whole genomes of two plasmid-bearing S. aureus isolates previously isolated from retail beef and chicken liver in our laboratory. Investigating a link between the presence of plasmids in these two isolates and the ability of S. aureus to survive in meat production environment was also aimed at. Next Generation Sequencing was performed in a MiSeq platform using the Illumina V2 reagent kit 2 x 250 cycles (Illumina Inc, San Diego California) with a coverage of >100 X. Library was constructed using the Nextera XT sample preparation kit (Illumina Inc, San Diego, CA). The sequence analysis and assembly was carried out using CLC Genomics Workbench 7.5.1 and the Microbial Genome Finishing Module version 1.4 (Qiagen Inc., Valencia). Genome sequencing of S. aureus strain B2-7A isolated from retail beef liver revealed the presence of a chromosome of 2,780,420 bp, a mega plasmid of 66,547 bp, and a small plasmid of 2,650 bp. Genome sequencing of S. aureus strain B2-15A isolated from retail chicken liver revealed the presence of a chromosome of 2,798,906 bp, a large plasmid of 16,511bp, and a small plasmid of 1,435 bp. The whole genome DNA sequencing for 2 S. aureus isolates from beef and chicken liver revealed the presence of numerous stress adaptation, defense, antimicrobial resistance, heavy metal resistance, and virulence genes carried on the main chromosome and their plasmids as well. This data can shed some light in explaining the survival of S. aureus in retail meat and highlight the threat fit pauses on people consuming these contaminated meats.

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 GPAs than that of other college students (Lowry, 2010). This research took place in the spring of 2018 at the University of Tulsa campus, consisting of 150 participants. It was hypothesized that students who get 8 or more hours of sleep each night will have higher GPA scores than those who do not get 8 or more hours of sleep each night. It was expected that the more sleep a student gets, the better he or she would perform academically. Students completed a survey consisting of information asking them about how much sleep they received each night during the school week (Monday through Friday).

Sutterfield, Bethany; Shinnerer, Camden; Ludewick, Gwendolyn; and LeBlanc, Gabriel
THE EFFECT OF DIFFERENT CONCENTRATIONS OF METAL IONS ON THE DEGRADATION OF DOPAMINE IN RELATION TO PARKINSON’S DISEASE

Current research suggests that an increase or decrease of metal ions in the brain can lead to an increased degradation rate of dopamine, also called neuromelanin, which can lead to Parkinson’s disease. It is not currently known however what the direct effects are of both an increase and decrease of metal ions and how far from homeostasis they have to be to cause dopamine degradation to increase. The three most common metal ions in the brain are copper, zinc, and iron. The concentrations of these three metals could affect dopamine degradation in different ways and has not been thoroughly studied from what I have researched. My research is based around what direct and measurable effects on dopamine are caused by different concentrations of these metal ions and whether or not the three metal ions themselves can have different effects. The current testing of dopamine degradation involves live test subjects and can be expensive and is not guaranteed to be effective. The method in which I study the degradation of dopamine is through electrochemistry. By placing a synthetic
dopamine film on an electrode I can run current through the electrode and measure its output using a computer. I can use this to compare effects of different metals at different concentrations to each other and to a blank electrode by soaking the electrodes in said concentrations. This setup should make my study easier and less time consuming, not to mention cheaper.

Taylor, Samuel
PREDICTIVE LEARNING FOR SIMULATED UAVS IN A DYNAMIC AND ADVERSARIAL ENVIRONMENT

Adversarial environments impose difficult problems on Unmanned Aerial Vehicle (UAV) navigation. Avoiding moving threats becomes a priority when the UAV is attempting to arrive at a particular destination unscathed. Proper evasion of these dynamic threats requires anticipating their future positions. However, different threats can exhibit different behaviors: some may pursue the UAV directly, while other may try to intercept. There is a wide range of possible strategies that different threats can take to thwart the UAV. Since the future position of a threat is dependent on what actions it takes in response to its beliefs, understanding the mechanics of how a threat responds to different stimuli is imperative for effective prediction to take place. One can model the potential reactions of the threat through a reward function, a mathematical function that yields greater reward for taking certain actions under different conditions. To predict the threat’s potential actions, a dataset is built by running inverse reinforcement learning (IRL) algorithms in test scenarios. The IRL algorithms reverse-engineer the reward functions from behavioral types by analyzing the data and fitting appropriate functions. The UAV uses the learned reward functions in actual environments by checking which reward function best matches the behavior of an observed threat. The reward function informs the UAV of likely future actions. The above ideas are implemented and applied in a simulation against different behavior types, with presented results. Ultimately, this process is a planned component of an in-progress system for adaptive and robust UAV planning, coordination, and navigation.

Thomas, Christopher
DISCLOSURE IN THE WORKPLACE

Employees face many decisions in their daily work-lives. Among these decisions is the option to reveal details about one’s personal life, a process referred to as self or direct disclosure (Cozby PC. Self-disclosure: a literature review, 1973; Clair et al., 2005). However, this decision comes with potential negative consequences, such as coworker disengagement/avoidance and lowered promotional mobility (Schrader, Malzer, and Bruyere, 2013). In the existing body of research, scientists generally identify specific demographics when studying the implications of personal-disclosure in the workplace. Despite the narrow scope of individual studies, research has shown that these various demographics share many predictors and outcomes. Whether it was sexuality, mental health, or physical disability, demographics who choose to disclose personal, possibly stigmatized, attributes report lower turnover intentions (Griffeth, Hom, and Gaertner, 2000; Chrobot-Mason et al., 2001). While there are marked differences between the content of disclosure, I hope to present an encompassing comparison of all disclosure types, highlighting both similarities and differences. This review of existing research will ideally reveal methods for organizations to improve relations and encourage conversations with many underheard demographics.

Thomas, Dana and Sheaff, Robert
DIFFERENTIAL OXYGEN USAGE IN CELLS LACKING THE TUMOR SUPPRESSOR P27KIP1

The p27kip1 tumor suppressor is commonly disrupted at the protein level in aggressive cancers, which is thought to result in inappropriate cell cycle progression. Recently, however, our lab discovered a novel role for p27 as part of a metabolic switch controlling carbon usage. Cancer cells typically operate under the Warburg effect (aerobic glycolysis), which directs carbon to biomass while still providing enough ATP. Surprisingly, cells lacking p27 switched to amino acid metabolism under low glucose conditions, which could provide a growth advantage during early tumor development. Since amino acids are metabolized via the TCA cycle and electron transport chain, these results imply p27-/- cells will be dependent on oxygen. To test this idea, ATP production in cells with and without p27 was analyzed in the presence and absence of oxygen. Glucose oxidase was used to deplete oxygen in the media, because during the oxidation of glucose it reduces molecular oxygen to hydrogen peroxide. Catalase was included to scavenge the peroxide molecules. Data indicate that p27-/- cells are preferentially dependent on oxygen after the switch to amino acid metabolism. These observations may prove useful in developing therapeutic intervention strategies to specifically target aggressive cancers with deregulated p27.
Tochtrop, Emily and Macdonald, Danielle
THE JOY OF COOKING WITH STONE TOOLS: USE-WEAR ANALYSIS OF MULTI-FUNCTIONAL TOOLS

To understand prehistoric people, we need to understand their material culture. The analysis of stone tools allows us to gain insight into how people made and used their tools, through which we can infer past people’s behaviors and activities. Use-wear analysis, or microwear analysis, is the study of microscopic wear patterns on the surface of stone tools. These microscopic wear patterns can be used to infer the tool’s original function. Although individual prehistoric tools may have been used for a variety of functions, many modern experiments focus on a single task, using a lithic on one contact material. To address the issue of identifying multifunctional tools in the archaeological record, I explore use-traces resulting from multiple food processing activities through a series of experiments. Specifically, a hypothetical pre-contact Oklahoman ‘kitchen’ is recreated; Texas chert lithic tools are used to prepare bison, fresh-water fish, squash, and onion; foods all found in the local environment. These experiments are conducted in sequence, with each tool used on several types of food. Using the same stone tool for food preparation, as one might move between cutting meat and vegetables while making dinner, creates tools with multiple wear types. I describe these multifunctional use-traces through traditional optical microscopy (stereo and reflected light microscopy) to identify visible traces of multifunctionality. Understanding and identifying wear traces resulting from multifunctional tools will contribute to our understanding of prehistoric tasks and how people interacted with their material culture in daily life. Furthermore, these experiments can help our understanding of social organization and labor divisions among ancient societies. These goals will be accomplished by linking women to stone tool production and use in the completion of food processing activities.

Trabucco, Eva
SIMILARITIES AND DIFFERENCES BETWEEN COACHES AND CAPTAINS IN AN ATHLETIC TEAMS

The purpose of this project is to better comprehend the role of leadership from coaches and captains in collegiate athletics. Leadership does not need to be restricted to the coach; players within the team can also fulfill important leadership functions (Fransen et al. 2014). Research has examined the roles and effects of leadership within a team environment and determined the importance of its presence among athletes. Athlete leadership is important for both individual and team outcomes (Krozier et al. 2017) which is displayed in the role of captain. Coaches also serve as team leaders but with different methods and leadership styles. While captains and coaches work towards the same goal of rallying and motivating their team to reach their desired success, they utilize distinctive approaches to achieve this. Coaches may use autocratic behaviors and a management style to direct their team and with the expectation that all teammates will follow those decisions (Lee et al. 2017). Captains typically take on a formal role of being either a task leader, a motivational leader, social leader, or external leader (Fransen et al. 2014). Through these methods, captains take a transformational approach in rallying their teammates with motivation. Coaches and captains utilize different skill sets and styles help their team reach one common goal. The focus of this presentation is to compare and contrast these leadership styles using anecdotal examples.

Trewitt, Jordan
TIME DELAY TAGS FOR COMMERCIAL GROUND PENETRATING RADARS

UHF ultra-wideband (UWB) tags with varying delay line are presented for potential underground usage with ground penetrating radars (GPR). Tags are constructed with UWB circular planar antennas with low cut off frequencies below 800 MHz. These delay line tags come in three different forms: simple linear polarization, cross polarization tags to decrease clutter and polarization independent tags to decrease user error. Additional methods to deploy these systems on underground pipes are discussed along with simulated and actual A-scans and B-scans from a vector network analyzer (VNA).
Vargas, Preston
ECONOMICAL SYNTHESIS OF INORGANIC LEAD HALIDE PEROVSKITES FOR OPTOELECTRONIC APPLICATIONS

Lead-halide perovskite materials have become hot topics in the research community as of late because of their high efficiency, stability, and tunable band gaps, which are useful properties for the conversion process within solar cells. One of the primary issues obstructing the adoption of this material within industry is the prohibitively high manufacture cost. We have developed a significantly less costly synthesis process for these quantum dots that takes advantage of the saponification reaction to leave the entire process viable in an ambient atmosphere. Thereafter, the resulting quantum dots have been characterized to have temperature variable morphologies and an excitation-variant band gap while retaining normal photoluminescent behavior in addition to the material’s signature atmospheric stability. These results move the perovskite nanomaterial one step closer to the eventual goal of creating a viable process for manufacturers to adopt.

Vissers, Hannah and Rosales, Daniela
EXPERIENCES OF UNDOCUMENTED LATINX IMMIGRANTS AND ADULT CHILDREN OF UNDOCUMENTED LATINX IMMIGRANTS

Latinx immigrants are often the targets of anti-immigration rhetoric and legislation in the US. However, while their economic impact is often debated in legislative committees, their actual experiences and stories go unheard. The goal of this research project was to gain a better understanding of the experiences of Latinx immigrants. We conducted and transcribed ten in-depth interviews, 45-90 minutes each, with eleven Mexican and Venezuelan immigrants living in Tulsa. Their documentation statuses varied from undocumented, DACAmented, permanent residents, and naturalized citizens. All interviewees’ names and other sensitive information were replaced with pseudonyms in the transcripts for the participants’ protection. Interview questions focused on the reasons for migration, the journey to the US, experiences living in the US, and thoughts and experiences related to the current political climate. After analyzing the transcripts, we identified four main themes. The first is “the importance of connections”. We found that connections, both social and practical, were integral parts of the immigrants’ journey to and subsequent life in the United States. The second theme, “the political is personal”, addresses the very direct and deeply personal impact that political events and legislative decisions have on Latinx immigrants’ daily lives. The third theme is “fear and uncertainty: normalized and omnipresent”. This theme explores the deeply-rooted fear that surrounds even the most mundane parts of everyday life for undocumented immigrants and their families. The fourth and final theme is “a model non-citizen,” in which we dissect the duality of being a good person while technically violating the law.

Waldman, Laura
MECHANICAL BEHAVIOR OF ELECTROMAGNETICALLY DETECTABLE POLYETHYLENE

Modern utilities pipes are often made from polyethylene or other thermoplastics due to resistance to corrosion and ease of installation. However, thermoplastic pipes and tubing are difficult to detect once buried and, as a result, are often damaged during excavation or construction. Location of these utilities is frequently performed using ultrasonic methods, which are expensive and can be difficult to use. Recently, there have been several proposals for rendering polyethylene detectable with electromagnetic techniques. One such approach is to impregnate the thermoplastic pipe with magnetic materials, which would allow for the detection of the buried pipe with simpler equipment, such as a metal detector. In this work, polyethylene has been doped with magnetic nanoparticles in order to give the plastic an inherent magnetic response. Two methods are investigated: a direct mix approach and a microencapsulation approach. These approaches alter the electromagnetic signature of the material, but can also have a negative impact on the mechanical behavior of the polyethylene. The impact of the added materials on the elastic properties and fracture of polyethylene is analyzed.
Wang, Guan
POST-FIRE SPATIAL DISTRIBUTION AND SOURCES OF SOIL CARBON AT A GRASSLAND-SHRUBLAND TRANSITION ZONE IN THE SOUTHWESTERN US

Nearly 70% of the world’s drylands, including large areas of the southwestern US, are experiencing rapid and extensive land degradation, concomitant with the woody shrub encroachment into grasslands, due to loss of vegetation cover, accelerated soil erosion, and the consequent loss of soil resources. Fires are known to decrease vegetation cover and increase soil erodibility, and the shifts in wildfire regimes are currently occurring in many drylands. Several studies have suggested that periodic fire favors the homogenization of soil resources and can provide some form of reversibility for the shrub-grass transition, making prescribed burning a potential tool for reducing the abundance of the undesirable shrubs and slowing the shrub encroachment process. However, the enhanced wind erosion and soil structure changes following fires may result in increased dust emission, promoted soil water repellency, reduced soil moisture retention capacity, loss of soil organic matter, and changes in C pool in the ecosystem. Soil carbon (C) is of crucial importance to maintain soil quality and productivity in order to stabilize the ecosystem services. The shrub invasion adds complexity on soil C pool variations in grassland-shrubland transition areas than areas dominated by a single physiognomy, and the relative distribution of each vegetation type to the soil C pool and its variability after wildfires are not well-understood. In this study, we used manipulative field experiments to investigate the influence of fire on the dynamics of spatial distribution and source partitioning of the soil C pool in different types of microsites. Replicated burned and control experimental plots were set up in a desert grassland in the northern Chihuahuan Desert in March 2016. Stable carbon isotopes of soil and plants, combining with their C contents, were used to investigate the spatial variability of the soil C pool, partition the contributions of soil C from grasses and shrubs, and assess the variation of the soil spatial C in ecosystems undergoing woody plant encroachment. Soil δ¹³C in the burned area have changed notably compared to the control area, especially in the shrub microsite. Soil δ¹³C increased from -18.8 to -17.0 after a windy season in soils under shrub canopies, and reached -15.3 in Mar. 2017, one year after the prescribed fire. In contrast, in control area, it decreased from -15.6 to -17.6 after a windy season, and then maintained consistently in the next nine months. Soil δ¹³C can reflect the relative contribution of soil organic matter from shrubs (C₃ plants) and grasses (C₄ plants). The kriging maps exhibited that the spatial distribution of soil δ¹³C homogenized during the experiment period at the burned site. The purpose of this study was to explore whether the spatial pattern changes of vegetation after the fire have corresponding effects on the localized distribution of soil δ¹³C and soil C partitioning. Our results indicate that the fire-induced shrub mortality and increased wind erosion improved the homogeneity of the soil C spatial redistribution, leading to a higher grass, than shrub, contributions in this ecosystems. The results suggest that fire can change the organic carbon interactions between soil and plants, which may further affect the shrub encroachment process as well as the dynamics of grassland-shrubland ecosystems.

Wessinger, JD
INTERCULTURAL EXCHANGE THROUGH FOOD

As the US, and Tulsa especially, become more globally connected, intercultural xenophobia and biases have had more opportunities to reveal themselves. The ability to combat in-group and out-group discrimination is personal experience with individuals of alternate groups. However, it is rare that biased individuals will find a neutral space in which to engage with others of the discriminated out-group. This research seeks to present a case that a common dinner table is an optimal location in which to connect disparate individuals in a way which does not necessarily place undue stress on either party.

Wijayasekara, Dulanjani
CHARACTERIZATION OF MAIZE DWARF MOSAIC VIRUS FROM JOHNSONGRASS IN OKLAHOMA

Maize dwarf mosaic virus (MDMV) is known to cause severe infection in susceptible maize (Zea maize) and sorghum (Sorghum bicolor) cultivars. Ability of MDMV to overwinter in Johnson grass provides an excellent inoculum source for infectivity of maize and sorghum. MDMV was first reported in Johnson grass in Oklahoma in 2017. Coat protein (CP) gene of MDMV Oklahoma isolates was used in a phylogenetic study to understand the evolutionary relationship to other MDMV isolates reported in other countries. Thirty five symptomatic Johnson grass samples were collected from 4 counties in Oklahoma (Muskogee, Payne, Osage and Tulsa) Coat protein gene of MDMV genome was amplified using specific primers. PCR products were cloned and sequenced to obtain 56 total CP sequences. Fifty two NCBI reported MDMV CP sequences
were used to build a phylogenetic using MEGA6 software. Multiple sequence alignment revealed a 39 base pair insertion in the N terminal region of the CP gene in all OK isolates along with five European isolates. This mutation has resulted in 13 additional amino acid residues in the CP gene. MDMV OK isolates are more evolutionary closely related to five European isolates that harbor similar 39 base pair insertion in the N terminal region of the CP gene. Our results indicate a persistent mutation in the CP gene of MDMV isolated in Johnson grass. It is important to understand the effects of this mutation in maize and sorghum as Johnson grass is known to be a wild relative of maize and sorghum.

Williams, Henry; Williams, Haley; and Loe, Elizabeth
SOLAR PANEL CELL PHONE CHARGERS

Red Cross volunteers travel to disaster sites to provide relief, and often disaster shelters do not have enough electrical outlets to meet their needs. In case of disasters such as Hurricane Harvey, many people may be relocated to temporary relief shelters. Solar-powered chargers would provide an additional electricity source to charge cell phones which are crucial to communication in these situations. The Solar Panel Cell Phone Charger Project for the Red Cross will allow the Red Cross to efficiently charge cellular devices in disaster relief areas around the globe. Approximately 2-4 solar chargers will be built, with each charging up to four phones. Each overall device will fold open to expose a 12V photovoltaic cell which can be charged in sunlight. The charge will be stored in a battery which will eventually charge the cell phones via USB ports. Each device will be lightweight, durable, and portable. Red Cross volunteers and natural disaster victims would immediately benefit from the chargers. Eventually we would like to improve our design and make more portable chargers for more widespread use among victims of natural disasters.

Williams, Braeden
DESIGNING COMPLEX COMPLIANT UNDERACTUATED ROBOTIC HAND MECHANISMS IN CONFINED SPACE

My TURC research was in the field of underactuated, anthropomorphic robotic hands. In the design of robotic hands, there are very apparent space restrictions regarding the placement of actuators, wires, rigid bodies, and compliant mechanisms. During my research, I explored two major design aspects of the Biological Robotics At Tulsa (BRAT) Research Group's current robotic hand, the TU Hand: design manufacturing processes and actuation of the thumb joint. The TU Hand uses tendon-like, coupled actuations to move the fingers together and allow for compliance. These coupled interactions allow for fewer actuators while the compliance allows the grip to conform to the object, and also allows for smooth motion between all fingers without conflict. To obtain this compliance with mechanical design of Nathanael J. Rake, different manufacturing processes had been discussed before my arrival. A resin mold process was used, but with varying success and low yield rates. During my research, I experimented with the manufacturing process and the materials of construction. These changes focused on new strategies because of the small scale production and small size. Yield rates were increased greatly in the parts that required higher precision. My second area of research involved the design of a two-position, underactuated thumb to allow for a larger taxonomy of grasps. This design utilized low power machinery and existing actuation. The design is still in being researched for many reasons, one being the discontinued manufacturing of certain electronic components.

Wirth, Denise; LeBlanc, Gabriel; Whitehead, Heather; Yungbluth, Jack; Ludewick, Gwendolyn; Barge, Laurie; and Cameron, Ryan
ELECTROCHEMICAL DEPOSITION OF IRON SULFIDES AND IRON HYDROXIDES: MIMICKING HYDROTHERMAL VENT SYSTEMS RELEVANT TO ORIGIN OF LIFE STUDIES

It has been hypothesized that geological structures on the ocean floor, called hydrothermal vent chimneys, may have been the location for the emergence of life on Earth and could potentially be the setting for the formation of life on other wet and rocky worlds. These chimneys are composed of a semipermeable mineral, typically iron sulfides and iron hydroxides, and were formed on the early Earth when basic hydrothermal fluid from inside the Earth’s crust met with the acidic ocean. The mineral structure is hollow in the center, similar to a chimney, separating contrasting internal and external solutions. This creates chemical and electrochemical gradients, providing the energy necessary to fuel the formation of simple organic
compounds needed for metabolism and the emergence of life. In the laboratory, these minerals are formed through dissolution or injection experiments. However, to better characterize these minerals, we present new methods for interfacing these systems with electrodes in order to evaluate their electrochemical properties. We utilize the splitting of water during chronoamperometry or cyclic voltammetry experiments to create local acidic and basic environments, forming the mineral directly on the surface of an electrode. Due to the robust connection between mineral and electrode, the mineral-modified electrodes can subsequently be analyzed using a variety of ex-situ techniques. Taken together, our results indicate that minerals relevant to origin of life research can be formed directly onto electrode surfaces for further electrochemical analysis, enabling more in-depth research into the role of these mineral structures in the emergence of life.

Wiseley, Carlie
INFORMATION LITERACY FOR TEENS IN A MID-SIZED PUBLIC LIBRARY

This study uses a mid-sized, Midwestern public library system, in an urban location, and with multiple branches, as a case study to examine the information literacy education that teens can receive from a public library. Previous research shows that teachers and librarians perceive relatively low levels of information literacy skills among teens, due to lack of time for teaching in schools as well as curricular restraints. Through a series of interviews conducted with librarians in this public library system, this study examines the specific definitions and teaching strategies being utilized by the library system. The interviews found that many, but not all librarians in this system have similar definitions of information literacy, as well as similar understandings of their own role and similar teaching strategies. The study found that teen customers of this library system will not always receive an equal information literacy education due to differences in resources and experience levels of personnel at each library branch. This study gives an understanding of some of the strengths and weaknesses of the teen services offered at this library system and contributes to a growing body of work on the responsibilities of public libraries in the education of teens.

Wolf, Rachel
WEAPONIZING CULTURE: HOW THE CULTURE BEHIND RUSSIAN HYBRID WARFARE SOWS AND PREDICTS FOREIGN REGIME INSTABILITY

Stability is critical to national security. When a region is unstable, it is easier for insurgencies to establish themselves, further straining the culture and increasing conflict. Russian hybrid warfare relies on sowing instability among nations, especially the US and NATO allies. To cause instability, Russia uses a combination of tactics including conventional and unconventional warfare, disinformation, and intelligence operations (Barnett, 2016; Center for Strategic and International Studies, 2015; Council, 2017; Renz & Smith, 2016). The “Ukraine Scenario” is a prime tactical case study. It refers to the current insurgency in Eastern Ukraine, specifically Russia’s illegal annexation of Crimea, and the methods used to exploit the weaknesses that made it easier to achieve their goal (Center for Strategic and International Studies, 2015; Renz & Smith, 2016). Barnett (2016) and Atlantic Councils (2017) argue that the main tactics used by the Kremlin to gain influence abroad is through political, economic, and social means. However, the recent reports to Congress focus more on economics and security and less on the role of culture (U.S. Government Publishing Office, 2018). By anthropologically comparing case studies, specifically former USSR republics, I will examine and analyze the cultural understanding informing Russian hybrid warfare and then apply those findings to countering attacks against the US and its allies. Previous analysis either briefly mentions the importance of culture or ignores it entirely (U.S. Government Publishing Office, 2018). However, few have recognized, and fewer still have explored, as this project aims to do, how hybrid warfare relies on cultural understanding.

Woolman, Chris
HYDROSENSE

Measuring water usage in areas affected by drought or with low access to fresh water is a vital task. Water is often overused by people who may not even realize their usage. Being able to monitor the water they waste on things such as showers would encourage many people to change their habits to use less water. The HydroSense project is an EPA funded project to develop a small water meter that can be connected in-line with a pipe to something like a shower head or faucet and report the amount of water used by the device wirelessly to be accessed by anyone from a computer or other web device.
Our design for this project uses a small hydroelectric generator that powers a board to measure the water flow over a period of time and then report that data back to a database. This presentation will present methods to lower the power consumption of the embedded system so that it can be powered almost indefinitely from a small battery and to control power flowing out of the battery to further increase the time between recharges.

Wright, Amber
PREDICTORS OF SOCIAL LOAFING IN TEAMS

Teams are universally used in work and learning environments. The success and satisfaction of a team can be determined by many individual and contextual factors that contribute to a team’s effectiveness. This study explores one important factor that often has deleterious effects on teams: social loafing (Latane, Williams, & Harkins, 1979). 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). Researchers often try to discover predictors of social loafing to anticipate whom and in what circumstances individuals are more likely to social loaf. These predictors for social loafing can be divided into individual input factors and team processes that occur during team functioning. The purpose of this study was to look at two individual input factors, intrinsic motivation and procrastination, and one team process, communication, as predictors for social loafing in a team. Data was collected in the form of self-report surveys from students working on group projects assigned in their courses. Data was then aggregated to the team level before it was analyzed with multiple regressions. Results indicate that individual difference factors, intrinsic motivation and procrastination, affect social loafing in the team. Implications of this research indicate that social loafing in a team can be predicted from the personality and motivation of the individual members within a team.

Yoder, Colleen
REACHING AND SERVING UNDERSERVED POPULATIONS IN TULSA, OKLAHOMA

Through five in-depth interviews, personal narratives were gathered in an attempt to better understand the issues individuals face when their job is to reach and serve underserved populations in Tulsa, Oklahoma. This method of research allowed me to obtain my interviewees’ work experiences from their perspective. The use of in-depth interviewing allowed me to capture each individual’s thoughts and feelings accurately. The interviews were transcribed and analyzed for themes. After combing through the transcripts four themes were found that were present throughout all of the interviews. These findings include a) identity as a helper, b) anti-immigrant rhetoric, c) job frustration, and d) language barrier. The importance of this research is that it asks a question that few others ask. Many research projects attempt to ascertain the barriers between underserved populations and resources, but few flip that question. It is important to recognize the frustrations and barriers that individuals face in reaching and serving underserved populations. In Tulsa, Oklahoma, this is a particularly important question, as there are a multitude of underserved populations that seem to continuously suffer.
SUBMITTED POSTER ABSTRACTS

Bailey, Ashley; Clausen, Ashley; Micol Rachel; and Davis, Joanne
THE EFFECT OF THREAT OF VIOLENCE ON THE TIME TO REPORT A SEXUAL ASSAULT

Affiliations: ¹University of Tulsa, Department of Psychology, ²University of Tulsa Institute of Trauma, Adversity and Injustice, ³Laureate Institute for Brain Research

Objective: An increased amount of time between a sexual assault and filing a police report is thought to negatively influence the perceived credibility of the rape survivor. However, little is known about factors that may influence the time to report a sexual assault. This exploratory analysis examined if threat of violence (towards the victim or the victim’s family) significantly impacts the time a survivor takes to report an assault.

Method: Participants included 631 female rape survivors ages 18-82 (M=29.6, SD=10.7) who completed a Sexual Assault Nurse Examiner exam. Age, time to report the assault, and threat of violence were assessed via self-report within the exam. Age was explored as a possible covariate. Independent samples t-tests were used to investigate potential differences in time to report a sexual assault between those who did and those who did not experience a threat of violence.

RESULTS: Age was not related to time to report (r=0.07, p=0.064) and not included as a covariate. Results suggest that time to report was not different between females who did (M=20.6 hours, SD=27.6) and did not (M=23.1, SD=27.4) experience a threat of violence (t(629)=1.145, p=0.252).

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

Key words: sexual assault, time to report, trauma, violence

Breese, Eric; AlZoubi, O.; Moseman, S.; Simmons, W.K.; Paulus, M.P.; Yeh, H.; Feinstein, J.S.; and Khalsa, S.S.
FLOATATION REST: A NON-PHARMACOLOGICAL APPROACH TO REDUCING PHYSIOLOGICAL AND PSYCHOLOGICAL STRESS IN ANOREXIA NERVOSA

Background: Floatation-REST (Reduced Environmental Stimulation Therapy) is a novel, body-based intervention for reducing physiological and psychological stress. No studies have examined the effects of Floatation-REST in individuals with anorexia nervosa (AN), a psychiatric disorder characterized by heightened anxiety, distorted body image, and disrupted interoception.

Methods: Participants completed a total of four floatation sessions. Following each float, participants completed self-report questionnaires and an open ended debriefing interview. Heart rate and heart rate variability (HRV) were recorded during each float, to evaluate the influence of floating on sympathetic and parasympathetic nervous system input to the heart.

Results: Twenty-one weight-restored outpatients with AN completed the study. Participants reported significant and large reductions in anxiety across each float session (p < 0.001, estimated Cohen’s D > 1). They also reported heightened interoceptive awareness for cardiorespiratory (p<0.01, Cohen’s d 0.2-0.5) but not gastrointestinal sensations, and reduced body dissatisfaction ratings on the Photographic Figure Rating Scale (p<0.001, Cohen’s d>0.5) following floating. Qualitative analysis of post-float interviews indicates that 100% of participants described their final float experience as relaxing, and 76% were interested in floating again. The forthcoming HRV analysis will examine influence of floatation-REST on cardiovagal activity.

Conclusions: Floatation-REST was well tolerated by the AN participants in this study, and there was no evidence of orthostatic hypotension (primary outcome). Subjective feelings of reduced anxiety and increased relaxation were further reflected in the participants’ descriptions of their experience. This initial trial suggests that Floatation-REST should be investigated for potential clinical benefit in more acutely ill patients.
Cantwell, Caleb; Refai, Fares; Rogers, David; and Lamar, Angus
ORGANIC DYE, VISIBLE-LIGHT PHOTOCATALYTIC IMIDATION OF ARENES USING N-HALO REAGENTS

Direct C-H functionalization of arenes and heteroarenes with the incorporation of N-aryl bonds is a valuable transformation due to the prevalence of aromatic amines in advanced materials, pharmaceuticals, and agrochemicals. Previous systems utilize expensive transition metal catalyzed/promoted methods of arene functionalization. However, recently, a number of systems have been developed as mild, light-promoted alternatives. These alternative systems operate through a N-centered radical (NCR) approach and typically require the synthesis of NCR precursor, a transition-metal photocatalyst, and/or a radical initiator. Our research group has recently discovered a non-metal catalyzed imidation reaction that utilizes a commercially available N-halo reagent under mild conditions. Our progress toward the development of an inexpensive and practical method for incorporation of C-N bonds to arenes via an organic dye, visible-light photocatalytic approach will be presented.

Chowdhury, Shuddha and Jahan, Sharmin
ASPECTS OF DATA ANALYSIS TO EVALUATE BRAIN WAVE DATA FOR FURTHER RESEARCH USES

We present our study of publicly available brainwave dataset and make some comparison with MUSE data output. Muse is a tool which gives accurate, real-time feedback on what’s happening in user's brain when they meditate. For this research, we will use Temple University’s publicly available EEG Corpus freely available brainwave data to see if comparing this dataset with MUSE data output is sufficient enough to carry on further human study research. This dataset consists of 12,000 patients’ 16-channel EEG data and it is taken from Temple University hospital repository. We will use the MUSE on ourselves to understand how it works so that we can see how closely the data it produces matches the publicly available data. Muse is a portable and wireless 4-channel EEG headband and we will use various data analysis techniques such as predictive analytics to compare Muse data with the publicly available data to check if we can find any similar interesting patterns or not or correlation analysis to correlate various attributes and characteristics. The potential of this preliminary study is that if we can find some similar properties in both cases then we can extend our research on a broader scale which can involve further human studies toward developing an activity recommendation system. This can recommend users’ various activities to improve his mental well-being such as improving focus, calming the mind, elevating mood based on the preliminary data analysis.

Devries, Kyle; Akeman, Elisabeth; and Aupperle, Robin
RELATIONSHIP BETWEEN SOCIOECONOMIC FACTORS AND PSYCHOLOGICAL WELL-BEING AND RESILIENCY IN COLLEGE STUDENTS

Introduction:
College students are at increased risk for experiencing anxiety and mood disorders compared to the general population, impacting academic and career outcomes. The demand on university psychological services has also been increasing, indicating a need for strategies to address students’ psychological health. Preventative teaching of cognitive-behavioral and mindfulness skills has had a positive impact on college students; and identifying factors that may influence students’ ability to benefit from such training may inform optimization of such programs. Previous research shows that lower economic stability increases stress levels and likelihood to experience anxiety and depression. However, it is unclear what role socioeconomic factors play in the psychological well-being of students and their responsiveness to resiliency training.

Methods:
365 first-year undergraduates at the University of Tulsa enrolled in a longitudinal study designed to assess the impact of resiliency training on psychological well-being and academic outcomes. The resiliency training consisted of four sessions during select orientation classes. Spearman’s rho correlation analyses will be used to examine relationships between baseline parental income, financial aid type, and NIH PROMIS Depression and Anxiety measures. Additionally, the potential moderating effect of socioeconomic variables on resiliency training outcomes will be assessed, using linear mixed models to determine the impact of training group and socioeconomic factors on depression symptoms at end of first semester. As the first author on this abstract is a university student, all data has been de-identified prior having access.

Results and conclusions:
Good, Stephen and Fisher, David

**USING NORMATIVE INFORMATION TO DISCOURAGE INSUFFICIENT EFFORT RESPONDING IN SURVEY RESEARCH**

This study investigated the use of a survey warning statement with normative information to reduce the incidence of insufficient effort responding on survey items. Insufficient effort responding (IER) consists of a lack of attention or effort toward one’s responses to survey items; as a result, the responses do not reflect the individual’s true standing on those items. Based on past research on the effectiveness of warning statements added to the beginning of surveys, as well as research on social conformity, we sought to determine whether survey respondents will be more attentive and accurate in their responses after being informed via a written statement that attentive responding is the social norm.

For this study, 242 Mechanical Turk users completed a survey consisting of items from the International Personality Item Pool as well as certain IER indices such as instructed response items. Additional IER indices regarding the reliability and variability of responses were calculated using participants’ responses to the personality items. We anticipate conducting a Mixed Factorial ANOVA to assess the independent variable of warning type as well as the variable of time points throughout the survey. After analysis, we will be able to provide results and discuss the subsequent implications. Our discussion will address the apparent effectiveness of normative information and warning statements in deterring IER as well as considerations and recommendations regarding Mechanical Turk as a source of survey respondents.

Harville, Payten; Beffa, Alex; Reavis, Madison; and Purser, Gordon

**KINETICS OF THE NON-ENZYMATIC HYDROLYSIS OF AQUEOUS L-ARGININE ETHYL ESTER IN VITRO**

L-arginine ethyl ester (LAEE) is a widely used sports supplement in the bodybuilding community for its ability to increase athletic performance. LAEE may be taken instead of L-arginine due to claims that the ester form allows for better bioavailability leading to lower doses required, though these claims have not been proven. For these claims of increased absorption to be true, LAEE must not hydrolyze into L-arginine and ethanol before being absorbed, which occurs in the various conditions of the body. A study of NMR analysis to quantify the rate of hydrolysis as a function of pH value, temperature and buffer concentration was performed. The experimental rate law of the hydrolysis of LAEE and a hypothesized mechanism are reported.

Jahan, Sharmin; Marshall, Allen; and Gamble, Rose

**VISUALIZING SELF-ADAPTIVE PLAN SIMULATIONS GIVEN EMBEDDED VERIFICATION CONCERNS**

A system that dynamically self-adapts at runtime, should comply with critical requirements. However, runtime verification is difficult even when the system was originally formulated to expect adaptation and allowable changes are preconfigured or prespecified. Our approach examines verification processes originally performed for compliance with system requirements to identify specific verification concerns, such as variables, safety and liveness property conditions, and architecture properties. The expectation is that if a verification concern is impacted by an adaptation then the reuse of the original verification process may be restricted. If verification process reuse is inhibited, then there is increased likelihood that the requirements relying on that verification concern may no longer be guaranteed. In this demonstration, we illustrate our approach to take identified verification concerns for each requirement and embed them as checkpoints within the code, given the flow of the verification process from which they were derived. Simulating an adaptation plan produces log files based on which checkpoints are reached. Failure to complete a path through the checkpoints without raising a flag indicates that the verification process may not be repeatable, and the adaptation plan may be risky to perform. We visualize the paths using ProM which shows where and how an adaptation plan may be problematic.
Khattab, Raneem; Alarbi, Ahlam; and Sheaff, Robert

THE PROTEIN KINASE INHIBITOR H-89 BLOCKS A METABOLIC SWITCH IN CELLS LACKING THE TUMOR SUPPRESSOR P27KIP1

The tumor suppressor protein p27kip1 is deregulated in many aggressive human cancers. A novel role for this protein was identified in previous work from our lab, which showed that cells lacking p27 can switch to amino acids as a carbon source when glucose levels are low. The goal of this project was to investigate the mechanism of the switch using the kinase inhibitor N-[2-(bromocinnamylamino) ethyl]-5-isoquinoline sulfonamide, or H-89. This drug inhibits several protein kinases, one of which is Protein kinase A, which is known to play an important role in cellular metabolism. Cells with and without p27 were distributed in a 96 well plate and allowed to attach. They were then treated with different concentrations of H-89 for various times. Effects on ATP production were monitored using a luciferase-based assay. Effects of H-89 on nutrient usage in cells with and without p27 were determined by monitoring glucose levels in the media to measure how much glucose was consumed. H-89 appears to force cells lacking p27 to use glucose, possibly by inhibiting glutaminolysis. Consistent with this result, the p27 -/- cells were more sensitive to the glycolysis inhibitor 2 deoxy-glucose (2DG) after adding H-89. The ATP levels were also decreased, which was measured using CellTiterGlo™, a luciferase-based assay that correlates the amount of light produced to ATP levels in the cell. Taken together these results suggest that protein kinase A activity, or that of another kinase targeted by H-89, is required for the metabolic switch in p27-/- cells. These observations will contribute to ongoing efforts to develop methodologies for specifically targeting cells lacking the p27 tumor suppressor, which may prove therapeutically valuable for treating aggressive cancers.

Eric, Ko; Hopkins, Megan; Lignieres, Austin; and Lamar, Angus

INVESTIGATION OF THE ROLE OF LIGHT IN THE VISIBLE-LIGHT PHOTOCATALYZED ACTIVATION OF N-HALOSUCCINIMIDE REAGENTSERERIC

Electrophilic aromatic halogenation is a critically important transformation in the synthesis of intermediates and end-targets in a wide range of fields that depend upon the construction of relatively complex molecules. Our research group has recently developed an approach toward halogenation of arenes that utilizes visible-light photocatalysis to activate stable, inexpensive N-halosuccinimide reagents. The results from a series of control reactions and experiments designed to probe the mechanism of the new methods for halogenation with regard to the effect of light upon the reaction/photocatalyst will be presented.

Matheson, Harley

THE EFFECTS OF LOAD CARRIAGE ON DYNAMIC BALANCE

1. INTRODUCTION: Musculoskeletal injuries are a common occurrence in military warfighters. Arguably, personal protective equipment (PPE) and rucksack loads may play a role in this increase susceptibility to injury in warfighters by altering stability and movement quality during performance of job related activities. The objective of this project was to determine the influence of PPE and rucksack carriage on dynamic balance.

2. STATEMENT OF METHODS: The study was a repeated measures design. Eleven (5 males; 6 females) recreationally active participants (age, 20.18±.75 years; height, 170.87±10.23 cm; weight, 68.17±13.87 kg) were recruited. Participants performed the y-balance test under three different conditions: no equipment, PPE and PPE with 40 lbs. rucksack. Each condition was separated by a 10-minute rest period. To perform the y-balance test, participants stood on their dominant leg at the center foot plate of the test instrument and reached as far as possible with the foot of the nondominant leg in the anterior, posteromedial and posterolateral directions. The distance reached in each direction was recorded. The reach distances were normalized according to the participant’s leg length. The normalized reach distances in the three directions were averaged to calculate a composite reach distance. A one-way repeated measures ANOVA was used to compare the three different conditions.

3. SUMMARY OF RESULTS: Normalized composite reach did not significantly change across conditions.

STATEMENT OF CONCLUSIONS: Our results suggest that PPE alone or combined with 40 lbs. rucksack carriage does not significantly influence dynamic balance measured by the y-balance test.
McDonald, Julie; Curtis, Hayden; and Li, Junran
IMPACT OF CLIMATOLOGIC FACTORS ON THE AIRBORNE LEAD IN NORTHEASTERN OKLAHOMA

Picher, Oklahoma is home to the Tar Creek Superfund site, which is part of the Tri-State mining district. The mines were in production from 1850 to 1950. One hundred years of production has left numerous chat piles on the surrounding environment directly affecting the town of Picher. One such byproduct of the mining includes lead (Pb) dust that have been transported around the town settling throughout and seeped into groundwater, lakes, ponds and rivers. Due to the contamination, many children in the area have elevated Pb levels in their bodies, which have led to learning disabilities and other problems. While numerous efforts have focused on the contamination of heavy metals in surface water and groundwater systems, no studies have investigated the addition of Pb via atmospheric dust and deposition to the aquatic environment. We collected data for atmospheric dust containing Pb from 2010 to 2016 in both Tulsa, Oklahoma and Picher, Oklahoma as well as precipitation data for these two locations. During our study of atmospheric dust for Pb, we found a temporal correlation between atmospheric concentration of Pb and precipitation. This was seen in annual patterns in both locations in graphs.

Muscavitch, Zachary
INVESTIGATION INTO THE INTRAGENOMIC VARIATION OF RDNA WITHIN THE SEXUALLY REPRODUCING GREEN ALGA, CHLAMYDOMONAS REINHARDTII

The rDNA array is vitally important, and as such it is present in multiple copies within a genome. This array was long thought to be kept homogeneous (with identical sequences) via concerted evolution, however recently numerous studies report significant intragenomic variation within this array, specifically in the ITS2 region. To test the hypothesis that concerted evolution is relaxed in sexual organisms, we will mate the sexual alga, *Chlamydomonas reinhardtii* and will compare the intragenomic variation of the parents with the intragenomic variation of the progeny. For this study we will mate the five compatible sexual strains of *C. reinhardtii* and isolate each of the 4 products of meiosis yielding 24 daughter cultures. Then extract and amplify the DNA from the parents and the progeny of the crosses and generate reference sequences via Sanger sequencing. Primers will be developed to specifically bind to ITS2, and a modified qSeq protocol will be used to assess copy number of ITS2 within the genome. Finally, the intragenomic variation will be assessed using the Illumina MiSeq platform. This work will be the first of its type to analyze a sexual alga and will compliment an earlier study on an asexual alga. Results from this experiment will shed light on the inheritability of intragenomic variation and will also increase our understanding of copy number variation in this scientifically important model organism.

Northcutt, Shelby
HOW EFFECTIVE ARE NON-BIOLOGICAL COMPLEMENTARY ALTERNATIVE MEDICINE TREATMENT OPTIONS IN REDUCING AGGRESSIVE BEHAVIORS IN CHILDREN WITH AUTISM SPECTRUM DISORDER: A SYSTEMATIC REVIEW

This systematic review aims to evaluate the effectiveness of non-biologic complementary alternative medicine (CAM) interventions at reducing aggressive/maladaptive behaviors in children with autism spectrum disorder (ASD). Articles included in this review were retrieved from a variety of databases based on the inclusion criteria of participants between the ages of 3 and 16, having an ASD diagnosis, and a non-biologic CAM intervention implemented to reduce aggression. From this, a total of 6 articles were collected, where it was found that the included interventions were effective at reducing aggressive behaviors in the participants. Two of the included studies were randomized control trials, three were controlled experiments without randomization, and one of the studies was a treatment group only design. The CAM interventions aimed at reducing aggression included in this review are qigong massage (n=1), acupuncture (n=1), and yoga (n=4). Small sample size across included studies, poor study design, and lack of research present as limitations to the conclusion for using non-biological CAM to treat aggressive behaviors in children with ASD over traditional behavioral/pharmacological interventions.
Parackal, Julia; Counter, Kaitlin; and Sheaff, Robert
USING CURCUMIN TO TARGET CANCER CELLS WITH DEREGRULATED P27KIP1

P27, a well-known cell cycle inhibitor, is deregulated at the protein level in many types of aggressive cancers. Recent work in our lab revealed cells lacking p27 can switch to amino acids as a carbon source in low glucose conditions. The switch could also be activated by the glucose analog 2-deoxyglucose (2DG). Because amino acids are metabolized via the TCA cycle, combining 2DG with the electron chain inhibitor rotenone synergistically and specifically targeted p27-/- cells. These results suggest 2DG combination therapy might be an effective therapeutic for targeting aggressive cancers with deregulated p27. Rotenone is toxic, however, so other compounds were screened for synergy with 2DG. Cells with and without p27 were treated with the compounds and 2DG alone and in combination, followed by analysis of ATP levels using the CellTiterGloTM assay from Promega. Curcumin showed promise, specifically reducing ATP levels in cells lacking p27 when 2DG was included. Curcumin is the curcuminoid in the spice turmeric, has been used extensively in Ayurvedic medicine, and is known to exhibit anti-tumor activity. We hypothesize that these effects may be mediated through targeting cancers with deregulated p27. Work is ongoing to optimize the use of 2DG and curcumin as combination therapy to specifically target these aggressive cancers.

Rischard, Mollie and Cromer, Lisa
COGNITIVE PREDICTORS OF RESPONSE TO COGNITIVE BEHAVIORAL TREATMENT FOR TRAUMA-RELATED NIGHTMARES IN A CHILD SAMPLE: THE ROLE OF EXECUTIVE FUNCTION

Children exposed to trauma are at risk for developing a constellation of stress-related symptoms including trauma-related nightmares and sleep problems (Cohen, Mannarino, & Deblinger, 2012). Although sleep-related concerns are prevalent and impairing following trauma (Connolly, McClowry, Hayman, Mahony, & Artman, 2004), they can be mitigated through cognitive behavioral treatment (CBT). Exposure, Relaxation, and Rescripting Therapy for Children (ERRT-C; Fernandez et al., 2013) is a CBT that addresses trauma-related nightmares and associated sleep difficulties. However, ERRT-C is not effective for all children (Fernandez et al., 2013; Kaier, 2017). It is possible that higher order cognitive processes could play a role in a child’s responsiveness to CBT. Executive functions (EF) are a complex set higher order cognitive abilities that enable children to engage in goal-directed behavior (Miyake et al., 2000). Poor EF is related to PTSD (Beers & De Bellis, 2003), sleep problems (Sadeh, 2007), and nightmares (Simor et al., 2012), and strong EF is related to resilience (Masten, 2015), better socio-emotional functioning and good emotion regulation (Best, Miller, & Jones, 2009). Given the protective utility of EF, we sought to examine whether being higher in EF was related to better treatment outcomes within a sample of children presenting with trauma-related nightmares. We evaluated EF pre-treatment using standardized measures in a sample of 24 children presenting with trauma-related nightmares. Treatment responsiveness was assessed based on measures of nightmare frequency, nightmare distress, PTSD symptomology, and sleep quality. Results from moderation analyses will be presented. Analyses used EF as the interaction term, pre-treatment data as the predictor and post treatment data as the criterion. Implications for treatment recommendations and planning for traumatized children experiencing nightmares will be discussed.

Royal, Kyleigh; Buchanan, Briggs; and Macdonald, Danielle
DISTORTIONS OF THE PAST: PARALLAX AND ITS INFLUENCE ON GEOMETRIC MORPHOMETRICS

Variability in artifact morphology can illuminate differences in cultural practices, learning communities, and tool function. Geometric morphometric analysis is a suite of methods for capturing and statistically analyzing shape differences in artifacts. However, little research has been conducted on how parallax—the effect of the position of an object in relation to the viewer or camera—effects how the shape of an artifact is measured with geometric morphometrics. It is important to assess the impact that parallax has on the analysis of artifact shape because in many cases artifacts are digitized from published photographs where the camera angle is not known. If there are significant differences in measurements based on different camera angles, it could lead to incorrect classification and perception of an artifact. To test the effect of parallax on standard geometric morphometric analyses of artifacts, we photographed three assemblages of stone artifacts (microliths) at multiple angles to test the degree to which parallax affects the measurement of shape of small artifacts photographed at close range (~50cm). This poster presents preliminary results from these experiments, exploring how parallax changes our understanding of artifact variability and our interpretations of past material culture.
Keywords: artifact variability, geometric morphometrics, parallax, shape

Thompson, Roberta
SOUTHERN OKLAHOMA IGNEOUS PROVINCE AS SEDIMENT SOURCE

Geochemistry of modern weathering on Pennsylvanian age Atoka Formation fine grained sediment in the Ouachita Trough is investigated alongside Southern Oklahoma Igneous Province (SOIP), and continental crust to determine if SOIP is a likely source of sedimentation and what effect modern weathering has on mudrocks. Recently published geochemical data for SOIP reveals a felsic and mafic igneous type sedimentation representative of the Atoka Formation chemopvenance mudrock that may challenge geological paradigm models. Geochemical accumulations of 166 rocks to include data obtained from Oklahoma Geological Survey SOIP, average continental crust (glacial till, present upper and lower continental crust, and Archean upper crust), and field samples collected within the Atoka Formation of the Ouachita Mountains are investigated. Index of Compositional Variability values indicate cratonic and inactive tectonic environments for sampled Atoka Formation mudrocks. Evaluation of trace element compositions places the Atoka mudrocks regionally in the upper continental crust and though no sign of ophiolitic components, trace element ratios infer a mafic deposition. Geochemical analysis of modern weathered Atoka Formation mudrocks do show promising indications that SOIP may be a liable source of sedimentation despite paleogeographic reconstructions establishing SOIP in the subsurface during deposition of the Pennsylvanian Period formations in the Ouachita Trough.

Walker, Hannah; Rischard, Mollie; and Cromer, Lisa
PROMOTING HEALTH AND RESILIENCE ON COLLEGE CAMPUSES: AN EXAMINATION OF THE UNIVERSITY OF TULSA’S BICYCLE ENCOURAGEMENT PROGRAM

College students are at an increased risk for developing unhealthy lifestyles (Racette et al., 2005). Some of these health-related threats to include poor eating habits, increased stress, and lack of consistent exercise, all of which can lead to poor physical, mental, and emotional health in students (Racette et al., 2005). Furthermore, poor health negatively influences college retention (Habley & McClanahan, 2004). International and freshmen students are at an increased risk for drop-out (Barefoot, 2004; Mamiseishvili, 2012). Bike sharing programs (BSP) can mitigate health problems and improve retention for at-risk students, by promoting physical activity and by offering reliable transportation that facilitates access to community resources (Dill, 2009; Cohen, Boniface, & Watkins, 2014). Thus, BSPs can foster health and resilience for at-risk students, and improve undergraduate retention rates. The University of Tulsa Rider Network (TURN) is a BSP that has invested in a bicycle fleet and in bicycle maintenance stations across The University of Tulsa (TU) campus. In order to determine if TURN serves as a resilience resource for at-risk students, the current study examined archival data about TURN users. TURN user demographic data from the 2015-2017 academic years was used to answer this query. We conducted chi-square analyses in order to determine if TURN users are proportionally representative of the TU student population, or whether TURN is over or under utilized by the most at-risk students. Findings will inform University retention-related programming.