Welcome to the first Tennessee Experiential Learning Symposium! We are excited you have joined us to experience what can happen when high-impact educational practices such as service learning, undergraduate research, and global learning come together. Experiential learning occurs both inside and outside of the classroom when students participate in hands-on activities that help the theoretical learning come alive. Here at the University of Tennessee, Knoxville, we are beginning our journey of Experience Learning, our new Quality Enhancement Plan. Experience Learning is a bold new initiative with the goal of transforming the educational experience for undergraduate and graduate students at UT. Specifically, it seeks to enhance students’ development and educational experiences by providing more opportunities for experiential learning. In planning for this event, schools from across the state came together to first plan an undergraduate research conference, later turning into what you will experience today – TELS.

As chair, I would like to formally thank the following individuals for serving on the inaugural TELS planning committee and for their assistance and guidance in creating this unique event:

Robert Bachman, The University of the South
Thomas Burns, Belmont University
Tom Cheatham, Middle Tennessee State University
Lauren Collier, Volunteer State Community College
Joy Drinnon, Milligan College
Christopher Gentry, Austin Peay State University
Cynthia Kelley, Motlow State Community College
Heidi Leming, Tennessee Board of Regents
Ted Lewis, Pellissippi State Community College
Salvatore Musumeci, University of Tennessee, Chattanooga

Thank you to UT students Vanessa Frye and Kolin Konjura who served on the local planning committee and handled much of the event design and logistics.

I would also like to thank Dr. Taylor Eighmy, Vice Chancellor for Research and Engagement, for his support and guidance in the growth of our undergraduate research program and the creation of this event.

We hope you will spend the day learning from each other and enjoy the unique melding of high-impact learning.

Marisa Moazen
Director, Office of Undergraduate Research
**TELS AGENDA**  
Friday, October 30, 2015

<table>
<thead>
<tr>
<th>Time</th>
<th>Function</th>
<th>Location</th>
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<tr>
<td>8:30-10:00 AM</td>
<td>Check-In and Light Continental Breakfast</td>
<td>Hodges Library, Mary Greer Room</td>
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<tr>
<td>8:45-10:00 AM</td>
<td>Vendor and Recruiter Check-In and Set Up</td>
<td>Hodges Library, Mary Greer Room</td>
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<tr>
<td>9:00-9:20 AM</td>
<td><strong>Opening Session - Keynote</strong></td>
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<tr>
<td>9:30-10:30 AM</td>
<td>Oral Performance Presentations - Thematic Tracks Session 1</td>
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<td>Culture, Heritage, &amp; the Creative Economy (1A)</td>
<td>Hodges Library, Room 253</td>
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<td>Improving Lives &amp; Communities (1B)</td>
<td>Hodges Library, Room 212</td>
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<td></td>
<td>Science, Technology, &amp; Society (1C)</td>
<td>Hodges Library, Room 213</td>
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<tr>
<td>10:00-4:00 PM</td>
<td>Poster Presentations, Exhibits, and Displays - Session 1</td>
<td>Hodges Library, 2nd Floor, Main Walkway</td>
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<tr>
<td>10:00-4:00 PM</td>
<td><strong>Recruiter Posters, Exhibits, and Displays open for viewing</strong></td>
<td><strong>Hodges Library, 2nd Floor, Main Walkway</strong></td>
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<td>10:45-11:45 AM</td>
<td>Oral &amp; Performance Presentations - Thematic Tracks Session 2</td>
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<td>Culture, Heritage, &amp; the Creative Economy (2A)</td>
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<td>Business &amp; Enterprise (2B)</td>
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<td></td>
<td>Science, Technology, &amp; Society (2C)</td>
<td>Hodges Library, Room 213</td>
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<tr>
<td>11:45-1:15 PM</td>
<td><strong>Lunch (11:45-12:15 pm, pick up box lunch)</strong></td>
<td><strong>Visit the Graduate School Fair</strong></td>
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<td>12:00-1:15 PM</td>
<td>Undergraduate Research Directors Meeting</td>
<td>Haslam Building, Room 401</td>
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<td>12:00-1:15 PM</td>
<td>Service Learning Directors Meeting</td>
<td>Haslam Building, Room 403</td>
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<td>12:00-1:15 PM</td>
<td>Study Abroad Directors Meeting</td>
<td>Hodges Library, Room 213</td>
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<tr>
<td>1:15-1:45 PM</td>
<td>Talk with the Poster, Exhibit, and Display Presenters about their work</td>
<td>Hodges Library, 2nd Floor, Main Walkway</td>
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<td>1:45-2:45 PM</td>
<td>Oral &amp; Performance Presentations - Thematic Tracks Session 3</td>
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<td>Culture, Heritage, &amp; the Creative Economy (3A)</td>
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<td>Sustainability, Agriculture, &amp; the Environment (3B)</td>
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<td>Science, Technology, &amp; Society (3C)</td>
<td>Hodges Library, Room 213</td>
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<td>3:00-4:00 PM</td>
<td>Oral &amp; Performance Presentations - Thematic Tracks Session 4</td>
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<td>Culture, Heritage, &amp; the Creative Economy (4A)</td>
<td>Hodges Library, Room 251</td>
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<tr>
<td>4:00-4:30 PM</td>
<td><strong>Closing Session</strong></td>
<td><strong>Hodges Library, Auditorium</strong></td>
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<tr>
<td>4:30 PM</td>
<td>Join us for the Frozen Pumpkin Drop!</td>
<td>McClung Plaza</td>
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Presenting Colleges & Universities

Austin Peay State University
Clarksville, Tennessee

Baptist College of Health Sciences
Memphis, Tennessee

Belmont University
Nashville, Tennessee

Middle Tennessee State University
Murfreesboro, Tennessee

Vanderbilt University
Nashville, Tennessee

Volunteer State Community College
Gallatin, Tennessee
Carson-Newman University
Jefferson City, Tennessee

East Tennessee State University
Johnson City, Tennessee

Johnson University
Knoxville, Tennessee

King University
Bristol, Tennessee

Maryville College
Maryville, Tennessee

Milligan College
Milligan College, Tennessee

University of Tennessee, Knoxville
Knoxville, Tennessee

University of Tennessee, Chattanooga
Chattanooga, Tennessee
The Trobriand Islands of the South Pacific engage in a ceremonial Kula trade by creating large shell necklaces (soulava) and armbands (mwali) and exchanging them with other islands over hundreds of miles of open ocean in small canoes, at considerable personal risk. Anthropologists study patterns of trade, reciprocity and ceremonial gift-giving and analyzed why these people would risk their lives for trinkets. An exercise in an Anthropology 1000 Mysteries of the Human Journey course at the University of Tennessee at Chattanooga explored the Kula Trade through active and experiential learning. Students formed “tribes,” created their own “Kula” jewelry, and developed trading partners and exchanged their necklaces and armbands with other students stationed on other “islands” dispersed around campus. The activity was analyzed using anthropological concepts and methods and the results were compared with the strategies used by Trobrianders who gain great respect and prestige through the Kula Trade. The student necklaces and armbands were sorted and analyzed in terms of: 1) materials; 2) construction; 3) design; 4) aesthetics; 5) quantity produced; 6) trading partners; 7) trading strategies, and 8) Kula ‘prestige’ elements. Tennessee students had access to even more materials and found art objects than the Trobrianders, so it was interesting to see how other technological materials, e.g., an iron bathtub claw foot, from a complex society were incorporated into designs. Some students started making their trade goods far ahead of schedule and used Kula culture designs with large shells while others were unfamiliar with “found art” construction or limited their creations to contemporary concepts. Students made a mean of seven pieces per tribe (range: 3-20) and used repetition and scale design elements, bright color schemes, and whimsical elements such as a bottle cap, paper money, and sticks and leaves found on the grounds. Each tribe created a distinctive “Kula persona” which was culturally compared with the Trobriander’s value and meaning system.

In one of the most influential examinations of experiential learning, Kolb argued that one of the keys to experiential learning is to mediate the transactions between persons (the student) and the environment. For my poster presentation, I will use a case-study approach to confirm one aspect of Kolb’s argument, that experiential learning happens through a complex, reciprocal “transaction” between the student’s objective context and his or her subjective experiences. My argument is that a study abroad experience provides an effective experiential learning experience because the act of “studying abroad” exposes the student not only to new cultural and educational experiences but also to new geographical experiences. I will use two moments my recent study abroad experience in Australia to show how geography influences the entire study abroad experience. I will examine my dive on the Great Barrier Reef and my internship in a community development organization. A close
look at this case will show that the geographical experience of the dive played a key role in shaping how I experienced the internship. My dive on the reef “exposed needs, values and behaviors” that then changed how I absorbed the internship—which then changed how I experienced Australia’s geography.

Chiasmus and Oral Tradition
Culture, Heritage, & the Creative Economy

Poster #3: Jackson Moser
Senior, Bible and Theology & Management of Nonprofit Organizations, Johnson University

It is undoubted that the Gospel of Mark uses the chiasmus as a rhetorical device in the telling and re-telling of the story of Jesus of Nazareth. Scholars today have also become increasingly aware, and have begun to study in depth the practice and performance of oral tradition/transmission. But how do these two seemingly unrelated topics synthesize? Using foundational oral performance literature from scholars such John Miles Foley and Jan Vansina, paired with biblical performance critics like Rafael Rodriguez, Richard Fowler, and Richard Buckaum, this project illustrates how the use of chiasm in Mark’s gospel functions as a call to action in the performance of the story. This call to action begins with Jesus the Nazarene’s ministry to spread the message of the nearness of the Kingdom of God (A). It then builds up to the climactic statement of Peter confessing Jesus as the awaited Messiah (G), thus changing the message to the Kingdom of God is here. Then as the story closes, so the call to action does with Jesus’s commission of the disciples to continue to build that kingdom (A’). And so, as research concludes that oral performance wears many different masks (i.e. comedy, drama, reenactment, etc.), and uses different avenues to convey their purpose(s), so the Gospel of Mark utilizes the chiasm as a means to communicate its message, and therefore leaving the audience with an opportunity to respond to what they heard.

Wandering Through Jordan: My Experience with the Modern Bedouin
Culture, Heritage, & the Creative Economy

Poster #4: Sara Poarch
Junior, Anthropology/Classical Archaeology, University of Tennessee at Knoxville

The Bedouin have a long history of a nomadic lifestyle in the Middle East. They are a people famous for their wanderings and tea-infused hospitality. Today they have become semi-settled and are mostly concentrated in the country of Jordan. It is in Jordan on the Ayn Gharandal Archaeological Project that I, Sara Poarch, met and worked side by side with the men of a local Bedouin camp and members of my team from the University of Tennessee led by Erin Darby. Through bonding over manual labor under the harsh Jordanian sun and many cups of tea, I learned about a culture steeped with a rich history and complicated customs very different than my own. It was through the experience of learning about their culture and explaining my own culture to them that I gained an incredible insight into how different we were in so many ways yet similar in so many others.
A Demographic Study of County Level Variables Impacting LGBT Settlement in the Mid-South

Governance & Society

Poster #5: Ian Chambers
Senior, Sociology, Austin Peay State University

The purpose of this research is to try to locate county level factors that lead to higher or lower numbers of LGBT (Lesbian, Gay, Bisexual, and Transgender) residents within the Mid-Southern United States. Our data sets come from the 2010 American Community Survey published by the Census Bureau, the 2010 US Religious Census published by the Association of Religious Data Archives and compiled by the Association of Statisticians of American Religious Bodies, and a Williams Institute at the UCLA school of Law study published in 2014. Multiple regression results showed that population size and high percentage of commuters positively predicted higher levels of same-sex households. Conversely, higher percentage of residents with less than a high school diploma negatively impacted the percentage of same-sex households.

Usability Study for a Surveillance-Monitoring Interface

Governance & Society

Poster #6: Alexander Hornick
Junior, Computer Science, Austin Peay State University

Gun crime is a growing concern in society. Law enforcement works to confront gun violence by using surveillance monitoring. One aim of this study, which was a continuation of our faculty mentors’ past research, was to assess the usability of a computer interface designed to facilitate the capture of behavior-based decisions regarding a target’s status as threat / non-threat. Participants performed two tasks. First, naïve controls viewed eight videos and identified suspicious behaviors from a pre-existing set of behaviors and made confidence judgments on whether someone was concealing a weapon. Study participants were also allowed to enter qualitative comments regarding the behaviors observed. Second, participants were asked to complete a system usability survey that measured such things as system reliability, ease of use, and recovery from mistakes. Findings contribute to our understanding of what features offer the greatest utility for the design of a surveillance-monitoring interface in assisting threat detection.

Reaching Outside the Classroom

Improving Lives & Communities

Poster #7: Morgan Riley
Senior, Radiation Therapy, Baptist College of Health Sciences
Brandi Birmingham
Senior, Radiation Therapy, Baptist College of Health Sciences

Service learning provides hands-on life experiences by connecting student learning outcomes from a course to a community service. The radiation therapy students at The Baptist College of Health Sciences participate in service learning to improve teamwork skills and enhance empathic communication skills needed to provide quality patient care. Students provide meals to oncology patients who are staying at Harrah’s Hope Lodge in Memphis, Tennessee. This lodge provides
complementary housing and transportation for patients who do not live in the area or cannot provide means of transportation for radiation therapy treatment. Students are able to gain hands-on experience while addressing the resident’s needs in dietary, social, and psychological areas that are taught in didactic oncology courses. The students are able to build on relationships made with patients in the clinical setting by volunteering at the lodge. In this way, radiation therapy students begin to see the patient as a person with feelings and fears, while understanding the effects of high-energy radiation. Self-reflection is key to the learning. Self-reflection offers opportunities for students to write about their personal strengths and weaknesses for improvement. Students also have the opportunity to group reflect during class and strategize as a team to address concerns related to patient care. The reciprocal effect of service learning allows students to grow personally and professionally while providing a service to our communities. Service learning is a win, win instructional strategy that occurs beyond the four walls of a classroom.

The Community Model for Transformation

Improving Lives & Communities

Poster #8: Abigail Gibbons
Senior, Human Services, Johnson University

The great educational theorist Paulo Freire has suggested that experiential learning involves what he calls “naming the world.” By this, he means that students learn best when they encounter the world through the process of dialogue, provided that students learn to engage in a “dialogue of equals.” Freire emphasizes the importance of authenticity in this dialogue. For my poster, I will argue that one of the keys to an urban immersion experience is another element of Freire’s formula, the dialogue between equals. Literature on immersion experiences suggests that an immersion experience increase self-awareness and cultural sensitivity. An additional, and perhaps more important, feature of an urban immersion experience is that the immersion itself provides the contexts and relationship that allow for the kind of equal dialogue that Freire is calling for. I will describe how an immersion experience allowed my roommate and I to “rename” our urban apartment as a place to grow relationships with each other and with our neighbors. Through that renaming process, we developed a relationship of trust and equality with a family in situational poverty living in the apartment complex, thus fulfilling Freire’s vision. I use a case-study method.

Developing Rich and Interactive User Interfaces for the Analysis of Strategic Materials

Science, Technology, & Society

Poster #9: Daniel Enciso
Sophomore, Computer Engineering, University of Tennessee at Knoxville

In this volatile global economy, securing the supply of strategic materials is a major national security interest of the United States. Supply chain decomposition requires locating and researching the mines, facilities, and companies associated with the production of that material. Analysts face two major challenges in decomposition: (1) vast quantity of data (i.e. “Big Data”) and (2) constantly changing supply chains. Analysts utilize a multitude of sources. Such sources used are commercial databases, products information, mining news, events, financial information, etc. for the decomposition of one supply chain. The visual presentation and physical accessibility of this
knowledge becomes crucial in order to identify information with new insights and high impact factors. Strategic Materials Analysis & Reporting Topography (SMART) is an analytic information system developed at ORNL to provide situational awareness of strategic material production and supply chain as well as supporting analysis of potential future outcomes. In this project I developed various technical components: (1) rich and interactive user interface for easy and fast visualization of the above information, (2) database schema for data storage, and (3) helper utilities such as extract-transformation-load (ETL) and feed aggregation processes. This project was completed successfully and will be integrated into the SMART software.

**Electrochemical Evaluation of Non-Precious Bimetallic Catalysts for Fuel Cell Applications**

*Science, Technology, & Society*

**Poster #10: Samantha Medina**
Junior, Material Science and Engineering, University of Tennessee at Knoxville

Proton exchange membrane fuel cell (PEMFC) and anion exchange membrane fuel cells (AEMFCs) are devices that generate electricity by means of a chemical reaction. Both PEMFCs and AEMFCs provide an environmentally friendly alternative to oil-derived fuels with higher efficiency than that of the combustion engine. They can be used to power cars, and for other portable applications. However, one of the major disadvantages of PEMFCs and AEMFCs is the high cost associated with using platinum group metals (PGMs) as the catalyst for the reactions taking place on both the anode and cathode electrodes. Replacing platinum at the cathode and anode electrodes with non-precious group metal (NPGM) catalysts would significantly decrease the cost of fuel cells. The purpose of our research is to find NPGM catalyst for the oxygen reduction reaction (ORR) taking place at the cathode. We synthesized NPGM catalysts using Cu, Fe, and their bimetallic combination with a carbon support and nitrogen precursors (CAMP). The as prepared catalyst show very low ORR activity, but after thermal activation under inert atmosphere the catalytic activity was significantly improved. Electrochemical activity was measured by the rotating ring disk electrode (RRDE) technique in both alkaline and acidic electrolytes.

**Food Choices in Healthy Weight Women**

*Science, Technology, & Society*

**Poster #11: Stephanie Ernest**
Senior, Nutrition- Dietetics, University of Tennessee at Knoxville

This study examines the relationship between food addiction (FA) scores and habituation to foods high and low in sugar and fat content in normal weight women. It is hypothesized that higher FA scores will be associated with slower habituation to a food high in fat and sugar. This study uses a one-group, within-subjects factor design, with the within-subjects factor being food (dried apricots [low in fat and sugar content] and chocolate cake [high in fat and sugar content]). Participants play a computer task to earn points to eat dried apricots in one session and chocolate cake in another session, with sessions counter-balanced across participants. The computer task is divided into 12, 2-minute trials, during which participants earn points towards access to 75 kcal portions of food. The computer task is programmed at a variable interval of 120 ± 42 seconds (VI-120) reinforcement schedule, so that participants are rewarded one point for the first mouse button pressed after approximately 120s have passed. The dependent variables are the number of consecutive two-
minute time blocks before responding, as determined by mouse button presses, ceases and the overall pattern of mouse button presses. A longer pattern of mouse button presses indicates slower habituation. Correlations between FA score and the number of consecutive two-minute time blocks before responding ceases and the overall pattern of mouse button presses will be conducted. Seven participants have completed all sessions and recruitment is ongoing to reach a sample size of 30 participants.

Potential Impact of Nuclear Power on Water Resources in the Southeast United States

Sustainability, Agriculture, & the Environment

Poster #12: Matthew Herald
Freshman, Nuclear Engineering, University of Tennessee at Knoxville

Water stress threatens to impact electricity production from thermoelectric plants in the Southeast United States (SE). This is concerning because 97.4% of electricity in the region is produced from thermoelectric sources. These coal, nuclear, and natural gas plants require water for waste heat rejection (WHR), comprising the majority of the SE’s water consumption (58.9%). Increasing nuclear power has been proposed as a way to reduce carbon emissions while being an efficient utilization of land resources compared to wind or solar. However, the impact of an increased reliance on water resources should be examined. To do this it is necessary to characterize the SE’s electricity mix, water supplies, and determine how these resources are used. In 2010, nuclear plants produced 22.5% of the electricity in the SE, yet comprised 36.8% of the thermoelectric water withdrawal. Thermoelectric plants withdrew the majority of water in the region (58.9%). Only a fraction of withdrawals are consumed by evaporation, but warmer water is returned to streams which can have harmful effects on aquatic ecosystems. Nuclear plants have larger water withdrawals per GWh because of their lower thermal efficiencies. As more nuclear plants are added to the region the thermoelectric water demand will grow. To reduce the amount of water needed for WHR, it is advantageous to build cooling towers in water stressed areas because of their low water withdrawals and slowly phase out once-through WHR except in areas where environmental impact is negligible. Technologies that could better utilize water resources such as dry heat rejection, waste heat recovery for desalination, and high-temperature reactors with higher thermal efficiencies such as salt cooled reactors and super-critical CO2 systems should be considered and are discussed.

Coral Reef Rehabilitation

Sustainability, Agriculture, & the Environment

Poster #13: Mary Poss
Junior, Concrete Industrial Management, Middle Tennessee State University

What is an effective way to rehabilitate a deteriorating coral reef system in the Dominican Republic? The decline of coral reef systems in the coastal areas of the Dominican Republic has contributed to a significant decrease in reef-dependent fisheries, a decrease in tourism, and a negative impact on the biodiversity of these reef systems. By installing artificial reef systems in the impacted areas, our hope is that new coral will grow on the artificial systems and provide an expanded habitat for the declining wildlife population. During the summer, our group of 10 students constructed 19 fiber reinforced
concrete prisms in Sosua, DR. The group evaluated various form options and opted to build our own rectangular forms using plywood. By doing so, we were able to cut our form material costs by 25%. Another advantage to this form, the shape allows the prisms to be stacked into a pyramid, creating more interior space for the wildlife to inhabit. Since installing these prisms, we have observed a variety of wildlife occupying the interior of our artificial reef system. Underwater photos and videos will continue to be taken in order to observe how the wildlife and coral are reacting to their new environment.

Session 1A

My Study Abroad Experience
Culture, Heritage, & the Creative Economy

Jay Alvarez
Sophomore, Spanish, Austin Peay State University
Kelly Hernandez
Freshman, Spanish, Austin Peay State University

My presentation will focus on the reasons why I recommend students to study abroad, specifically in Spain. I will discuss the cultural differences I noticed between Spain and the United States. I will also discuss some of the tourist sites I visited in Spain, my living conditions, and the food I tasted. I will also share what I enjoyed the most about studying in Spain. This presentation will also provide the audience with details about the language school I attended. I will also talk about how studying abroad can help you gain employment and put you above other students who have not studied abroad.

A Relentless Haunting: Ghosts of Possession in
Virginia Woolf, Nathaniel Hawthorne, and D.H. Lawrence
Culture, Heritage, & the Creative Economy

Megan Fontenot
Senior, English and Humanities, Milligan College

The unique, episodic construction of the short story genre offers artists a specialized platform for intense examination of certain themes. The motif of possession occurs repeatedly and with special significance in Virginia Woolf's "Haunted House," in Nathaniel Hawthorne's "Young Goodman Brown," and in D.H. Lawrence's "A Rocking-Horse Winner." Each story depends on a slightly different nuance of the word possession, yet together they contribute to a larger conversation on the dangers of a possession that is both illusory and enslaving. Woolf interrogates the fragmented position of the possessor, while Hawthorne takes a singular look at the state of being possessed. Lawrence encapsulates both of these observations in the form of a single character as he attempts to navigate the damning reality of being at once the possessor and the possessed. Through this conversation, possession becomes redefined as an abstract state of suspension between power and weakness, choice and fate, ultimately resulting in a ghostly and fractured Self, haunted by an unattainable peace.
The Feminine and the Heroic: Grendel’s Mother, Judith, and Portrayals of Anglo-Saxon Women Acting Outside Gender Roles

_Culture, Heritage, & the Creative Economy_

Honor Lundt
Senior, Linguistics and Communication Disorders, University of Tennessee at Knoxville

Anglo-Saxon women held lower status than men. These women had limited options, confined to marriage or monasticism, and acts of violence fell into the purview of men. In both history and most of literature, women are never meant to take personal revenge. Both Grendel’s mother, from Beowulf, and Judith, from the eponymous poem, act outside typical gendered expectations of female action by behaving violently. Judith is accepted for her act of violence because of her adherence to expectation for feminine behavior and the historical precedent for warrior queens, while Grendel’s Mother is condemned for her rejection of most feminine expectations and her act of vengeance. The primary literary sources were Beowulf and the poem Judith, based on the Vulgate book of the same name. Primary historical sources, such as The Anglo-Saxon Chronicle, were used to examine the gender expectations and social norms through which contemporary readers would understand literary characters. Women of rank, such as Æthelflæd of Mercia, occasionally held significant political power and could command armies in times of crisis. Similarly, Judith kills Holofernes to save her city and then returns to her feminine role of encouraging violence rather than participating. On the other hand, Grendel’s Mother kills a man for personal revenge and does not conform to Anglo-Saxon feminine standards. In the end, it is compliance to gender roles and the presence of historical precedent that causes Judith to be rewarded for violence, while Grendel’s mother is condemned to death.

Session 1B

Belmont Volunteers for Literacy
_Improving Lives & Communities_

Denee Headen
Freshman, Marketing, Belmont University
Rachel Petty
Sophomore, English, Belmont University

Belmont Volunteers for Literacy is a student-lead organization that is dedicated to improving and raising awareness about literacy in Nashville. This organization leads a plethora of literacy initiatives that have involved students from all over Belmont’s campus. Two major events that this organization hosts are an elementary school Poetry Contest and Belmont’s Annual Family Literacy Day. All public elementary schools are invited to submit student poems which are judged by a Poetry class with the top poets invited to work with songwriting students and professional songwriters to set their poems to music. Songs are posted online for the community to vote. Family Literacy Day is held at a city park near campus and the whole Nashville community is invited to bring their children to this celebration of literacy. There are reading circles, literacy-based games and crafts, food, and the awarding of the winners of the children’s poetry contest. At least 300 students participate in the planning and implementation of this celebration each year. Service-Learning classes help with setting up the various aspects of Family Literacy Day, and students from various student organizations typically volunteer to read to the children and host activities.
Assessing the Awareness of Community Stakeholders Concerning the Appalachia Service Project

Improving Lives & Communities

Jacob McGlamery
Junior, Psychology, Milligan College

The objective of my project was to determine the awareness of a specific service organization in the communities in which they were active. This research was done on behalf of the Appalachia Service Project, a service organization based in Johnson City, TN. The process of information gathering primarily consisted of personal interviews with community leaders. We surveyed the leaders of four counties across Appalachia in order to ascertain whether or not knowledge of ASP was available. We then took the responses of these individuals in order to formulate recommendations for ASP to improve relationships with these communities.

Bikers Who Care Give: Hundreds of Cyclists Improving the Lives of Seriously Ill Children, One Engine Rev at a Time

Improving Lives & Communities

Miranda Salters
Senior, Communications, Austin Peay State University

There are a myriad of non-profit organizations geared towards raising money and support for childhood cancer, mental, and physical illness. As of 2015 there are over 30,000 non-profit organizations advocating for ill children nationally and locally, in the United States. This video project will showcase a specific organization whose goal is to broaden awareness in their community of childhood illnesses by putting the metal to pedal. This project will address how these bikers have successfully raised thousands of dollars annually, set themselves apart from local non-profit organizations, and how they’ve used their bikes to raise awareness in their community. By showcasing powerful and moving testimonials from the bikers and recipients of the organization, as well as the significant impact, and influence the bikers have in the community, this production will demonstrate how they have been successful in using the biker community in order to establish a prosperous non-profit organization.

Session 1C

Independent Summer Research Experience:
Developmental Cognitive Neuroscience at the University of London Birkbeck Babylab

Science, Technology, & Society

Kimberly Bress
Sophomore, Neuroscience, University of Tennessee at Knoxville

In the second semester of my first year at the University of Tennessee, contacted the University of London Birkbeck Babylab to inquire about opportunities for undergraduate research internships. After communicating with Katarina Begus and Carina de Klerk, two researchers at the Babylab, I was accepted as a Birkbeck Babylab research intern for the summer of 2015. While at the Babylab, I was
involved with three projects. The first, called the “Who versus What” project, investigated whether infants prefer to learn categorical information rather than item specific information. The distinction between these two types of information is made by the use of articles such “a” or “an”. For example, “this is a dog” implies categorical information while “this is dog” implies specific information. We utilized EEG to observe the measure of theta oscillation in the brains of infant subjects. This rhythmic activity reflects whether infants selectively prepare to encode one type of information more than the other. In addition, I was also involved with two studies involving functional near infrared spectroscopy (fNIRS), a novel brain imaging technology. One project investigated infant understanding of social relationships, while the other investigated infants’ ability to imitate and mimic. As an intern, I was involved in a very large portion the research process, from participant recruitment to observing data analysis. Through this independently organized research experience, I gained a valuable understanding of the research process within the field of developmental cognitive neuroscience and obtained real world experience with essential brain imaging technologies.

Science and Outdoor Fitness in Costa Rica, January 2015 Study Abroad Course
Science, Technology, & Society

Casey Gentile
Junior, Biology BS, Maryville College
Thomas Moore
Junior, Biology BA, Maryville College

Will yoga make you a better scientist? Does surfing help with research? What is the connection between fitness, the outdoors, and science? To find some answers, fifteen students, with majors ranging from Business to Biochemistry, and two instructors spent 14 days in Costa Rica (CR) visiting science research centers, assisting with data collection, and completing outdoor physical activities designed to increase personal fitness. Course goals included experiencing, understanding, and appreciating CR cultural heritage, exploring various natural environments to compare/contrast flora/fauna with that of Eastern Tennessee/Southern Appalachia, assisting researchers on scientific investigations including botanical and agroforestry-centered and animal-focused projects, comparing and contrasting environmental and economic development policies in CR and the US, and engaging with people from a different culture. Prior to departure, students learned to identify ~50 CR plants and animals and researched rain forest ecology, global climate change, GIS (geographic information systems), and leatherback sea turtle biology for group presentations. Physical activities included hiking, surfing (with lessons), whitewater rafting, flatwater kayaking, swimming, snorkeling, and yoga on the beach. Afterwards, students reported deeper understanding of connections between science research and physical fitness, both as it involves the importance of being physically fit enough to conduct certain kinds of research, but also as it relates to enhanced impact on physical activities when you understand the natural systems of your surroundings.
We present the results of research on the eclipsing binary star system Epsilon Aurigae. This system is unique in that it can be seen with the naked eye and has the longest known period and eclipse duration of any such star system. The current model of this star system describes an opaque, rotating disk of dust surrounding a young, newly formed star that orbits a yellow supergiant star once every 27.1 years. As the dusty disk passes between the Earth and the supergiant star, it causes the apparent brightness of the start to decrease by roughly 50% over a nearly 2 year period. We are analyzing polarized light data taken during the 1982-84 eclipse and comparing it with more recent data from the 2009-11 eclipse. The polarized light observations are used in an attempt to model the shape of the disk and the geometry of the disk and supergiant star system. The analysis is complicated by the presence of non-radial pulsations of the supergiant star that create variations in the polarized light in addition to those caused by the eclipse.

As an artist, my artwork has explored legacy and success using the study of Art History and historical studio practices. Translating to the “Work of the English”, Opus Anglicanum were expertly crafted embroideries that became highly sought after in church collections creating an economic commodity for the crafters. While reading, in Latin, an inventory of Opus Anglicanum located in the Vatican collection, I noticed that many of the embroideries had listings denoting the names of women, and specifically historically known Anglo-Saxon women. I am interested in understanding what role women had in the creation of Opus Anglicanum, and how the aesthetic they utilized in the creation of the embroidery closely resembles other examples of surviving Medieval and Gothic artwork. The focus of my studio art practice is to utilize art historical techniques in contemporary work. I use intrinsically perceived feminine materials to start a dialogue between societal expectations of domesticity and how I fit into a gender role. By utilizing techniques associated with hobby crafts, I can elevate those traditional skills or materials, to express my position as a female artist. In an attempt to preserve the skills, women are traditionally praised for possessing.
The Trobriand Islanders live off the coast of Papua, New Guinea and engage in a ceremonial trade of Kula—shell necklaces and armbands that are exchanged from island to island for prestige and the development of lifelong trading partners. The islanders take about six months to create elaborately decorated canoes which they use for the journey across hundreds of miles of dangerous waters. Red necklaces are traded only for white armbands and vice versa, with necklaces going clockwise and armbands counter-clockwise around the islands. The goal is balanced reciprocity with an emphasis on giving more than receiving for good will and social relationship. Traded jewelry can remain in an individual’s possession for only a few seasons and then must be circulated to the other islands. Students enrolled in Anthropology 1000 Mysteries of the Human Journey at UT Chattanooga, 8,000 miles away, replicated the Kula Trade in an experiential learning exercise. Each semester the class formed “tribes” who study Kula, make necklaces and armbands of their own, and trade them from tribe to tribe dispersed around campus on “islands” formed in campus buildings. The results of the Fall 2015 exercise will be presented. The exercise highlights the importance of building friendships, reciprocal relationships, and developing cross-cultural comparisons as well as concepts such as fieldwork and adaptation. Anthropologists puzzled over the Kula Trade and risking one’s life for trinkets, but the exercise demonstrated the importance of symbols, social prestige, and creating lifelong relationships for survival.

This paper examines two very distinct Christian communities of third century CE Egypt - one in the city of Alexandria, and another in the Egyptian countryside - and analyzes the diverse factors that prompted the development of two distinct identities (“city” vis-à-vis “country”), despite sharing a common religion. Between the second and fourth centuries CE, political, religious, and social life in Egypt fluctuated with the succession of various governing officials whose attitude toward Christianity changed based on the current political zeitgeist. In what is often believed to be a show of social defiance, Christians did not participate in civic forms of religion and other social rites required by Roman authorities, which prompted local persecution of Christian communities. A key text for noting these differences is the Apocalypse of Elijah, the main template for this paper. Although recent scholarly approaches have attempted to use this text to explain the differences between “city” and “country” Christianity in Egyptian religious terms, I argue that by examining each community’s hermeneutical approach to interpreting apocalyptic literature one be best draw out notions of identity within two competing visions of Christian faith and practice, using the Apocalypse.
Session 2B

Creating and Developing a Marketable Product

*Business & Enterprise*

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Mimi Trenkle  
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Kara Rose O’Malley  
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This experiential learning project consisted of a challenge to create a new product from concept to consumer. This included target market needs assessment, target market trends, new product design, competitor analysis, a distribution and marketing plan, and financial analysis. The product created was a cooler decorating kit, titled “The Ultimate Cooler Kit” which includes a set of materials used for decorating a cooler. Considering the large market (i.e., Greek life, family trips, sports tailgating), this new product fills a significant gap in the marketplace. This increasing trend of creating uniquely designed coolers that serve as personalized gifts or creative trophies, serves as a testament to the potential success of this newly created product concept. In addition to creating a full business plan, a promotional video was created and edited that promotes and demonstrates the new product and its concept to potential stakeholders.

Session 2C

Prototype Magnetic Shield Compensating Earth’s Magnetic Field Down to 1nT

*Science, Technology, & Society*

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Some sensitive experiments require a magnetic fields below nT level. The challenge becomes clear when the Earth’s ~50,000 nT magnetic field is taken into account. Our prototype aims to compensate for the Earth’s magnetic field and reduce the field inside the volume to approximately 1nT. To accomplish this challenge we have designed a cylinder comprised of three layers, and by using in the first layer active magnetic current supplied coils we will manipulate the magnetic field inside the Volume. There are two active compensating coils and twoMu-metal (Magnetic Shield Corporation) passive shields The active compensating coils consist of a solenoid along Z-axis and a set of l Helmholtz coils with cos phy distribution to comensate magnetic field in X-Y plane. In theory these two coils + rotations should cancel out the majority of Earth’s Magnetic field within the chamber. This filed will be further reduced by two annealed passive shielding. Prototype is being studied for the possible experiment with ultra-cold neutrons at LANL.
Glucocorticoid Synthesis Inhibition Effects on Recall of Acquired Fear Memories

*Science, Technology, & Society*

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Repeated exposure of a neutral stimulus with a noxious event, such as an electric shock, results in a fear association memory. Repetition of the stimulus without the noxious event causes extinction of the memory in a context-dependent manner. In contrast to the non-clinical population, posttraumatic stress disorder (PTSD) sufferers have heightened fear responses following extinction when extinction occurs in a different context than acquisition. This disruption in context-dependent extinction is likely attributed to abnormal hippocampal volume and functioning. Metyrapone, a glucocorticoid synthesis inhibitor, significantly depresses cortisol levels preventing its binding to receptors. Highly concentration of receptors in the hippocampus suggests that metyrapone administration may disrupt normal hippocampal functioning. The current study evaluates the effects of fear modulation by cortisol suppression in a context-dependent manner. Healthy adult males undergo fear conditioning and subsequent extinction using the Garfinkel et al. paradigm. We replicated the results of this paradigm in healthy control subjects to ensure its efficacy. Cortisol is suppressed at recall, and fear memory is assessed by changes in skin conductance (SCR). Results to be presented are pilot and preliminary SCR data.

Stimulating the Reflection Gene: Improving Reflection in a Junior Level Biology Service-Learning Course

*Science, Technology, & Society*

Rachel Harmon
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How can the reflection of a junior level biology service-learning project be improved? Extensive research based on this question led to a model that was developed and tested on three different junior level biology courses. The model spans across the course, from beginning to end in 3 or 4 stages (depending on the type of service project.) The model was created and implemented by a service-learning peer mentor for the biology department. Quantitative data from the final stage of the model indicated that the students had gained a more globalized perspective of the impact of their service, as well as understanding and changing in their cultural assumptions of the population being served after participating in this model of reflection. The students also gained the ability to readily identify the connections between their service and course learning objectives through this method. This reflection process can be applied to a service-learning course within any discipline or at any level.
Within high-context Muslim cultures, standards the given society generally accepts as virtuous determine how individuals gain or lose honor for themselves and their communities. The research of anthropologists such as Duane Elmer and Bill Musk address such standards and detail how age, nationality, religious piety, community ties, success, and a variety of other factors all determine the honor a high-context society attributes to each of its members. For my poster, I will explore how a Western outsider, upon entering such a high-context community and finding himself or herself at a place of shame, could work to gain honor within that given context. Through a Case Study approach, conducted in a high-context Muslim community at a Chinese university, I will show how I gained honor in three distinct groups. Within a Pakistani context, gifts, quality time, and honest faith-based questions all contributed to my eventual place of honor within Anhui’s Pakistani community. In a Central Asian context, a knowledge of the region, and participation in celebrations all contributed to my gradual gaining of honor. Finally, only through the honor given to me from a close friend, Akram, did I receive honor in the Yemeni / Afghani community.

Talkin’ ‘bout Tolkien : Exploring and Understanding J.R.R. Tolkien’s Catholicism within The Lord of the Rings Series
Nature, Heritage, & the Creative Economy

Clinton Day
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J.R.R. Tolkien’s writings have erected a wall between his readers as to whether or not his works reflect his Catholicism. Readers on one side argue that his works are directly influenced by his Catholicism and present direct examples from within the text itself. For example, is there a correlation between the rebirth of Gandalf in The Two Towers to the rebirth of Christ, or does the lembas bread Frodo and Sam eat serve as a sacramental? On the other side stands Tolkien himself, disagreeing with every rebuttal and proclaiming that his works transcend beyond religion. Whether Tolkien meant to or not his Catholicism has nestled itself within his writings. Through the close reading of The Lord of the Rings, this paper explores the connections between Tolkien’s writing and his religion, specifically how the characters and objects are symbolic of Catholic motifs. By considering the claims of other scholars as well as making its own claims, this paper asserts its perspective as to how Tolkien’s Catholicism has influenced his works, leading to the overarching understanding as to the prominent effect Christianity has on ones writing.
Coral Thayer  
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This project looks into the excavation of the bathhouse during the 2015 season at ‘Ayn Gharandal, a Tetrarchic Roman military fort located in the Wadi Araba just north of Aqaba, Jordan. Sitting underneath the loose sands of wadi wash, the fort’s bathhouse has been remarkably preserved prior to excavation. In the 2015 season, two squares were opened in the bathhouse: one investigated the heating systems of the cauldarium and tepidarium, and the other strove to uncover the graffiti on the walls of the frigidarium. While working to achieve these goals, new rooms were found: a praefurnium, a courtyard, and a second phase room that was dense with artifacts including coins and cooking pottery. Through explaining the structures of these rooms and the artifacts found within them, this project will explain the structure of these rooms, examine possible explanations regarding their ancient uses, and contribute to our understanding of the cultural significance of a Roman bathhouse on the Arabian frontier.

**Session 3B**

**Blame it on the Weather: Perceptions of Climate Change and Challenges to Adaptation in the Callejón de Huaylas Region of Ancash, Peru**  
*Sustainability, Agriculture, & the Environment*

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Climate change affects a variety of natural resources, but its impact on water availability warrants the most concern. This issue draws attention to the fact that our planet is changing and more importantly reveals that the systems we have developed to allocate water resources have a low capacity to adapt. Nowhere is this issue more pressing than the areas surrounding the Cordillera Blanca region of northern Peru where subsistence agriculture, hydro-electric projects, and coastal commercial farms compete for seemingly dwindling water resources provided by high-altitude glaciers. Although hydrological systems are changing in the Andean region, is the claim that there exists a water deficit valid? How do perceptions of what truly drives a water deficit impede adaptation action and to what extent can climate change be used as a scapegoat to avoid addressing internal issues? Through the use of qualitative interviews with actors in the water governance network of Callejón de Huaylas region, I compare the various perspectives of how climate change is impacting water resources. I then demonstrate how inconsistencies in these perspectives of the role of climate change in water availability impede adaptation by failing to address root systemic issues. As climate change highlights problems within infrastructure and policy, it becomes clear that a deficiency, or, a perceived deficit, is not necessarily a function of climatic change, but rather, internal systemic weaknesses.
**Investigation of Green and Microscale Techniques in the Synthesis of Various Flavones**  
*Sustainability, Agriculture, & the Environment*  

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The intended goal of this investigation was to optimize yields in flavone synthesis using green solvents and microscale techniques. Flavonoids have been noted to have a vast array of applications in medicine including anticarcinogenic properties, neurogenesis promotion, antimicrobial characteristics and immune enhancement. The objective of this investigation is to optimize the yields of three different environmentally friendly flavone synthesis reactions. This approach consists of manipulating the time spent on the initial esterification of o-Hydroxyacetophenones as well as changing the organic solvent used in the Baker-Venkataraman rearrangement. The amount of time spent on the pre-filtration during the esterification reactions of o-Hydroxyacetophenones with 2-chlorobenzoyl chloride, 4-chlorobenzoyl chloride and 4-nitro chloro benzoyl chloride, respectively, is varied to 30, 60, and 90 minutes totaling nine experimental groups. Each experimental group undergoes extraction using Dimethyl Sulfoxide (DMSO) as an organic solvent employed in the subsequent Baker-Venkataraman rearrangement to β-Diketones.

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**Environmental Literacy and its Implications for Effective Public Policy Formation**  
*Sustainability, Agriculture, & the Environment*  

Julianna Burchett  
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Environmental literacy is a measure of a person’s knowledge about the interactions of humans and their environments, environmental issues, and the various connections in ecological systems. Recent studies have demonstrated that there are major shortcomings in the public’s understanding and awareness of environmental issues, specifically the impacts humans have on climate change. The public’s deficiency in environmental literacy is preventing the formation of environmental policy. This is because the level of the public’s environmental awareness and concern has demonstrable effects on whether individuals are willing and able to participate in the creation of public policy that improves environmental quality. Based on an examination of public policy, environmental policy, environmental education literature pertaining to public knowledge and understanding of the environment, and environmental education literature, it is evident that the rapid growth of ecological issues in recent decades is demanding the need for a better informed society. The focus of this thesis is to analyze contemporary literature about public understanding of environmental problems, the role of the public in formulation of public policy related to environmental issues, and the role of education in combating environmental illiteracy. Further, this thesis addresses the increasingly important role of formal and informal education in enhancing and reinforcing the public’s basic knowledge of science, the environment, and related issues that affect individuals’ everyday lives and well-being.
Isolation and Characterization of Anaerobic Microbial Communities from Hydraulic Fracturing Fluids
Sustainability, Agriculture, & the Environment

Sheridan Brewer
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Hydrocarbon production from hydraulic fracturing of gas shale in the US has skyrocketed recently and is projected to keep growing. With the increase of this unconventional drilling method, concerns have been proposed about environmental safety and dangers to human health. This method involves injecting water-based fluid between 1-3 km deep into the Earth and the fluid produced from the well after drilling is often reused in other hydraulic fracturing operations. The goal of this study is to identify novel organisms that might have bioremediation capabilities for the toxic flowback water and compare microbial communities isolated from fracking water samples in anaerobic conditions. Water samples from Pennsylvania include six different collections of produced (flowback) water, a flowback mix tank, and three different treatment tanks. Inoculations from the water samples were grown under anaerobic conditions in high salinity marine media and halotolerant hydrocarbon degradation dependent media. DNA was extracted, and 16S rRNA gene sequences were used to identify the isolated microbes, and the microbial communities were characterized by 16S rRNA gene amplicon Illuminia sequencing. The physiological conditions of some significant isolated microbes were further characterized by the Omnilog phenotypic microarray system. Early results show presence of numerous anaerobic microbes including sulfate reducers.

Session 3C

Description of a Potential Mirror Matter Effect on the Neutron Lifetime
Science, Technology, & Society

Louis Varriano
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A precise measurement of the neutron lifetime is important for calculating the rate at which nucleosynthesis occurred after the Big Bang. The history of neutron lifetime measurements has demonstrated impressive continuous improvement in experimental technique and in accuracy. However, two most precise recent measurements performed by different techniques differ by about 3 standard deviations. This difference of 9.2 seconds can possibly be resolved by future experiments, but it may also be evidence of a new effect. This research investigates the possibility of explaining this difference by a mirror matter effect present in these experiments. Both mirror matter, a candidate for dark matter, and ordinary matter can have similar properties and self-interactions but will interact only gravitationally with each other, in accordance with observational evidence of dark matter. Although mirror matter does not couple to ordinary matter by Standard Model interactions, some additional interactions might exist, providing small mixing of ordinary matter neutral states, like the neutron, with mirror components. This work provides a phenomenological description of the neutron-mirror neutron interaction and considers the effects that may occur within the experimental framework. The cases of the three experiments performed in the last decade to detect the possibility of the mirror interaction are examined under this description.
The Budapest Semesters in Mathematics program offers students of mathematics the unique experience to study mathematics in an unfamiliar setting amongst a diverse class of students that undergraduates do not get to experience in traditional classroom settings. Budapest Semesters in Mathematics offers Fall, Spring and Summer semesters and this presentation will focus on the Summer 2015 semester, highlighting the Introduction to Abstract Algebra course and the Advanced Mathematical Problem Solving course. The presentation will briefly cover the application process, tuition and fees, acceptance and preparation, arriving in Budapest and the culture differences, the mathematical rigor of the courses, and the student body assembled for the Summer 2015 Semester. This presentation will highlight the benefits of studying mathematics in another country and why it is important for undergraduate students to challenge themselves both academically and culturally.
The goal of this project is to translate ten poems from the original Chilean Spanish into modern English poems with as strict adherence to the external, internal, and visual structure of the original form. Form, rhyme, and meter are kept as close as possible while also allowing the necessary room for change so that the poems are not translated literally but with proper cultural equivalents so the poem flows stylistically. This poetic integrity ensures that the translated poem imbibes the reader with the same imagery, ideas, and inspiration that the original did. This project also highlights some of the most common pitfalls of translation in regards to linguistic construction pattern, diction, and language circulation. This project also begs, and answers the question of why translation itself is needed. Translation is vital because it is an honest first person account of another culture and way of thinking. This newfound appreciation allows for a level of connectedness and serves as a reminder of the universal themes that humanity gravitates to in order to better understand themselves, their community, and their world. Observers should walk away with a better understanding of what translation is, what it is not, why it is a necessary component of literature, even, and especially in the 21st century, as well as a heightened appreciation of the written word and the value of every single word when trying to articulate and express oneself.
“achievement” generalized reciprocity where they stressed prestige and quantity for its own end “to be the best,” rather than the modestly expressed by the Trobrianders. Experiential cultural comparisons not only highlight the difficulties of cultural understanding and change, they make anthropological examples come alive and become more salient.

Finds at the ‘Ayan Gharandal 2015 Season

*Culture, Heritage, & the Creative Economy*

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The site of ‘Ayn Gharandal is approximately 70 km to the north of the Gulf of Aqaba in southern Jordan. Aqaba, both today and in antiquity (then known as Aila), is a port city with a major highway starting there and running to the north. It is on this highway that ‘Ayn Gharandal is located -- a Roman military fort and bathhouse dating to roughly the fourth century CE. The summer of 2015 marked the most recent field season for the site by a team from the University of Tennessee and the University of Missouri, Colombia, opening multiple squares in the bathhouse and one to the east of the fort’s principia. It is on this latter square that this presentation will focus, tracing the progress through the field season, from the preseason hypotheses of locating a courtyard or antechamber to ultimately revealing the finds and conclusions drawn by the dig team of which I was a part. Finds from the 2015 field season include multiple complete or nearly complete vessels with their origins in Petra, sherds of Egyptian Red Slip (a first ever at the site!), painted plaster featuring Greek letters, Roman coins, and significant architectural finds, including an unexpected religious structure. This field season also uncovered the entryway into the principia from the east.
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