

4-19-2018

## 2018 - The Twenty-third Annual Symposium of Student Scholars

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23<sup>rd</sup>  
Annual

SYMPOSIUM OF  
STUDENT SCHOLARS  
— & —  
STUDENT  
RESEARCH RECEPTION  
—  
APRIL 2018

*Recognizing excellence in student scholarship and creative activity*



# 23<sup>rd</sup> Annual Symposium of Student Scholars

## Undergraduate Research/ Creative Activity Reception

April 19, 2018

### Program

9:30am – 10:45am	Concurrent Oral Session I (Bagwell Education Building and Wilson Building)
11:00am – 12:15pm	Concurrent Oral Session II (Bagwell Education Building)
12:30pm – 1:45pm	Concurrent Oral Session III (Bagwell Education Building)
2:00pm – 3:00pm	Poster Session I (Convocation Center)
3:00pm – 4:00pm	Poster Session II (Convocation Center)
4:00pm – 5:00pm	Reception with hors d'oeuvres (Convocation Center)
5:00pm – 6:00pm	Awards Ceremony (Convocation Center)

#### Members of the Stage:

Dr. Ken Harmon, Interim President

Dr. Donald McGarey, Interim Vice President for Research

Dr. Mike Dishman, Dean of the Graduate College and Associate Vice President for Research Policy and Compliance

Dr. Valerie Whittlesey, Associate Vice President for Curriculum

Dr. David Evans, Dean and Assistant Vice President of Library Services

Dr. Amy Buddie, Director of the Office of Undergraduate Research

# Abstracts

# Bagwell College of Education

## Elementary and Early Childhood Education

### ***Between the Lines and Out of the Box: Critical Literacy***

Poster Presentation

Undergraduate Student(s): Kinsey Shrewsbury

Research Mentor(s): Virginie Jackson

*This case study examined the perceptions of a preservice teacher during the implementation of critical literacy with the integration of digital technology into a K-5 classroom setting. A formative experiment (Bradley & Reinking, 2011) model was used to better understand the perceptions of preservice teachers while implementing critical literacy in K-5 classroom settings. The teacher-centered, continuous mentorship focused on critical literacy and technology integration served as the intervention. This case study showed how teachers can fit critical literacy through technology integration into the literacy block by engaging students in shared or interactive reading activities with predetermined critical literacy questions as discussion points throughout the story. The results of this study also indicate that teaching critical literacy appears to affect elementary grade students positively. The pedagogical goal is for teachers to modify mandated curriculum so that they build learning experiences about student's lives in engaging ways-multiple, multimodal, and multifaceted.*

### ***The Misconceptions of Native Americans in Education's Past***

Oral Presentation

Undergraduate Student(s): Erin Tinnell

Research Mentor(s): Sohyun An

*What are elementary students expected to know about Native Americans in our history? How can we teach young children about Native Americans and their perspectives in a better way? The purpose of this research is to critically analyze the official school curriculum on Native Americans in elementary social studies curriculum and find ways to transform the current curriculum toward a more inclusive and accurate teaching of Native Americans in the past and present of the United States. After spending time in a classroom and seeing how the subject is being taught, there is a great deal of content that students are missing out on. Schools are doing an injustice to their students by not teaching Native Americans in a way that can help the community. The research methodology will include critical content analysis of state standards and school curriculum on Native Americans. Following the analysis, analysis of transformative literature and resources on Native Americans will be conducted. The research findings will be presented with focus on the current status of teaching about Native Americans to elementary students and the possible transformative curriculum on the topic. The research will contribute to a better history and social studies education that will help students be able to empathize with the Native Americans and learn to not repeat the mistakes of our past.*

## **Inclusive Education**

## **ACCEPTANCE: Training Peer Mentors Using Evidence Based Practices**

Graduate Student(s): Jasmine V. Ennis

Oral Presentation

Research Mentor(s): Kate Zimmer

*Children with autism are often ostracized by their peers due to their nonconforming social interaction skills and their limited interactions with others. Despite concerted efforts to expand the definition and nature of 'inclusion' in public school systems across the nation, this issue persists and negatively impacts such children even into adulthood. A possible contributing factor to this problem is that their typically developing peers have limited knowledge or awareness of how to support them in attaining and demonstrating appropriate social skills.*

*The purpose of this experimental study is to test the theory that there is a significant increase of implementation of evidence based practices, as observed through peer mentor interactions, once the peer mentor training intervention is complete. Additionally, the purpose of incorporating the second intervention of Mursion virtual simulations is to further increase the implementation of evidence based practices by the peer mentor.*

## **Translanguaging in Content Classes: A Study of a Trilingual Preschooler**

Poster Presentation

Undergraduate Student(s): Shakira Bell, Mari Heimlich

Research Mentor(s): Jayoung Choi

*Mari Heimlich and I, Shakira Bell, would like to share our research experience as undergraduate students at the Symposium of Student Scholars at KSU. Both of us have been involved with Dr. Choi's research about her own trilingual children's language practices at her home context.*

*The research project is a qualitative research study that has many implications for all teachers who teach linguistically and culturally diverse students in schools. The project explores how two preschoolers make sense of and express meaning by drawing on all of their linguistic resources in a multilingual household where they speak Korean, Farsi, and English. It problematizes the fact that multilingual students come to schools required to speak only English and challenges a monolingual ideology pervasive in the U.S.*

*Dr. Choi has been collecting audio, video recordings of her children's conversations as well as writing her observations in her research notes. The major research questions are a) How does a trilingual preschooler draw on three languages, Korean, Farsi, and English to make sense of his world and to express meaning? And b) What are the implications of the trilingual preschooler's translanguaging practices in formal schooling? The research findings so far show simultaneous multilingual preschoolers' flexible and creative use of all languages in making meaning.*

*The poster session includes two parts with the first part addressing translanguaging practices of a trilingual preschooler. The second part will address practical tips on how to support students' home languages in elementary classes.*

# Coles College of Business

## Economics, Finance, & Quantitative Analysis

### ***Analysis of Productivity for A.L. Burruss Institute Projects***

Undergraduate Student(s): Reanna McKee, Sarai Bauguess

Research Mentor(s): Ryan Falvai

*Since 1999, the A.L. Burruss Institute has been providing applied research skills and data collection services to nonprofits and local governments. One of their main services is survey data collection through their phone lab. When the lab is being actively used, productivity reports detailing the number of interviewers, dials, completed surveys, and hours worked are collected daily. The goal of this project is to learn how to improve efficiency for the lab by using this secondary data as well information about each project, including the cost and estimated completion date. We will be using regression analysis in R to build an equation to determine how many interviewers, supervisors, and hours spent dialing are needed to complete a project or a certain number of completed surveys. We will be using productivity data on all projects dating back to July 2016. This gives us access to 13 projects. We expect to be able to predict the estimated completion time for a project as well as examining the efficiency of each additional interviewer and each project.*

## Marketing & Professional Sales

### ***Namaste in the USA: The Growing Pains Yoga Faces in American Culture***

Poster Presentation

Undergraduate Student(s): Clay Wilderman, Tammy Le, Daniel McNabb, Autumn

Richardson, Jake Vasquez

Research Mentor(s): Mona Sinha

*Complementary and alternative medicines have soared in popularity among US adolescents and adults as they explore a more holistic approach to cure everyday ailments, aches, and pains. Yoga, a mind, body, and spiritual practice can be traced back nearly 5,000 years to its birthplace in India. This case study examines the practice and background of yoga, its rising popularity in the United States, and the challenges it faces in becoming mainstream given its roots in Hinduism and its classification as an alternative healthcare practice as opposed to mainstream western medicine. The case represents a start-up company's perspective and the business issues they must evaluate before launching their yoga studio in the US.*

*Yoga assists achieving inner peace, focus, and aiding in overall mental wellness within children and adults alike. Around 36.7 million Americans actively practice Yoga (2016) and believe that it relieves stress, enhances athletic performance, and increases strength and flexibility. Over 36 programs offer yoga in over 940 schools across the US, however, the adoption of the practice in schools alongside the upturn in mental and physical awareness actually pose several threats to yoga programs. Not only have*

*they become the subject of scrutiny because of yoga's religious affiliation with Hinduism and shift away from western medicine, but qualified yoga instructors are in weak supply due to the quick explosion in popularity. In schools and new studios alike, beginning yoga studios and programs face challenges in the US that the Brahmans, Rishis, and Yogis could never foresee.*

### ***The Jungle of e-Commerce: Why Amazon is Failing in China***

Poster Presentation

Undergraduate Student(s): Kamila Daza, Susana Diaz, Devin Mann, Sinan Nurdogan, Adam Stasevich, Alexys Wilson

Research Mentor(s): Mona Sinha

*Amazon is \$768 billion retailing giant that has been hugely successful in the United States and many other international markets, but has failed to make a dent in China's emerging e-commerce market. Its' market share in the United States is 44% but in China it has merely a 0.9% share of the market since its entry in 2004. The dominant ecommerce player in China is Alibaba with a 51.3% share of the market. This case study describes China's market and compares the marketing strategies of Amazon versus Alibaba. In particular, this case examines the cultural similarities and differences between the American and Chinese consumers, Chinese consumers' distrust to foreign companies, Amazon's target audience and Chinese consumer groups, Amazon's distribution system in China, and different pricing options in China's e-commerce market. The case questions help evaluate the best course of action that Amazon must take to succeed in China.*

### ***Vodafone: Digitizing India's Cash to Code with MPesa***

Poster Presentation

Undergraduate Student(s): Jackson Lott, Eady Connally, Kelly Herrera, Michael Phillips, Tyler Black, Tyler Bohn

Research Mentor(s): Mona Sinha

*Vodafone is trying to enter the mobile wallet market of India with their product, MPesa, which was originally designed and implemented successfully in Kenya, providing millions with access to mobile financial services. Currently over 90% of transactions in India are cash based, which not only hampers business but also exacerbates issues like corruption and counterfeiting. With a rising penetration rate of mobile phones and more mobile internet users, India is a very attractive place for companies to offer mobile wallets. According to industry estimates, the mobile money market is expected to reach USD \$112.3 billion in 2021 from USD \$21.2 billion in 2016- a compound annual growth rate (CAGR) of over more than 39.6%. Vodafone hopes to target those people who either don't have bank accounts, or who rarely use them, with their product MPesa. With sweeping government reforms and investment on infrastructure, India is becoming more desirable for companies like Vodafone to enter the country's mobile wallet market; however, Vodafone lost its early entrant advantage share to Paytm and other local new entrants. Vodafone has plans on expanding their recent efforts further to make MPesa the number one mobile payment system in India. To succeed, Vodafone will have to face competitive, regulatory, and culture challenges. The threat of growing competitive pressure could reduce market share and*



*profitability as customers have a wide choice of suppliers to choose from in this highly competitive market with multiple alternative providers national and international players.*

### ***The Great Wall of AirBnB China***

Poster Presentation

Undergraduate Student(s): Abbie Hillis, Gavin Cagle, Ryan Calhoun, Chris Wingate, Kaleigh Young, Alexis Tremble

Research Mentor(s): Mona Sinha

*Airbnb has over 2 million listings worldwide of which less than 2 percent are in China. This case study identifies the key marketing challenges faced by Airbnb in China. It faces stiff competition from a number of local companies, such as Tujia and Mayi which grabbed market share in China, long before AirBnB. Moreover, AirBnB caused quite a stir in the market when they launched a new brand name for the company: Aibiyang. This translates to “welcome each other with love.” Not only did this fail to win over Chinese travelers, but also seemed to backfire on the company when travelers deemed the new brand name to be meaningless and confusing. Airbnb has faced a number of setbacks in the world’s largest travel marketing, many of which are rooted in cultural issues, the speed and convenience between platforms, and the strict regulatory environment.*

*The Chinese market has always been an extremely difficult market for Western tech companies to prosper and profit. Even though Airbnb has not entirely lost the attention of its Chinese tourist, it is critical that this company find its niche in China’s hospitality market instantly. The case questions help evaluate AirBnB’s current and future marketing strategy in China.*

### ***AirBnB: Facing Late Entrant Disadvantage in China***

Poster Presentation

Undergraduate Student(s): Ryan Patel, Wes Davis, Drew Boles

Research Mentor(s): Mona Sinha

*Multinationals struggle in entering emerging markets, especially one as complex and regulated as China. Indeed, many have already failed or have been restricted from operating there. AirBnB pioneered a unique hospitality idea perfect for the rise in ‘sharing economies’ and has been successful in many countries. However, when it entered China, it found that local upstarts like Tujia had already established dominant positions. In addition, Tujia had innovated and taken on property management. AirBnB changed its name change to Aibiyang in order to localize but found out that the word has some offensive connotations and hence, was not received well. This case study describes AirBnB’s multiple challenges in competing in China including understanding local cultures and preferences, dealing with competitors, and even navigating the complex regulatory restrictions. The case raises interesting questions about how AirBnB can change its marketing strategy in order to overcome its rough start in China.*

### ***Disney’s Bollywood Battle***

Poster Presentation

Undergraduate Student(s): Nikita Patel

Research Mentor(s): Mona Sinha

*India is a rapidly growing emerging market with a large film industry. Entertainment companies like Disney have entered the market, hoping to cash in on the growing demand for entertainment. However, Disney has failed in replicating its global success in India. Competing with Bollywood needed a deep understanding of socio-cultural factors which was not easy given India's large diversity in terms of regional diversity of languages, social norms, sub-cultures and the fierce competition from established local competitors. This case study examines Disney's struggle to compete against entrenched Bollywood competitors. By understanding Disney's marketing strategy in India in the context of the country's economy, culture, political and social background, the case study contextualizes the challenges that multinationals face in their international foray.*

### ***Ola v. Uber: The Blaring Battle between India's Locally Trusted Transportation Company and Their New, Infamous Rival***

Poster Presentation

Undergraduate Student(s): Elizabeth Beall, Kevin Testerman, Alexa Baumgartner, Anasasia Krunk, Greg Chafin, Kevin McKay

Research Mentor(s): Mona Sinha

*India is a high growth emerging market which is also urbanizing rapidly and facing challenges in terms of traffic congestion, pollution and infrastructure constraints. This case study describes the launch of Uber in India and the stiff challenge it faces from a local ride share start up, Ola, as well as other local transportation options. India is a lucrative market since 90% of the 1.1 billion population does not own cars. Both companies have since introduced motorbike services, the country's most popular, cheap and convenient transport option for maneuvering around traffic-clogged cities. This case study describes Indian consumers' transportation preferences, the challenges faced and recent technological advances. Nowadays with Ola, 200,000 rides are placed daily on apps and Uber with 5 million registered on the Uber app. Ola being a local company has been able to offer services that local consumers find valuable, for example, grocery delivery differing ride styles, and the choice of economy, carpool, etc. Ola's market leadership poses a significant challenge for Uber in a market that is critical for its success, given its recent debacle in China coupled with the many corporate, legal and leadership problems the company is facing in the United States. The case questions will help examine the underlying growth factors, opportunities, struggles and obstacles in the battle between Uber and Ola.*

### ***Toto: A Game of Thrones Taking Place in the U.S.***

Poster Presentation

Undergraduate Student(s): Georhton Correia do Carmo, Gabrielle Bordelon, Rachael Amatriain, Lauren Benson, Erin Lutz, Lauren Welch

Research Mentor(s): Mona Sinha

*Toto is a 100-year-old Japanese Company; Toto manufacturers are at the epitome of Luxury and Innovative Bathroom Utilities. Toto has differentiated its brand with a plethora of state of the art*

*bathroom equipment such as, One-Piece, Two-Piece, and Wall-Hung toilets, as well as Bidets, Washlets, and Toilets with built-in Ultraviolet Sanitation equipment. Through both a century of history and a commitment to excellence, Toto has positioned its brand above the competition. However, despite its long history of excellence, Toto's recent entry into the U.S. market has been challenging. The 'Bathroom Conversation' makes it difficult for Toto to advertise to the High-Class clients they aim to appeal to. Apart from Changing Societal Perception, Toto also faces a Target Market Issue. Though Toto has established its brand as an exclusive and luxurious manufacturer, its high price point and technological innovations may not effectively appeal to their intended target market. Toto's groundbreaking Actilight Technology destroys bacteria and is an overall healthier approach to human waste disposal; however, the \$10,000 price tag of the Neorest toilet may be well above what most Americans would be willing to budget for a toilet. This case study explores the struggles of Toto in the United States. The case questions focus on the marketing strategy changes that Toto must make to succeed in the US.*

### ***How Advertisers Can Use Social Media to Release More Dopamine to Improve the Affect on the Consumer Purchase Decision***

Poster Presentation

Undergraduate Student(s): David Carter

Research Mentor(s): Sandra Pierquet

*This research study aims to outline the connection between dopamine and social media, with the overall goal being to aid marketers in creating more effective online advertisements personalized for the consumers. Since the discovery of dopamine in 1957 by Arvid Carlsson, marketing and this "bliss" neurotransmitter have been on a crash course. The neurotransmitter dopamine is primarily concentrated in the basal ganglia and is a precursor to norepinephrine. What this means in common terms is dopamine is associated with our tasks and rewards center, i.e. when something unexpectedly good happens like trying a new food or a surprise hug our dopamine is triggered in our basal ganglia. (In contrast, certain adverse drugs can release dopamine and are speculated to be responsible for addictive properties).*

*Social Media is currently sitting at over a 100 billion dollar industry and shows no signs of stopping. The attentive marketer should realize this and be putting his time and effort into this field. This paper will strive to demonstrate the link between dopamine and the popularity of social media by answering the question: 'Is there a significant link between dopamine release and the addictive nature of social media?'. It is hypothesized that there will be a significant relationship established, and that the study will demonstrate the human brain's natural release of dopamine can be commandeered in order to create strong brand loyalty and customer satisfaction.*

## **Information Systems**

### ***Using Biometric Tools to Understand the Relationship Between Individual Characteristics and Cognitive Abilities***

Oral Presentation

Graduate Student(s): Solome Mekbib

Research Mentor(s): Adriane B. Randolph, Kimberly Cortes

*Students in the field of STEM often struggle with understanding bigger concepts, problem solving, and retaining information during the learning process. It is imperative to understand the elements of cognitive learning by assessing each student and collecting data on student performance. This research study presents a unique perspective using a 3D modeling approach; and mobile brain-computer interface technologies, such as electroencephalogram (EEG), and eye tracking technologies to uncover cognitive challenges. Understanding differences in various cognitive tasks such as meditation, athleticism, and biometric computer usage between males and females could ultimately improve the burden that come with cognitive impairments. While this study focuses on the general STEM student population, it has implications for further studies in various population such as geriatrics and individuals struggling with memory loss disorders.*

### **Responsible Disclosure Best Practices**

Undergraduate Student(s): Kelly Dodson, Peter Easton

Research Mentor(s): Andrew Green

*Data breaches are becoming commonplace in today's connected environment. Digital criminals are becoming smarter, more organized, and leveraging new technologies faster and more efficiently to identify and exploit vulnerabilities. Companies facing this exponentially expanding threat landscape, in addition to an evolving regulatory environment, are scrambling to protect their people, systems, applications, networks, and processes from both internal and external threats. Often, companies are breached many months or even years in advance of discovery, if it's discovered at all, making remediation of damages an uphill battle. Suffering a data breach exposes companies to fines, revenue loss, image tarnishing, and in extreme cases, bankruptcy. With such significant ramifications, companies are often incentivized to delay notification, or even go so far as to cover a breach up. Recent, highly publicized, large scale data breaches and resulting company behavior has led to discussions and legislation changes in both the public and private sector. In an effort to not only treat a symptom of the underlying problem, responsible disclosure/bug bounty programs have been deployed by companies to leverage the knowledge, skills and time of security researchers to proactively discover their vulnerabilities. These programs provide a safe way for researchers to report their findings, and in some cases, publicly and financially reward the individuals who responsibly disclose them.*

*Our research in progress will explore the necessity and best practices of responsible disclosure/bug bounty programs, by exploring the current programs in place at the top 20 Fortune 500 tech companies.*

## **College of Architecture and Construction Management**

### **Architecture**

**[Re]Defining Chandigarh**

Poster Presentation

Undergraduate Student(s): Dhruvee Patel

Research Mentor(s): Ameen Farooq, Peter Pittman

*Chandigarh is the first planned modern city in India as a symbol of nation's faith in the future designed by Le Corbusier in 1951 in the East Punjab. Through investigation it became apparent that Le Corbusier proposed design principles for Chandigarh that were already theorized for Bogota in Colombia and Marseille in France following his concept of Radiant village that was never built.*

*His design for Chandigarh was more of a prototype model, which failed to capture the spirit of Indian culture and community, making it harder to navigate and familiarize with the city. If architecture is a reflection of society and culture then, is Chandigarh a successful project or a failed experiment?*

*Evidences can be seen in Sector 1, the head of the city with administrative buildings stretched out on a vast barren plain following the Modular system. It is more like a play of massive sculptural buildings with open isolated voids in the front designed in harmony with human proportional system yet hard for a human to connect to.*

*Hence, the aim of the project is to propose a new plan for Sector 1 as the head of the city, which is connected to its body facing the city in opposition to what Le Corbusier proposed in the administrative area that turns its back towards people in this city. This study is more about revisiting and redefining the administrative area of Chandigarh that is more responsive to people.*

*This study is an attempt to show how to actually translate the term "Modernism" in Indian context instead of blindly transferring it and imposing Western principles in India.*

## College of Computing and Software Engineering

### Computer Science

#### *Inquiry on the Accuracy of Grades on Representing Acquired Knowledge*

Poster Presentation

Undergraduate Student(s): Sourav Debnath

Research Mentor(s): Paola Spoletini

*Grading is foundational to our current educational system; grades are used to provide feedback to students about their understanding of the subject and to provide guidance and motivation for further studying. Grades are also used by education administrators to rank students according to their achievements and allow admission or retention to an institute or a class or program of the institute. However, this amount of dependency on grades is concerning given that there are not a lot of evidence on the accuracy and reliability of this quantitative representation of acquired knowledge. This research aspires to explore this evidential gap and find the real correlation between grades and knowledge.*

*Initially the research plans to conduct an online questionnaire directed to Kennesaw State University students who have taken at least junior level computing classes. Specifically, the questionnaire inquires students about their major, the motivation behind choosing the major, the expectations and outcomes of the classes they have taken, how much they have mastered the learning outcomes and how much the learning outcomes helped them prepare in the subsequent higher level classes. Next, the research plans to organize a focus study group where the quantitative data gathered from the questionnaire will be used to build a qualitative grounded model on how the students feel about the accuracy of the grades they receive at the end of a class. In the end, this research aims to reflect on the efficiency of our current grading system and proposes a newer alternative where the classes will be designed to revolve around real-world objectives and students will be graded on their mastery of these objectives. Since these objectives are universally applicable, students, educators, and even employers can confidently rely on the objective grades. However, further research will confirm whether such alternative is feasible.*

### ***Animal Detection Using R-CNN***

Poster Presentation

Undergraduate Student(s): John Jajeh, Masood Abdul Salam

Research Mentor(s): Mignon Kang

*By applying regions on CNN features, R-CNN provides computer vision solutions for multiple-object detection. In our research, we are utilizing AlexNet's pre-trained model in the Caffe framework to detect approximately 400 different animal species and are acclimating this work from KSU's GPU server to the Android environment. After an individual downloads the application and an animal is detected, he/she can click on the animal, which will prompt Google to search the animal label. Essentially, this app will allow users to photograph unfamiliar (or familiar) animals for identification and better personal understanding.*

## **Information Technology**

### ***Food for Thought***

Poster Presentation

Undergraduate Student(s): Mizzani Walker-Holmes

Research Mentor(s): Carl DiSalvo

*This project explores public opinion on the Supplemental Nutrition Assistance Program (SNAP) in news and social media outlets, and tracks elected representatives' voting records on issues relating to SNAP and food insecurity. We used machine learning, sentiment analysis, and text mining to analyze national and state level coverage of SNAP in order to gauge perceptions of the program over time across these outlets. Preliminary results indicate that the majority of news coverage is negative, more partisan news outlets have more extreme sentiment, and that clustering of negative reporting on SNAP occurs the South. Our final results and tools will be displayed in an on-line application that the ACFB Advocacy team can use to inform their communication to relevant stakeholders.*

# College of Humanities and Social Sciences

## Foreign Languages

### ***Il Silenzio***

Poster Presentation

Undergraduate Student(s): Kenneth Samuel Presley

Research Mentor(s): Federica Santini

*My work is called "Il Silenzio". In one of my Italian classes, we briefly studied Italian Feminist Art by artists such as Ketty La Rocha and Giulia Niccolai, and Fausta Ottini. Their work fascinated me. La Rocha Niccolai, and Ottini used photography and collage and other creative means to create works whose themes are centralized around the struggle of women in Italy at the time. These themes include being silenced, political manifestation of silencing, and the influence of religion on daily life. These really spoke to me on a personal level. My piece is directly influenced by these great artists, and is centralized around the same themes, but from the perspective of the LGBTQIA community in America.*

### ***How Giulia Niccolai has Changed Italian Contemporary Literature***

Poster Presentation

Undergraduate Student(s): Santiago Meneses

Research Mentor(s): Federica Santini

*I have been studying Italian contemporary author Giulia Niccolai for 2 semesters with Dr. Santini, and I am currently writing my final paper for senior seminar on her life, work, and her role not only in Italian literature, but in feminism. Also, I discuss how she is one of the most underrated authors in Italy, and why she deserves more recognition, based on her work in photography, literature, and art. The following is a short introduction and the thesis from my paper:*

*Italian is one of the languages that gave birth to some of the most significant and important authors, especially in contemporary literature and the Renaissance. They influenced the history of literature not only during the Renaissance, where some of the best writers of all time, such as Petrarch, Dante and Boccaccio became figures, but in the 20th century, when authors such as Umberto Eco and Giulia Niccolai were framed in Italian literary history. Although Eco is more known and has received more credit, many experts in contemporary literature argue that Niccolai has had a greater impact, especially from a feminist point of view. Although Niccolai was one of the most underrated authors of her time, due to her vast areas of expertise and experience in poetry, translation and photography, she was one of the most important authors of contemporary Italian literature. There was not another Italian author so innovative in his works like her.*

## Interdisciplinary Studies

***The Globalization of Korean Pop Music: An Analysis of the Cultural and Social Effects***

## Poster Presentation

Graduate Student(s): Isla Baldrige

Research Mentor(s): Jeongyi Lee

*Korean popular culture has expanded its reach to an international audience at an astounding pace in the past several years. Most notably, Korean pop music (commonly referred to as K-pop) has engaged and entertained many individuals and has crossed language barriers, becoming a beloved genre of music around the globe. This study will compile research to present insight into what has made K-pop so successful in the past several years from a sociological standpoint and how this has also spurred interest in Korean culture and language. A history of the cultural and social effects of K-pop on a transnational scale will be tracked from the 2000s to present.*

## ***“Corn and Tomatoes” – An Edible History Project Examining Their Historical Role in Southern Foodways***

### Poster Presentation

Graduate Student(s): Suzie McWhirter

Research Mentor(s): Tom Okie

*This research was conducted as part of an edible history project for a graduate study of movements in American culture, particularly southern food in American history. As such, the culminating activity has produced this essay, which provides an explanation for how tomatoes and corn became an intrinsic part of the foodways of the American South. It briefly describes the history of these two ancient vegetables and their journey from South America (tomato) and Mexico (corn) as they made their way first into Southern gardens, then kitchens, and finally its culture. Identifying various specific historical examples such as the tomato clubs started in South Carolina that used the canning of tomatoes to transform social hierarchies at a grassroots level and which ignited rural girl's entrepreneurial spirits, it shows how fully these two vegetables have become part of the cultural fabric of Southern food history. Exploring festivals and regional specialties where tomatoes and corn reign supreme, this research demonstrates how the various Southern areas (Old South, Coastal/Low Country, Appalachia, Creole, Deep South) have adopted these two vegetables. Using first person point of view in order to employ an embodied prose approach specifically aimed at using my experience as a Southerner in order to inhabit the space of the narrative, this project provides the opportunity to explain the historical scholarship on southern foodways while also relating what I hope is a compelling narrative.*

## ***Feminist Bookstores and Gender and Women's Studies Activism***

### Oral Presentation

Undergraduate Student(s): Dartricia Rollins

Research Mentor(s): Letizia Guglielmo

*With second wave feminism women moved on from fighting for their right to vote to their right to exist outside of the home and without violence. Women took to the streets to fight against wage gaps, racism, domestic violence as well as the right to a safe abortion. Out of this wave came a building of a movement. The feminist bookstore movement created more than 100 independent feminist bookstores*



*across the nation, existing to not only create space for women to organize, but space for women to escape abuse, find resources and see themselves reflected in literature. Along with the feminist bookstore movement came a surge of gender and women's studies programs, that sought to thoughtfully examine sex and gender beyond the binary and gender roles and to galvanize women through history that reflected their experiences. Feminist bookstores provide the context as well as resources that gender and women's studies programs need to examine intersectionality as more than just a word, but a way to address social issues. My research will explore the relationship between the feminist bookstore movement and the emergence of gender and women's studies programs from the seventies up until today. I will use peer reviewed literature as well as a firsthand account and experiences of interning at a feminist bookstore and how it has shaped my learning in the gender and women's studies program.*

### ***Tracing Misogyny in American Culture***

Poster Presentation

Undergraduate Student(s): Jeremy Hall, Brayden Milam

Research Mentor(s): Letizia Guglielmo

*Contributing to a two-volume set of reference essays on misogyny in American culture, researchers explored the history, current trends, impacts of, and responses to misogyny across a range of topics and areas of American life. The scope of this research included politics, education, literature, sports, beauty and fashion, public policy, health and medicine, film, music, video gaming, science, and technology among a variety of other topics. Working collaboratively as a research team, the authors identified key events, figures, and organizations as well as sources of additional information for a target audience of near-peers (i.e. upper-high school and beginning college students). This poster presentation will showcase the findings of this collaborative research, including a chronology illustrating the pervasiveness and persistence of misogyny in American culture. Given our current political and cultural climate and the more frequent and widespread use of the term misogyny by various media outlets and among voters during the 2016 presidential election, this project contributes to ongoing conversations on the topic and, among its intended audience of advanced high-school/beginning college students and the general public, informs a more recent shift in public conversation on sexual harassment and assault. Significantly, the researchers' findings are also grounded in and informed by an intersectional approach to the topic with the goal of expanding and complicating current definitions of the term misogyny.*

### ***Misogyny in American Culture: A Case Study on Radio and Journalism***

Oral Presentation

Undergraduate Student(s): Jordan Hawthorn, Laine Magaletta, Andrea Putala

Research Mentor(s): Letizia Guglielmo

*Misogyny finds itself deeply rooted in the fields of radio and journalism with implications for both professionals within these fields and the audiences who are influenced by their content. Contributing to a two-volume set of references essays exploring misogyny in American culture, researchers explored the history, current trends, impacts, and responses to misogyny in radio and journalism, identifying primary forms of misogyny that involve a dislike of, contempt for, or ingrained prejudice against women*

*that often results in devaluing or slandering women for entertainment purposes, devaluing women's professional abilities, and distrust of women as reliable resources of information. Researchers also discovered that the education of emerging journalists plays a significant role in shaping the content that is covered, sidelining and silencing subjects such as human rights, abortion, and lifestyle. In radio, for example, there remains clear sexism in the form of shock jocks like Don Imus and Rush Limbaugh. Recognizing that expressed bias against women and sexism remains evident in professional attitudes and behaviors in these fields, presenters will outline the far reaching and persistent impacts of this misogyny. Women, for example, still face sexual harassment and assault in the workplace, and digital and social media have facilitated both new forums for women's voices as well as backlash in the form of online trolls. Responses to this misogyny, as presenters will explain, include female led news sites, magazines, radio shows, and podcasts as well as increased efforts to document and publicize the number of women working within various media.*

## **English**

### ***The Process of Developmental Editing***

Oral Presentation

Undergraduate Student(s): Courtney Bradford

Research Mentor(s): Lara Smith-Sitton

*This presentation will discuss the creative process behind writing and editing a narrative from a high school student's experience of immigrating to America and leaving behind her home country. In addition, it will also discuss the process of developmental editing with an author and how that helped create the essay. As well as discussing the process behind helping write and edit the author's essay, it will include a reading of the finalized narrative, which comes from a collection entitled *Green Card Voices: Immigration Stories from Atlanta High Schools* that our class helped edit and create with the young immigrants who shared their stories. This presentation will fit well alongside other presentations and papers that discuss immigration in America.*

### ***Why Students Should Story Themselves: The Benefits of Autoethnographic Writing***

Oral Presentation

Undergraduate Student(s): Stephen Oweida

Research Mentor(s): Lara Smith-Sitton

*For many students, college represents a period of great change. As students learn, meet new people, and engage in new activities their identities shift. Shifting identity causes enough stress on its own, but then consider all of the other stressors a college student might experience in the United States: gender and sexual identity issues, issues of race, campus safety, physical and mental disability, social media issues. Even the prospect of picking a major can be a confusing, stress-inducing journey.*

*Engaging with stories changes the way readers experience and interpret their own lives and the world at large. We gain an understanding from reading a story that otherwise would have gone unnoticed. Stories fill in the gaps where meaning is hard to find, and they create epiphanies when a resolution is*

*evasive. Storying the self through autoethnographic writing lets the writer interpret their own life in order to gain a deeper understanding of themselves. Students who deal with all of these issues are searching for that deeper meaning, that connection, and resolution. Each student has their own story, and each one is worth writing about. This presentation will discuss why autoethnography is a valuable writing tool for students seeking to enhance their professional endeavors, for those experiences moments of stress, and for anyone who appreciates the value of stories. This type of writing is important because it can help find the solutions to the many problems facing college students today.*

### ***Call It Love or Call It Reason: The Rhetoric of Phil Ochs***

Poster Presentation

Undergraduate Student(s): Annie Doragh

Research Mentor(s): Letizia Guglielmo

*The 1960's saw the rise of a wide variety of social movements collectively referred to as the New Left, and accompanying this was an explosion of musicians using their songs in support of these movements and in protest of those who stood against them. Protest music became a popular form of political speech, the legacy of which is seen in the continuing fame of artists like Bob Dylan, Pete Seeger, and Woody Guthrie. However, another musician has seen a resurgence of popularity thanks in part to the presence of the far left in social media: Phil Ochs. Offering a more radical stance on social issues than many of his contemporaries, Ochs was immensely popular in his time, performing sold out shows at Carnegie Hall and drawing large crowds at rallies and festivals. While the songs of mainstream artists like Dylan have been analyzed for rhetorical significance, the body of Ochs' work has largely been ignored in academic research. This project attempts to address this gap by engaging in a rhetorical analysis of Phil Ochs' music with particular emphasis on his 1965 album I Ain't Marching Anymore. Through his music, Ochs uses classic Aristotelian rhetorical tactics that make his songs powerful pushes for change, a theme which I will explore thoroughly. I will also address his renewed popularity as well as an intriguing trend where his songs are being covered with updated lyrics that make them politically relevant to modern America.*

### ***Potential for Change: The Power of Instagram as Space for Rhetorical Discourse on Disability***

Oral Presentation

Undergraduate Student(s): Jade Rivers

Research Mentor(s): Letizia Guglielmo

*Social movements are often examined post-movement in terms of rhetorical appeal; that is, only after successful mobilization are social movements looked at rhetorically on a broad spectrum. Disabled people have, for decades, been organizing and mobilizing for social change, but the advent of social media has revolutionized access for disabled people. This access has facilitated the creation of many spaces for activism on social media that are deeply rhetorical. Among these spaces is instagram. This particular digital space has become a haven for raising consciousness in the disabled community, and my presentation will be exploring the ways that disabled activists are making rhetorical appeals on Instagram to unite people inside and outside of the disabled community, creating broad potential for mobilization that was formerly inaccessible to that particular community.*

## ***Do You Speak Twin?***

Oral Presentation

Undergraduate Student(s): Coty Peltonen

Research Mentor(s): Jeanne Bohannon

*I will be performing a sociolinguistic discourse analysis on the code-switching patterns present in verbal communication between twins. The purpose of this analysis is to identify the patterns, if any, in the communicative tendencies between a set of twins in comparison to their communication with individuals outside of their sibling relation. For the purposes of this study, I identify the patterns present in twin YouTube personalities, focusing on choices in diction and rhythm in their speech and measure the magnitude of difference in those choices once speaking with an individual other than their sibling. The overall lack of research done in this particular area of linguistics prompts the focus of this analysis, as there is a scant amount of published academic material focusing on code switching in this manner. With the newfound age of technology reducing the overall verbal communication necessary world wide, how will the staggering reduction in verbal communication affect the way that even those who are considered to possess the closest connections to one and other speak between themselves?*

## ***Phil Elverum and American Transcendentalism***

Oral Presentation

Undergraduate Student(s): Emmanuel Castillo

Research Mentor(s): Jeanne Bohannon

*Music outside of classical or jazz canon has the reputation of being viewed as “low-art” by academia, an often classist description that erases the voices of non-traditional work made by non-traditional artists, no matter the influence that art or artist may have accrued. The work of Phil Elverum, an American indie/folk/experimental songwriter known best for the music created under the monikers the Microphones and Mount Eerie, has a strong case to be made as a descendent of American Transcendental literature, and therefore elevates his music to the “high-art” worthy of academic study, and continues the conversation for other art to be considered similarly via a more equitable lens of academic writing. Through a textual analysis of his work, this presentation aims to compare and evaluate the distinct thread that can be run from the work of prominent Transcendentalists, such as Walt Whitman, and the themes they would incorporate to the work of Elverum as a modern version of the pastoral writing that was common at the time of the movement. In his own words, Elverum describes his recent writing as “Close and direct. Dense with easy words. [...] Say everything as it is.” In addition, this paper will closely examine how Elverum has furthered the conversation begun by the Transcendentalists. Additionally, the textual analysis will be supplemented by Elverum’s own words in various interviews with journalists, in which he echoes and reinforces the connection between the thematic elements of both his work and Transcendentalism.*

## ***Hard and Brittle: Subversive and Subjective Language in The Glass Menagerie***

Oral Presentation

Undergraduate Student(s): Jennifer Frykman

Research Mentor(s): Jeanne Bohannon

*Due to ongoing reports that are rapidly emerging about the harassment and unfair treatment disabled persons, and women, face daily, it is important to reexamine Tennessee Williams's play *The Glass Menagerie*. The play was published in 1944 and features only four people, including the supposedly disabled Laura Wingfield. Laura's impairment is both the driving force of the plot, as well as the reason for the title. Laura is also treated and made to feel like the delicate glass figurines she handles by the subjective language used when speaking to her. For this project, I examine the play and the language used by, as well as about, Laura. I conduct a textual analysis to determine the lasting effects on Laura, and hope to add to existing research regarding the danger of subjecting women and disabled persons to stigmatizing language.*

### ***Dialect of The Coen Brothers***

Oral Presentation

Undergraduate Student(s): John Samuel Mecum

Research Mentor(s): Jeanne Bohannon

*Recorded sound was first incorporated within film with *The Jazz Singer* in 1927. Thousands of movies have been made in the near 100 years since then, and they have utilized dialogue to advance narratives and further immerse audiences within the medium. The settings and characters that exist within these stories are from all over the world, and they incorporate a large variety of languages and dialects. Two filmmakers in particular, brothers, Joel and Ethan Coen, make movies that take place in vastly different and unique sections of the United States. The characters that exist within these stories, while unique and memorable in their own ways, are meant to represent the actual people from these regions. What separates the Coen Brothers from other filmmakers, is the importance they place on the dialects spoken by the actors. After multiple viewings and readings of the screenplays, this presentation will linguistically analyze the dialogue of four films by The Coen Brothers and assess whether or not the focus on dialect, can be used to advance the narrative of the story, or only exists as a part of the story's setting. The four films: *Fargo*, *The Big Lebowski*, *O Brother, Where Art Thou?*, and *No Country For Old Men* take place in four vastly different parts of the country. From Minnesota to Texas and Mississippi to California, these stories contain characters with unique backgrounds and dialects that demonstrate how much normal, everyday, language can shift and transform within the borders of our own country.*

### ***Is it Stereotypical? The Language and Tone Presented by the Female Characters in "The Office"***

Poster Presentation

Undergraduate Student(s): Chinonye Nwachukwu

Research Mentor(s): Jeanne Bohannon

*I will present a summary of a linguistic analysis in which I compare and contrast the language and tone presented in the dialogue of female characters in the hit American television comedy "The Office". This type of analysis of popular culture artifacts is important because it addresses how different types of*

women are portrayed on television and how audiences respond to their tone and word choice. In my presentation, I will give a sense of how the writers and possible audience members view women based on the linguistic constructions that drive the actions of specific female characters. This research will let viewers identify female gendered stereotypes in not only media but also in society while exposing the ridicule of stereotypes based on perceived language constructions. I will use dialogue from the female characters in "The Office" including (but not limited to) Pam Beesly, Angela Martin, Jan Levinson, and Phyllis Vance to linguistically show the portrayal of women and make the point that the way audiences perceive these female characters translates into how audiences perceive women in everyday communicative interactions.

### ***Silently Struggling in a New World: Exploring English Language Learners with Language Disabilities***

Poster Presentation

Undergraduate Student(s): Cindy Andrea Terrey

Research Mentor(s): Jeanne Bohannon

*With the awareness that Spanish speaking households compose a significant number of students in English language learning (ELL) programs, this researcher will be illuminating areas of academic ambiguity where language learning overshadows learning disabilities in the United States— a country with no official language. This phenomenon will be thoroughly examined using textual methodologies such as secondary analysis, theoretical study, and an extended literature review to describe how these correlations negatively impact students with English as a secondary way of expression. By emphasizing this gap within academia, it is the hope of the author that additional teacher-created resources will be readily accessible and ELL students with these disadvantaging circumstances will not go undetected.*

### ***Me, Myself, and They: The Use of Non-Binary Gender Language in Steven Universe***

Oral Presentation

Undergraduate Student(s): Samantha Rotunno

Research Mentor(s): Jeanne Bohannon

*Because of the decreasing number of people identifying with cis-gender identity and the need for multiple gender inclusion within children's television shows, I will analyze the linguistic phenomena of non-binary gender representation within the context of Cartoon Network's production Steven Universe. Through a textual analysis of this production, I will examine the language used and determine if the linguistic message, gender inclusivity, is clear to the audience. This research is important because of the cultural struggle our society faces in understanding and representing non-binary gender identity. The importance of understanding non-binary gender constructs cannot be understated, and Rebecca Sugar, the first female show-runner for Cartoon Network and creator of Steven Universe, understands the significance of her work. At the 2016 San Diego Comic Con, Rebecca stated, "It really makes a difference to hear stories about how someone like you can be loved. And if you don't hear those stories, it will change who you are."*

### ***From Social Media to KSU: The Language and Presence of the Far Right***

## Oral Presentation

Undergraduate Student(s): Annie Doragh

Research Mentor(s): Jeanne Bohannon

*America is currently experiencing unprecedented levels of cultural and linguistic divisiveness along with a resurgence of white nationalism into mainstream culture. Despite this heated political climate, there is scant research on these groups and how they operate in the public sphere. The general consensus is that far right memes and discourse have come to dominate sites like 4chan and Reddit, but this assumption precludes the possibility that these individuals also exist on other platforms as well. The lack of academic research on the language, symbols, and images used by these groups and the way they communicate their messages to others needs to be addressed. This project is a discourse analysis of white supremacists and self-identified members of the alt-right movement across various social platforms, particularly on sites like Tumblr where far right nationalism is not expected to exist. I will also include a journalistic examination of the ways white nationalist messages are communicated on a more local scale in order to explore how these sentiments do not solely exist online but manifest in the physical world as well.*

## ***A Study on Social Media's Influence Upon the Evolution of Slang***

### Poster Presentation

Undergraduate Student(s): Mary Kate Sturgeon

Research Mentor(s): Jeanne Bohannon

*As social media platforms become increasingly prevalent in our society, they have begun to heavily influence the ways in which we communicate with each other. Particularly fascinating is the effect of social media sites and texting upon slang, which has evolved significantly over the past few decades. Therefore, I am researching why slang is so prevalent in our society, as well as how and why it has changed as a result of social media. My project also explores the phenomena of how online platforms have influenced the connotations of certain words so that they later become slang terms. Because both slang and social media are significant societal factors and they are constantly changing even today, this information is incredibly relevant. For this project, I have conducted a textual analysis which examines numerous peer-reviewed research articles and various social media posts. Social media platforms, according to Daniel Goleman, are prevalent in our everyday lives due to the fact that "social media expand(s) our universe. We can connect with others or collect information easier and faster than ever".*

## ***Dialectal Differences in Literature***

### Poster Presentation

Undergraduate Student(s): Katarina Kocsisova

Research Mentor(s): Jeanne Bohannon

*As African Americans continue to have their home languages marginalized by societal forces, their linguistic input into how language grows remains important. Given this importance, I will conduct a textual analysis of African American English and its influence during the Great Depression with its influence on language and people in the 21st century to describe how authors use dialects to create*

characters. I will conduct this research by evaluating character dialogue in *Wonderland Creek* by Lynn Austin and its accuracy historically. I expect to find that African American English is separate from Standard American English and that it was accurately portrayed in *Wonderland Creek*. While the events in the novel are fictional, the issues of class and race are similar to real events from the Great Depression which adds to the book's historical accuracies that are still relevant today. Throughout history many writers have attempted to portray the past honestly, while others have skewed the past in biased directions. In *Wonderland Creek*, Alice says, "I wanted to stand up and shout that this was unfair, but loud voices were not permitted in the library." With my research, I am taking the opportunity to stand up and shout about how separating people due to skin color or financial status is unfair.

### ***First-Year Student Comprehension of Graphic Textbooks***

Poster Presentation

Undergraduate Student(s): Matthew Tikhonovsky

Research Mentor(s): Amy Buddie

Today's professors continue to be challenged by the ever-increasing problem of encouraging and motivating students to read textbooks and course material. In recent years, universities across the nation have attempted to address this problem by adopting graphic textbooks, textbooks that rely on graphic visuals over text alone. These textbooks are often filled with humorous comics, engaging visuals, and interactive applications. One such example is *University Life: A College Survival Story* (Payne, 2011), which is used in first-year lectures, and another example is *Fun Home: A Family Tragicomic* (Bechdel, 2006), which was recently on Duke University's summer reading list. Although graphic textbooks have a large presence at many universities, there is little quantitative research backing their efficacy. The purpose of this study is to examine if the graphic visuals in a graphic composition textbook, *Understanding Rhetoric: A Graphic Guide to Writing* (UR; Pallis et al., 2013), increase student motivation to read the textbook and help them learn the material better. In order to collect data, first-year students in English composition courses will be given either a passage directly from UR with the graphic visuals or a passage directly from UR without the graphic visuals. To determine that students do not learn better from the passage with graphic visuals because they have more time to process the information, a third passage without the graphic visuals but with unrelated comics will also be given to students. Students will be asked comprehension questions about the passage as well as questions about their perceptions of the passage. It is anticipated that the survey results will determine that students are more motivated to read the graphic textbook and learn better from the passage with the graphic visuals.

### ***The Semantics Behind Saltwater Geechee***

Oral Presentation

Undergraduate Student(s): Sophia Dammann

Research Mentor(s): Jeanne Bohannon

As technology expands and people move farther from their place of birth, languages and cultures specific to small, often marginalized groups of people are assimilated into the mainstream and lose their distinctiveness. Sapelo Island, Georgia has a unique geographical location, and as a result Saltwater



*Geechee, the Island's historic language, is still spoken by some of the inhabitants. This preservation of language has assisted in sustaining the Saltwater Geechee culture. However, the population that speaks the language is dwindling, and the once vibrant culture is fading. Through a textual analysis of Cornelia Walker Bailey's book, *God, Dr. Buzzard and the Bolito Man*, this presentation will describe the semantic meanings of words, phrases, and cultural practices specific to the people of Sapelo Island. Not only does the number of people who speak Saltwater Geechee and practice its culture continue to grow smaller, one of the leaders of the fight to preserve the language and culture, Cornelia Walker Bailey, recently passed away. While I acknowledge the fact that I have not lived on or spoken to the people of Sapelo Island, and therefore do not have an intimacy with the language and culture, I have conducted thorough, scholarly research on the Saltwater Geechee dialect. Current and additional research that analyzes linguistic information about Saltwater Geechee helps keep the language and culture alive. This makes the research I have done on this topic and my presentation stemming from it worthy of attention.*

***To Believe or Not to Believe? A Linguistic Analysis of Twitter Users' Responses to Sexual Assault Allegations Against Prominent Male Figures***

Poster Presentation

Undergraduate Student(s): Madison Bodenhamer

Research Mentor(s): Jeanne Bohannon

*Due to there being minimal research available surrounding the ways in which social media is used as a tool to express opinions, I found a need existed to explore how members of society respond to sexual assault allegations through Twitter. Through a textual analysis, I will evaluate tweets made in response to sexual assault allegations against men in power roles and how these responses are influenced by specific variables. I am particularly interested in how the presentation and timing of allegations affect the public's acceptability of assault claims. For this textual analysis, I will utilize social media movements, such as #MeToo and #TimesUp, as well as Twitter's search feature to find remarks made about specific sexual assault cases. I am expecting to find that people will report less believability towards accusers when they are assertive in their presentation of allegations and when the timing of their allegations coincides with an important time in the life of the person accused. These findings may indicate ways in which society can better educate its members on sexual assault and the misconceptions prevalent within rape culture. Understanding how people use social media platforms to showcase their opinions on sexual assault may provide insight into how this issue can be better addressed.*

***Imprimatur: A Poetry Reading***

Oral Presentation

Graduate Student(s): Valerie Smith

Research Mentor(s): Tony Grooms, Ralph Wilson, JoAnn LoVerde-Dropp

*What does it feel like behind that door*

*at the end of the hall, in that nosebleed*

*section of the house? No matter how small,*

*we fill our extra corners with fake ferns  
and peace lilies, a lonely aloe vera plant.*

*We say we need an extra room  
to keep the next guest in a plush bed  
of shiny sheets and sham comforters,  
with two formica tables, and a wall clock  
permanently saving time.*

*Here is the door we pass by and peek in,  
toss old furniture, lightbulbs, and pens,  
the door for future guests to pass through  
to the afterlife, waiting for memories  
to live and die over the weekend.*

*Inside, that one window looks nowhere,  
draped lightly like a mosquito net,  
a corner view obscure, a fortress secure,  
a mausoleum for one dead fly in the sill,  
lifeless, except dust mites bathing in sunlight.*

*Sheltered out of the elements,  
captive like mice in the wall, we tiptoe,  
listen for the thinness. Light creeps in,  
touching the feet of passersby as if to ask,  
who will stay and when?*

## **Write it Out: Reflective Writing in Writing Centers**

Oral Presentation

Graduate Student(s): Emily Deibler

Research Mentor(s): Lara Smith-Sitton

*Mental health sometimes evades academic discussions about creating an accessible environment for disabled students. However, this matter continues to influence student life. According to the National Alliance on Mental Illness, "75 percent of lifetime cases of mental health conditions begin by age 24." Furthermore, within the same study, they assert that one in four students are diagnosed with mental illness (eleven percent with anxiety; ten percent with depression), and over eighty percent of students experience overwhelming stress because of myriad reasons. Ultimately, these findings reveal that, for many students, mental issues remain a focal point in their lives, and writing centers act as an extension of ensuring student success. This is because writing centers offer a place for students to reflect on how and why they write, and this reflection goes a long way in creating a safe, productive environment for struggling students.*

*The presentation encompasses the possibility of reflective university writing center workshops tailored for multiple students that allow students to journal about their experiences to improve their emotional health. While writing center tutors and coordinators are not trained psychological professionals and should encourage students to take advantage of the appropriate university resources, writing has been proven to provide a constructive emotional outlet for people, and the presentation would explore the transformative role of reflective writing.*

## **Sociolinguistic Analysis of Asian American English**

Oral Presentation

Undergraduate Student(s): Jin Jo, Madison Palmer

Research Mentor(s): Jeanne Bohannon

*According to the United States Census Bureau, the population of Asians in the United States has increased from 12 million in 2005 to 17 million in 2016. As populations of minority races in the U.S. grow, so does the representation of them in popular culture and mass media. From ABC's TV show *Fresh Off the Boat* to the rising generation of Asian American Youtubers, a wave of Asian American linguistic and languaging presence in today's entertainment is higher than ever before. In my presentation, I will discuss a close analysis of sociolinguistics connected to these representations spoken by contemporary Asian American comedians to provide perspective on their influence on the general public's view of Asians. As Author Jess C. Scott states, "People are sheep. TV is the shepherd."*

*With the 2018 Winter Olympics being held in South Korea, Asian Americans have come to the forefront of the media and brought greater attention to Asian people who were born in America. In my presentation, I will describe and analyze the linguistic phenomena of the appearance of an Asian accent that emerges among some American-born Asians. In an effort to describe and analyze this phenomenon, I will present a literature review of scholarly articles along with editorials and YouTube videos of subject matter experts who have previously discussed this topic as well as look for instances of accidental*

*discrimination against Asian Americans who speak without an accent. As Connie Zhou said, "I'm tired of taxi drivers asking where I'm 'originally' from."*

***"Girls Are Such a Drag": A Sociolinguistic Analysis of Misogynistic Lyrics in Pop Punk Music***

Poster Presentation

Undergraduate Student(s): Ash Scarborough

Research Mentor(s): Jeanne Bohannon

*Due to the increasing influence of song lyrics on American youth culture's values and norms, it is imperative for discourse analyses to pay particular attention to this linguistic phenomenon. Current rhetoric involving misogynistic lyrics in popular music focuses much of its attention on rap and hip-hop genres of music and minimal focus has been put on the substantial amount of misogynistic lyrics in pop punk music. Both genres frequently reproduce harmful ideas about women and relationships, but one faces constant scrutiny for its misogynistic lyrics while the other is notoriously romanticized. I argue that the genre is free to express its frustration and hatred of women without criticism because of the majority white racial demographics of pop punk music. Through a textual analysis of lyrics from popular pop punk bands such as Blink 182 and Fall Out Boy, I will examine the methods pop punk bands deploy to produce misogynistic ideologies through lyrics. I will then discuss the ways gender, class, and race contribute to the largely ignored phenomenon of misogyny in pop punk music.*

**Geography and Anthropology**

***Atlanta BeltLine: Ecological Utopia or Aestheticized Uneven Development?***

Poster Presentation

Undergraduate Student(s): Griffin Matthews

Research Mentor(s): Sarasij Majumder

*Atlanta's BeltLine project has been criticized for failing to deliver on its promise of affordable housing and its reinforcement of gentrification, displacement, and uneven development of the city to the point that the creator of the project has dissociated himself from it. The BeltLine has altered Atlanta residents identity and spatial perception of the city. Drawing from the Dr. LeAnn Land's idea of property ideology along with the works of Michel Foucault and Henri Lefebvre, I have developed a "space ideology" to analyze the relationship between space and identity. This space ideology incorporates ideas on the production of space, the construction of identity through the gaze, utopias and heterotopias, and the role of the built environment in modernist and post-modern urban planning. Using the framework of space ideology, I examine the BeltLine project against the context of the historical development of American cities to analyze the disparity between the original idea of the BeltLine and its current manifestation.*

***Indus Civilization in High School World History Textbooks***

Poster Presentation

Undergraduate Student(s): Aubree Martin

Research Mentor(s): Teresa Raczek

*Students are taught to accept everything in their history textbooks as fact. However, textbooks include more than facts; some information is interpretation, while other information can be incorrect or misleading. This study analyzes the ways the Indus Civilization is presented in high school world history textbooks. Specifically, the sections on the Indus civilization in five high school world history textbooks were analyzed for content and accuracy. Each sentence was entered into an Excel spreadsheet and marked as either fact or interpretation. Facts were checked for accuracy while interpretations were evaluated to see if they are commonly held opinions by archaeologists. This study shows that the information given to high school students can be misleading and that interpretations are often presented as facts.*

### ***A Spatial Analysis of Factors Influencing Beer Locations***

Poster Presentation

Undergraduate Student(s): Erick Owens

Research Mentor(s): Mark Patterson

*This study examines the location of brewery types with socio-economic data to determine whether a relationship between these data exist, and if so, what the nature of the relationship is. We begin by compiling a database of location and type of brewery (n=6000), and then geocode the address of the breweries to produce a map showing the distribution of breweries in the U.S. Next, we overlay socio-economic data (independent variables) such as population (raw and density), income levels, and education levels, with the brewery locations (dependent variable), which allows us to conduct a geographically weighted regression (GWR) analysis. This analysis shows us which variables can be used to explain the location of the breweries. Preliminary results show that several variables have statistically significant local  $r^2$ . We conclude with a brief discussion on why some variables are statistically significant, while others are not.*

### ***War over Water. The Battle That Has Been Simmering for Decades.***

Poster Presentation

Graduate Student(s): Kelly Linz

Research Mentor(s): Nancy Pullen

*Freshwater may know only of its natural and human-made boundaries – by way of aquifers, lakes streams, and dams – but competition for freshwater is evident in various parts of the world, even the United States, particularly where water boundaries cross established political borders. This is apparent with the ongoing competition of freshwater among Georgia, Alabama, and Florida in what is often referred to as the Tri-State Water Wars. The water basins in question include the Alabama-Coosa-Tallapoosa basin, which crosses Georgia and Alabama, as well as the Apalachicola-Chattahoochee-Flint basin, which crosses Georgia, Alabama, and Florida. The wars pit Georgia, with its well-established agriculture industry and growing Atlanta metropolitan statistical area to Alabama's needs for its population, hydroelectric power and fishery economies, and Florida's water-stressed, multi-million-dollar shellfish industries. This project will showcase the role of geography in delineating water needs*

*among these three states, and the current ecological, political, economic and judicial stances regarding this decades-long water dispute.*

### ***Using Geospatial Data to Determine a Least Cost Path Analysis of a Public Transport System for Atlanta***

Poster Presentation

Undergraduate Student(s): Carly D'Allen

Research Mentor(s): Robert Allen

*I worked to create a least cost path analysis for building a public transit system that circles Atlanta as one continuous line. Atlanta relies on MARTA as it's primary public transport. MARTA lacks in connecting the suburbs of metro Atlanta to Atlanta. When Atlanta was awarded host of the 1996 Olympics, they quickly expanded the roadways, such as interstate 85, in attempt to accommodate more traffic. With an increase in population since then, these roads have become congested with personally owned motor vehicles. I will be creating this project for my final project in my Advanced GIS course, under Dr. Robert Allen. I used different map layers and an algorithm to determine the most cost effective, and physically plausible route. Layers include: source, cost, and cost distance measures. These layers will come together to display information about metro Atlanta in a cell or raster data format. Along with the addition of other research I will be able to display the cost, benefits, and other impacts of the transit route created. This project will show a potential solution to Atlanta traffic. A successful public transport will allow those living in metro Atlanta to access the Atlanta perimeter and/or a connection to MARTA without sitting in rush hour traffic.*

### ***The Art and Production of Maya Eccentrics***

Poster Presentation

Undergraduate Student(s): Ellie Stanley

Research Mentor(s): Terry Powis

*Lithic technology and flint knapping have assisted in our understanding of the creation of power symbols in ancient Maya life. Maya elites relied on a multiple of ways to display their power and social status within their society during the first millennium AD. These characteristics included body modifications like scarification, tattooing, teeth filing, and cranial deformation. Beyond physically altering the human body, elites also manipulated the control of trade over vast distances. Obsidian, or volcanic glass, was traded far and wide, and once on site was worked into a myriad of shapes and sizes that were manufactured by highly skilled artisans. These artisans created power symbols, called eccentrics, that were objects utilized by elites alone. These eccentrics have rarely been researched or reproduced which is due to the complexity of the manufacturing process. This research focuses on the techniques and tools used to (re)create the eccentrics as well as a discussion on their form and function in Late Classic (AD 600-800) Maya society.*

### ***Observer Error Associated with Craniometric and Macromorphoscopic Trait Analyses***

Undergraduate Student(s): Christopher M. Goden

Research Mentor(s): Alice F. Gooding

*In forensic anthropology, an important component of skeletal analysis is the estimation of ancestral origin. Two methods are most commonly used: observation of gross macromorphoscopic traits and craniometric analysis. While both methods are commonly used in the field, there is little research testing the interobserver and intraobserver error rates associated with each. This study tests the interobserver and intraobserver error associated with one nonmetric method (MaMD) and one metric method (3Skull) using anatomical teaching crania of unknown ancestral origin. Two observers used Hefner's (2017) macroscopic trait scoring method to collect 17 nonmetric trait data, and collected 28 craniometric measurements using a Microscribe G2x Digitizer from each cranium.*

### ***How Students Feel Their Academic Performance is Impacted by Their Housing Situation***

Poster Presentation

Undergraduate Student(s): Ryan Seedorf

Research Mentor(s): Brandon D. Lundy

*Housing is a cornerstone need of every human and plays a significant role in how we interact with the world; therefore, housing must affect students' academic performance in significant ways. This study documents students' personal narratives about their student housing situations and their opinions about how their living situations impact their university academics. Through focus groups and semi-structured interviews with undergraduate students at a large, comprehensive university, this study compares various living situations with opinions about how these arrangements shape overall academic performance. The emergent themes will be coded inductively looking for patterns about how these two essentials of humanity, housing and education, are interdependent and affect each other in sometimes unanticipated ways.*

### ***Support for the Preservation of Cultural Heritage***

Poster Presentation

Undergraduate Student(s): Lydia Wood

Research Mentor(s): Brandon D. Lundy

*With the growth of neoliberal values in U.S. society, many sites valued as important to cultural and historical heritage are threatened by a lack of public support, funding, and interest. The effects of this erosion of support for cultural heritage can be seen in many counties throughout northern Georgia, where historical sites have been neglected and even destroyed during the expansion of the suburbs and other infrastructural projects. Preservation and the study of cultural heritage allows communities to feel pride in themselves and exercise their political rights based on a shared heritage. In order to protect cultural heritage, research shows the importance of educating the public. The goal of this project is to research ways institutions associated with cultural heritage, such as historical societies and museums, educate the public. Semi-structured interviews will be conducted with heritage experts to gather data on how the issue of cultural heritage is understood and dealt with on a cultural level. Data will also be gathered through focus group discussions with history and anthropology majors at Kennesaw State University, in order to see how cultural heritage is perceived and valued by university students educated on these issues. Based on the literature reviewed, this study hypothesizes that the best way to*

*educate the public about cultural heritage should be direct communication with the public, especially youth. Through experience and research, school activities and childhood museum visits can spark a fascination with history and heritage that lasts a lifetime and can directly affect policy decisions beyond neoliberal considerations that focus on short-term fixes instead of long-term preservation, heritage, and patrimony.*

***Energy Consumption at Kennesaw State University and Potential Conservation Strategies***  
Poster Presentation

Undergraduate Student(s): Rachel Langkau

Research Mentor(s): Brandon D. Lundy

*Energy is fundamental and fully embedded in daily life; however, many common sources of energy are nonrenewable and therefore need to be carefully managed. Wasted energy is not only costly, but it can also have negative environmental effects. Therefore, in order to maximize the benefits and minimize consequences, it is important to modify behaviors and create effective systems. Throughout day-to-day activities on university campuses, energy is utilized in various forms to power things such as classrooms, electronics, and transportation. Since universities are undeniably a major source of localized energy consumption, they are likely major sources of energy waste as well. The purpose of this research is to investigate energy waste and consumption habits on campus at Kennesaw State University by collecting data through direct observations and semi-structured interviews. The main research questions being asked are; how is energy consumption/waste distributed across campus? What are the most common causes of energy waste at a university? How can energy consumption on campus be reduced? Interviewees were purposefully selected from clubs and organizations such as the Students for Environmental Sustainability, Social Culinary Society, EcoOwls, ENACTUS, and Engineers for a Sustainable World. The data collected will be used to support proposed conservation strategies that will enable KSU to become more environmentally conscious and energy efficient.*

***To Be or Not to Be Effective: Negotiating NAGPRA Law in the Southeastern United States***  
Poster Presentation

Undergraduate Student(s): Alexandra Beckett

Research Mentor(s): Brandon D. Lundy

*The Native American Grave Protection and Repatriation Act (NAGPRA) was enacted in the United States in 1990 to return the patrimony of and protect the rights that Native Americans have concerning their physical remains and cultural property held in public collections throughout the United States. Before 1990, these ethical issues were dealt with at the institutional levels and researchers rarely considered these ethical dilemmas when digging up and curating Native American cultural heritage. This law has dramatically affected the study of Native Americans. This research, which focuses on the Southeastern United States, provides valuable insights into the positive and negative effects NAGPRA has had on archaeology, anthropology, Native American studies, museums, and the overall treatment of human remains in general since its implementation. The researcher will conduct semi-structured interviews through purposive sampling with archaeology and anthropology professors at universities and employees at museums that hold Native American cultural heritage. The researcher will also*



*conduct direct observations at museums to observe how patrons react to displays of Native American artifacts. The anticipated results will likely show a complex mix of both positive and negative outcomes related to the implementation of the NAGPRA law both hindering potentially valuable research on Native Americans and their cultural history, while positively forcing ethical considerations into the overall research process. NAGPRA law may need to be amended in order to allow for a more cohesive relationship between Native American groups and the researchers who work closely with them including further considerations about indigenous researchers working within their own communities.*

### ***Geography of Birders: Spatial Connections Through the Lens of Birdwatching***

Poster Presentation

Undergraduate Student(s): Nicki Smith

Research Mentor(s): Ulrike Ingram

*Birdwatching is a fundamentally spatial pursuit connected to both physical landscape and spatial perceptions. In 2002, the Cornell Lab of Ornithology launched their eBird citizen science program which allows birders to track and share their species observations. That is has since become one of the largest biodiversity related citizen science projects in existence points to the significance of the relationship between birdwatcher and bird, as well as the space in which it exists. This project utilizes the eBird basic dataset and includes observations made in Georgia in 2016. ESRI basemaps, US Census Bureau data, and GIS layers from the Atlanta Department of City Planning provided avenues for geospatial analysis of eBird's tabular data. Analyses of the location of observations, locality types, and observation protocol types offer insight into how birds and birdwatchers share human environments. The data show a high degree of interaction in populated areas, at home, and even along roadways. These observations are of particular importance, as they represent interactions which occur during everyday life. It shows that birds are bridging this gap between human spaces and wilderness, creating rare opportunities for humans to foster connections with nature—something that is crucial to the future of conservation.*

### ***Dungeons and Dragons: Social Needs met through Gaming?***

Poster Presentation

Undergraduate Student(s): Cassidy Steele

Research Mentor(s): Brandon D. Lundy

*The role-playing game Dungeons and Dragons has enthralled people since its release in 1974. Why has it remained relevant for more than four decades? Does its popularity have anything to do with how it serves as a creative outlet fulfilling our human need for sociality? How are communities formed as a result of playing Dungeons and Dragons? These are just some of the questions this research looks to address. To answer the question, how does Dungeons and Dragons affect players' social lives?, data was collected through semi-structured interviews with players who have been involved in the game for at least one year and who are over the age of 18. Study participants were identified through purposive and chain referral sampling techniques. Additional data was collected from various publicly accessible Dungeons and Dragons communities through direct observation at gaming stores. This research explores how this game promotes the social wellbeing of players in meaningful ways. The results of this*

*study may be applicable to other subcultural groups where collective actions promote a shared sense of community.*

### **HopeWorks**

Poster Presentation

Undergraduate Student(s): Matthew Henning

Research Mentor(s): Ulrike Ingram

*Weather constantly changes from hot to cold and houses will deteriorate over time. The low-income elderly are not as able to keep their homes updated or properly weatherized. HopeWorks is a non-profit organization that helps qualified low-income senior citizens of Georgia with the cost of new gas appliances and with weatherization. I'm creating maps and analyzing census data to help HopeWorks reach as many senior citizens as possible. HopeWorks has two separate programs helping consumers of Southern Company gas and electric services. The first allows low-income seniors with emergency repairs to gas furnaces and hot water heaters, or alternatively replaces these appliances. The second program makes renovations to the elderly individual's home to properly weatherize it for energy efficiency and lower bills. My project is to show the areas in the state of Georgia that have the most low-income seniors that could benefit from the two programs that HopeWorks offers to the customers of Southern Company. I collected coverage maps from a Southern Company representative and then I applied the census data for the state of Georgia for the 2010 census year. HopeWorks provided me with limited data about past consumers that have been helped and I made a graph of how many elderly citizens were helped in the years of the programs. In order to qualify for the HopeWorks programs, consumers have to be at least sixty years of age, own their own homes, and be a customer of Southern Company's subsidiaries (Georgia Power, Atlanta Gas Light, etc).*

### ***Hematogenous Osteomyelitis in Juveniles: An Examination of Pathophysiology and Variation in Occurrence in the Archaeological Record and Contemporarily***

Poster Presentation

Undergraduate Student(s): Hannah Bauguess

Research Mentor(s): Alice Gooding

*Osteomyelitis is a general term for a group of diseases that cause inflammation of the bone. In most cases, the cause is infectious agents entering the bloodstream from other infected areas, especially traumatic or surgical wounds (hematogenous osteomyelitis). The main causative agents are *Staphylococcus aureus* (staph) and *Streptococcus* (strep). Other causes of osteomyelitis include indirect infection from soft tissue infections or sepsis (Ortner 2003, 181). Although osteomyelitis can occur at any age, hematogenous osteomyelitis is especially prevalent among juveniles. The location of occurrence is related to the timing of development of the growth plates, as well as the vascular supply associated with stages of growth in the long bones (Ortner 2003, 181-182). The epiphysis (end of bone) is relatively protected by the epiphyseal growth plate, which means it usually only enters into the diaphysis and metaphysis (the middle section) of bones. As such, the most common site of infections are the long bones, especially the femoral and tibial metaphysis (Ortner 2003, 182). Before the availability of antibiotics, osteomyelitis was a common clinical condition, so much so that hematogenous osteomyelitis in juveniles*

*made up the greatest percentage of total cases (Ortner 2003, 181). It would follow that this disease would be highly prevalent in the archaeological record, but the literature does not reflect this. While this may be due to the limited archaeological remains available, it is important to explore how pathological conditions, like osteomyelitis, affect the human skeleton both in the archaeological record and clinically in juveniles today.*

### ***Cross Cultural Perspectives of the Display of Human Remains***

Poster Presentation

Undergraduate Student(s): Alicia Karrick

Research Mentor(s): Alice Gooding

*The ethics and laws concerning the display of human remains in museums has been long debated by curators, government officials and academics alike. A cross cultural examination of ethics regarding the display of human remains is vital in understanding a regions cultural values concerning the dead. A linguistic analysis was done using sample collection summaries from museums around the world that assisted in understanding the ways in which museums communicate their collections to the public. A particular social construct was hypothesized to significantly influence legislation regarding the display of human remains. This construct suggests that cultural norms affect the public interest, the public interest affects ethics, and ethics will affect law. In return, laws affect cultural norms and the cycle will continue. This preliminary research will contribute to a larger understanding of how cultures determine ownership of the dead as well as how it is then communicated to a public audience.*

### ***Historic Preservation in North Georgia: Effectiveness in Financial and Visitor Sustainability***

Poster Presentation

Undergraduate Student(s): Camille Coe

Research Mentor(s): Brandon D. Lundy

*Historic preservation sites and museums are key institutions of public history and therefore an integral part of American heritage interpretation and maintenance. Even though these sites play a significant role in their communities, many are struggling to maintain financial stability and to remain relevant and engaging to visitors. The goal of this research is to shed new light on the specific issues these sites face, and determine the best approaches to counteract those problems and ensure a long and successful future for these vital cultural institutions. The focus of this research is to determine what approaches workers at historic sites and museums put in place to ensure the sites remain operational and prosperous by focusing on how they find and secure funding to operate day-to-day, and what programs they enact to stay relevant and attract new visitors. The researcher expects to conduct four semi-structured interviews with administrators at historic preservation sites and museums in North Georgia. She will also conduct direct observation at these same sites, as well as several others, to determine how effective the approaches at each site are at attracting and sustaining visitor attention. Through these methods, the researcher expects to find that approaches focused on creating engaging environments that promote visitor interaction with physical materials and new information will be most successful at amplifying community appeal. It is probable that by focusing on bringing in new visitors and ensuring they will return through interesting and innovative exhibits and activities, the institutions financial situation*

*will become more secure rather than focusing on obtaining funding through private donations and grants. These findings give a new focus and direction for historic sites to consider on their path to visitor and financial sustainability as well as community interaction and engagement.*

### ***Effects of Violent Entertainment Imagery on U.S. Society***

Poster Presentation

Undergraduate Student(s): Kenya Cummings

Research Mentor(s): Brandon D. Lundy

*Some researchers have suggested that by the age of 18, the average child in the United States has witnessed 200,000 acts of violence. Violence can be seen in all aspects of U.S. society, especially entertainment. Recent studies have shown that the media's influence on aggression is not determined by how much is shown, but rather the content itself. This study samples KSU undergraduates directly involved in any aspect of media and conflict management to better understand their views and opinions around this important topic. Focus groups and interviews were conducted with purposefully selected clubs and majors based on their appropriateness to the research study. Three focus groups with selected clubs and four interviews were carried out. The data indicates that people have varied opinions around the effects of violence in the media on society, although most agree that there is an effect. While this study is exploratory, I am certain that people hold strong opinions about the topic. Unfortunately, more research is necessary to see how closely people's strongly held beliefs match the empirical evidence on the topic.*

### ***The Spatial Relationship between Water Quality and Roads/Traffic in Northern Georgia, USA***

Poster Presentation

Undergraduate Student(s): Emily Aust

Research Mentor(s): Jun Tu

*Non-point urban runoff is the major cause of stream impairment in northern Georgia. Pollution from anthropogenic activities is expected to increase due to rapid population growth and urban sprawl in the area. However, the impact of roads and traffic on water quality has not received much attention from state and local watershed management plans and has not been studied well elsewhere either. A better understanding of the spatial relationship between water quality indicators and roads/traffic variables is necessary to make effective plans to control their impact. This study analyzed the spatial relationship between water quality and roads/traffic, as well as land use and population density, in 40 watersheds of northern Georgia using GIS and statistical analyses. GIS analyses were used to delineate watersheds for water quality sampling sites and to derive roads/traffic indicators such as Road Density and Vehicle Miles Traveled (VMT). Statistical analyses were used to compare the relationships between Specific Conductance (SC, a water quality parameter) at sampling sites and the roads/traffic, land use, and population indicators of the watersheds. The results show that SC has a significant positive relationship with road density as well as percentage of urban land, while there exists a significant negative relationship with percentage of forested land. Road density is a point source of pollution closely linked to urban land use and has a similar impact on water quality. Thus, the contribution of urbanization and*

*related activities to water pollution as they vary across space should be taken into consideration in state policies.*

### ***Where We Get Our Information: Gender Representation in Archaeology Textbooks***

Poster Presentation

Undergraduate Student(s): Chelsea Smith

Research Mentor(s): Teresa P. Raczek

*Recent studies find that women publish 60% fewer articles than men publish in American archaeology journals. However, female representation in archaeology textbooks has not been well studied. My research looks at both photos and citation practices in archaeological textbooks to determine the ratio of women and men representation as compared to those working in the field of archaeology. My research counted the number of women, men and ungendered persons in photos, as well as women that were cited versus men that were cited. The percentage of women versus men in textbooks shows that men are cited far more often, but the actual percentage can vary from textbook to textbook. This research is important for the clarity of citation practices, and because these disparities affect the readers of the textbooks.*

### ***“And the Point Is?” An Analysis of Intact Projectile Points from a Middle Woodland Period Site***

Poster Presentation

Undergraduate Student(s): Will Heflin

Research Mentor(s): Terry Powis

*The Lower Dabbs Site, a Middle Woodland period (300 BC-AD 600) site, is located on the banks of the Etowah River in Cartersville, situated just a few miles northwest of the Etowah Indians Mounds. It has been the location for KSU’s archaeology field school taught by Dr. Terry Powis. While the artifacts (primarily ceramics) from Lower Dabbs have revealed a considerable amount of cultural information about the daily life of prehistoric Native Americans in north Georgia, we have yet to learn about the lithic assemblage found after two years of investigation. While ceramic materials are undoubtedly important evidence when it comes to analyzing and dating a site, lithic materials are arguably equally important. Lithic materials refer to such items as stone tools and weapons. One of the main lithic artifacts found include projectile points (often referred to in popular culture as ‘arrowheads’). The purpose of this project is to analyze intact points from the site, as well as discern these points from what people commonly refer to as arrowheads. Additionally, this research addresses the presence of what is known to the archaeological community as a “PP/K” (Projectile Point/Knife), and discusses how they differ from traditional projectile points. The understanding of these recovered materials is just as essential (if not more) to understanding the role of pottery at this small village site. The understanding of these Middle Woodland lithic materials could potentially reveal evidence such as dietary patterns, subsistence strategies, and even trade routes amongst the peoples of this time period.*

### ***Innovation of Design: Early Ceramic Vessel Traditions in The Southeast***

Poster Presentation

Undergraduate Student(s): Gary Owenby

Research Mentor(s): Terry Powis

*The earliest pottery in North America was found on Stallings Island in the Savannah River Valley. Stallings pottery is fiber-tempered ceramics that appear in the archaeological record during the Middle Archaic Period. The use of organic material, such as Spanish moss, as a temper helped to bind the clay to ensure it survive the firing process. Early Stallings assemblages were undecorated shallow bowls with curved bottoms that replaced soapstone slabs as a means for indirect cooking, and later led to direct heat cooking. Around 3200 B.P. a shift occurs in the Savannah River and coastal assemblages of Stallings pottery that includes various types of decorative design. The designs provide no added functionality to the ceramic vessels, but nonetheless proliferated upriver to the Georgia coast, north to the Carolinas, and south to Florida. This research will examine the prominent theories behind the spread of decoration incorporated into ceramic production in the Middle Archaic by comparing expanded gender roles, ceremonial importance, and socioeconomic changes.*

### ***Diversity in Video Games: The Personal Experience of Gamers***

Poster Presentation

Undergraduate Student(s): Rebecca Ruggles

Research Mentor(s): Brandon D. Lundy

*Diversity in video games has often been ignored or caricaturized such as in Final Fantasy VII, where the main character, Barret Wallace, is portrayed as African American. Video games are now big business, impacting almost every facet of American society and earning more than \$91.5 billion dollars annually. This research explores how triple A games portray character identities and why these portrayals may be changing? Data will come from five semi-structured interviews with gamers about their experiences and perceptions about how diversity in video games affects their views about and enjoyment of the games they play. Do diverse characters enhance their gaming experience? Do they choose games that reflect their own cultural identity better? Furthermore, through a content analysis of five popular video game online forums, posts will be analyzed to see what people are saying about increased character diversity online. I hypothesize that how diversity is portrayed in current games can have either a positive or negative affect on perceptions of self-worth and cultural identity, especially among minorities. With how much video game franchises are expanding, and as they try and capture more market share among diverse players, game designers are adding more character options. Public opinion is key to discovering if game companies are helping or hindering the intersectionality of cultural identity, gaming, and diversity.*

### ***Factors that Affect Veteran Employment and Reintegration***

Poster Presentation

Undergraduate Student(s): Jeff Roberts

Research Mentor(s): Brandon D. Lundy

*The issue of veteran unemployment affects millions of Americans; but often times, translating skills obtained in the military to the civilian sphere is difficult for veterans and their would-be employers. To try and correct this egregious disservice to U.S. military veterans, we must identify the factors that*

*affect veteran employment and reintegration. The process of improving the situation starts by looking at the current factors affecting veteran employment and reintegration as well as what research is being done to address the issues of properly preparing demobilized soldiers for life after the military. For example, current information being disseminated about the translation of military skills into marketable civilian credentials include findings that suggest approximately 76% of veterans felt unable to transfer their skills acquired in the military to civilian employers. Furthermore, the literature on veteran community integration suggests the unemployment rate of veterans has fallen to an all-time low of 3.5%, and yet, many of those who have found employment are not happy with the opportunities available. This study asks veterans how they feel about their employment opportunities and evaluates the resources being made available to them through civilian institutions such as universities including Kennesaw State University. With the feedback provided from veterans and their service providers, we can begin to discuss potential improvements and adjustments to some of the methods that are currently being employed to reintegrate military veterans back into society and possibly provide a more prepared and employable veteran community.*

### ***Discovering Ierapetra: Arthritis in Roman Crete***

Poster Presentation

Undergraduate Student(s): Alexandra Beckett

Research Mentor(s): Susan Kirkpatrick Smith

*Ierapetra is a town on the southeastern side of the Greek island of Crete. Starting in 2013 and to present day, archaeologists and physical anthropologists have been working through burial research in Ierapetra to find answers to the unknowns regarding the ancient people that resided there between approximately the 1st - 3rd centuries AD. Among these discoveries are the pathologies that plagued these ancient people, and what these pathologies could have meant for the daily lives of the people in Crete. This research, which focuses on three main excavation sites, Dialektaki, Petrantonaki, and Maliotaki, has uncovered that many of those living between the 1st - 3rd centuries AD lived with arthritis. Throughout the semester, I examined Dr. Susan Kirkpatrick Smith's fieldnotes on the Ierapetra excavation sites and placed them in an excel spreadsheet. Through this deductive method of research, I was able to decipher which pathologies were the most common. The results have shown a complex mix of many pathologies throughout the bones of the ancient people of Ierapetra, with the most common pathology found being arthritis. The study of arthritis on the bones of the ancient people of Ierapetra living between the 1st - 3rd centuries AD opens doors for further research into their daily lives. I suspect through my analysis that I will be able to compare their lives to others found at other sites from Crete or Greece.*

### ***Many Faiths, One Beginning: Universality in Norse, Maya, Greek and Celtic Faiths***

Poster Presentation

Undergraduate Student(s): Adam Cusick

Research Mentor(s): Terry Powis

*Numerous religious faiths have pervaded the world for much of known human history, but these belief systems often have significant variation in their core tenets, especially with those that have no contact. Religions which are in close proximity to one another tend to have some degree of syncretism, such as*

*having comparable deities, due to having some transmission of their cultures. One group of similar base beliefs is the Indo-Europeans, with its members having been studied for parallels before. To contend with these previous studies, this project will look at the beliefs of the Norse, Greek, and Celtic cultures, all of which are in the Indo-European group, in conjunction with the Maya culture, who is an outlier in Central America. Various facets, including the cosmology and pantheon of each of the religions, will be looked at to find any form of universality between the beliefs of these four groups, with a moderate degree of similarity being expected.*

## **History and Philosophy**

### ***Epiphanius's Condemnation of the Nazarenes: When Orthodox Christian Theology is Threatened by Jewish Practice***

Oral Presentation

Undergraduate Student(s): Erik Mattson

Research Mentor(s): Brian Swain

*In 377 AD, Epiphanius of Salamis compiled the Panarion. In this book, Epiphanius condemned eighty different groups as heretical to the Catholic faith. One of these groups, the Nazarenes, were condemned by Epiphanius because they continued to observe the Torah. The Nazarenes believed that Jesus is the Son of God and the Messiah, that the Old and New Testaments are Holy Scripture, and that the dead will be resurrected. He condemned them for their external practices despite their orthodox internal beliefs. This observation becomes more intriguing when, in another section of the Panarion, Epiphanius rejoiced about other Jews who continued to observe the Torah after they came to believe in Jesus Christ. What can account for these two drastically different reactions? This study makes the case that Epiphanius condemned the Nazarenes because their public Torah observance undermined his supersessionist theology which says that the Catholic Church replaced the nation of Israel as God's chosen people and that the Mosaic Law was superseded by the New Covenant brought by Jesus Christ. In contrast, the other Torah-observant Jewish-Christians were living in a Jewish community and their faith in Jesus was kept secret. Epiphanius saw this as the Catholic message finding victory among the Jewish people and rejoiced in it. The Nazarenes were publicly proclaiming faith in Jesus while observing the Torah that had supposedly been cancelled by Jesus. Epiphanius perceived this as a challenge to the Catholic Church's supremacy, thus resulting in their condemnation.*

### ***The People of the Cumberland Plateau: Yesterday, Today and Tomorrow***

Poster Presentation

Undergraduate Student(s): Macey Hurst

Research Mentor(s): Katherine Perrotta

*The area of East Tennessee that lies between the Appalachian and Cumberland Mountains is called the Cumberland Plateau. This area reaches from Chattanooga to Bristol. Many people not from this region label it as redneck, back-woods, or hillbilly. Many don't consider it to be a place that holds modern*



*values, such as conservation and education. Through archival research, I will study this area during the Great Depression to explore how this place's reality is different.*

*During one generation, the Plateau changed from a place defined by isolation and limited education to a hub of scientific research and a major provider of green energy. My family's historical narrative reflects the Plateau's narrative throughout this change. This change can be traced back to events taking place during the Great Depression. My great-grandfather was a farmer, but all his children were scientists, engineers or nurses. The forces that helped change for my family were the same forces leading changes in the Plateau. To better understand these forces, I examine how New Deal programs during the Great Depression like the TVA, the CCC, and the PWA changed and influenced the Plateau.*

*How did an isolated mountain community change from primarily uneducated farmers to chemists and engineers? How did they go from having no power to a provider of green energy? Does the credit belong to the community, or to the programs that helped it? These questions might help us understand how to help impoverished, isolated communities today.*

### ***Christian "Atheism": A New Perspective in Light of Second Temple Judaism***

Oral Presentation

Undergraduate Student(s): Jonathan Mann

Research Mentor(s): Brian Swain

*The dominant scholarly position holds that the Roman state condemned Christians as atheists because of their refusal to offer sacrifice to the pagan gods. This explanation needs further refinement as it fails to account for this heretofore unnoticed fact: Jews also faced charges of atheism, but received no such accusations between 27 BC and 66 AD while the Second Temple still stood. During this time, the Roman state did not consider Jews to be atheists even though like Christians they eschewed sacrifice to Roman deities. The very fact that Jews performed daily sacrifices to their god and explicitly on behalf of the emperor demonstrated their commitment to the prosperity of Rome, thereby rescuing Jews from accusations of atheism. Rabbinic Judaism was later established in the 90s AD as a way for Judaism to continue to function without a temple. It became a religion that spiritualized and replaced temple sacrifice. While Judaism went through this evolution, Christians historically have spiritualized sacrifice, where belief in Jesus's sacrificial death functioned as a final sacrifice. As a result, both Jews and Christians did not offer sacrifices on behalf of the emperor and were thus deficient in outward displays of religiosity and loyalty to the Roman state. In the eyes of Rome they were "spiritual, but not religious;" they were atheists. In light of this, I argue that Christians were condemned as atheists not simply because they failed to participate in pagan sacrifices, but because they did not sacrifice at all.*

## **International Conflict Management**

### ***The Peace Corps and Youth Development: Returned Volunteers' Perceptions of Practice***

Oral Presentation

Graduate Student(s): Gianni Bisio

Research Mentor(s): Darina Lepadatu

*As of 2018, over 250,000 Returned Peace Corps Volunteers (RPCVs) had served in over 140 countries worldwide, with these former Volunteer having worked with youth both in schools and in their communities; however, very little has been studied on the roles in which these RPCVs played in, and their feelings towards, this work. The purpose of this study is to gain a better understanding of the ways in which RPCVs reflect on their work with youth during their service with the Peace Corps and gender-based considerations in their community service, helping to gain insight on the ways Volunteers perceive their service. Using personal interviews and textual content analysis of RPCVs focusing on the certain perceptions of their service, this study aims to fill a gap in the existing literature on the Peace Corps, which lacks in specific attention towards the Peace Corps' role in youth development. The current findings show that the perceptions of RPCVs vary between age, gender, countries served, and the years of their service. Though more research is necessary, the finding provide a direction for practical policy choices for the Peace Corps regarding Volunteer activities and attitudes while addressing youth development.*

### ***Adaptability: The Role of Conflict Managers in Crises***

Oral Presentation

Graduate Student(s): Joshua Hill

Research Mentor(s): Darina Lepadatu

*Whether as the result of war, poverty, or natural disaster, people are being forced to flee their native lands at an alarmingly high rate worldwide. The United Nations High Commissioner for Refugees estimates that there are currently over 65 million persons globally who have been forcibly displaced from their homes, and of that number, 22.5 million are refugees. With those numbers steadily increasing, a need exists for programs that educate and prepare professionals whose intent is to work with refugee groups and the local populations that receive them, and one of the key concepts of such programs is adaptability, the ability to adjust to new and changing conditions. One such program, a class that places students and alumni in various roles during a refugee community crisis, is available at Kennesaw State University. Through participant observation and interviews with simulation participants, this qualitative study seeks to examine the role of adaptability in said simulation and to understand how the use of programs like this are of benefit to conflict practitioners.*

### ***Black and Blue Lives Matter - Improving Relations by the Police and the African American Community by Addressing Perceptions***

Oral Presentation

Graduate Student(s): Brenda L. Cleaver

Research Mentor(s): Darina Lepadatu

*The objective of my research is to analyze the effects of perception on the behavior of police towards the African American community and the behavior of the African American community towards the police. Specifically, the study will focus on how the police thinks the African American community perceives them and how the African American community thinks the police perceives them. I will also analyze and identify the best practices, i.e., methods and strategies that address such perceptions and ultimately*

*improve relations between police and the African American community. I plan to interview police officers and African American community members; observe events sponsored by a local police department designed to improve police-community relations, and analyze the content of newspaper and magazine articles, press releases, videos, blog posts, etc regarding perceptions and actions taken to address them.*

### ***The Relationship Between Law and Dispute Resolution: Assessing the Level of Mediation Enculturation in the Legal Community***

Oral Presentation

Graduate Student(s): Vittorio Indovina

Research Mentor(s): Darina Lepadatu

*This paper addresses the topic of the relationship between law and culture and, in particular, the capacity of law to change or constitute culture in a given context. Starting from the case study of the Italian Mandatory Mediation Law, it presents the results of a qualitative research conducted with the aim of understanding how mandatory mediation is affecting the practice of Italian lawyers. Content analysis of a Facebook group of Italian mediators and five interviews to lawyers of Milan are the qualitative research methods. Interviews that came into force in Italy with the aim to promote and spread the culture of Alternative Dispute Resolution, it argued that, after seven years from its enactment, the enculturation process of mediation is not giving valuable results. At the same time, it highlights the need and importance of implementing research to verify the level of enculturation of mediation in a given society. It proposes a possible research direction to measure the level of mediation enculturation within the Italian context and in any other country where laws are enacted to provoke a change in the legal culture, providing some suggestions to researchers based on Spiro's model of enculturation process.*

### ***The Experience of Being Hungry***

Oral Presentation

Graduate Student(s): Almuth Merkel

Research Mentor(s): Darina Lepadatu

*Do food secure and food insecure people experience hunger differently? Physiologically, there is a big discrepancy between hunger in terms of appetite, and hunger in terms of starvation. Regarding the availability of food in developing and industrialized countries, the probability that people in industrialized countries suffer from hunger is far lower than for people in developing countries. Furthermore, social safety nets, mainly established in developed democracies, prevent starvation. Nevertheless, a big part of the population in the United States finds itself in a critical food security situation. The literature on food insecurity approaches hunger largely quantitatively. This article aims to provide a qualitative approach to describe the experience of being hungry from different perspectives. Therefore, interviews were conducted with people who experienced food security and food insecurity. This article analyzes different narratives derived from the interviews, as well as an expert interview on food security, and a content analysis on how being-hungry is addressed in different sources on the internet. The public discussion does not differentiate between being hungry when being food secure and*

*being food insecure. Nor is there consciousness within the population for different stages of being hungry. To increase consciousness for the situation of the real poor, an emotionally charged topic like hunger needs to be addressed.*

***Reparations for Conflict Based Sexual and Gender Based Violence: Victims' Narratives from the DRC, the Rape Capital of the World***

Oral Presentation

Graduate Student(s): Brittany Foutz

Research Mentor(s): Darina Lepadatu

*I will address how the implementation of the use of reparation mechanisms affects the satisfaction of sexual-violence victims of the Democratic Republic of Congo. The existing literature is lacking regarding measuring the level of satisfaction among sexual violence victims that have received reparations in the DRC. I will compile data of victims of sexual violence in the DRC, and experts in sex trafficking and International Criminal Court Registered Experts. This data will be recorded from all possible press releases available and information from the International Criminal Court's Strategic Plan, and also some structured interviews with victims. Through my research, the Court and its stakeholders can assess the progress made by the institution in terms of the effectiveness and quality of its work regarding reparations.*

***Negotiation and Conflict Resolution Strategies of Millennials in the Workplace***

Oral Presentation

Graduate Student(s): Cynthia P. LeMay

Research Mentor(s): Darina Lepadatu

*The Millennial Generation is now the largest workplace cohort, surpassing Generation Xers and Baby Boomers. This results in a new workplace culture dominated by Millennials but often managed by Baby Boomers. In addition, Millennials have unique characteristics that are in conflict with traits identified in negotiation theory as necessary for successful outcomes. To examine this conflict, this study will utilize semi-structured interviews and focus groups with Millennials and NonMillennials to examine the following research question: do Millennials in the workplace negotiate and resolve conflict differently than other generational cohorts? This qualitative approach will provide rich data collection to answer the research question. Furthermore, triangulation achieved by employing two research methods will enhance accuracy by allowing results to be corroborated. The expected findings are that Millennials negotiate differently than other generational cohorts consistent with their unique traits.*

***Female Labor in the Arab Gulf: Towards a Feminist and Intersectional Understanding of Women's Empowerment in Oman***

Oral Presentation

Graduate Student(s): Hania Bekdash

Research Mentor(s): Darina Lepadatu

*Development agencies, governments, and researchers alike often associate a rise in the female labor force rate with democracy, modernization, economic growth, and greater gender equality. The implicit assumption is that an increase in female labor has an overall positive multiplier effect on women's empowerment. However, the concept of "women's empowerment" as nearly synonymous with economic growth and gender equality does not entirely align with transnational feminist and intersectional approaches to "empowerment". The primary difference between the two notions is that the latter, feminist intersectional empowerment, recognizes additional inequalities including race, class, and more, that compound power imbalances on women; whereas the former, the economic-focused notion of women's empowerment, largely considers only one aspect of disempowerment: gender inequality. In the absence of a feminist and intersectional framework, existing patriarchal structures and gendered relationships of power may be reinforced as other embedded hierarchies remain. Drawing on the work and growing debate laid out by feminist scholars, sociologists, anthropologists, and political scientists, the aim of this interdisciplinary research is to question a dominant development paradigm by introducing more contextualized variables that contribute to a more robust notion of women's empowerment. Therefore, this research questions the extent to which the formal female labor force participation rate, an often-cited variable of empowerment, is associated with transnational feminist and intersectional notions of women's empowerment. The paper takes Oman as case study because, despite structural limitations, the female labor participation rates have soared in recent years, while feminist and intersectional empowerment of women remains dubious.*

### ***In What Ways and Under What Conditions are Internet and Communication Technologies (ICTs) Managing Election and Ethnic Violence in Kenya***

Oral Presentation

Graduate Student(s): Kevin A. McMahon

Research Mentor(s): Darina Lepadatu

*In the moment of crisis, the wise build bridges and the foolish build dams. - Traditional African Proverb*

*This project begins with a synopsis of the new mobile technology and data analysis tools that are impacting the methods and techniques of conflict management. The past few years have witnessed an explosion in the distribution of mobile phones in areas of the world traditionally prone to conflict. Commensurately, advancements in data analysis and machine learning have effectuated the ability to rapidly scan Twitter and Facebook feeds. The project reviews the current literature, categorizes the early views into three camps, develops a framework, and proposes a case study in order to peel back the hype and determine the actual ways that the tools are or are not effectively transforming the field. Interviews of technologists, NGOs, and election officials will be the primary data collection method. Additionally, content analysis will be conducted on platform data sets. Affordance Theory then emerges as the primary conceptual framework in which to gauge efficacy. This work will contribute in a meaningful way to the dearth that many observers have noted. After a decade of ICT implementation in various humanitarian and governance applications, ironically little formal research has been conducted. The Kenyan election case study depicted in this proposal will serve to substantially advance this endeavor.*

## ***The Space for Uncertainty: U.S. Mediators' Experience with Ambiguity and Self-Awareness During Mediation***

Oral Presentation

Graduate Student(s): Jessica Hill

Research Mentor(s): Darina Lepadatu

*Within the field of mediation, there currently is interest in how participation in the arts (such as music, visual arts, theater, and other types of performance) can support creative approaches to conflict resolution. However, specific theories explaining such connections are not fully developed. The purpose of this qualitative study is to explore possible intersections between two specific mediator skills—comfort with ambiguity and self-awareness—that are also used in one type of performance art—improvisational (improv) theater. Data were collected through semi-structured interviews in order to better understand how mediators think about ambiguity in their work, how they make meaning of those experiences, and how they understand their own decision-making processes and actions during a mediation. Additionally, a focus group was conducted with mediators who also provide training in the field. These data provided insights about skills mediators use and how to teach those skills. Understanding mediators' experiences with ambiguity and self-awareness during mediations can contribute to further theory development, support improvement to existing mediator trainings, as well as inform questions about whether alternative forms of training—such as arts-based workshops—can provide opportunities for mediators to practice these skills in new ways.*

## **Political Science**

### ***Individuals with Higher Education Levels Increase Voter Turnout Rates***

Oral Presentation

Undergraduate Student(s): Lauren Wilhite

Research Mentor(s): April Johnson

*During the 2016 presidential election, the Trump voter was referred to as “uneducated”. While Trump won the presidency, many have questioned how presidential candidate Hillary Clinton lost the election when polls claimed she would win by a landslide. To effectively understand what happened in the 2016 election I decided to examine the Presidential election of 2012 where education was not considered a major determinant in the election results. Researchers believe the main reason for the 2016 upset is due to pollsters not factoring into consideration that college-educated individuals are more likely than their non-college-educated peers to take surveys, potentially causing a treatment effect in the results. The research will discuss the background other researchers have conducted. Additionally, this study analyzes the 2012 presidential election while considering numerous variables that could potentially affect an individual's likelihood of turning out to vote in elections. All data are from the 2012 General Social Survey whose sample is a reflection of the American population. Using respondent's highest degree attained and comparing it to voter turnout as well as basic demographics, the results revealed a correlation between the variables which provided substantial evidence to support the hypothesis. Based on the results found in this study, an individual's education level influences his or her likelihood of turning out to vote in elections.*

## ***Public's Perception of Legitimacy Regarding the US Supreme Court***

Oral Presentation

Undergraduate Student(s): Justin Kelley

Research Mentor(s): April Johnson

*After the highly political election cycle in 2016, there has been an increase in the number of challenges, promised to the public, regarding the new administration's policies. But, in the opinion of the public, is the constitutionally established US Supreme Court, where these challenges will be made, the legitimate authority to determine them, or have these institutions become the political puppets the Framers warned us of. To determine this, an experiment was developed to quantify and evaluate this. Using the TAPS group's 2016 survey about Public Feel, from a US population reflective sample, I developed an index for legitimacy from questions posed by the group, then compared it to results from questions involving the perception of political involvement of the US Supreme Court and basic demographics. The correlation of my index and the perception of political involvement shows a causal relationship between the two variables, at a  $P < .05$  significance level. With the declining legitimacy of the judicial institutions in the public's opinion, how can these establishments continue to determine challenges in the namesake of the public when they are no longer viewed as legitimate, by the public?*

## ***Criminal Activity in America's Sanctuary Cities***

Poster Presentation

Undergraduate Student(s): Alyssa Ross

Research Mentor(s): April Johnson

*There has been an increase of debate on whether or not immigration has a relationship to crime rates in the United States. Sanctuary cities, a jurisdiction that does not cooperate with the federal government's immigration laws, have been singled out as "hotbeds" of crimes. This research paper explores the validity of the claims that sanctuary cities are places of exponential criminal activity. I analyzed twenty cities, ten sanctuary and ten non-sanctuary, to find if there is a relationship between immigration and crime rates. I use a variety of different types of crime to operationalize the dependent variable: violent crime, rape, murder, aggravated assault, and property crime. Preliminary results indicate that there is a complex relationship between immigrant presence, local policy, and crime rates within cities. In a time of increased political polarization and usage of hot topics in the political arena, an exploration of crime rates in sanctuary cities is critical to understanding if there is a genuine relationship between immigration and criminal activity.*

## ***Uncovering the Truth Behind Chemical Weapons in the Syrian War***

Poster Presentation

Undergraduate Student(s): Brandon Christopher Vines

Research Mentor(s): (not submitted)

*Over seven years of brutal civil war, thousands have been killed or wounded by illegal chemical weapons. Despite these weapons being banned by international treaties and agreements, the horrific*

death toll continues to mount. Most recently, on April 7, 2018, more than 500 people were reportedly gassed with chlorine in the rebel-held enclave of Douma near the Syrian capital of Damascus. American Ambassador to the United Nations Nikki Haley recently warned: "the great evil of chemical weapons use, that once unified the world in opposition, is on the verge of becoming the new normal." While any use of chemical weapons is deplorable, lasting preventative measures by the international community have been paralyzed. This lethal gridlock has been partially enabled by intense disagreements over where, when, and if chemical weapons were used. As an active war zone bringing in neutral fact finders is near impossible, and often when investigators do arrive evidence has long been lost or destroyed. This project aims to remedy this problem by taking advantage of the Syrian War's unique nature as a conflict in a social-media world. Hundreds of thousands of hours of video, millions of images, and ceaseless reporting has been produced over the last seven years. No small part of it dealing with chemical weapons use. This ongoing project gathers, preserves, and publicly presents this trove of evidence for each of the dozens of suspected chemical weapons attacks in Syria.

## **Psychology**

### ***Year of India Study Abroad Seminar: The Attitudes Towards Mental Illnesses and Accessibility to Mental Health Services in Rural and Urban India***

Poster Presentation

Undergraduate Student(s): Celessia Cannon, Brooke Satterfield

Research Mentor(s): Ginny Zhan

*The purpose of this project was to assess the attitudes regarding mental health in both rural and urban India. Then conduct an evaluation of the overall accessibility to mental health facilities for those with mental illnesses. This was accomplished by reviewing research found in scholarly articles relatable to the topic, supplemented by observations made in India. Upon completing the research, the following conclusions were drawn. There was an overall negative stigma associated with mental health in India. The available mental health facilities are sparse in both rural and urban India. Additionally, those suffering from mental health illnesses were typically met with some form of social, political, and cultural isolation. This project can further recent efforts aimed at addressing both the lack of education surrounding mental health disparities found within in India, while also eliminating the shame commonly associated with mental illnesses.*

### ***Microaggressions of Gender Towards Women in the Gaming Community***

Oral Presentation

Undergraduate Student(s): Girard Young Jr

Research Mentor(s): Jeanne Law Bohannon

*Social media has become the primary mechanism for how our society performs social functions and social gatherings. However, the rise in digital communication has led to immense campaigns of cyberbullying, online harassment, and threats, especially towards women. In video games, it is even more extreme, resulting in a hostile phenomenon known as #GamerGate.*



*#GamerGate led to a new breed of anti-feminist subculture, which takes delight in engaging in online harassment, which often results in violent messages of physical threats, intimidation and even rape. This subculture has developed its own slang, and that slang is representative of the norms and associations within the anti-feminist subculture regarding #GamerGate. In my research presentation, I will be describing a discourse analysis of the #GamerGate phenomenon by evaluating gender linguistic microaggressions towards women by analyzing #hashtag post on the social media platform Twitter. In the presentation, I identify the specific lexical words that gamers use as gender slurs, insults, and slights against women.*

### ***Factors Influencing Dog Adoptability***

Oral Presentation

Undergraduate Student(s): Sarai Bauguess

Research Mentor(s): Amy Buddie

*Research shows that physical characteristics are among the most important factors when it comes to adopting or buying a dog (Lepper, Kass, & Hart, 2002). Most of the current research focuses on training dogs or statistics that are provided by shelters. I wanted to expand on the literature by surveying potential adopters and/or buyers. I also wanted to expand the literature by asking about specific characteristics that people look for in a dog. I am also looking to see what characteristics are less significant when people look for a new dog. The reason for this is that current research has shown that labeling a dog a certain breed has increased the length of the stay in the shelter for the dog (Gunter, Barber, & Wynne, 2016). For this project, I reached out to a local animal shelter and asked for their help in recruiting potential participants. They posted the anonymous survey link on their social media networks. I also posted the survey link on my social media networks. The survey contains demographic questions as well as questions relating to exactly what a potential adopter is looking for in a dog. There are 156 participants in the study currently. I hypothesize that behavioral characteristics, such as aggressiveness or an ability to get along with children, will be less influential to the decision-making process compared to physical characteristics. I expect to find that other characteristics, such as information on a card (weight, dog's background, etc.) or the distance to obtain the dog will have a lower influence on a person's likelihood to adopt a dog. The results of this study can help shelters better understand the factors associated with dog adoptability and can contribute to conversations regarding the adoptability of dogs who have been labeled as aggressive breeds, such as pit bulls.*

### ***The Role of Diagnostic Labels on Perceptions of Behavior***

Poster Presentation

Undergraduate Student(s): Madison Bodenhamer, Haley Smith, Alisanne Jensen, Sarah Deveau, Kenya Morgan, Kelly Watson, Morgan Moore, Bethany Shields

Research Mentor(s): Tracie Stewart

*Autism Spectrum Disorder (ASD) is a developmental disorder that impacts individuals' social, communication, and behavioral abilities. There are certain stigmas surrounding the diagnostic label of autism, some negative and some positive. The purpose of this study is to explore the stigmas associated with children who have been diagnosed with autism versus children who have not been diagnosed. This*

*study also explores if age is a factor in the stigmas surrounding autism. We hypothesized that people will show more sympathy towards a child who has been diagnosed with autism than they would show towards a child who has not been diagnosed. Additionally, we believe that people will be more judgmental of a child's parents when there is no label of autism than when the label of autism is present. Finally, we predict that people will show lower levels of comfort when the label of autism is not present versus when the label is present. To examine the results of these hypotheses, we surveyed students from around the campus of Kennesaw State University. The results showed that our initial hypotheses were both correct and false. Children with the label of autism were shown to receive slightly higher sympathetic reactions and less parental judgment. However, comfort level did not show any significant results. Also, age of the child did not yield significant results when shown alongside the label.*

### ***Assessing Gender Differences in Sexual Trafficking Attitudes and Myth Acceptance***

Oral Presentation

Undergraduate Student(s): Elizabeth Perry, Jonathan McFarland, Mandy Losito, Meghean Teefy, Alexandria Goldstein

Research Mentor(s): Dorothy F. Marsil, Corinne McNamara

*Global sex trafficking is a pervasive and harmful crime that is not bound by race, gender, or socio-economic status. Recently, there has been a growing focus on this issue within the legal system. It is equally important to have public awareness of this type of sexual victimization, including how it may be viewed by males and females. Thus, the purpose of this study was to assess gender differences in college student's knowledge, attitudes, and myth acceptance regarding the sex trafficking of women and girls. We hypothesized that participants would endorse some sex trafficking myths, especially those related to victim agency and bodily autonomy. In addition, we hypothesized that there would be gender differences in some attitudes and myth endorsement. Undergraduates were recruited through SONA from Introductory Psychology courses at KSU to participate in the study. One hundred fifty-four participants completed an online survey. As expected, participants endorsed certain sex trafficking myths, but there was some general awareness of factual information, particularly for participants who had completed prior sexual assault prevention/intervention education programs. Likewise, some gender differences were noted. The findings from this pilot study will help us better understand the attitudes and myth acceptance associated with sex trafficking between men and women. In turn, this can help inform future research and educational and advocacy efforts to fight the commercial sexual exploitation of sexually trafficked individuals.*

### ***Gender Differences are Disappearing: Attitudes on Sex Trafficking Tactics and Rape Victimization***

Poster Presentation

Undergraduate Student(s): Meghean Teefy, Mandy Losito, Elizabeth Perry, Jonathan McFarland

Research Mentor(s): Dorothy F. Marsil, Corinne McNamara

*Commercial sexual exploitation by force, fraud, and coercion are tactics used by sex traffickers. Although sex trafficking is an ongoing, pervasive problem, there is no known research on gender*

*differences regarding knowledge and attitudes about sex trafficking tactics and the perception of these women and girls as victims of rape. Thus, the purpose of this study was to compare male and female college students' knowledge and attitudes regarding sex trafficking tactics and their beliefs about whether these individuals are rape victims. Consistent with rape myth acceptance research on gender (Russell & Hand, 2017), we hypothesized that there may be gender differences in knowledge and attitudes about sex trafficking tactics and there would be gender differences in the perception of trafficked individuals as victims of rape during their commercial sexual exploitation, such that women would more likely than men to endorse these tactics as rape. Undergraduates were recruited through SONA from Introductory Psychology courses at KSU to participate in the study. One hundred fifty-four participants completed an online survey. Unexpectedly, there were few gender differences in knowledge and attitudes about sex trafficking tactics, but there were no differences in perception of rape victimization. Both men and women thought the tactics used to commercially sexually exploit trafficked individuals did constitute rape. These findings will help us better understand attitudes and beliefs associated with sex trafficking tactics and rape victimization.*

### ***The Relationship Between Attitudes on Institutional Responses and Sex Trafficking Awareness and Myth Acceptance***

Poster Presentation

Undergraduate Student(s): Jonathan McFarland, Alexandria Goldstein, Elizabeth Perry, Mandy Losito, Meghean Teefy

Research Mentor(s): Dorothy F. Marsil, Corinne McNamara

*Sex trafficking is a dangerous and illegal business in which individuals are commercially sexually exploited when they are under the age of consent or by using force, fraud, or coercion. Recently, there has been a growing focus on this issue within the legal system, but no known research exists relating perceptions of effectiveness of the criminal justice system, as well as beliefs about prescriptive institutional responses to the acceptance of common myths and misconceptions surrounding the victims of sexual trafficking and the tactics used by sex traffickers. Thus, the purpose of this study was to examine the relationship between college student's awareness, attitudes, and myth acceptance regarding the sex trafficking of women and girls and their beliefs about the effectiveness of current techniques used to combat the problem and the need for resources in that effort. We hypothesized that the participants who had less awareness and endorsed sex trafficking myths would be less likely to support current and potential resources being used to combat sex trafficking and would be less likely to contribute to such efforts. Undergraduates were recruited through SONA from Introductory Psychology courses at KSU to participate in the study. One hundred fifty-four participants completed an online survey. As expected, there was a relationship between awareness, myth acceptance, and attitudes about resources used and willingness to support such efforts. The findings will help us better understand attitudes and beliefs associated with sex trafficking and communicating efforts to combat sex trafficking within communities.*

### ***The Relationship between Sexual Assault Beliefs and Understanding of Consent***

Poster Presentation

Undergraduate Student(s): Abrian Poole, Amber Wallace, Shelby Benson, Tommy Hampton

Research Mentor(s): Corinne McNamara, Dorothy F. Marsil

*Interpersonal violence (IPV) is a concern for college students; however, the salient factors that contribute to these acts of violence are still largely unclear. Thus, this study focuses on how the prevalence of unwanted sexual advances relates to demographic variables, such as ethnicity, gender, and sexual orientation, and attitudes towards consent. As a part of a larger study, participants will complete a modified version of the short form victimization version of the Sexual Experiences Survey (SES-SFV). The 7-item survey includes questions that define acts of sexual assault. To each item, participants indicate how many times (if any) since age 17 they experienced the event, and by how many perpetrators. I predict that heterosexual males will report attitudes that consider consent as less important, thus corresponding to higher reports of IPV victimization by heterosexual females. Chi-square analyses will be conducted to compare the prevalence of unwanted sexual experiences between subgroups of demographic variables. Further, a multinomial regression will be conducted to examine attitudes towards consent and demographic variables as predictors of sexual assault. The preliminary analyses and their implications will be discussed.*

### ***The Relationship Between College Students and Their Pets***

Undergraduate Student(s): Olivia Bekker

Research Mentor(s): Suma Mallavarapu

*The purpose of this research was to see how the quality of a person's attachment to their pet affects their perception of the amount of social support they are receiving. We recruited a sample of 309 undergraduate students who were pet owners. Students were enrolled in a General Psychology course at Kennesaw State University during Spring 2017. Data were collected using SurveyMonkey®. To measure the quality of pet attachment, we used the Lexington Attachment to Pets Scale. To measure perceived social support, we adapted the Multidimensional Scale of Perceived Social Support. There was a significant relationship between quality of attachment to one's pet and perceived social support [ $r(307) = 0.77, p > 0.001, r^2 = 0.59$ ]. We also collected demographic data on variables such as ethnicity, gender, year in college, type of pet owned, number of years of pet ownership, and pet gender. We studied how these different variables affected the quality of pet attachment and perceived social support.*

### ***Watch Me Give: A Look at Narcissism as a Moderator to Donating to a Non-Profit***

Poster Presentation

Undergraduate Student(s): Austin Prewett

Research Mentor(s): Paul Story

*Recently several online crowdfunding sites have begun to emerge such as; Kickstarter.com, GoFundMe.com, Indiegogo.com. Each allows users a platform to share their ideas that require funding. People can read their stories and donate. How these users are able to raise money without any form of marketing or evidence that they are legitimate begs the question; is there something in it for the donator other than selflessness? This research article investigates the role of narcissism in willingness to donate to a non-profit organization. Study 1 seeks to determine the relationship between narcissism and giving behavior. Study 2 seeks to prime a state of narcissism in participants and determine whether there is a difference in their willingness to donate depending on if they encountered a non-profit that is not doing*

*well and willing to reveal the identity of their donors, or the opposite. If a relationship between a primed state of narcissism and donating behavior exists, it could contribute to the existing body of knowledge pertaining to non-profit marketing and crowdfunding research.*

### ***Measuring LGBTQ+ and non-LGBTQ+ Levels of Escapism Through Media***

Undergraduate Student(s): Bo King, Allyson Rhiley

Research Mentor(s): Paul Story

*For this study, we have decided to compare LGBTQ+ and non-LGBTQ+ individuals and their levels of escapism through media. Levels of escapism will be quantified through hours spent: reading, playing video games, using the internet for pleasure, and streaming or watching television shows. LGBTQ+ identifying individuals still are not wholly accepted in society and are at risk for higher levels of risky behavior, suicide, addiction, and mental distress. Due to the marginalization of the LGBTQ+ community, we are expecting individuals identifying as LGBTQ+ to report higher levels of escapism compared to participants that do not identify as LGBTQ+. We are collecting data through a self-report measure on a google form that participants choose to participate in without any form of compensation.*

### ***The Relationship between Motion Offset and Neural Inhibition with respect to EEG***

Poster Presentation

Undergraduate Student(s): Shawyun Khoshneviszadeh

Research Mentor(s): Tim Martin

*As part of a study of whether motion offset reflects neural inhibition, subjects were asked to perform the stop signal paradigm and a motion direction discrimination task while EEG was recorded. Here I report the analysis of the stop signal evoked response potential. In this experiment, 11 subjects were presented with a stimulus (x or an o) and asked to respond. On some trials they were presented with a stop signal and their ability to withhold their response was recorded. If the subject successfully stopped at the given signal, the delay in signal presentation was increased, and this step procedure was followed until the participant was no longer able to hold their response. After the data had been collected, the evoked response potential for both the target and stop signals were analyzed. No relationship was found between the stopping ability and the latency of the N2 component of the target evoked response potential. The results are discussed with respect to the stop signal paradigm and inhibition.*

### ***The Lateralized Readiness Potentials and the Psychological Refractory Period***

Poster Presentation

Undergraduate Student(s): Amir T. Woods, Kevin Smith

Research Mentor(s): Tim Martin

*The interactive relationship between the brain and the body continues to be the focal point of physiological research. However, pinpointing the onset of a lateralized readiness potential (LRP) has proven to be a challenge. Measured using electroencephalography, LRPs are negative electrophysiological signals originating from the motor cortex that are initiated approximately 200ms prior to the onset of the motor response. We used the psychological refractory period (PRP) paradigm*

*task to generate LRPs and measure the onset of the motor response. In the PRP paradigm, the subject emits motor responses after being rapidly presented with two different stimuli corresponding to two tasks. A PRP is a psychological phenomenon in which a subject's response to the second stimulus is significantly delayed due to the processing of the first stimulus. Upon analyzing the latency of the response locked LRPs of 19 subjects, using the PRP paradigm task, we found that the interaction between the stimulus onset asynchrony (SOA) and task difficulty was not quite significant, with a  $p$  value of  $p = 0.051$ . There were also no significant effects of SOA or task difficulty on amplitude and onset of the LRP.*

### ***Connectivity Analysis of Regions of Interest Between Regional Accents***

Poster Presentation

Undergraduate Student(s): Brandon Mitchell

Research Mentor(s): Tim Martin

*The purpose of the study was to examine whether there is a neurological preference for regionally specific accents. The three accents examined were a regionally familiar accent (North Georgia Southern North American), a regionally unfamiliar accent (Korean), and a regionally indistinct accent (Midwestern North American). Each subject ( $n = 13$ ) was administered one paragraph of each accent while the electroencephalograph (EEG) was recorded through a NuAmps NeuroScan 7181 amplifier. A sLORETA analysis using pairwise comparisons between each accent revealed significant differences between the Midwestern and North Georgia accents, mild differences the Midwestern and Korean accents, and little to no differences between the North Georgia and Korean accents. The inferior temporal gyrus of the temporal lobe, moving in a rostral direction from Wernicke's area, was the center of most differences.*

*Additionally, a sLORETA lagged connectivity analysis revealed that the North Georgia and Korean accents had markedly higher connectivity across all eight frequency bands when compared to the Midwestern amongst the specified regions of interest. The four regions of interest included the Primary Auditory Cortex, the Prefrontal Cortex, and Broca's and Wernicke's areas. Connectivity differences between the Korean and North Georgia accents were mildly variable, with the North Georgia accent producing the higher connectivity between the two. Total coherence and instantaneous coherence analyses mirrored the marked disparity between the Midwestern accent versus the Korean and North Georgia accents, however, they revealed less disparity between the Korean and North Georgia accents.*

### ***The Use of Participant-Confederates in Examining Behavior Among the Falsely Accused: A Pilot Study***

Undergraduate Student(s): Dara Latimer, Ahmad Sarris, Christine Davidson

Research Mentor(s): Jennifer Willard

*False confessions, which are admissions of guilt of a criminal act by an innocent individual, are a leading cause of wrongful convictions (Drizin & Leo, 2004). Researchers have primarily focused on identifying coercive elements of interrogations and confessor characteristics that increase the likelihood of false confessions, rather than examining potential relationship factors between the perpetrator and the*

*false confessor. This pilot study examined whether Russano et al.'s (2005) cheating paradigm could be modified to include a participant-confederate who is either a stranger or a friend. Participant-confederates engage in a staged cheating incident and then send a plea to innocent-participants asking them to falsely admit to cheating. Innocent participants are then confronted by researchers. Participants (N = 36) were randomly assigned to be a participant-confederate or innocent-participant. Of the 18 sessions, data from five sessions were eliminated due to participant stress, technology issues, or suspicion. Of the remaining 13 sessions, nine included strangers and four included friends. Only one participant falsely confessed in the stranger sessions, whereas two participants falsely confessed in the friend sessions. Results suggest that Russano et al.'s cheating paradigm can be successfully adapted using participant-confederates; thus, allowing researchers to examine the role of relationships in false confessions.*

### ***Self-Reported Willingness to Let Friends Falsely Take the Blame***

Poster Presentation

Undergraduate Student(s): Dara Latimer, Karina Gartavel, Stephen Gilcrease

Research Mentor(s): Jennifer Willard

*One reason people falsely take the blame is due to a desire to protect the perpetrator (Gudjonsson et al., 2007). These individuals typically have a relationship with the perpetrator (Mallory et al., 2015), and among friends, closeness influences people's willingness to falsely take the blame (Willard & Burger, 2017). However, it remains unclear under what circumstances people are willing to let someone take the blame for their misconduct. We sought to examine whether relationship status (i.e., casual vs. close friend) influenced people's willingness to let their friend take the blame for them. Furthermore, we examined whether the friend's receptiveness to taking the blame would influence participants' responses. Lastly, we explored the potential relationship between individual differences (e.g., belief in a just world) and participants' willingness to let their friend falsely take the blame. Overall, participants' willingness to let their friend take the blame for them was low. However, results indicated that certain situational and individual difference factors were related to willingness. Future research is needed to examine whether the factors that predict willingness in this study also predict behavior. However, these results may begin to inform law enforcement under what conditions perpetrators may allow individuals to admit, plead guilty, or confess for an offense they themselves have committed.*

### ***Attentional Threat Bias and Evoked Response Potentials***

Undergraduate Student(s): Bianca Sarrecchia, Courtney Wilson

Research Mentor(s): Tim Martin

*Attentional threat bias is the tendency of some people to respond more quickly to a target that is cued by a threatening word rather than by a non-threatening word. People with higher attentional threat bias have a greater risk for developing an anxiety disorder than the general population. In our experiment, we investigated the relationship between evoked response potentials and attentional threat bias (ATB) with the use of the ATB paradigm. The ATB paradigm uses two cues, one threatening word, and one non-threatening word. The target is an arrow which faces either left or right and appears under the threatening word or non-threatening word after the cue. The cue does not predict where the target will*

*appear and does not indicate where the participant's attention should subsequently lie. We initially looked at the evoked responses to the cues. We correlated the slope of the contingent negative variation (CNV) with the ATB and the State-Trait Anxiety Inventory (STAI) and did not find any statistically significant correlations. However, we are continuing to investigate other electrophysiological correlates of the ATB and STAI.*

***Demonstrating the Relationship Between Childhood Trauma Exposure and Emotional Dysregulation Through the Fear-potentiated Startle Paradigm***

Undergraduate Student(s): Edmund Tella, Olivia Lauzon, Jesse Edmond, Bianca Sarrecchia, Royce Alfred, Olivia Tyler

Research Mentor(s): Ebony Glover

*Past studies have demonstrated that exposure to childhood trauma may result in increased reactivity to stressful stimuli as well as long-term changes in psychophysiological and emotional reactivity. In our lab, we employed a fear-potentiated startle (FPS) paradigm wherein patients were conditioned to form an association between a neutral conditioned stimulus (CS) and an aversive unconditioned stimulus (US) through a number of pairings such that the mere presentation of the CS will elicit a fear response. This is followed by a period of extinction wherein the US is no longer paired with the CS. By the end of the extinction period the presentation of the CS should no longer elicit a fear response. A previous paper has demonstrated that those who were exposed to childhood physical abuse demonstrated a heightened baseline startle reactivity. It has also been demonstrated that childhood trauma is a predictor of emotional dysregulation later in life. Those with emotion dysregulation have been shown to have difficulty extinguishing conditioned startle responses. This paper aims to examine the relationship between FPS, childhood trauma, and emotional dysregulation. Participants (N= ) underwent a fear conditioning and completed both an Emotional Dysregulation Scale (EDS) and the Childhood Trauma Questionnaire (CTQ). We hypothesize that high baseline startle reactions will correlate positively to both childhood trauma and emotional dysregulation. This would suggest that emotional dysregulation may be a manifestation of the neurobiological effects of exposure to childhood trauma.*

***Using Fear Potentiated Startle Rate to Examine African American Women with Childhood Trauma Exposure: Are They at Higher Risk for Post-Traumatic Stress Diagnosis?***

Poster Presentation

Undergraduate Student(s): Kayla Herren, Olivia Lauzon, Jesse Edmond, Bianca Sarrecchia, Royce Alfred, Olivia Tyler

Research Mentor(s): Ebony Glover

*Adolescents exposed to traumatic events during early stages of their lives can experience long lasting effects due to their trauma exposure. Childhood trauma exposure can affect emotion regulation and put adolescents at risk for being diagnosed with posttraumatic stress disorder later in life. This risk is even higher for African American (AA) women, who are more likely to be exposed to trauma and have higher rates of PTSD than Caucasian American (CA) women. Previous research supports the idea that childhood trauma exposure may affect the emotional response to threatening cues, but little research has been done evaluating race differences in emotion regulation in women exposed to childhood trauma. The*



goal of this study is to compare startle rates of AA women compared to CA women with childhood trauma exposure and evaluate the risk of being diagnosed with posttraumatic stress disorder. Participants underwent a fear conditioning task and their acoustic startle responses were quantified during presentations of a feared stimulus and during a safe condition. They also completed the Childhood Trauma Questionnaire to determine their degree of exposure to childhood physical, sexual, and emotional abuse. Findings from this research may contribute to our understanding of biological factors contributing to mental health disparities in this country.

### ***Childhood Emotional Abuse and Alcohol Use in Young Adults***

Undergraduate Student(s): Alexandra N. Mercado Baez

Research Mentor(s): Ebony Glover

Childhood emotional abuse (i.e., sustained exposure to psychological maltreatment from caregivers) has been linked to depression, anxiety and problematic alcohol use in later life. However, there is limited understanding of neurobiological factors leading to these adverse outcomes. The acoustic startle response is a reflex that is modulated by neural systems implicated in emotion regulation. The goal of the current study is to examine the relationships among childhood emotional abuse, alcohol use, and acoustic startle response in college students. Participants were recruited from Kennesaw State University's Research Participation System. They completed the Childhood Trauma Questionnaire (CTQ) and the Kreek McHugh Schluger Kellogg scale (KMSK scale). KMSK measures the overall degree of self-exposure (frequency, duration, and amount) of alcohol during the period of time when an individual is drinking the most. It is hypothesized that individuals with higher exposure to childhood emotional abuse will report higher alcohol use and show higher startle responses. Such findings could contribute to identifying the neurobiological mechanisms linking childhood maltreatment with later alcohol use in young adults.

### ***Is Test Anxiety Associated with Emotion Regulation Deficits?***

Undergraduate Student(s): Jesse Edmond, Olivia Lauzon, Bianca Sarrecchia, Royce Alfred, Olivia Tyler

Research Mentor(s): Ebony Glover

Test anxiety is a physiological and behavioral response to one's own concerns and fears about taking an exam. Previous research has linked high levels of test anxiety to increased arousal, heart rate, and blood pressure. However, neural mechanisms regulating these activities are poorly understood. Our lab uses the fear-potentiated startle (FPS) paradigm to quantify acoustic startle responses in the presence of conditioned stimuli (CS) previously paired with aversive stimuli (US). This model is well established as a noninvasive tool to measure amygdala activity and characterize biological correlates of emotion regulation. The current study examines the relationship between fear extinction, a decline in conditioned fear expression following repeated presentations of the CS alone, and test anxiety. An inability to inhibit startle responding during extinction is a sign of emotional dysregulation. Participants recruited from Kennesaw State University completed the Westside Test Anxiety Scale before undergoing FPS. It is hypothesized that those who have higher test anxiety will show deficits in

*fear extinction. By linking test anxiety with emotion dysregulation, this project may give us a better understanding of the biological mechanisms underlying test anxiety.*

### ***Marijuana Use and Emotion Regulation in College Students***

Undergraduate Student(s): Bianca Sarrecchia, Olivia Lauzon, Jesse Edmond, Royce Alfred, Olivia Tyler

Research Mentor(s): Ebony Glover

*Marijuana reform is underway in the United States surrounding political climate at state and federal levels. The federal scheduling of marijuana generally limits research, respectively, the relationship concerning emotion regulation is even more obscure. The Affective Neuroscience Lab holds a unique advantage to contribute to this budding body of research by monitoring physiological amygdala activity and evaluating results in accordance with the KMSK self-report drug use survey measure. We utilize the fear-potentiated startle (FPS) paradigm to non-invasively monitor the psychophysiological responses (i.e., acoustic startle reflex) to conditioned stimuli (CS), shapes presented on a computer screen, sometimes paired with an aversive unconditioned stimulus (US), an air blast directly to the larynx. Our sample, (n=104), had a higher rate of current drug use with marijuana, (21.4%), than any other drug including alcohol, (15.5%). Previous literature suggests deficits in fear memory processing when the amygdala of a rat is infused with a pharmacological correlate of marijuana. We hypothesize that participants who reported marijuana use will show greater deficits in emotion regulation than reported nonusers. This study may contribute to a deeper understanding of potential implications of marijuana use on the emotional welfare of college populations.*

### ***The Relationship between Alcohol Consumption and the Menstrual Cycle in Women***

Undergraduate Student(s): Fathma Elgaydi, Olivia Lauzon, Jesse Edmond, Bianca Sarrecchia, Royce Alfred, Olivia Tyler

Research Mentor(s): Ebony Glover

*People typically overconsume alcohol during periods of high anxiety and stress. Women are disproportionately diagnosed with anxiety-related mental health disorders compared to men. Yet few studies have examined alcohol use in women and its implications for psychiatric illness. One factor that is rarely examined in the context of alcohol consumption is the menstrual cycle. Low estrogen (follicular phase of the cycle) has been associated with heightened anxiety. However, previous research has shown that women consume more alcohol during the luteal phase (high estrogen phase) of their menstrual cycle. This is inconsistent with our prediction that women in the follicular phase would consume more alcohol due to their heightened anxiety state. The current study aims to further examine the relationship between the fluctuation of reproductive hormones across the menstrual cycle and alcohol consumption in women. In addition, fear-related behaviors will be examined in men compared to women across various stages of their reproductive cycle and levels of alcohol consumption. The Fear potentiated paradigm is used to measure participants' startle responses during presentations of conditioned stimuli (CS) previously paired with aversive unconditioned stimuli (US) (danger condition), and during presentations of CSs never paired with USs (safety condition). Participants self-reported their amount of alcohol consumption using the Kreek-McHugh-Schluger-Kellog scale (KMSK scale) to quantify the*

*frequency, duration, and amount of alcohol consumption. It is hypothesized that women in the follicular phase of their cycle will report higher alcohol consumption relative to women in the luteal phase, and show higher startle compared to other groups.*

### ***The Effects of Deception and Stress on Participants and Researchers***

Undergraduate Student(s): Emily Griner, Daria DiResta

Research Mentor(s): Jennifer Willard

*Deception plays a vital role in psychological experiments investigating false confessions. This study examines participants' and researchers' reactions to the use of deception and stress in a cheating paradigm. Participants were randomly assigned to play the role of participant-confederates or innocent-participants. Participant-confederates were asked to cheat on a test and then send a plea for their partner (i.e., innocent-participant) to falsely admit guilt. Innocent-participants are then falsely accused of cheating. Researchers assessed participants' reactions to confrontations and participants' perceptions of their study experience. All participant-confederates were willing to deceive a naïve participant. Of the 24 confrontations, two sessions were terminated due to excessive stress in innocent-participants. All participants' stress levels were lower after debriefing. Additionally, participants who were deceived and those who acted as deceivers tended to rate their study experience positively. Lastly, one of the four undergraduate researchers falsely confronting participants requested changing to a non-confrontation role. Results suggest that even though most participants and researchers were not negatively affected by the deception and stress induced, caution must still be exercised when using a cheating paradigm.*

### ***The Intergroup Sensitivity Effect Among Racial Groups***

Poster Presentation

Undergraduate Student(s): Scarlet Hernandez, Amilynne McLeroy, Caleb Lang

Research Mentor(s): Katherine White

*The Intergroup Sensitivity Effect (ISE) is the tendency for people to respond more negatively when their group is criticized by an outgroup versus an ingroup member. The ISE has been demonstrated for nationality and profession, but not race. The present studies sought to replicate the ISE across racial groups. In experiment 1 (N = 248), participants responded to praise or criticism of their ingroup delivered by an ingroup or outgroup member. Criticism from an outgroup speaker was more negatively received than criticism delivered by an ingroup speaker. Feelings toward the racial outgroup did not influence reactions to criticism. Unexpectedly, White participants responded more positively to praise delivered by an outgroup member (reverse ISE). Experiment 2 (N = 272) used a similar design to further probe the "reverse ISE". Participants read comments of praise delivered by an ingroup or outgroup member. The "reverse ISE" was absent among Black participants, but replicated for White participants for both Black and Asian outgroup speakers. This effect was moderated by participants' motivation to avoid prejudice for the Asian outgroup speaker. These studies replicate the ISE for racial groups and reveal a unique effect that has not been observed in previous ISE research (reverse ISE).*

### ***Exploring Relationships between Cell Phone Use Behaviors, Peer Relational Expectations, Entrapment, and Personality***

Undergraduate Student(s): Kendall Poovey, Lindsay Connell, Karina Gartavel, Rosemarie Sullivan

Research Mentor(s): Jennifer Willard

*The current study investigates the potential relationships of cell phone use behaviors, mobile relational expectations of peers, feelings of entrapment (a term in the literature referring to guilt and/or stress one experiences due to mobile relational expectations from peers), and personality through an exploratory analysis. Results from previous studies indicate that individuals who report higher amounts of relational expectations from friends also report higher feelings of entrapment (Hall & Baym, 2011). Additionally, texting, but not voice calling, was associated with the experience of entrapment (Thomee, Harenstam, & Hagberg, 2011). Using survey responses from a larger ongoing study, correlational data analyses were run in SPSS for a small sample (N = 27). Results expanded on and replicated previous findings in the literature concerning relationships between cell phone behaviors, the experience of peer expectations, and entrapment. Findings from this study also uniquely add to the literature by suggesting that some individual differences may moderate feelings of entrapment. In our data set, conscientiousness significantly predicted lower feelings of entrapment. In the future, a larger sample size might extrapolate other trends observed in the data.*

### ***The Effects of Personality on the Stress Response***

Poster Presentation

Undergraduate Student(s): Kristina Thursby

Research Mentor(s): Sharon Pearcey

*Stress can influence many aspects of our lives causing negative physical and psychological health outcomes. The relationship between personality and the stress response is complex. This study will examine how individuals with certain personality types will respond to a social stressor. Fifty-two college students participated in the Trier Social Stress Test (TSST) and completed online questionnaires assessing personality traits and state anxiety. The TSST is a social stress task where participants are asked to prepare and deliver a five-minute speech and complete a mental arithmetic task for five minutes in front of two confederates dressed in lab coats who have been trained not to give any positive feedback. State anxiety was measured before and after the TSST. The Big Five personality inventory was used to examine the five personality traits of extraversion, neuroticism, openness, conscientiousness, and agreeableness. In this study, we hypothesize that the personality traits of neuroticism and openness will be related to a large increase in anxiety following the TSST. Conversely, we hypothesize that extraversion, agreeableness, and conscientiousness will be related to a modest increase in anxiety after the stressor. The results of this study should help by providing evidence for which personality traits have a more positive stress response, which could lead to a healthier life outcome.*

## **Sociology and Criminal Justice**

### ***What's Not to "Like"? University Police Departments' Facebook Outreach***

Poster Presentation

Undergraduate Student(s): Brittany Brewer, Landon Carver, Kathryn Deaton, Tequila Jackson, Kelly Neal, Aimee Ouellet, Leah Reilly, Danielle Teemer  
Research Mentor(s): Beverly Crank, Heidi Scherer

*Community policing has become a cornerstone philosophy in police departments throughout the United States, and the use of social media has the potential to reinforce the bond between community and local law enforcement. The purpose of the current study is to examine how campus police departments utilize Facebook, by analyzing the type of information they convey to the larger campus community. Extending previous research on social media usage among police departments (e.g., Brainard & Edlins, 2015; Dai, He, Tian, Giraldi, & Gu, 2017; Heverin & Zach, 2010), we conduct a content analysis examining Facebook usage among eight college campus police departments in Georgia. Individuals posts are examined from each department from August 1, 2017 to December 31, 2017. Common themes among university police departments' posts are identified, and potential policy implications from these initial findings are discussed.*

### ***Eliminating Drug Use: A Comparative Analysis of the Efficacy of Substance Abuse Intervention Programs***

Poster Presentation

Undergraduate Student(s): Karen Perdue, Debria Duggens, Kendell Kievit, Lindsay Sears  
Research Mentor(s): Evelina Sterling

*While collectively, substance abuse intervention programs have been shown to have variable rates of success, a number of programs have proven to be quite effective using replicable measures of success over the long term. The purpose of this study was to determine which specific factors of were most likely to lead to success among substance abuse intervention programs by evaluating and comparing five major national substance abuse programs implemented over the past 30 years. Given the nature of this study and its reliance on the perception of others, a qualitative research method was applied in conjunction with a comparative analysis assessing both programs deemed failures or ineffective in preventing substance abuse and those considered to be successful or effective with regard to long-term outcomes. Specific statistics showing marked improvements are included, though a substantial amount of evidence has been obtained through case studies, community engagement measures, and interviews with experts in the field. Results indicated that substance use intervention programs were most likely to be successful when the following factors were present: non-traditional curriculums, such as encouraging physical activity; peer support groups; situational re-enactments; and lastly, the acquisition of resistance and coping skills. In addition to this, some program participants were less likely to engage in substance abuse if the specific physical effects of substance use were known initially. With this research, our hope is to provide a framework for future health educators and public health professionals to utilize which can incorporate proven and specific evidence based results while still allowing the flexibility to cater to community and demographic differences.*

### ***Defining "Healthy": Changing Food Trends Over The Past 150 Years***

Oral Presentation

Undergraduate Student(s): Hannah Carter, Sarai Bauguess, Caitlin Streetman, Simon Gipson

Research Mentor(s): Evelina Sterling

*For over a century, society's goal has been to achieve healthier eating habits. The U.S. regularly implicates ways to encourage better eating habits among individuals. The purpose of this study was to investigate how the definition of "health" has evolved throughout the history by assessing specific health food trends. By assessing the evidence contained in four websites and twelve journal articles, a meta-analysis of the history of current food trends was developed, including the introduction of the first food store, the beginning of vegan food as well as frozen food, and the start of genetically modified food. These four major trends have been some of the most influential. The relationship between what consumers consider healthy and the current food trends is complex and often contradictory. With industrial modernization came the emergence of microwavable foods and easy to make meals. Although this trend became a staple for American society due to convenience, concerns about genetically modified products and chemical preservatives also arose. Ongoing debates still ensue about how "healthy" food can be if it has been genetically altered or preserved; however, healthier microwave options have been developed and are consistently used in popular dietary trends. Over time, being healthy shifted into being measured by vegetable intake instead of purely relying on counting calories. Therefore, the rise of veganism and vegetarianism peaked. Currently, the biggest trend has been a shift back to eating only organic foods. So now, the rise of health food stores across the nation has developed a market for the health trend of eating strictly organic foods, much like the food society consumed before modern industrial times. In conclusion, the cliché that "history repeats itself" is accurate given that health trends have altered how society has viewed health across time.*

### ***College Students Who Are Parents: Opportunities and Barriers for Success***

Oral Presentation

Undergraduate Student(s): Tequila Porter

Research Mentor(s): Evelina Sterling

*The purpose of this study was to investigate the unique needs and factors for success of college students who are also parents. Many experts suggest that most postsecondary institutions in America are ill-equipped to meet the needs of non-traditional students. Additionally, the number of college students who are also parenting is also increasing further highlighting this lack of preparation. Unfortunately, we know very little about this population since official statistics are not collected for this group, especially at the college and university levels. This study included qualitative analyses of about 30 college students who are also parents. Semi-structured one-on-one interviews were conducted, and a modified grounded theory approach was utilized to analyze the transcripts. College students who are parents often feel overlooked, invisible, or disconnected within the larger college community. A major concern among these students is the lack of access to on-campus support to help ensure retention, promotion and graduation. Disclosing family information can single students out because of the stigma associated with younger parents and may be seen as playing the 'student-parent card' by asking for preferential treatment. The reality is, this group has unique needs that should be equally considered for accommodations just as any other special group on-campus that may be at risk for poor retention, promotion and graduate rates.*

## ***Cyberbullying Victimization and Psychological State***

Poster Presentation

Graduate Student(s): Mark Walker

Research Mentor(s): Gang Lee

*With the invention of social media and increasingly widespread access to electronic communication more research is needed on the possible effects of cyberbullying. Specifically, identifying the effects of cyberbullying on the psychological state of cyberbully victims is a key step in raising awareness for the seriousness of the issue as well as contributing to the overall knowledge of the topic. A literature review on the current research define cyberbullying from a research perspective. The central hypothesis of this study is that cyberbullying victimization results in changes to the psychological states of victims. Data for the study were collected from two universities in South Korea utilizing multi-stage cluster sampling with a sample of N = 710. This research is conducted in order to better understand the relation between cyberbullying victimization and psychological state.*

## **College of Science and Mathematics**

### **Chemistry and Biochemistry**

#### ***New Developments in the Chemistry of polyNHCs: Synthesis and Coordination***

Poster Presentation

Undergraduate Student(s): Alexander Mason, Reagan Hooper

Graduate Student(s): Richard Justice

Research Mentor(s): Daniela Tapu

*Since the isolation of the first stable carbene by Arduengo in 1991, N-heterocyclic carbenes (NHCs) have emerged as a very useful type of ligands for homogeneous catalyst design, due to their high topological and electronic versatility, as well as a great coordination capability. The majority of known NHCs are either monofunctional or difunctional with tethered carbenes poised for chelation to a single metal center. Essential to the advancement of NHC-based materials has been the design and synthesis of new systems featuring multiple NHC moieties capable of functioning independently of each other. These multitopic NHCs are not only structurally fascinating, but could also function as building block for accessing new classes of polymers, as self-assembled materials and recyclable catalysts. The synthesis of several new classes of polyNHCs will be presented. Details on the chemistry of these carbenes with respect to their ability to support catalytically relevant metal complexes will be provided.*

#### ***New Cerberus-type N-Heterocyclic Carbenes: Synthesis and Coordination***

Poster Presentation

Undergraduate Student(s): Reagan Hooper, Natalie Harris, John Malone

Graduate Student(s): Maleek Montgomery

Research Mentor(s): Daniela Tapu

*The chemistry of N-heterocyclic carbenes (NHCs) has witnessed tremendous development in the past two decades. NHCs have not only become some of the most versatile ligands for transition metals, but they also have emerged as powerful organic catalysts in molecular chemistry. This project will describe our efforts towards the synthesis and characterization of a new rigid multitopic NHC featuring geometrically isolated carbene moieties for incorporation in multimetallic complexes. The role of these complexes in catalysis will be discussed.*

### ***Toward the Development of a New tris-NHC. Coordination to Coinage Metals***

Poster Presentation

Undergraduate Student(s): Shawn Allison, Andrew Duenas

Graduate Student(s): Maleek Montgomery

Research Mentor(s): Daniela Tapu

*Recently, there has been an increasing interest in the design of sophisticated ligands because they can provide additional functions for use in catalysis and in material science. Poly-N-heterocyclic carbenes have been used with great success for the synthesis of such ligands. This project describes the synthesis and characterization of a new such poly-NHC. The new ligand was characterized by proton and carbon NMR spectroscopy. Its coordination to two coinage metals (gold and silver) was achieved. The new complexes were characterized by NMR spectroscopy and X-ray analysis.*

### ***Synthesis of alpha-Alkynyl- and Aziridinyl-phosphonates from alpha-Phosphonovinyl Triflates***

Poster Presentation

Graduate Student(s): M. Tanner Dawson, David Kercher

Research Mentor(s): Christopher W. Alexander

*Alpha-phosphonovinyl triflates are a novel class of phosphonates that have been developed in our lab. We are exploring their chemical nature and have been successful in widening the synthetic scope of these molecules. For example, we have successfully used them as substrates in organopalladium catalyzed reactions to prepare alpha, beta-functionalized vinylphosphonates. Recently, we have developed a method to prepare alpha-alkynylphosphonates via a base promoted E2 reaction. Additionally, the triflates have been reacted with amines to afford alpha-aziridinylphosphonates via a Gabriel-Cromwell reaction. Interestingly, we have observed competing E2 and Gabriel-Cromwell reactions depending on the amine used. A summary of our method to synthesize alpha-alkynylphosphonates and alpha-aziridinylphosphonates from alpha-phosphonovinyl triflates will be presented.*

### ***Silicone Wristbands as a Passive Personal Detection Device and the Creation of Calibration Curves using SAS***

Poster Presentation

Undergraduate Student(s): Francisca L Small

Research Mentor(s): Christopher R. Dockery



*There are numerous challenges to tracking a person's chemical exposure. large variety of chemicals even in "low" exposure environments and often in low concentrations. Some of the limiting factors to wide spread use of person detection devices is the cost of developing, deploying and then finally extracting the chemicals, for this reason researchers have started looking into the use of silicone wristbands. The bands are inexpensive, durable, and require little effort on the part of the wearer to maintain. Research has shown that silicone wristbands will readily absorb a wide range of chemicals from hydrocarbons and personal care products to pesticides and industrial compounds that can then be extracted and analyzed via Gas chromatography-mass spectrometry (GC-MS). The purpose of this project was to create calibration curves of chemicals extracted from silicone wristbands as a passive personal detection device using Statistical Analysis System (SAS) of caffeine and nicotine, as well as toluene and doxepin which have not been studied previously.*

### ***Evaluating Volatile Organic Compounds for Contact-Independent Antagonism of Pseudogymnoascus destructans***

Poster Presentation

Undergraduate Student(s): Ashley McDonald

Research Mentor(s): Christopher Cornelison, Kyle Gabriel

*White-nose syndrome (WNS), a disease caused by the fungus Pseudogymnoascus destructans, is responsible for the extensive mortality of bats in the United States. In an effort to develop tools to reduce bat mortality attributed to WNS, an in vitro experiment was conducted to quantify the inhibitory effects of select volatile organic compounds (VOCs) as well as explore potential synergistic activities. The experiment involved exposing mycelial plugs of P. destructans to various concentrations of B23 as well as B23 and decanal together at equimolar ratios. Measurements of the plugs were taken over the course of the 13 day experiment allowing the quantification of the P. destructans mycelial growth when exposed to VOCs. The results were favorable and suggest these compounds may be effective at mitigating the impact of WNS on impacted bat species.*

### ***Content of Diphenhydramine in Various Over-the-Counter Medications Using Ultraviolet/Visible Spectrometry***

Poster Presentation

Undergraduate Student(s): Dalton Boutwell, Brianna Nicole Woolery

Research Mentor(s): Huggins Z. Msimanga

*Diphenhydramine is an antihistaminic medication used to alleviate symptoms such as watery eyes, itching, runny nose, and coughing. Among the various brands of diphenhydramine, Benadryl is the most used. Some brands are labeled as containing 25 mg per tablet, which is the same amount that Benadryl is acclaimed. The question is, in consideration for the consumer, how close to Benadryl are the amounts of diphenhydramine in the various brands? What is the magnitude of the variance? Four sample brands of Walgreen's brand (Waldryl), Walgreen's liquid (Wal-dryl cherry), Benadryl, and Wal-Mart brand (Equate) were prepared and analyzed for their content of diphenhydramine using spectroscopy. Based on the diphenhydramine structure, a Cary 100 UV Spectrometer was our choice for collecting data. A calibration equation was developed using standard solutions to quantify the different*

brands. Benadryl was found to be 23.87 mg/tablet, illustrating a 4.51 percent error. For the liquid cherry-flavored Wal-dryl brand, the strength was determined to be 25.07 mg/dosage, with a 0.30 percent error, while the Wal-Mart Equate brand was determined to be 26.372 mg/tablet, with a 5.46 percent error. Walgreens was determined to have a dosage/strength of 33.35 mg/tablet for their Wal-dryl brand, with a 33.39% error.

### ***Fragment-Based Drug Discovery via Thermal Shift Assay***

Undergraduate Student(s): Kimberly Meyberg

Research Mentor(s): Thomas Leeper

*The bacterium P. aeruginosa is recognized for its ability to frequently develop multidrug resistance to antibiotics during treatment of infections. My project focuses on strategies to find novel antibiotics that are less likely to evolve resistance rapidly by studying how solution conditions and small fragments can perturb protein binding interfaces. I have established a screen of buffer conditions varying in pH and salt using a thermal shift assay as part of the Fragment- Based Drug Discovery (FBDD) method to optimize thermodynamic stability of the target P. aeruginosa glutaredoxin protein. This method screens for small molecules that bind selectively to a target protein; these could then be coupled to reactive warhead inhibitors to covalently inhibit the target protein. The thermal shift assay uses the fluorescence of a hydrophobic dye to monitor the stability of the protein as it is subjected to increasing temperatures. Progress towards a screen of small fragments from an existing library of lead molecules for hits that non-covalently bind to and increase stability in the target protein will be presented. The optimized buffer conditions will be combined with several previously observed fragment hits that bind to glutaredoxin to observe the thermal shift obtained. Nuclear magnetic resonance (NMR) data will be collected on the newly obtained fragment-protein complexes and compared to existing multidimensional NMR data from previously obtained fragment-protein complexes.*

### ***Computational Study of Protonated Nitrogen Dimer and Interpretation of Infrared Spectra***

Poster Presentation

Undergraduate Student(s): Reagan Hooper, Dalton Boutwell

Research Mentor(s): Martina Kaledin

*The infrared spectrum of protonated nitrogen dimers has been the subject of both computational and experimental studies due to its relevance in astrochemistry. The experiment has provided complex spectra whose resolutions may be aided by computation, specifically in the near-infrared region. Here we have utilized DFT-B3LYP, Moller-Plesset MP2 perturbation theory, and molecular dynamics to generate and analyze the spectra of both neat and argon-tagged N<sub>2</sub>-H<sup>+</sup>-N<sub>2</sub> complexes. As expected, significant anharmonicity was observed for parallel proton transfer between N<sub>2</sub> molecules. Potential energy scans for proton transfer and argon binding were carried out, and Lennard-Jones fitting was attempted to quantify the weak interaction parameters between argon and the cation and for use in an existing potential energy surface.*

### ***Leveraging Gene Disc® Real-Time PCR Technology for the Targeted Production of Unique Barrel-Aged Beer***

## Poster Presentation

Undergraduate Student(s): Michael Monsees, Jessica Sutherland

Research Mentor(s): Chris Cornelison, Kyle Gabriel

*Real-time Gene Disc® PCR technology possesses the ability to identify a plethora of traditional beer spoilage microorganisms (e.g. Gram-positive and negative bacteria as well as wild-yeast strains). Spoilage microorganisms generate turbidity, off-flavors, and packaging issues that result in product losses, lower productivity, and profitability due to the suspension of production, and product recall, which taken together has a significant negative impact on customer confidence and brand image. This technology also has the capability to identify and quantify advantageous yeasts and bacteria for brewing, in which we at Monday Night Brewing utilize for the production of unique tasting barrel-aged beers. During the barrel-aging process, acidulated malt was added that is a natural carrier of various microorganisms. By applying Gene Disc® technology, we were able to identify and quantify beneficial microorganisms as well as allow for the modification of time for the aging process and the contemplation of which ingredients to add next to create and maintain an ideal environment for optimal fermentation. This new and exciting technology is revolutionizing the quality control process in the beer brewing industry and supports the development of authentic beers by allowing us to create the perfect/ideal environment for optimal fermentation conditions for the production and distribution of great quality beer.*

## ***An Investigation of Cognitive Load of General Chemistry Students Using a Virtual Modeling Activity***

Undergraduate Student(s): Tia Gordon

Graduate Student(s): Jenifer Calvert

Research Mentor(s): Kimberly Cortes, Adriane Randolph

*Reducing the cognitive load of students in STEM classes will allow them to learn more efficiently and focus more on the essential components in these courses. In general chemistry specifically, increasing the conceptual understanding of structure function relationships can decrease the cognitive load. The goal is to minimize the cognitive load of the general chemistry curriculum to provide more cognitive capacity for learning. At the beginning of a General Chemistry I course, a survey was administered that measured spatial ability and conceptual understanding. Thirteen right-handed students with varying spatial skills were identified to participate in the stimulated learning environment. The learning environment consisted of a virtual learning activity focused on intermolecular forces. To determine the level of cognition and the area of the brain that was triggered by the modeling activity, the brain activity of the student was recorded using electroencephalogram (EEG). Preliminary results focusing on patterns in student completion of the activity, usage of the model, and brain activation will be discussed.*

## ***Determination of the Cognitive Load of Modeling Tasks in Organic Chemistry***

Poster Presentation

Undergraduate Student(s): Lisa Bateganya, Aana Hampton-Ashford

Graduate Student(s): Jenifer Calvert

Research Mentor(s): Kimberly Cortes, Adriane Randolph

*Undergraduate students enrolled in chemistry courses typically experience high levels of stress and frustration when trying to visualize chemical compounds using a 3D representation. Increased amounts of stress can be caused by students having a large cognitive load. Previous research has indicated that manipulating physical models of molecular structures can enhance student understanding in courses, such as organic chemistry. However, when processing problems using models, students sometimes require higher cognitive loads due to completing unnecessary tasks that make processing information more complex. This study focused on determining aspects of a physical modeling activity in Organic Chemistry that impact the cognitive load of students. Tobii Glasses 2 was used to track what students looked at when completing the modeling tasks and electroencephalogram (EEG) to determine what part of the brain was activated during the activity. Results discussed will include observations of how students interacted with the models during the activity, what areas of the brain were activated during the activity, and suggestions for improvement of the activity based on the results.*

### ***Determination of the Cognitive Load of Serine Protease 3-Dimensional Models***

Poster Presentation

Undergraduate Student(s): Lana Aleuy

Research Mentor(s): Kimberly Cortes, Adriane Randolph

*With virtual and physical 3D modeling activities becoming more incorporated in the biochemistry curriculum to help students understand the relationship between structure and function, a greater cognitive load is often accompanying these 3D model activities. Learning about what part of 3D models cause the increase in cognitive load is essential to finding a solution to decrease them and in turn making the content more accessible for the student. Recordings of students solving 3D models of serine proteases using Tobii Glasses 2 and electroencephalogram (EEG) data were analyzed. The primary findings suggest that students had difficulty matching surface plates with their corresponding backbones, for the focus was less on the actual properties resulting from the structure (such as geometric and electric complementarity) and function of the enzyme as a whole and more on the shape of the enzymes, the magnets, and colors.*

### ***Determining the Cognitive Load of a Virtual Substrate Docking Activity in Biochemistry***

Oral Presentation

Graduate Student(s): Jenifer Calvert

Research Mentor(s): Kimberly Cortes, Adriane Randolph

*Understanding how students learn and process information in biochemistry is critical to developing physical and virtual modeling activities that facilitate student learning while also decreasing cognitive load. To meet this goal, research was conducted to identify the cognitive elements connected to a virtual modeling activity in biochemistry. Using EEG (electroencephalogram) and eye tracking technologies, researchers measured and recorded the cognitive processing of student participants while they were asked to manipulate and answer questions about during a substrate docking virtual modeling laboratory. Analysis of this data will provide information necessary to develop curriculum that does not undermine student learning because of excessive cognitive load.*

### ***Use of Biometric Techniques to Determine Differences in Exposure to Content when Reading and Processing Metabolic Pathways***

Oral Presentation

Graduate Student(s): Kimberly Kammerdiener

Research Mentor(s): Kimberly Cortes, Adriane Randolph

*Being able to move between multiple representations is an important skill in biochemistry. Schematics are a type of representation commonly used in biochemistry instruction often combined with chemical structures to form a metabolic pathway. As little work has focused on schematics in biochemistry, this study uses the Tobii X2-30 Compact Eye Tracker system and electroencephalogram (EEG) to record experts and students enrolled in various biochemistry courses as they read and process various metabolic pathway images. This presentation will focus on differences in areas of interest (AOI), fixation, scan path analysis, and brain activation among and between the different groups.*

### ***Determining the Interaction of Pex5 with Kinases and the Phosphorylation Status of Peroxisome Proteins***

Poster Presentation

Undergraduate Student(s): Christina Nguyen, Joshua Sukumar, Thomas Potts, Ki Dae Kim

Research Mentor(s): Rajnish Singh, Carol Chrestensen

*Peroxisomes are cellular organelles critical in the metabolism of lipids and reactive oxygen species. Peroxisomes are highly dynamic rapidly changing size, abundance and protein content in response to environmental conditions. These changes, collectively referred to as peroxisome biogenesis, rely on peroxisome biogenesis factors, Pex proteins that together regulate peroxisome function. Current research, has put the spotlight on reversible protein phosphorylation to regulate peroxisome dynamics, with Pex proteins in yeast, like pex11p and pex14p requiring phosphorylation for their function. This project focusses on a critical peroxisome biogenesis protein Pex5 – a peroxisome translocation signal-1 (PTS1) receptor, that binds to peroxisome proteins in the cytoplasm and transports them to the peroxisome. Preliminary studies in our lab using yeast two hybrid assay have shown that full length Pex5 interacts weakly with a stress activated kinase- MK2, indicating the potential of phosphorylation of Pex5 and/or Pex5 associated proteins. This study seeks to confirm the interaction of Pex5 with MK2 using a GST-pulldown assay as well determine the phosphorylation status of proteins associating with GST-Pex5 fusion proteins using phosphor-serine and phosphor-tyrosine antibodies. Results from this study will provide valuable information on this crucial oxidative stress combatting organelle, specifically on mechanisms of protein import into the peroxisome and provide insight into how phosphorylation regulates peroxisome function.*

### ***Evaluation of Leadership Styles and Teachers' Self-Efficacy Among a Cohort of Chemistry and Physics Teachers***

Poster Presentation

Undergraduate Student(s): Sarah Ake, Jared Long

Research Mentor(s): Michelle L. Head

*The statistics regarding the rate at which new science teacher leave the profession are grim. Therefore, it is important to develop an understanding of factors that may contribute to teacher retention. It is hypothesized that two such factors are teacher self-efficacy and teacher leadership. This presentation will present the results from a five-year longitudinal study that seeks to explore how these two factors develop among new teachers. To accomplish this goal, two quantitative measures were utilized: the Multifactor Leadership Questionnaire (MLQ) and the Teachers' Efficacy Beliefs System – Self (TEBS-Self). The results from each instrument have been triangulated with qualitative data collected in the form of the teachers resumes and interviews with the teachers. An overall increase in all areas of both the MLQ and the TEBS-Self instruments were observed over this five-year period. These results have been shown to further relate to the degree to which the participant have been active in their local school and broader science education community.*

### ***Design of Silicone Based Composite Materials Consisting of Zinc Oxide Nanorods and Gold Nanoparticles: Photocatalytic Activity***

Poster Presentation

Undergraduate Student(s): Kristi Moncja

Research Mentor(s): Bharat Baruah

Composite materials designed by depositing zinc oxide (ZnO) nanoparticles on silicone substrates. ZnO nanoparticles were then grown into nanorods. Gold nanoparticles (AuNPs) were then deposited on the ZnO nanorods (ZnO-NRs) as a plasmonic enhancer. The composite materials, ZnO-NRs@AuNPs were characterized scanning electron microscopy (SEM) and energy dispersive X-ray (EDX) line analysis. These composite materials were then assessed for degrading pollutants and toxic compounds in aqueous solutions under UV and visible light irradiation using a UV-visible spectrophotometer.

### ***Design of Graphene@Sand Composites for Water Purification***

Poster Presentation

Undergraduate Student(s): Connie Wei

Research Mentor(s): Bharat Baruah

*This project centers around the synthesis of graphene derived from a banana peel, a natural and cheaper source of carbohydrate. We have deposited graphene on the pure sand substrate. In this process, the natural sugar present in the banana peel is extracted and in-situ deposited on the sand and finally burned in the oven in absence of oxygen to create graphen@sand composite materials. We have compared the adsorption capacity of sand, and graphene@sand composites in adsorbing organic contaminant from water. Several dye molecules were tested to confirm the viability of these composite's adsorbability with the help of UV-visible spectroscopy.*

### ***Design of Binary Composite Materials Containing Nanostructured TiO<sub>2</sub> and Plasmonic Nanoparticles on Cotton Fabric: Photocatalytic Applications***

Poster Presentation

Undergraduate Student(s): Latanya S. Downer

Research Mentor(s): Bharat Baruah

*In this study, we will design composite materials containing nanosized TiO<sub>2</sub> and plasmonic nanoparticles (NPs). Cotton fabric will be utilized as a solid support to generate binary (TiO<sub>2</sub>-NP) NP. TiO<sub>2</sub> nanostructures will be immobilized on cotton fabric by using hydrothermal methods. Plasmonic nanoparticles will be synthesized using ex-situ methods and will be surface modified. Finally, binary materials will be created by dip-coating or drop-casting colloidal nanoparticles. The composite materials will be characterized by scanning electron microscopy (SEM), Energy-dispersive X-ray, Raman spectroscopy, XRD and thermogravimetric analysis (TGA). The photocatalytic degradation of model dye molecules will be monitored by UV-visible spectroscopy.*

### ***Design of CF@AgNPs Composite Materials by in-situ Synthesis of AgNPs on Cotton Fabric: SERS Detection***

Poster Presentation

Undergraduate Student(s): Michael Woods

Research Mentor(s): Bharat Baruah

*We design composite materials containing silver nanoparticles (AgNPs) and cotton fabric (CF). The cellulose in cotton fabric contains -OH groups. These -OH groups are deprotonated by a pretreatment process, and Ag<sup>+</sup> ions are allowed to bind. In a consecutive step, the Ag<sup>+</sup> ions are reduced to fiber bound AgNPs generating CF@AgNPs. Three different CF@AgNPs composites are created varying the concentration of precursor AgNO<sub>3</sub> solution. The composite materials will be characterized by scanning electron microscopy (SEM), Energy-dispersive X-ray, FTIR spectroscopy, and thermogravimetric analysis (TGA). The CF@AgNPs composites are assessed for the detection of toxins and explosives using surface-enhanced Raman Scattering (SERS) technique.*

## **Mathematics**

### ***Active Learning— The Key to Students' Academic Success Within Science and Mathematics Courses?***

Poster Presentation

Undergraduate Student(s): Cynney Walters

Research Mentor(s): Kadian M. Callahan, Scott A. Reese

*This is a research study that explores the relationship between students' learning experiences and their academic success in science and mathematics courses at Kennesaw State University (KSU). In recent years, the general consensus of academic institutions' understanding towards STEM courses is that there has been a decline in students' enrollment and achievement. Seeking improvement, researchers have called for a systemic change in undergraduate STEM teaching and learning practices ("Essential Questions"). In this particular study, the focus is on the examination of students' learning experiences in undergraduate science and mathematics courses. Previous studies have shown that the most successful science and mathematics courses tend to utilize active learning practices. The researchers'*

*purpose is to identify the practices used in the most successful classrooms and implement them in other courses. The classroom will serve as observational grounds for the collection of data through the use of the COPUS instrument. COPUS (Classroom Observational Protocol for Undergraduate STEM) is a continuous, minute-by-minute protocol used to record the simultaneous tasks and behaviors of students and the instructor. The researchers will also further investigate students' personal learning experiences through focus groups. The results of this study will provide information about the learning practices, achievement, and retention of undergraduate students taking science or mathematics courses at KSU.*

### ***A Data-Driven Framework for the Advancement of Disabled Persons***

Poster Presentation

Undergraduate Student(s): Mizzani Walker-Holmes

Research Mentor(s): Meng Han

*Augmentative and alternative forms of communication technologies provide the opportunity to offer people with disabilities who have complex communication needs with access to express themselves and communicate without difficulties. This project explores the use of data technologies to improve and advance the lives of disabled persons' using natural language processing, deep learning models and electronic augmentative and alternative communication systems. The fundamental objective of the project is to give speech to a larger number of people who may have lost the ability due to natural causes or unforeseen events, and to overall make it easier for disabled people to communicate through technology.*

### ***A Mathematical Model for the Effect of Domestic Animals on the Basic Reproduction Number of Human African Trypanosomiasis (Sleeping Sickness)***

Poster Presentation

Undergraduate Student(s): Sagi Shaier

Research Mentor(s): Meghan Burke

*The Human African Trypanosomiasis (HAT) parasite, which causes African Sleeping Sickness, is transmitted by the tsetse fly as a vector (which passes on the parasite, but does not contract the disease). It has several possible hosts, including humans and domestic animals, which are affected by the disease when bitten by an infected fly. It has long been assumed, because domestic animals can be a host for the parasite, that keeping domestic animals near human populations increases the spread of the disease. However, several parameters found in the literature, including the shorter lifespan of the male vector and the female vector's preference for domestic animals, made us question this assumption.*

*We have developed a differential equation compartmental model to examine whether increasing the domestic animal population can be used to deflect the infection from humans and reduce its impact. This 9-dimensional system of nonlinear ordinary differential equations includes tsetse flies in their various stages of maturity, which is more than most previous models have done. We have calculated  $R_0$ , known as the basic reproduction number. This  $R_0$  can tell us whether the disease will spread and become an epidemic, or not. We used an advanced technique known as the Next Generation Matrix method to obtain an expression for  $R_0$  based on the other parameters in the model.*



*Our study indicates that strategies that were not previously considered, such as vaccinating domestic animals, may reduce the impact of the disease on humans even better than vaccinating humans.*

### ***Efficient Plant Arrangements***

Poster Presentation

Undergraduate Student(s): Winston Smith

Research Mentor(s): Jennifer Vandenbussche

*Ecologists are interested in how the growth of plants is affected by the species of plants seeded nearby. In this problem, we are specifically looking at the effects of the species of plants placed equidistant from some focal plant. We accomplish this by placing the plants on a triangular grid, where each plant of interest is surrounded by a neighborhood of six equidistant plants. We are only concerned with the species of the plants in a neighborhood, not the relative position of them to the plant of interest. Given  $k$  plant species, how can we efficiently arrange plants on a triangular grid such that each possible neighborhood appears?*

## **Molecular and Cellular Biology**

### ***Analysis of novel heart defects in akirin mutants***

Poster Presentation

Undergraduate Student(s): Hayley Milner, Madison Hupp

Graduate Student(s): Austin Howard

Research Mentor(s): Scott J. Nowak

*Among the metazoans the heart is one of the earliest discrete organ structures to form during embryogenesis, in a process highly conserved across the phyla. Heart development is controlled by a cascade of factors beginning with the emergence of cardiac progenitors known as cardiomyoblasts. In *Drosophila melanogaster* the specification of cardiac progenitors from mesoderm, differentiation and patterning of cardioblasts, and ensuing heart formation is controlled by the recursive action of the Tinman/Nkx2-5 transcription factor, which is itself initiated by the activity of the Twist bHLH transcription factor. Previous work done in the Nowak lab has identified Akirin as a highly conserved cofactor that works with Twist to selectively regulate expression of Twist target enhancers, such as *mef2* and *tinman*. *akirin* mutants have a significant initial decrease in *tinman* expression levels as compared with wild-type embryos. *akirin* mutants further display profoundly abnormal hearts displaying defects in heart patterning, with disrupted organization and reduced numbers of Tinman-positive cardiomyoblasts. We have developed live imaging assays that indicate that *akirin* mutant hearts display profoundly abnormal contractions. Taken together, these data indicate that Akirin represents a new co-regulator of the cardiac developmental pathway, and is critical for heart patterning and formation.*

### ***Kinetic Characterization of Cellular Entry, Trafficking and Cargo Release by a Novel TAT-Derived Cell-Penetrating Peptide***

Poster Presentation

Undergraduate Student(s): Hannah Moorman

Graduate Student(s): Robert L. Dickson

Research Mentor(s): Jonathan McMurry, Julia LeCher, Daniel Morris

*Commonly derived from viral proteins, cell-penetrating peptides (CPPs) confer onto other macromolecules to which they are attached the ability to cross membranes in a rapid, nontoxic manner. They have long held great promise as delivery vehicles for biomolecular cargos for research and therapeutic purposes. However, standard CPP technologies rely on covalent linkages between CPP and cargo that commonly result in endosomal entrapment and destruction of cargo. Our group developed a high affinity, reversible, non-covalent CPP-adaptor, TAT-CaM, that solves this problem, releasing cargos into the cytoplasm with high efficiency. TAT-CaM consists of the cell-penetrating sequence of HIV transactivator of transcription fused to human calmodulin. It binds calmodulin binding site (CBS)-containing cargos with nM affinity in the presence of Ca<sup>2+</sup>, but not at all in its absence. Prior studies utilizing TAT-CaM to deliver an array of protein cargos to living mammalian cells found that delivery was so rapid that the kinetics could not be described using standard assays. The present report describes development of an assay utilizing cell culture under flow to observe penetration and cargo delivery in real-time. Baby hamster kidney cells were cultured in flow chambers that were installed onto a confocal microscope stage under culture conditions. Subconfluent cells were exposed to fluorescently labelled TAT-CaM/cargo complexes as live images were collected from time 0. Parameters such as concentration and time of dosing were examined with respect to efficient cellular delivery as evidenced by cargo-induced increases in cytoplasmic fluorescence. Differential fates of CPP-adaptors and cargos were also observed using compatible fluorophores with TAT-CaM expected to traffic to lysosomes while cargo localized to the cytoplasm. The results of this work will increase our basic knowledge of CPP trafficking with respect to mode and kinetics of entry and as well as inform future efforts to develop effective CPP-based delivery methods for therapeutics.*

### ***Real-Time Analysis of Cellular Trafficking of APE1 in Cancer Cells***

Poster Presentation

Undergraduate Student(s): Steven Ho

Research Mentor(s): Jonathan McMurry, Julia LeCher

*The apurinic/apyrimidinic endonuclease (APE1) is a multifunctional protein widely studied for its role in DNA repair, inhibition of reactive oxidative species and transcriptional co-activation. APE1 primarily localizes to the nucleus though redistribution of APE1 to the cytosol is a common phenomenon in many diseases. In cancer biopsies, an increase in cytosolic versus nuclear APE1 correlates to increased metastasis and poor patient outcome. The goal of this work was to study APE1's subcellular localization in living cancer cells following direct delivery of APE1 protein via a novel cell penetrating peptide-adaptor (CPP). We created chimeric CPP-adaptor constructs that could readily bind APE1 in presence of calcium and dissociate in the absence of calcium. These constructs were expressed in E. coli and purified via fast protein liquid chromatography. Binding kinetics of APE1 with our CPP adaptor were determined by optical biosensing. Live cellular uptake was assayed by confocal microscopy following introduction of fluorescently labeled APE1 into living cancer cells. Free APE1 was readily delivered into living cells via our CPP adaptor and quantified by mean fluorescent intensity, 72.6 MFI*

*with our CPP and 2.7 without. In cancer cells, over 90% of APE1 localized to the cytoplasm. Our model system allows us to analyze APE1's cellular distribution in real time. Currently, are investigating localization of APE1 to different cellular compartments under conditions, such as oxidative stress, associated with carcinogenesis.*

### ***Development and Application of TAT-CaM in Cryptocodium cohnii***

Poster Presentation

Undergraduate Student(s): Joshua Falkowski

Research Mentor(s): Jennifer Cooper

*Cryptocodium cohnii is a unique dinoflagellate that is both an important part of the environment, and a valuable source of the omega-3 fatty acid docosahexaenoic acid (DHA). Outside of its use in DHA production, little is known about the organism. We are currently attempting to manipulate and investigate this dinoflagellate by using the Cell-Penetrating Peptide (CPP). The specific CPP we are using is TAT-CaM, which is a hybrid protein made of a TAT, a protein taken from HIV that enters the cell via endocytosis, and calmodulin (CaM) a protein that releases its bound constituents in low calcium environments like the interior of the cell. If this can be done, it will allow deeper study of C. cohnii, such as a further exploration of the species' unique DHA content, and an investigation of their histone deficient DNA. We have established that C. cohnii is not killed in the process of CPP by using detailed hemocytometer viability counts. We have also found promising signs of successful penetration of the cells using TAT-CaM, which has been bound to Dylight-550 labelled myoglobin. Confocal microscopy results indicate that TAT-CaM is associating with the cell. Future work will focus on optimizing Tat-Cam CPP in C. cohnii.*

### ***Characterizing SpNox Enzyme Chimeras***

Oral Presentation

Undergraduate Student(s): Brittany Notice, Emily Onyekwere

Research Mentor(s): Susan Smith

*NADPH oxidases (NOXes) are a family of eukaryotic enzymes that produce reactive oxygen species (ROS). These transmembrane proteins move electrons from NADPH through FAD and across the membrane to the final electron acceptor O<sub>2</sub>, forming the superoxide anion O<sub>2</sub><sup>-</sup>. Superoxide and downstream ROS are crucial signaling and cytotoxic molecules whose misregulation is associated with disease states ranging from diabetes to cancer. SpNox is a recently discovered prokaryotic NOX homolog from *Streptococcus pneumoniae* that is robust to bacterial expression and isolation, making it a good model system for study of the NOX family. The focus of this research project is to characterize the biochemical properties of SpNox using mutants and chimeras. The mutants are SpNox F397S and F397W, which in homologous systems affect affinity for the substrate NADPH and/or the cofactor FAD. The chimeras are composed of the wild type prokaryotic SpNox transmembrane domain and a human dehydrogenase domain of NOX 2 or NOX 4. With each NOX type, there are 4 different chimeras; each contains a slight variation in the composition of their cytosolic loops that connect the transmembrane helices. We are using these chimeras because mutations in the human NOXes will create structural constraints during electron transport, allowing us to more easily study this fundamental NOX*

*function. Our results indicate differences in activity and in cofactor and substrate affinity among the various constructs used.*

### ***A Conserved Role for ETS Genes in Paired Appendage and Urogenital Development***

Poster Presentation

Undergraduate Student(s): Kira Monell

Research Mentor(s): Marcus Davis, Amanda Cass

*Development of paired appendages (limbs in tetrapods; fins in fishes) and the urogenital system (reproductive and urinary organs) share a number of similarities. Among these are the sharing of genes and gene networks that explain the occurrence of syndromic birth defects in paired appendages and genitalia. Among the genes recently demonstrated to contribute to the development of both organ systems are the ETS family of transcription factors. ETS genes are known to mediate limb outgrowth and proper digit number as part of the well known Shh-Gremlin-Fgf regulatory network. Experimental studies in the mouse show that the ETS genes Etv4 and Etv5 play a role in both limb and genital tubercle development. Our lab has recently demonstrated that Etv4 and Etv5 are also expressed in the paired fins of fishes. However, this early evidence of a conserved role for ETS genes in appendages requires further characterization, and any possible role for Etv4 and Etv5 in the urogenital system of fishes remains undescribed. Here we describe the expression of these ETS genes in the paired fins and urogenital system of the American paddlefish, *Polyodon spathula*, a “living fossil” model system that we use to test hypotheses about the evolution of gene regulation. Our results show striking similarities with the patterns of Etv4 and Etv5 seen in the mouse, providing further evidence that a conserved Shh-Gremlin-Fgf regulatory network, mediated by ETS genes, is shared by fins, limbs, and diverse urogenital homologues across vertebrate evolution.*

### ***Tactile versus Electrical Sensory Input to Stimulate the Zebrafish (*Danio rerio*) Escape Response***

Poster Presentation

Undergraduate Student(s): Kayla Vargas, Ashley Turcios

Graduate Student(s): Victoria Mendiola

Research Mentor(s): Lisa Ganser

*The escape response, or c-start response, provides a quantifiable assay for measuring changes in the communication of the neural circuit components that govern survival behaviors. Initiation of the escape response relies on the detection of mechanostimuli that trigger Mauthner neurons or M-cells, a pair of commissural neurons that extend the full length of the spinal cord to integrate stimuli through interneurons. Mauthner cells integrate directional information from stimuli, and convey bilateral, excitatory responses to motor neurons innervating trunk muscles. Communication between Mauthner neurons by commissural interneurons induces reciprocal inhibition necessary for coordinated movement. From an early embryonic period (16 hpf), zebrafish receive and respond to direct touch stimuli with escape behaviors. Previous studies comparing head touch-induced responses with responses elicited by an auditory cue indicate that fish do not develop auditory/ vestibular induced responses until 70 hours post fertilization. From this developmental milestone, instead of needing direct touch stimuli,*

*the fish employs the octavolateralis system to detect disturbances in the water. The escape response has been extensively characterized in larval zebrafish and is often used for testing innate and genetically altered reactions to stimuli. As a prelude to my thesis research regarding treatment of spasticity through reestablishment of balanced excitatory and inhibitory inter-neuronal signaling in the escape circuit, we investigate the relationship between c-start responses evoked through electrical and tactile stimuli. The importance of standard repeatable methods to elicit escape behaviors removes variables that may influence the integrity of the measured escape response and our ability to elicit consistent behaviors.*

### ***Characterization of Candida auris a novel drug resistant fungal pathogen***

Poster Presentation

Undergraduate Student(s): Ruby Rizvi, Carlye Lapham

Graduate Student(s): Ryan Parker

Research Mentor(s): Christopher Cornelison, Kyle Gabriel

*Candida auris is an emerging fungal pathogen first documented in Asia that has since spread rapidly in healthcare facilities across the world, resulting in serious infections, some of which have been fatal. C. auris, is an invasive yeast species that has been found to be resistant to all three of the major classes of antifungal drugs. The doses required to kill the pathogen with these antifungals are toxic to humans. There is little information about C. auris in the databases of commercial identification systems, leading to C. auris to be often misidentified for C. haemulonii and Rhodotorula glutinis, yeasts that C. auris shares biochemical identification markers with. Misidentification of the pathogen can lead to an improper course of treatment as well as difficulties controlling outbreaks within hospitals. The Bioinnovation Lab of Kennesaw State University has been working to find ways to properly identify and treat C. auris. Preliminary research is being conducted to assess the growth of C. auris as well as other Candida species and their utilization of various carbon and nitrogen sources. Spectrophotometry absorbance values and hemocytometer cell counts were used to identify the growth of the yeast and ease in quantification of population values. These tests will provide data to aid in the proper identification of C. auris. Continual research will consist of using essential oils to test the efficacy and potential synergism, which includes the interaction between the yeast and the essential oils in an effort to find treatment against C. auris infections.*

### ***Characterization of CRISPR- mediated Gene Regulation in Myxococcus xanthus***

Poster Presentation

Undergraduate Student(s): Maya Maarouf, Tiajah Sherman

Research Mentor(s): Ramya Rajagopalan

*Myxococcus xanthus is a gram-negative bacterium found in soil, mainly studied for its exceptional cell signaling mechanisms. Starvation-induced development of M. xanthus is an excellent model to investigate the way bacterial communities sense and respond to environmental signals. M. xanthus is known for its multicellular response during starvation. Morphological changes include cell differentiation from rods to round spores within special structures called fruiting bodies to evade starvation. The gene regulatory network for this process includes the dev operon, which is similar to CRISPR-Cas systems that aid in phage defense. Genes of the dev operon, such as devT, devR, and devS,*

regulate spore formation by repressing expression of *DevI*, also encoded in the operon. *DevI* acts as a sporulation timer and inhibits spore formation when highly expressed. We will perform experiments to identify the mechanism of developmental regulation by *Dev*TRS proteins. Cas proteins typically associate to form a “Cascade” complex that binds to target nucleic acid sequences. To test whether *Dev*TRS proteins associate to form such a complex, we will do bacterial two-hybrid analysis. We have cloned the *dev*TRS genes separately into bacterial two-hybrid analysis vectors, and will test them for interactions in various combinations. Positive interaction between one or more *dev* proteins will support the idea of complex formation. These experiments will help define the mechanism by which *Dev*TRS proteins affect spore formation and help better understand the role of CRISPR-Cas systems in gene regulation. This allows for improved comprehension of regulatory mechanisms in bacteria, with industrial and therapeutic applications.

### ***The Hangry Behavior of Myxobacteria: Transcriptome Analyses of Starving Cells***

Poster Presentation

Undergraduate Student(s): Sarah Joie Beauvais

Research Mentor(s): Ramya Rajagopalan

*Myxobacteria* exhibit social behavior by coordinating cellular response through cell signaling, making them perfect models to study these mechanisms. They are commonly found in soil. One example of their social behavior is the ability to coordinate multicellular spore formation (sporulation) during starvation and their predatory nature toward other bacteria and yeasts. The gene *csgA* codes for C-Signal production, which indicates close cell proximity—an important prerequisite for the starvation response, which in turn activates transcription factor *FruA*. *FruA* coordinates with *MrpC*, a starvation-induced transcription factor, and upregulates expression of thousands of genes essential for sporulation, while shutting down unneeded metabolic processes. In this project, I used R to perform various bioinformatics tests to analyze which genes were upregulated or down regulated in deletion mutant strains of *csgA*, *fruA*, and *mrpC* compared to the wild type (DK1622) strain of *Myxococcus xanthus*. Out of the hundreds of genes downregulated in the mutant strains, we selected around 50 candidates for further analysis. Some of them are predicted to code for proteins involved in peptidoglycan synthesis and remodeling, such as penicillin-binding proteins, carboxypeptidases, and the *Fts* cell division proteins. Others interesting candidates are CRISPR-Cas genes which are typically involved in mediating bacterial immunity to phage attack. I will do GO enrichment analysis on the list of differentially expressed gene get a functional profile and to identify those that are over or under represented. This analysis provides rich insights into gene regulation and cell signaling mechanisms with potential applications in industry and medicine.

### ***The Development Inhibitor and its Playmates***

Poster Presentation

Undergraduate Student(s): Kara Kelley, Tiajah Sherman

Research Mentor(s): Ramya Rajagopalan

*M. xanthus* is a gram negative member of the *Myxococcus* family that forms biofilms. *M. xanthus* is a model organism for studying cell signaling as it is a social bacterium that regulates its behavior in

response to external signals. When it lacks the nutrients needed to sustain itself, it sporulates and forms fruiting bodies. Two transcription factors, MrpC, and FruA, modulate the expression of 1000s of genes during starvation-induced cell-differentiation. One of the loci regulated by these proteins is an operon called the dev operon.

DevI, a 40-amino acid peptide product of the dev operon, acts as a sporulation timer. The role of small proteins in gene regulation is increasingly being recognized. DevI prevents *M. xanthus* from unnecessary sporulation by giving the bacteria more time to respond to the starvation signal before committing to the time and energy consuming process. DevI positively regulates transcription from the dev operon and the genes that code for MrpC and FruA, but the mechanism is unknown. We hypothesized that DevI could act as a modulator of transcription by interacting with MrpC and FruA and helping them bind to promoter recognitions sites.

A bacterial 2 hybrid analysis performed between FruA, MrpC, and DevI will be the first step to shining light on how the DevI protein regulates sporulation timing, and promises novel insights into the means by which small proteins regulate cellular processes. Understanding how DevI works will also allow for future potentials such as preventing biofilm formation in industrial pipelines.

### ***Does ngn-1 regulate the expression of daf-18 in the context of AIY axonal outgrowth?***

Poster Presentation

Undergraduate Student(s): Alexandra Beasley

Graduate Student(s): Elyse Christensen

Research Mentor(s): Martin Hudson

The transmission of nerve impulses along an axon, along with the integration of these signals via the central nervous system makes activities as simple as standing up or as complicated as taking a test possible. What are the genetic factors that control whether a cell becomes a neuron versus any other cell type? In addition, what controls how a neuron extends axons and dendrites so that it can make a synapse and communicate with other neurons? To gather an idea on how molecular biology plays a role in the genetic expression of neuronal developmental factors, we are studying the transcription factor *ngn-1*, which encodes neurogenin, a protein predicted to be required for neuronal development in the *C. elegans* nematode. *C. elegans* is a useful model for this research as they are easy to grow, have a short generation time of three days, a fully sequenced genome, and a sophisticated array of genetic tools with which to probe gene function. We hypothesize that *ngn-1* regulates *daf-18* to control the correct axon outgrowth of AIY interneurons. We have created single mutant strains for *daf-18* and *ngn-1*, as well as a *daf-18; ngn-1* double mutant. All three strains contain the GFP reporter gene *mgIs18*, which allows us to visualize the AIY interneurons in the head region of *C. elegans*. If *ngn-1* regulates *daf-18*, then the *ngn-1; daf-18* double mutant should not be any different from either single mutant. However, if these genes function in parallel, non-redundant pathways, then the double mutant should be worse than either single mutant alone.

### ***Does Neurogenin Control the Expression of cnd-1 in Caenorhabditis elegans?***

Poster Presentation

Undergraduate Student(s): Jessica Radchuk

Graduate Student(s): Elyse Christensen

Research Mentor(s): Martin Hudson

*Problems in nervous system development can lead to neurodevelopmental disorders such as Kanner syndrome, Tourette's syndrome, and Down syndrome. Transcription factors (TFs) are a class of proteins that help control the expression of genes, and multiple TFs are required for correct specification and function of the nervous system. It is difficult to understand how transcription factors work in an organism as complex as humans. Fortunately, many TFs are conserved across species, allowing the use of simple organisms such as the nematode *Caenorhabditis elegans* in understanding TF function. *C. elegans* have an invariant cell lineage, a fully sequenced genome, and provide an opportunity to study these genes in a more controlled, simple way.*

*Neurogenin is a TF involved in neuronal differentiation. In fruit flies and mice, *ngn-1* is known to regulate the basic Helix-Loop-Helix (bHLH) *cnd-1*, although whether this is so in other organisms is not understood. To further understand the relationship between *ngn-1* and *cnd-1*, we are creating a *C. elegans cnd-1; ngn-1* double mutant strain bearing a GFP reporter that marks the motor neurons in the ventral nerve cord. With this GFP marker, we will be able to compare the ventral nerve cord in *C. elegans ngn-1* and *cnd-1* single mutants with the *ngn-1; cnd-1* double mutant. If *ngn-1* controls *cnd-1* function, we anticipate that the *ngn-1; cnd-1* double mutant will appear similar to each single mutant. However, if *ngn-1* has no role in *cnd-1* function, then the double mutant should be synergistically worse than either single mutant.*

### ***srw-85 expression is controlled by the basic-helix-loop-helix transcription factor *cnd-1/NeuroD1****

Poster Presentation

Undergraduate Student(s): Derrica McCalla

Research Mentor(s): Martin Hudson

*To drive cell fate specification, differentiation and the overall development of the nervous system, it is essential to have the right pro-neural transcription factors and cell signaling pathways to mediate these processes. What is of particular interest are the downstream targets of these pro-neural factors and the lack of research being done in understanding their relevance in the neuro development. Unpublished data has identified a small number of genes controlled by the pro-neural transcription factor *cnd-1*. This protein is a member of the basic-helix-loop-helix family of transcription factors and is orthologous to human NeuroD1. *cnd-1* mutants were previously shown to have defects in axon morphology as well as in cell fate specification, so by studying this transcription factor and its possible targets, we can assess its role in neuronal cell fate specification. The question then is how can we find genes that are controlled by *cnd-1* and the role they play in the development of the nervous system? We performed RNAseq assays and bioinformatics, comparing RNA transcripts from WT and *cnd-1* mutant embryos. We identified a set of *cnd-1* downstream targets that show significant *p*-values when comparing transcripts isolated from WT and *cnd-1* mutants. We are validating these targets using GFP reporter genes and genetic approaches. Preliminary data indicates that the G protein-coupled receptor gene *srw-85* is*



*strongly regulated by cnd-1. In addition, we find that srw-85 is exclusively expressed in a single pair of sensory neurons.*

### ***Identification of a novel C. elegans CAMSAP/patronin allele via RNAseq***

Oral Presentation

Undergraduate Student(s): Wendy Verola

Graduate Student(s): Wendy Aquino Nunez

Research Mentor(s): Martin Hudson

*cnd-1(ju29) mutants contain a novel ptrn-1 allele that was discovered in the cnd-1 mutant strain received from the Caenorhabditis elegans Stock Center. The ptrn-1/patronin gene is significantly down-regulated in cnd-1(ju29) mutant. We used DEXseq to map individual RNAseq reads onto a genomic scaffold. We find that cnd-1(ju29) mutants have significant differences in transcript levels at the 3' end and 3' untranslated region of the ptrn-1/patronin gene. ptrn-1 codes for a Ca<sup>2+</sup> sensitive microtubule minus-end binding protein and is an ortholog of human CAMSAP (Patronin/Nezha/Calmodulin- and spectrin-associated protein). The CKK (calmodulin-regulated spectrin associated domain) is located at the C-terminus in CAMSAP proteins. ptrn-1 inhibits DLK-1 and the MAPK cascade and it is suggested that it inhibits microtubule dynamics. The CKK domain of ptrn-1 is necessary and sufficient for its function in MT dynamics. This allele is a 7kb deletion that removes the 3'UTR of the ptrn-1 gene, that appears to affect transcript levels of the 3' coding region also. Does this novel ptrn-1 allele enhance cnd-1(ju29) axon guidance defects? Why a ptrn-1 gene that is not on the same chromosome as cnd-1 should co-segregate is not known. We hypothesize that ptrn-1 mutants enhance the axon guidance defects seen in cnd-1 mutants. Work is on-going to cross our novel ptrn-1 allele into a different cnd-1 allele (gk718) to assay for axon guidance effects. Then a PCR of F2 generation will be performed to confirm outcross of ptrn-1(-/-) away from cnd-1(ju29). The DNA will then be sent for analysis.*

### ***What is the Relationship between Neurogenin and Ephrin during Neuronal Development?***

Poster Presentation

Undergraduate Student(s): Benjamin L. Crews

Research Mentor(s): Martin Hudson

*In order to grow from a single cell to a fully functioning human, numerous temporal and spatially specific genes need to be activated. In the nervous system, improper regulation of these genes leads to neurodevelopmental disorders ranging from mild depression to severe motor disorders. Neurogenin (ngn-1) is a transcription factor required for axonal guidance and the connectivity of neurons, and therefore plays a large role in neuronal development. However, the processes by which ngn-1 regulates this development are still unclear.*

*To better understand how ngn-1 regulates neuronal development, we are studying how this gene functions in Caenorhabditis elegans. This 1mm-long roundworm is an excellent model organism to study because their transparent bodies allow us to visualize their neurons and track each cell as the worm grows to full size. Also, C. elegans' short life span provides an opportunity to quickly analyze genetic crosses. Finally, ngn-1 function appears to be deeply conserved between C. elegans and humans*

*(indeed many organisms), playing a key role in regulating neuronal development, allowing us to extrapolate findings.*

*The cell surface ephrin (efn-4) is a ligand required for neuroblast migrations and thus could be under the control of ngn-1. In order to study their relationship, we are attempting to create a double mutant worm containing both ngn-1 and efn-4 mutations.*

*To see the effects of this relationship, we will examine the double mutant's AIY by tagging them with GFP. The AIY interneurons function in thermotaxis, locomotion and the starvation response. We will compare the AIY morphology of these double mutants with the tagged AIY of ngn-1 and efn-4 single mutant worms. Furthermore, changes in the double mutant worm's behavior and morphology will also provide insight into the ngn-1 and efn-4 relationship.*

*This project is a small part of a larger project focusing on how ngn-1 regulates neuronal development throughout the C. elegans nervous system. This research will hopefully provide insights into neurogenin function in humans and allow us to develop remedies for human neurodevelopmental disorders such as schizophrenia and autism.*

### ***Does ngn-1 regulate the expression of daf-18 in the context of AIY axonal outgrowth?***

Poster Presentation

Undergraduate Student(s): Alexandra Beasley

Graduate Student(s): Elyse Christensen

Research Mentor(s): Martin Hudson

*The transmission of nerve impulses along an axon, along with the integration of these signals via the central nervous system makes activities as simple as standing up or as complicated as taking a test possible. What are the genetic factors that control whether a cell becomes a neuron versus any other cell type? In addition, what controls how a neuron extends axons and dendrites so that it can make a synapse and communicate with other neurons? To gather an idea on how molecular biology plays a role in the genetic expression of neuronal developmental factors, we are studying the transcription factor ngn-1, which encodes neurogenin, a protein predicted to be required for neuronal development in the C. elegans nematode. C. elegans is a useful model for this research as they are easy to grow, have a short generation time of three days, a fully sequenced genome, and a sophisticated array of genetic tools with which to probe gene function. We hypothesize that ngn-1 regulates daf-18 to control the correct axon outgrowth of AIY interneurons. We have created single mutant strains for daf-18 and ngn-1, as well as a daf-18; ngn-1 double mutant. All three strains contain the GFP reporter gene mGls18, which allows us to visualize the AIY interneurons in the head region of C. elegans. If ngn-1 regulates daf-18, then the ngn-1; daf-18 double mutant should not be any different from either single mutant. However, if these genes function in parallel non-redundant pathways, then the double mutant should be worse than either single mutant alone.*

### ***Does Neurogenin regulate vab-1 during neurogenesis?***

Poster Presentation

Undergraduate Student(s): Omar Daouk

Graduate Student(s): Elyse Christensen

Research Mentor(s): Martin Hudson

*Schizophrenia is a mental disorder that roughly affects 1% of the world population and disrupts a person's emotional, cognitive and social actions in life that can lead to other psychotic symptoms. A previous study has linked schizophrenia to certain mutations found in chromosome 5 in humans. Neurogenin-1, a basic helix-loop-helix transcription factor gene also found on chromosome 5, is a key regulator of neural differentiation. Neurogenin-1 has been implicated in some schizophrenia cases, although how this occurs at the molecular level is not well understood.*

*To further understand the role of Neurogenin-1 during human neuronal development, we are looking at an ortholog gene, *ngn-1*, in a much simpler organism, the nematode *Caenorhabditis elegans*. This 1mm-long roundworm is a powerful model organism for studying neuronal differentiation, due to its short life cycle, transparent body morphology, and its fully sequenced genome. Our preliminary data reveals that *ngn-1* regulates multiple aspects of axon guidance during neural development. Based on the phenotypes seen in *ngn-1* mutants, we hypothesize that *ngn-1* may regulate transcription of axon guidance genes including the Eph receptor tyrosine kinase *vab-1*.*

*To address this question, we have created strains that contain the following mutations; *vab-1* alone, *ngn-1* alone, and both *vab-1* and *ngn-1*. These strains also contain a GFP reporter gene that drives GFP expression in just one pair of interneurons in the head. These strains will allow us to compare any differences in location or displacement of the AIY neurons in the double mutant when compared to each single mutant alone. If *vab-1* functions in the same genetic pathway as *ngn-1*, then the double mutant should not be significantly different when compared to each single mutant alone.*

### ***The Transcription Factor ztf-29 is Required for C. elegans Nervous System Development***

Poster Presentation

Undergraduate Student(s): Ciara Hosea

Research Mentor(s): Martin Hudson

*In humans, Kallmann syndrome (KS) is classified by lack of sense of smell due to olfactory bulbs not forming to completion, resulting in delayed or absent puberty. It has been shown that this disease is x-linked and has the ability to be passed to offspring. The investigation of the cause of KS has proven difficult, as about half of present cases of Kallmann syndrome have no known specific cause, leading to the conclusion that there are multiple factors at play and not just one gene, protein, or transcription factor in particular. However, the model organism, nematode *C. elegans*, has an ortholog gene of the human gene *KAL1*, *kal-1*, that might be used to study the transcriptional regulation of *kal-1* to provide a better understanding of KS. The *kal-1* gene has a promoter driving GFP in the strain of *C. elegans* known as *otIs33*. It has been shown that a percentage of the double mutant strain, *ztf-29;otIs33*, contain a specific expression phenotype that shows a wider nerve ring than normal. The aim of this project is to determine how *ztf-29* plays a role in the cell adhesion or axon guidance of *kal-**

*1 expressing neurons, as well as conclude why this widening of the nerve ring occurs, and which neuron specifically is responsible.*

### ***Quantification of Human-, Dog-, and Total Animal-associated Bacteroides in Cobb County Creeks***

Poster Presentation

Undergraduate Student(s): Jay Detillo

Research Mentor(s): Mike Beach

*Microbial source tracking (MST) attempts to identify specific animal sources of fecal contamination in the environment. While traditional fecal coliform enumeration can give a general measure of contamination, the specificity imparted by modern MST provides a more informative assessment of contaminants and their likelihood to affect human health outcomes.*

*We have been developing a MST system that detects DNA biomarkers from the gram negative bacterial genus Bacteroides. They are strict anaerobes found in large quantities in the intestines of animals. Bacteroides cannot survive long periods outside of their hosts and are considered a good indicator of recent fecal contamination in environmental waters.*

*Unlike E. coli or Enterococci, host-specific strains of Bacteroides exist. This can be attributed to their inability to proliferate outside of their hosts, resulting in a close relationship by which they evolve into species-specific strains. To this end, we have been developing Bacteroides-based species-specific assays that identify the presence of 16S rRNA gene sequences uniquely found in Bacteroides associated with their corresponding host species.*

*We tested three quantitative real-time Polymerase Chain Reaction (qPCR) assays for their ability to detect human-, dog-, and total animal-associated Bacteroides from environmental water samples. Our experiments confirmed their ability to quantitatively assess the level of contamination from these species in the environment. We are further refining our tests to include an internal amplification control to correct for PCR inhibition stemming from the environment. As we continue to optimized the qPCR assay, we hope to add new species tests to our MST toolbox.*

### ***Niche Partitioning for an Assemblage of Bats in the Piedmont of Paulding County Georgia***

Poster Presentation

Undergraduate Student(s): Sarah Mashburn, Shaleah Daye

Research Mentor(s): Thomas McElroy

*Bat community diversity in northwest Georgia consists of up to 16 insectivorous species. Explaining the coexistence of bat species that consume similar food resources is of interest to ecologists. Current hypotheses about bat community structure focus on methods of resource (food, space, time) partitioning. The objective of this research is to delineate patterns of resource utilization for bat species. We have monitored bat activities in two wildlife management areas in the Raccoon Creek Watershed of northwest Georgia. The two regions differ in landscape management histories and long-leaf pine restoration stages.*

*Our results indicated a significant difference in species presence and activity between regions. We found less temporal overlap than expected by chance within each site. Thus, time and space may be important factors in niche partitioning in this area. Our current project is investigating the diets of bat species that may specialize in eating different taxa of arthropod prey. The application of DNA barcoding to dietary studies allows prey taxa to be identified. Insectivorous bats eat a great diversity of prey. A DNA based approach may provide a means of assessing the range and diversity of prey for each species. We are using a taxon-specific primers to resolve prey species. We have recovered prey DNA from all fecal samples and will sequence the PCR products. We expect to detect a phylogenetically broad range of prey. The methods developed here will permit the study of bat diets and will be of great benefit to the conservation of these ecologically important predators.*

### ***Differential Analysis of Individual *Centruroides vittatus* Venom***

Poster Presentation

Undergraduate Student(s): Isabella S Batallas, Kelci R Knight, Whitney Smith

Research Mentor(s): Eric Albrecht, C. Neal McReynolds, Thomas McElroy

*Scorpions are well known, venomous arthropods (Class: Arachnida, Order: Scorpiones). Their venom is composed of neurotoxins, proteases and cytotoxic peptides which plays a major role in toxic components such as inflammatory, antimicrobial and hemolytic activity. Venom is key for the survival of scorpions as it is involved in defense against prey and in feeding on predators. *Centruroides vittatus* (bark scorpion) is commonly found in North America, with habitat ranges from Nebraska to southern Texas. For this study, scorpions were harvested from Laredo, Texas (27°57' N, 99°43' W), held in captivity for 4 months and fed a consistent diet of *Acheta domesticus*, prior to milking. The venom signatures from individual size class IV scorpions and the pooled samples from size class IV and I-III scorpions were investigated. Sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE) and LiCor scanning techniques were employed to resolve differences in venom signatures. Selected protein band (8) returned normalized intensity values of 88394, 46533, and 45719 for LUC 1, LUC 2, and LUC 5, respectively. This suggest LUC 2 and LUC 5 expressed a 2.75 fold higher expression compared to LUC 1. Examination of pooled size class I-III and size class IV venom suggests size class IV venom displays higher intensities for bands 3, 4 and 7 compared to size class I-III scorpions. Our data suggests there is a difference between individual *C. vittatus* venom signatures.*

### ***Survey and Analysis of Georgia's Most Contaminated Environmental Sites***

Poster Presentation

Undergraduate Student(s): Sean Fletcher

Research Mentor(s): Melanie C. Griffin

*Biomes, communities of vegetation and the microorganisms adapted to that particular environment, are undeniably essential to health of the ecosystem and all that thrives within them. Without question, the presence of toxic metal by-products, chemical pollutants, medical and radioactive waste can significantly impact the health of the biome communities. Governmental monitoring institutions like the Environmental Protection Agency, compile databases listing environmentally hazardous sites but the data can be difficult to navigate for retrieval of useful information. In this study, we examined the state*

of Georgia and conducted surveys of databases to determine the most contaminated sites. We categorized the top hazard by type and determined the locations by county. Major contributors to these biohazards generally include industry, agriculture, landfills and urban development and their impact is also highlighted in this study. Our study attempt is to achieve a ranking of these sites based on environmental impact in an accessible format. This could be utilized as list of targets for environmental remediation. In our study, we have observed that some sites are designated for cleanup by the government while other equally hazardous areas are not. This further supports the need for the scientific community to be engaged and to study the affected environmental sites. Advancements in technologies and approaches in cleaning these sites can only be made through careful research on the effects of the contaminants on the biomes and to inform recommendations for the conservation and preservation of these biomes for future environmental health and society impact.

### ***The DNA Regulator Lrp is involved with the Pseudomonas quinolone signal (PQS) quorum sensing network***

Poster Presentation

Undergraduate Student(s): Sheereen AbdulKabir

Graduate Student(s): Mareena Pitts

Research Mentor(s): Melanie C. Griffin

*The opportunistic human pathogen Pseudomonas aeruginosa controls the transcription of multiple virulence genes through a coordinated quorum sensing network hierarchy. Pseudomonas Quinolone Signal (PQS), which has been identified as 2-heptyl-3-hydroxy-4-quinolone, is the third quorum sensing system, with the other two being the acyl homoserine lactones of las and rhl. Phenotypic analysis of an Lrp insertion mutant, PW9942, suggests that Lrp is involved in biofilm production and siderophore production, which have also been shown to be regulated in part by PQS. We investigated the molecular interaction between the Lrp DNA binding protein and the pqsA-E biosynthetic operon. pqsA-E is transcribed as a single operon with one upstream control region. Using Biolayer Interferometry, we demonstrate here that Lrp recognizes and binds to the PQS regulatory region and may play a role in the regulation of the quorum sensing pathway. This interaction with the quorum sensing network represents a novel function of Lrp not previously reported. This also supports our previous studies suggesting Lrp has a global regulatory role (albeit indirectly) in P. aeruginosa perhaps by influencing the PQS signaling factor in the intercellular signaling network of quorum sensing. Although it is known that PQS regulates the production of virulence factors, understanding the complete role and interactions between Lrp and PQS within the quorum sensing network may lead to new targets for the development and therapeutic applications for treatment against hospital-acquired infections.*

### ***Generation of new antibiotic selections for prokaryotic CRISPR gene editing***

Poster Presentation

Undergraduate Student(s): Rick Liebold, Ashley Hicks

Research Mentor(s): Melanie C. Griffin

*The investigation of gene function often involves gene knock-out or mutational analysis. These procedures can sometimes be insufficient or difficult to achieve. CRISPR technology is a promising new*

*advance in this field, exploiting a naturally occurring prokaryotic defense system to effect changes in specific DNA sequences known as gene editing. This system can be used to generate direct insertion or deletions in targeted gene sequences. This is possible because the structural RNA molecule targeting the gene of interest (pTarget) and the endonuclease required for cutting the DNA and introducing the mutation (pCas) are carried on plasmids. These plasmids may be transformed into suitable hosts for selection and gene editing. Herein lies the obstacle and focus of our study. Some of the organisms we are interested in studying here at KSU, namely Pseudomonas (Griffin) and Aeromonas (McGarey) bacteria, are naturally resistant to the antibiotic markers on the plasmids carrying the CRISPR system. We present the generation of modified CRISPR plasmids with new resistance markers for gentamycin and tetracycline. We seek to knock-out the natural antibiotic resistance in the Pseudomonas and Aeromonas strains to test our new CRISPR plasmids before continuing onto our investigation of metabolic and regulatory pathways of these bacteria. Upon successful generation, these plasmids will be available to the scientific community for prokaryotic gene editing.*

### ***Preparation and Comparative Analysis of DNA Competence Among Enteric Bacteria***

Poster Presentation

Undergraduate Student(s): Matthew Seth Oxford

Research Mentor(s): Melanie C. Griffin

*No Abstract Provided*

### ***Understanding the Regulation and Activity of Hyaluronidase Produced by Aeromonads***

Poster Presentation

Undergraduate Student(s): Monica Sowder

Research Mentor(s): Donald McGarey, Pyeongsug Kim

*Hyaluronidases (HAase) are enzymes produced by a number of organisms, including bacteria, that degrade the substrate hyaluronan (HA). Hyaluronan is a polysaccharide, specifically a glycosaminoglycan, widely present in soft tissue of animals. In nature, the degradation of HA by a bacterial hyaluronidase is to use HA as a carbon and nitrogen source; however, HAase enhance tissue destruction and spread of infection by pathogens. Aeromonas are waterborne bacterial pathogens that cause diseases including gastroenteritis, wound infections, and acute necrotizing fasciitis. An initial screen of five different species showed the presence of a putative HAase gene in Aeromonas hydrophila, A. salmonicida, A. veronii, and A. aquariorum, but not A. bestarium. Although most Aeromonas strains were positive for the HAase gene, very few demonstrated phenotypic HAase activity (no HA degradation). Only one strain, A. hydrophilia 1280, displayed HA degradation regardless of condition. It has become apparent that an understanding of the regulatory elements controlling HAase expression and activity for aeromonads is lacking, and therefore the objective of this study. To date it appears that expression of HAase is independent of glucose availability; however, other growth medium constituents seem to influence activity and are under investigation. In addition to medium components, control of gene expression by quorum sensing and the possible role of metal co-factors in enzyme activity are under investigation. Understanding the regulation and activity of Aeromonas HAase will be important*

to understanding the mechanisms leading to tissue destruction and spread of infection as a means of preventing progression and severity of disease.

### ***Identifying Cadmium-Resistant, Probiotic Bacteria for Potential Protection Against Cadmium Toxicity in Drosophila Melanogaster***

Poster Presentation

Undergraduate Student(s): Pardis Madjidi, Olivia Brooks

Research Mentor(s): Donald McGarey, Pyeongsug Kim, Anton Bryantsev

*Cadmium (Cd) is a heavy metal with many beneficial industrial uses, but can cause harmful health effects when toxicity is reached. Usually, toxicity occurs through the accumulation of Cd either through inhalation or ingestion. Cadmium toxicity can affect many organs, but damage to kidney and liver is most common due to concentration at those sites. The body is capable of reducing toxicity; however, too much Cd can overload this compensatory mechanism. Bacteria have natural mechanisms to counter heavy metal toxicity, so finding a bacterium capable of reducing Cd toxicity in a host would prove beneficial. It is unknown if intestinal probiotic bacteria resistant to Cd toxicity, can serve to protect the host against ingested Cd and subsequent toxicity. The objective of this study was to select, identify and characterize bacteria displaying resistance to high-levels of Cd. After testing four commercially available probiotic preparations, the most resistant to Cd was Bacillus coagulans GBI-30, 6086, which grew 1 mM of Cd. A second bacterium isolated from a human fecal sample, likely Escherichia coli, was resistant at 2 mM Cd concentration. Both bacteria were fed separately to Drosophila melanogaster (fruit fly) over 5 days, before the flies were fed toxic levels of Cd. Flies fed the Cd-resistant bacteria died at similar rates as the control population. Although no survival benefit was observed, additional experiments are underway to determine if these bacteria are becoming established in the fly's gut.*

### ***Confirming the Functional Roles of the Ortholog Genes ahpB of Aeromonas hydrophila and hap of Aeromonas salmonicida***

Oral Presentation

Undergraduate Student(s): Rahiq Rahman

Research Mentor(s): Donald McGarey

*Aeromonas salmonicida, a globally-distributed, aquatic bacterium is a fish pathogen with high mortality rates causing severe hemorrhaging. Open wounds, warm waters, and crowded habitats allow A. salmonicida to spread quickly in a population, costing the fishing industry over \$40 million annually. Aeromonas hydrophila, a related species, is a similar fish pathogen; however, A. hydrophila also infects humans, leading to clinical diseases including gastroenteritis and rapid flesh destruction.*

*Relative to the A. hydrophila genome, A. salmonicida has undergone substantial changes based on its adaptation to salmonid hosts, providing insights into the mechanisms used for infection. However, they maintain similar genes such as hap of A. salmonicida and ahpB of A. hydrophila. The gene hap is reported to encode a hemagglutinin/protease. Hemagglutinin is a factor in the clumping of red blood cells (RBCs). In A. hydrophila, the gene with highest homology to hap is ahpB, which encodes an elastin degrading enzyme called elastase. Elastin is the extracellular protein enabling elastic tissues like skin to*



*stretch. Using an elastin-orcein assay, we have shown that both A. salmonicida (unexpected) and A. hydrophila (expected) exhibit elastase activity. Therefore, this study aims to confirm the functional roles of the proteins encoded by hap and ahpB to understand their role in the progression of disease, and if they should be targeted to reduce disease severity.*

*This is accomplished by cloning the hap and ahpB genes into strains of E. coli, followed by induction of genes. Elastin-orcein and hemagglutination assays test for new functionalities in the transformed E. coli. The protein product is later purified and analyzed.*

### ***The role of the Rbf1 tumor suppressor in the differentiation and maintenance of Drosophila muscles***

Poster Presentation

Undergraduate Student(s): Kaveh Kiani

Research Mentor(s): Anton Bryantsev, Maria Chechenova

*Retinoblastoma protein (pRb) is expressed virtually in all cell types with the main purpose of cell cycle control. A growing number of reports demonstrate that pRb is also implemented in early steps of myogenesis, but whether this function is independent from its role as cell cycle regulator remains unclear. To clarify this issue, we used a temperature-sensitive expression system to address the importance of fly pRb homolog, Rbf1, at different stages of adult muscle development. When the Rbf1 gene was downregulated in myoblasts (early knockdown), it caused muscle weakness and flightlessness in flies.*

*We next determined the role of Rbf1 at later stages of myogenesis by delaying Rbf1 knockdown by several hours (late knockdown). Under these conditions, all muscles, including jump muscles, developed normally and were functional in young adults. However, after 2 weeks the experimental flies developed muscle weakness that affected their flying, jumping, and climbing abilities. This decline in muscle functionality was paralleled by a reduction in mitochondrial gene expression. Specifically, the expression of mitochondrial IV subunit COX5A in flight muscles was downregulated by 85%, while the expression of other mitochondrial components (e.g. RFeSP, SdhB, Idh, and Adk1) was down by 30-40%.*

*Our data demonstrate that the Rbf1 gene is involved at different stages of myogenesis. Although in early myogenesis Rbf1 functions as cell cycle regulator, later it becomes the maintenance factor, supporting muscles in the differentiation state. Further studies, performed on this model, will explore the mechanisms mediating this transition in Rbf1 functioning.*

### ***Absorbing epithelium of the midgut as the model to study toxicity mechanisms of the heavy metal cadmium***

Poster Presentation

Undergraduate Student(s): Olivia Brooks, Brandi Huggins, Hannah Stratton

Research Mentor(s): Anton Bryantsev

*Cadmium (Cd) is a toxic heavy metal and environmental pollutant. Ever increasing exposure to Cd poses a health concern, because in humans Cd accumulates in kidneys and causes damage to the absorbing epithelium of proximal renal tubules. We used Drosophila as a model to study the mechanisms of Cd toxicity in absorbing cells of the midgut (enterocytes).*

*Chronic exposure of flies to 1mM Cd in the food significantly shortened their lifespan, affected midgut morphology, and activated the esg reporter (esg>GFP). Normally, esg>GFP is expressed in solitary intestinal stem cells, but in response to Cd exposure, its expression expanded over enterocyte clusters, each containing 4 and more cells. This change in esg>GFP signal indicates increased proliferation of midgut stem cells, which might be triggered by Cd-induced cellular damage to enterocytes. Consistently with this observation, experimental overexpression of the anti-apoptotic factor Diap1 in enterocytes significantly increased fly survivorship across various Cd concentrations. We conclude that midgut enterocytes are the critical target that determines Cd tolerance in flies.*

*We used the fly model to further gain insight into the mechanisms of Cd toxicity. Specifically, we addressed whether cells die because Cd induces oxidative stress in midgut enterocytes. However, genetic methods to make enterocytes more resistant to reactive oxygen radicals failed to improve Cd tolerance. Based on these results, we conclude that oxidative stress does not play a major role in Cd-induced death of epithelial cells.*

### ***Effects of Hemocytes and Hemocyte Signaling on Longevity in Drosophila***

Poster Presentation

Undergraduate Student(s): Allyson Sams

Research Mentor(s): Anton Bryantsev

*In flies, hemocytes are universal immune cells that circulate in the hemolymph and participate in cellular and humoral immune responses. In this work, we used hemocyte-specific Hml driver to affect properties of hemocytes in adult flies. Expression of proapoptotic gene rpr resulted in a ten-fold reduction of hemocyte counts without causing apparent adverse effects on flies. Unexpectedly, the experimental flies with depleted hemocytes lived substantially longer than their control counterparts. An alternative approach to reduce hemocyte amounts by knocking down expression of anti-apoptotic gene Rbf1 also resulted in lifespan extension. Although in this case the lifespan extension was less profound, it was in a good agreement with the lesser extent of hemocyte count reduction. Conversely, expression of constitutively activated oncogene mutant RasV12 (but not dominant-negative mutant RasN17) moderately increased hemocyte counts and shortened lifespan of the experimental flies. Collectively, our data strongly suggest that the amount of hemocytes in adult flies inversely correlates with their longevity.*

*In order to probe for the molecular mechanism that enables hemocytes to affect longevity, we addressed the central molecule in hemocyte humoral immune signaling - Rel (Drosophila homolog of NF- $\kappa$ B). Experimental flies with hemocyte-specific knockdown of the Rel gene demonstrated an extension in their lifespan. Consecutively, when hemocytes expressed the activated truncated form of Rel (Rel68), it*

*shortened the lifespan of flies. We conclude that Rel plays a role in hemocyte-dependent longevity, potentially via stimulating expression of secretory peptides.*

*Our study adds up to the growing evidence that the immune system plays a significant role in longevity.*

### ***Flight and Jump Muscles Respond Differently to Experimental Cachexia and Impaired Insulin Signaling***

Oral Presentation

Graduate Student(s): Matthew Giedd

Research Mentor(s): Anton Bryantsev

*Cancer cachexia is a metabolic syndrome characterized by progressive wasting of muscle tissue in the presence of a tumor. In many cases, progressive muscle wasting becomes a primary cause of mortality in cancer patients, although molecular mechanisms of such phenomenon are not fully understood. In this study, we assessed cachexia sensitivity in the two largest but otherwise highly distinct types of muscle fibers belonging to indirect flight muscles (IFMs) and jump muscles (TDT).*

*Using a previously established model, we induced cachexia in adult flies by expressing a mutated transcriptional activator yorkie (yki) via the esg driver, in the midgut. Cachectic esg>yki flies progressively lost flight ability within two weeks after midgut neoplasia induction (82% flight-impaired flies), which suggested dysfunctional IFMs. Accordingly, succinate dehydrogenase (SDH) activity assay revealed reduced mitochondrial activity in 35% of IFM fibers in esg>yki flies, while 10% of IFM fibers were completely degenerated and lacked any SDH activity. We recapitulated the cachectic phenotype, without midgut neoplasia, in IFMs overexpressing a dominant-negative insulin receptor (100% flight-impaired flies, 11% degenerated IFM fibers at 2 weeks). In contrast to IFM data, TDT muscles did not demonstrate exacerbated fiber degeneration or significant functional decline (retaining 80% of jumping power and 100% of live fibers at 2 weeks) in esg>yki flies.*

*Our results indicate that muscles with high energetic expenditures, like IFMs, become most vulnerable to insulin signaling perturbations caused by collateral tumors. The comparative model of IFM and TDT muscles may reveal genetic factors that determine the difference in cachectic response.*

### ***Expression of Telomerase mRNA in Nile Tilapia Tissues***

Poster Presentation

Undergraduate Student(s): Alexis Smith, Kristina Howard

Research Mentor(s): Jennifer Louten

*Telomeres are repeated sequences of DNA that constitute the ends of chromosomes. Telomere length can be maintained by the activity of the ribonucleoprotein telomerase. Telomerase expression is readily observed in human stem cells and germ cells, but the gene is turned off in most normal human somatic tissues. In contrast, telomerase activity has been observed in tissues of fishes, including rainbow trout and Japanese medaka. It is unknown whether telomerase is constitutively expressed in Nile tilapia, a*

*freshwater fish of interest because it is one of the most common farm-raised fish for human consumption. In recent years, a novel virus named tilapia lake virus (TiLV) was discovered and found to be the cause of mass die-offs of tilapia populations. In this study, we designed primers and used them to perform reverse transcriptase polymerase chain reaction (RT-PCR) analysis of telomerase expression in eleven tilapia organs. All eleven organs showed telomerase expression, with highest expression in the kidney and intestine. Our study is the first to show that telomerase is constitutively expressed in a variety of adult Nile tilapia tissues.*

### ***Effects of Essential Oils as Antifungal agents against Aspergillus flavus and Aspergillus parasiticus and detection of Aflatoxin B1***

Poster Presentation

Undergraduate Student(s): Yawa Zolome, Shideh Khorsandi

Research Mentor(s): Premila Achar

*Aspergillus flavus and Aspergillus parasiticus are the most common aflatoxin B1 (AFB1) producing fungi in peanuts. Aflatoxin contaminated peanuts continue to be a serious problem in Georgia. AFB1 is the most toxic and dangerous carcinogen to humans and animals. There has been considerable interest in the use of essential oils (EOs) with antimicrobial activities against Aspergillus spp in peanuts. EOs is known for their GRAS (Generally Recognized As Safe) status. Previous work in our lab screened several essential oils against this mold in peanut. Our current study was to test the Minimum Inhibition Concentration (MIC) and Minimal Fungicidal Concentration (MFC) of selected EOs, Clove and Cinnamon. MIC and MFC were determined by the plate diffusion procedure (Hadacek and Greger, 2000). Filter paper disc was impregnated with EOs at various concentrations: 500ppm, 1000ppm, 2000ppm, and 2500ppm, respectively. Treated disc was placed at the center of each agar plate containing mycelia and spores. Experiments were repeated for synergistic activity of the two oils (Pinto et al. 2009). All experimental set up were incubated at 28±2°C for 24, 72, and 96h and replicated thrice. AFB1 in treated samples were tested by biochemical methods. Aflatoxin production was promoted on specific media, Rose Bengal and Czapek dox agar. After incubation period, we observed that Clove oils showed the maximum MIC and MFC effect over Cinnamon at 2500ppm against both Aspergillus flavus and Aspergillus parasiticus. We detected presence of AFB1 in fungal extract by Thin Layer Chromatography. Quantification of AFB1 is in progress using GC-MS and HPLC.*

### ***Thermal Stabilities of Foodborne Pathogen Salmonella enterica serovar Thompson and Bacteriophage ΦEnt***

Poster Presentation

Undergraduate Student(s): Samantha Thompson, Andrew Marchant

Research Mentor(s): Jean Lu

*Salmonella are a group of bacterial pathogens frequently causing foodborne illness. Effective control of Salmonella is important to improve food safety. Bacteriophages or phages (viruses that attack bacteria) have emerged as promising biocontrol agents against bacterial pathogens. To effectively use phages to control Salmonella, the thermal stabilities of both Salmonella and phages need to be investigated. The objective of this study is to evaluate the thermal stabilities of Salmonella enterica serovar Thompson and*

phage  $\Phi$ Ent (attacking the *Salmonella*) at various temperatures. The thermal stabilities of *S. Thompson* and  $\Phi$ Ent were measured in water baths at 37, 50, 63, and 72°C. Samples were taken at 0.5, 1, 2, 3, and 4 minutes. Cell and phage concentrations were estimated using plate count method and plaque assay, respectively. The results showed that *S. Thompson* and  $\Phi$ Ent were stable at 37°C. At 50°C, cell concentration remained unchanged while phage concentration decreased about 1.5 log units within 1 min and slightly decreased thereafter. At 63°C, cell concentration decreased 1-log unit within 1 min, and dropped below the detection limit within 3 min. In contrast, phage concentration decreased 2.5 log units within 30 sec, and decreased slowly thereafter. At 72°C, cell concentration quickly dropped below the detection limit within 30 sec while phage concentration decreased much slower. In conclusions, the thermal stabilities of *Salmonella Thompson* and phage  $\Phi$ Ent vary with the temperature over the time. The study provided valuable data for the application of phage  $\Phi$ Ent as a biocontrol agent against *Salmonella Thompson* at various temperatures.

### ***Characterization of the Molecular Defects of 9p Deletion Syndrome using CRISPR Technology*** Poster Presentation

Undergraduate Student(s): Anna Gaede, Divine Forteh-Ngochi, Leilani Manera

Research Mentor(s): Xueya Hauge

*An individual inherits one set of chromosomes from the mother and one set from the father. 9p deletion patients inherited a faulty chromosome 9 with a missing piece of chromosomal DNA from one of parents. These patients have triangular shaped head (called trigonocephaly), severe mental disability, heart defect and autistic-like behavior. Trigonocephaly is a key feature of 9p deletion syndrome. A broader term for the distorted skull is craniosynostosis. Scientists have identified several genes which cause craniosynostosis when they are mutated. None of these genes are located on human chromosome 9, thus are unlikely the cause of the trigonocephaly seen in 9p deletion patients. The cause of the trigonocephaly in 9p deletion syndrome is unknown. Cerberus 1 (CER1) gene is a candidate gene and it is located on 9p. CER1 gene plays an important role in early embryo development. To investigate the potential role of CER1 gene in causing trigonocephaly, we used CRISPR technology to precisely remove a regulatory element near CER1 gene. CRISPR is a new and powerful tool in genome editing. CRISPR stands for clustered regularly interspaced short palindromic repeats. We used CRISPR and Cas9 to make double stranded DNA cuts in the pre-selected DNA sequences on the human chromosome 9p. In the first series of CRISPR experiments we precisely deleted the enhancer 5008 using CRISPR in a user-friendly human cell line HEK. We are currently investigating the effect of the enhancer 5008 on the CER1 gene activity in the human mesenchymal progenitor cells.*

### ***Detection of Chitinase and $\beta$ -1, 3 Glucanase Genes Against *Aspergillus flavus* in Transformed Peanuts***

Poster Presentation

Undergraduate Student(s): Rilwan Solarin, Glodi Bokanya, Roxie Lazo-Gonzalez

Research Mentor(s): Premila Achar

*Infection of peanut crops by *Aspergillus flavus* and *A. parasiticus* is a serious problem in Georgia. Specifically, *Aspergillus flavus* and *A. parasiticus* produce aflatoxins, which are among the most*

carcinogenic and naturally occurring compounds known to pose significant health risks to human and animals. There is no direct action peanut farmers can take to control fungi that produce aflatoxin in peanut seeds. Transgenic approaches are being undertaken to prevent invasion by *Aspergillus* fungi or to prevent biosynthesis of aflatoxin. The hydrolytic enzymes, rice based chitinase and  $\beta$ -1, 3 glucanase, have been established to be active defense mechanisms against various pathogens, especially fungal diseases, with particular reference to *A. flavus*. The goal of this project was to transform peanut plants with chitinase and glucanase genes against *A. flavus*, via *Agrobacterium* mediated transformation. Somatic embryos were transformed by co-cultivating with *Agrobacterium tumefaciens* plasmid constructs (pCAMBARGlu 289 & pCAMBAR Chi11, Dr. Muthukrishnan, Kansas State Univ). Specific primers were used to confirm successful gene inserts into transgenic peanuts by Polymerase Chain Reaction (PCR). While the Chitinase gene, was detected at ~700bp, the Glucanase was amplified at ~1200bp in the genetically modified (GM) peanuts. The quantification of these pathogen-related (PR) enzymes was done using a GUS histochemical assay. The GUS histochemical assay confirmed successful gene insert into the transgenic explants, however, Chitinase was not stably inserted. Characterization of expressed  $\beta$ -1 3 Glucanase gene was done by SDS-PAGE and Western Blot analysis. Estimation of total protein in GM peanuts was done by standard Bradford method. Our present study successfully standardized somatic embryogenesis and regeneration protocol in peanuts. The successful transformation led to the production of 50% or more of transgenic plants as evidenced by the GUS assay. While further tests will merely confirm the successful expression of proteins, we conclude that the transgenic peanut lines possessing fungal resistance genes may offer an alternative to traditional breeding and use of synthetic fungicides, in managing *Aspergillus* species.

### ***The role of EphR/ephrin Signaling in a Food-Seeking Sensorimotor Neural Circuit***

Poster Presentation

Graduate Student(s): Miranda Arnold

Research Mentor(s): Martin Hudson

*In order for the nervous system to develop accurately, specific guidance molecules are required in order for neurons to create contact with adjacent neurons at their cell-surface receptors. Eph Receptor tyrosine kinases (EphRs) and their ephrin ligands are crucial for many aspects of vertebrate CNS development, and mutations in these genes lead to a variety of neurodevelopmental defects. Studying these molecular aspects of these proteins in mice is difficult due to overlap in EphR and ephrin expression pattern and function. However, the nematode *C. elegans* contains only a single EphR and just 4 ephrin ligands making it a simple system for investigating EphR/ephrin function.*

*Previous work from the Hudson lab showed that mutations in the EphR/ephrin pathway led to defects in food seeking forward locomotion. Using GFP-reporter genes, we identified morphological defects in AIY interneuron development. The AIY interneurons are part of a circuit that processes information from amphid chemosensory and thermosensory neurons to the command motor neurons, and are crucial for controlling attractive and aversive behaviors.*

*To better understand the role of EphR/ephrin function in the sensorimotor circuit, we performed tissue-specific rescue experiments. We find that driving ephrin-1 expression from a pan-neural promoter is*

sufficient to rescue *ephrin-1* dependent food-seeking behavioral defects. However, this did not rescue the morphology of AIY interneurons, suggesting that defects in either the sensory neurons or the motor neurons underpin the behavioral phenotype observed. Work is on going to understand what role the *EphR/ephrin* genes play in sensory neuron development, and motor neuron development.

### ***Understanding Voltage-gated Sodium Channel Auxiliary Subunits via Bioinformatics***

Poster Presentation

Undergraduate Student(s): Nathaly Maia, Daisy McGrath, Nicholas Revelas

Research Mentor(s): Tsai-Tien Tseng

*Voltage-gated sodium channels are well known to initiate action potentials in electrically excitable cells. Auxiliary subunits for these voltage-gated ion channels diversify the functions of the principal subunit in the capacity of transport kinetics and biogenesis. Our goal has been to elucidate the relationship between function and evolution on a structural basis for each of these families. Three families of sodium channel auxiliary subunits have been included in our study: beta1 (SCN1B)/beta3 (SCN3B), beta2 (SCN2B)/beta4(SCN4B), and TipE. All beta subunits have been shown to have a role in modulating the gating kinetics of voltage-gated sodium channels. Previous findings were expanded after BLAST searches to reveal over 150 new homologues of beta1 and beta3 subunits, which was a significant increase from eight sequences as reported before. Furthermore, secondary structural similarity between beta1/beta3 and beta2/beta4 was observable without established similarity on their primary sequences. Kyte-Doolittle hydrophathy plots demonstrated similarities in topology between all beta subunits to indicate the common structural feature of one transmembrane helix. In addition to ones previously reported from insects, we recently discovered homologous sequences of the TipE family from small crustaceans. Sequence similarities were demonstrated by multiple sequence alignments from each family. Phylogenetic trees were derived from multiple sequence alignments to infer evolutionary relationships among these potential homologues. Mutations that cause disruptions in observed disulfide bonds may result in epilepsy syndrome. In addition to sequence-level conservations, our results will show an expanded view on the phylogenetic relationships among members of each auxiliary subunit family.*

### ***Shh/Gremlin/Egf regulatory network genes are expressed during both fin and urogenital development in paddlefish***

Poster Presentation

Undergraduate Student(s): Liz Osburn, Bonnie McKinnon

Research Mentor(s): Marcus Davis, Amanda Cass

*In humans, congenital birth defects in limbs (e.g. arms & legs, hand & feet, and the digits) are often observed in syndromic association with abnormalities in the urogenital system (internal and external reproductive anatomy, the urinary tract, and kidneys). Experimental studies in the mouse, as a proxy for human development, reveal that genes in the Shh/Gremlin/Egf gene regulatory network interact to promote proper outgrowth and differentiation of tissues in both of these organ systems. Recent data from our lab has revealed that genes in this network are similarly expressed in the paired fins (homologs of limbs) of the "living fossil" American paddlefish *Polyodon spathula*, a useful outgroup comparator to*

*the derived model system vertebrates. However, what remains unexplored is whether these same genes also play a role in the development of the urogenital system in paddlefish. To address this question, we used a combination of RNA in situ hybridization and cryosection histology to determine the expression patterns of many network genes during development of the tissues of interest. We assayed developing paddlefish embryos for the genes Sonic Hedgehog (Shh); the Shh receptors Ptch1 and Ptch2, the Shh response elements Gli1 and Gli3, and the Shh regulators Bmp4 and Fgf4. Our results demonstrate similar gene sharing in paddlefish and mammals, supporting the hypothesis that the Shh/Gremlin/Fgf network is a conserved organ patterning mechanism common to all jawed vertebrates.*

### ***Does CPP Delivered Catalase have Measurable Physiological Effects?***

Oral Presentation

Undergraduate Student(s): Beryl Khakina

Research Mentor(s): Susan Smith, Jonathan McMurry, Julia LeCher

*Catalase is an enzyme found in nearly all living organisms and is used as a defense against oxidative stress, specifically by degrading the hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) into water and oxygen. We have demonstrated successful penetration of catalase into the BHK mammalian cells using cell penetrating peptide (CPP) technology: both fluorescence from catalase conjugated with amino dye 555, and catalase activity in cell lysates, is significantly higher in CPP+catalase treated cells than in cells treated with catalase alone. Here we examine two questions related to these results. First, does the catalase traffic to peroxisomes, its correct location in mammalian cells? Secondly, does catalase delivered as cargo on a cell penetrating peptide protect mammalian cells against damage from H<sub>2</sub>O<sub>2</sub>? Confocal microscopy was used to quantify the colocalization of TaT-CaM delivered catalase to the peroxisome, the known subcellular location of catalase, in baby hamster kidney (BHK) cells. Cell viability was assessed by treating BHK cells with different concentrations of hydrogen peroxide for different times. Protein S-glutathionylation provided a method for assessing physiological effects of CPP delivered catalase. BHK cells exposed to H<sub>2</sub>O<sub>2</sub> showed increased levels of S-glutathionylation of proteins. Preliminary densitometry analysis shows a statistically significant difference between the S-glutathionylation in CPP catalase treated cells and the non treated cells. Here, we present results from colocalization and physiological protection of CPP delivered catalase assayed to date.*

### ***Mitochondrial targeting of protein cargos exogenously delivered via a novel cell-penetrating peptide adaptor system***

Poster Presentation

Undergrade Student(s): Hope Didier

Research Mentor(s): Jonathan McMurry, Julia LeCher

*Cell penetrating peptides (CPPs) have been used to deliver molecular cargos into a variety of cells and cell types and hold great promise for altering environments within living cells for therapeutic and research purposes, e.g. protein replacement therapy for metabolic diseases. CPPs and biomolecules to which they are attached are rapidly endocytosed, but there is a growing recognition that they become entrapped in endosomes and are eventually targeted for degradation. Our group has developed a CPP-adaptor system that reversibly binds cargo proteins in a Ca<sup>2+</sup>-dependent manner, solving the so-called*



*'endosomal escape problem.'* Ca<sup>2+</sup>-flux during cellular trafficking induces release of cargos from CPPs, allowing their subsequent delivery to the cytoplasm. The purpose of the present study was to determine if efficient targeting to mitochondria is possible. A synthetic gene encoding a model cargo consisting of myoglobin fused to a His-tag, a calmodulin binding site (CBS) and a mitochondrial targeting sequence (MTS) was made. Protein was expressed and purified from *E. coli* using metal affinity chromatography. MTS-CBS-myo was spontaneously bound the CPP-adaptor, TAT-CaM. Binding and Ca<sup>2+</sup>-dependent release was characterized with biolayer interferometry (BLI). Binding was nanomolar in affinity in the presence of Ca<sup>2+</sup>, and negligible in its absence. MTS-CBS-myo was fluorescently labelled and delivered into baby hamster kidney cells with TAT-CaM. Penetration was assayed by confocal microscopy. Mitochondrial targeting was verified by observing colocalization of MTS-CBS-myo with a fluorescent mitochondrial marker. Future directions include delivering proteins with activities relevant to mitochondrial biology and mitochondrial disease, e.g. superoxide dismutase for alleviation of oxidative stress that leads to mitochondrial DNA mutations.

### ***Kinetic Characterization of Novel Protein-Protein Interactions in Helicobacter Pylori Flagellar Assembly***

Undergrade Student(s): Ji Su Lee

Research Mentor(s): Jonathan McMurry

*Helicobacter pylori* is an  $\epsilon$ -proteobacterium that colonizes the stomach in half of the world's population. It is the primary cause of peptic ulcers and chronic gastritis, and is a major risk factor for gastric cancer and mucosa-associated lymphoma. *H. pylori* cells generally possess 2 to 6 polar flagella that are required for host colonization. The assembly of flagella occurs via a dedicated Type III Secretion System (T3SS). Although studies of flagellar gene regulation in *Escherichia coli* and *Salmonella* have shed much light on the mechanism by which gene expression is coupled to flagellar assembly, little is known with regard to how *H. pylori* coordinates such activities and there are a number of striking differences between *pylori* and other bacteria in structure, regulation and genes involved. Using known flagellar genes and gene products as well as leads from yeast two-hybrid interactome 'hits', the goal of the present study was to validate, kinetically characterize and develop biological context for flagellar protein-protein interactions in *H. pylori*. Proteins were expressed in and purified from *E. coli*. Biolayer interferometry (BLI), an optical biosensing technique was used to screen an array of candidate proteins for interaction. Hits from that screen were fully characterized in association-then-dissociation experiments to determine kinetic and affinity constants. Studies in progress at the time of submission are seeking to characterize the context of interactions *in vivo* via knock-out and mutagenesis experiments. The results of these studies will provide a valuable framework for gene regulation studies in *H. pylori* and other  $\epsilon$ -Proteobacteria.

### ***Specific Histidines Play A Role in pH Sensing***

Poster Presentation

Undergraduate Student(s): James Scott, Emily Onyekwere

Research Mentor(s): Susan Smith

*The pH sensitive nature of dinoflagellate bioluminescence provides an excellent tool for studying the pH sensing mechanism of proteins. The dinoflagellate Lingulodinium polyedrum generates bioluminescence*

through the interactions of two proteins – luciferin binding protein (LBP) and the enzyme luciferase (LCF) – with the enzyme substrate luciferin (LH2). At pH8, LCF is inactive, and LH2 remains bound to LBP. When the pH drops to 6, LBP releases LH2, and LCF becomes active, catalyzing the oxidation of LH2 and producing light as a by-product. In LCF, specific histidines are known to confer the pH sensing that regulates activity. We hypothesize that one or more of the 9 histidines in LBP confer the pH sensing that controls LH2 binding. LBP in which pH sensing histidines have been mutated should be incapable of delivering LH2 to LCF, which can be detected in a luminescence assay. So far, site directed mutagenesis of the LBP coding sequence has resulted in alanines substituted at H167, H209, H211, H340 H347, H638, H639, and H483[SMS1], with mutant H347A still to be made. Purified recombinant mutant and wildtype LBP preparations were “charged” by incubation with LH2 at pH 8, followed by sized exclusion chromatography to remove free LH2. Each mutant is tested in a luminescence assay to measure its ability to deliver LH2. Some mutants show less luminescence than wildtype, whereas other mutants show the same emission of light as the wild type. Thus, some but not all histidines affect LBP’s ability to sense pH.

### ***Microbial Voltage-gated Ion Channels***

Poster Presentation

Graduate Student(s): Kevin Bennett

Research Mentor(s): Tsai-Tien Tseng

Voltage-gated ion channels (VIC) form a superfamily that is well known for transporting potassium, sodium and calcium ions in excitable tissues. Ancestral members of this superfamily were thought to transport only potassium ions, unlike modern homologs from eukaryotes, which also transport sodium and calcium ions. The discovery of a sodium channel from *Bacillus halodurans* had significantly renewed the interest of physiological roles for ion transport in bacterial and archaeal species. Structurally, these bacterial channels shared the same topology with their eukaryotic counterparts while their shared history of evolution remained unresolved. The selectivity filter for ion specificity had a markedly different sequence composition that contradicted the canonical understanding of sodium-selectivity development, despite a highly conserved topology. This study addresses the inclusion of novel homologs into the overall evolution of ion-selectivity. An exhaustive similarity search was conducted on all domains of life to include all sequences that showed similarity to functionally characterized voltage-gated ion channels. Bacterial sequences were compared against other characterized sequences with multiple alignment to confirm the observed similarity to eukaryotic calcium selectivity pores. Phylogenetic trees were also built from these alignments to show that potassium-selective channels from ancestral bacteria gave rise to a potential calcium-selective precursor in addition to potential functional assignments of putative homologs. This precursor likely gave rise to sodium selectivity when passed to bacteria and calcium selectivity in eukaryotes. These findings would suggest that sodium specificity arose at least twice in VIC evolution, which provided the explanation for a sodium-selective channel from *Bacillus halodurans*.

### ***Designer Cell-Penetrating Peptides for the Treatment of Cervical Cancer***

Poster Presentation

Undergraduate Student(s): Juana C. Bejarano

Research Mentor(s): Jonathan L. McMurry, Julia C. LeCher

*Human papillomaviruses are the causative agents of cervical cancer. Cancer arises after integration of viral oncoproteins into the host genome with subsequent loss of regulatory viral protein E2. Reintroduction of E2 into cervical cancer cells can reduce cell proliferation and promote apoptosis in vitro. However, E2's therapeutic potential is dampened by the need for impractical delivery mechanisms such as gene transfection or viral vector delivery. An alternative approach is to deliver the protein directly to cells. Cell penetrating peptides (CPPs) are a promising means for the development and delivery of protein-based therapeutics. We previously developed a novel CPP-adaptor system for the rapid and effective delivery of bioactive proteins into living cells. While highly effective at delivering E2 for the induction of senescence or apoptosis in cervical cancer cell lines, our CPP can also be taken up by normal cells. The goal of this work was to devise a new CPP-adaptor for the targeted delivery of viral protein E2 into cervical cancer cells. We created chimeric cancer-specific CPP constructs that can readily bind E2 in presence of calcium but dissociate rapidly in its absence, representative of the extracellular and intracellular environments, respectively. Constructs were expressed in E.coli and purified via immobilized metal affinity chromatography. Binding kinetics of our cancer-specific CPP with various cargos was determined utilizing optical biosensing. Our CPP bound protein constructs with nanomolar affinity in the presence of calcium and not at all in the absence of calcium. Currently, we are utilizing mixed normal/cancer cell cultures to verify our adaptor will only target cancer cells. This work aims to validate that our methodology can be used for direct and targeted delivery of functional protein for the induction of senescence/apoptosis in cervical cancer.*

***New bis(amidine) ligands for highly luminescent copper<sup>I</sup> complex array***

Poster Presentation

Undergraduate Student(s): Alvaro Calderón Díaz, Nattasith Siwabut

Research Mentor(s): Michael Stollenz

*Molecular wires consisting of linearly arranged metal atoms that are embedded in polydentate ligand scaffolds have attracted considerable interest within in the past decade. In particular, Group 11 metal centers in multinuclear molecular frameworks are in the focus, since they facilitate closed-shell metal  $M^I \cdots M^I$  ( $d^{10} \cdots d^{10}$ ) interactions ( $M = Cu, Ag, Au$ ). The extraordinary luminescence properties of these materials result in potential applications not only for nanoelectronics, but also as powerful building blocks in organic light-emitting devices/diodes (OLEDs).*

*Our concept is based on a series of the new polydentate bis(amidines) with a sterically protected flexible backbone. These ligands undergo with mesitylcopper a clean conversion into multinuclear homoleptic clusters that are highly luminescent. Herein, we present three new bis(amidine) ligands and a novel linear tetranuclear copper<sup>I</sup> complex.*

***Digold bis(amidine) complexes upon insertion into NH $\cdots$ N' hydrogen bonds: Synthesis, structures, and molecular dynamics in solution***

Poster Presentation

Graduate Student(s): Omar Ugarte Trejo

Research Mentor(s): Michael Stollenz

*Group 11 metal centers that are embedded in polydentate ligand scaffolds have attracted considerable interest within in the past decade, since they facilitate closed-shell metal  $M^I \cdots M^I$  ( $d^{10} \cdots d^{10}$ ) interactions ( $M = Cu, Ag, Au$ ). The extraordinary luminescence properties of these multinuclear clusters result in potential applications not only for nanoelectronics, but they also serve as powerful building blocks in organic light-emitting devices/diodes (OLEDs).*

*Our concept is based on a series of the new polydentate bis(amidine) ligands with a sterically protected flexible backbone. The goal of this project is to explore the coordination chemistry of ligands that are capable of providing two additional donor sites, with regard to the formation of new unusual homo- and heteronuclear coinage metal clusters. Herein, four new bis(amidines) and the molecular structures of a representative ligand and its dichloro-digold complex, determined by X-ray crystallography, are presented.*

### **Ecology, Evolution, and Organismal Biology**

#### ***Nitrogen Cycling in Seagrass Systems: Do Macroalgae Alter Sediment Conditions?***

Poster Presentation

Undergraduate Student(s): Stephen Jones, Kelly Nguyen, Daniel Lord, Lina Tran

Research Mentor(s): Troy Mutchler

*Anthropogenic nitrogen inputs in estuaries have been linked to eutrophication and global declines in seagrasses. Excess nitrogen can stimulate growth of macroalgae that shade seagrasses and change sediment chemistry. In particular, macroalgae blooms have been associated with decreased dissolved oxygen and increased concentrations of toxic hydrogen sulfide and dissolved inorganic nitrogen. These changes in sediment chemistry have the potential to affect the nitrogen cycle processes that determine whether nitrogen is recycled within the system or exported to the atmosphere. The objective of this research is to explore relationships between macroalgal biomass and physical and chemical sediment characteristics throughout St. Joseph Bay, FL. Porewater and exchangeable ammonium, porewater sulfide, organic matter, sediment grain size, and C:N content will be analyzed to look at sediment chemistry in areas with and without macroalgae cover. Comparisons will be made between sites to examine the effects of macroalgae and location within the bay. In addition, correlations will be used to detect relationships between the sediment characteristics and macroalgal biomass. These data will contribute to a broader study seeking to understand how macroalgae affect the fate of nitrogen inputs in St. Joseph Bay.*

#### ***Comparison of Photosynthetic Rates for Two Evergreen, Temperate Species of Different Growth Forms (Tree versus Herb)***

Poster Presentation

Undergraduate Student(s): Sarah Andrews, Sean Caton, Shaila Sabusa

Research Mentor(s): Paula C. Jackson

*We compared photosynthetic rates as determined through light response curves of two plant species with very different growth forms and different leaf anatomies. Magnolia sp. and Hexastylis sp. are both evergreen, temperate plants that grow in the Southeastern US. Magnolia grows as a tree, reaching up to ~37 meters high, whereas little brown jug (Hexastylis sp.) is an herbaceous plant, reaching only a few centimeters above the ground. Because of the differences in growth form, leaf anatomy, and ecological differences, we hypothesized that significant differences would exist in their overall light response curves and in the extent of the relationship between their maximum photosynthetic rates and temperature.*

*We worked on the Kennesaw State University, Kennesaw campus and all individuals selected were growing on a south-facing slope of a hill in the arboretum. We selected 10 individuals of each species and chose one south-facing leaf per individual. To determine light curves we used a portable photosynthesis system (Licor 6400), and measured changes in CO<sub>2</sub> assimilation ( $\mu\text{mol m}^{-2}\text{s}^{-1}$ ) with increasing light. We collected temperature data using an infra-red thermometer gun, and collected data on leaf temperature of individuals of each species as well as leaf litter temperature surrounding individuals of Hexastylis sp.*

*Contrary to our expectations, our preliminary data indicate that the small herb species Hexastylis sp. presents a maximum photosynthetic rate that is almost double that of the tree species (Magnolia sp.). We continue to collect data on changes in maximum photosynthetic rate with changes in leaf temperature as the season progresses.*

### ***Using Ion Competition to Evaluate the Collapse of Vermiculite Interlayers***

Poster Presentation

Undergraduate Student(s): Samantha Swartzendruber

Graduate Student(s): James Thornhill

Research Mentor(s): Daniel Ferreira

*The collapse of clay interlayers is an important discussion in soil science. Due to the Fukushima Daiichi nuclear power plant meltdown clay soils in the surrounding area are contaminated with <sup>137</sup>Cs. <sup>137</sup>Cs is said to be irreversibly trapped inside vermiculite interlayers (Sawhney, 1964). This research intends to show at what time interval vermiculite interlayers, if ever, become collapsed where they can no longer interact with other cations. These findings would support the idea that <sup>137</sup>Cs is irreversibly bound to clay interlayers, therefore it cannot be removed through traditional remediation techniques. The interlayer collapse will be measured as a function of ion exchange competition between K<sup>+</sup> and Cs<sup>+</sup>. In theory, vermiculite interlayers should decrease in size as exposure time increases.*

### ***The Effect of Biased Media on Degree of Opinion Change Concerning Nuclear Energy as a Function of Education Level***

Poster Presentation

Undergraduate Student(s): Reed Walker

Research Mentor(s): Daniel Ferreira

*Surveys were given to participants to judge their opinions on various statements related to the costs and benefits of nuclear power to society before and after reading a supportive or negative article. Responses were recorded based on a likert scale and changes in their opinions based on reading one of the articles were determined. The degree of change of their opinions generated by the consumption of supportive or negative articles related to nuclear power and differences in the malleability of respondents' opinions based on education level will be discussed.*

### ***The Effect of Surface Runoff on the Water Quality of a Creek Located on the Campus of Kennesaw State University***

Poster Presentation

Undergraduate Student(s): Benjamin Nwadike, Ben Harner

Research Mentor(s): Lisa Adams

*This study investigated the water quality of a creek that runs through the campus of Kennesaw State University. The goal was to assess the effects of surface runoff from the surrounding environment on the creek by measuring conductivity and turbidity values. YSI 600R and YSI ProDSS handheld water quality instruments were used to measure conductivity and turbidity levels at three different locations along the creek. Precipitation levels were collected within 48 hours of sampling times in order to assess the effect of surface runoff on conductivity and turbidity values. Notably higher turbidity and conductance levels were observed at one of the sampled locations that were attributed to its proximity to campus parking, thus receiving more contaminated runoff than the other sites. A general trend observed was an increase in turbidity levels with recent rainfall. This investigation will help us better understand how water quality is affected by surface runoff in an urban setting and hopefully improve the general health of the natural campus environment.*

### ***Influence of Chinese Privet on Riparian Soil Decomposition***

Poster Presentation

Undergraduate Student(s): Victoria Romero

Research Mentor(s): Matthew Weand

*Chinese privet (*Ligustrum sinense* Lour.) is a non-native, woody shrub from China that was introduced to the United States in 1852, and now dominates many riparian zones in the southeast. This study tests the hypothesis that Chinese privet alters decomposition and carbon cycling in riparian zones, using a soil incubation experiment. Samples of native riparian soils were placed in vertical PVC columns with either native or privet litter on top. Columns were incubated in a greenhouse in the dark, with soils gravimetrically maintained at 70% water-holding capacity. Over several weeks an infra-red gas analyzer was used to measure soil respiration (carbon dioxide [CO<sub>2</sub>] efflux produced through microbial decomposition of the soil and litter). We also periodically sacrificed columns to measure mass loss of the litter layer. While this experiment is on-going, we expect privet litter to have a stimulatory effect on decomposition, resulting in greater CO<sub>2</sub> efflux compared to native litter. Alterations to decomposition patterns in invaded riparian zones are important because these changes can affect the dissolved organic matter and other nutrients that arrive in adjacent aquatic systems.*

## ***Linking Spatial Distributions of Injury on Seagrass Blades of *Thalassia Testudinum* to Sea Urchin *Lytechinus Variegatus* Grazing Patterns***

Oral Presentation

Graduate Student(s): Adrianna L. Parson

Research Mentor(s): Joseph M. Dirnberger

*Patterns of injury to plants can yield information on herbivore activity and impact that would be otherwise difficult to observe directly. However, it is often difficult to attribute injury to specific herbivores. Here, we examine injury to Turtlegrass, *Thalassia testudinum*, across various spatial scales to assess whether patterns in injury can inform us on grazing behaviors of the Green (or Variegated) Urchin, *Lytechinus variegatus*. Urchin densities at 7 sites along St. Joseph Bay (Florida, USA) increased dramatically from inshore to offshore (from 0 urchins inshore to as much as 570 individuals/100m<sup>2</sup> 500 m from shore). Blades with injury tended to be distributed in a similar pattern along the bay. Along blades, injury was more frequent on older, distal portion of blades, than the more recently produced basal portions. The type of tissue grazed by urchins (live tissue or senesced tissue) was visually assessed by gently turning over individual urchins in situ. Urchins that were feeding consumed senesced tissue more frequently (>2X) than live tissue. Relative availability of tissue types within the seagrass bed, as well as seagrass cover and various physical parameters were also assessed and compared to visual measurements of grazing, fecal content and urchin spatial distributions. Based on these results, assessment of blade injury can be used to compliment more labor-intensive methods in evaluating the way in which *L. variegatus* grazes on *T. testudinum* in situ.*

## ***Biocontrol of Foodborne Pathogen *Salmonella* Using Bacteriophage $\Phi$ Ent***

Oral Presentation

Undergraduate Student(s): Andrew Marchant

Research Mentor(s): Jean Lu

*Salmonella is one of the most common causes of foodborne illness. To prevent Salmonella infection, it is imperative to control Salmonella in food systems. Using bacteriophages (phages) to control bacterial pathogens is a novel biocontrol method. The objectives of this project were to measure the growth kinetics of phage  $\Phi$ Ent and to determine the efficacy of the phage as a biocontrol agent against *Salmonella enterica* serovar Thompson in a model food system (cucumber juice). The one-step growth curve of the phage was determined at the multiplicity of infection (MOI) of 0.02 in Tryptic Soy Broth at 37°C. The effectiveness of  $\Phi$ Ent against *Salmonella* was evaluated at MOIs 1, 10, and 100 in cucumber juice at 37°C over a 5-hr period. Phage titer and host concentration were measured using plaque assay and the plate count method, respectively. One-step growth curve of the phage showed that its latent period and rise period were about 40 min and 30 min, respectively. The average burst size was 32 phage particles per infected cell. During the first 3 hours, phage infection only at an MOI of 100 completely inhibited the host growth in cucumber juice. Additional one-hour phage infection, regardless of the MOI, caused a rapid cell lysis resulting in greater than 3-log and 5-log reductions in host concentration compared with the initial and final host concentrations, respectively. These results show that phage  $\Phi$ Ent is effective against *Salmonella* Thompson, suggesting that it is a good candidate as a biocontrol agent against *Salmonella* in food systems.*

## ***Biological Control by Plant-Growth Promoting Rhizobacteria***

Poster Presentation

Undergraduate Student(s): Brooke Warres

Research Mentor(s): Christopher T. Cornelison

*Plant growth promoting rhizobacteria (PGPR) are bacteria that form an intimate relationship with a plant's roots and through this interaction in the rhizosphere, increases the plant growth and systemic health (Kloepper and Schroth 1981). PGPR are widely used as biocontrol methods in agriculture because chemicals they produce are sometimes antifungal. Unfortunately, in some soils, they are not as effective due the competition between the endemic microorganisms. It is believed that if local strains of PGPR are identified, they will then be able to thrive since they are well adapted to those respective soil communities. In this research, soil organisms have been isolated from the KSU Hickory Grove Farm to search for a more effective organic biocontrol method. Once the soil organisms were found, they were then screened against Botrytis cinerea, a common pathogen of strawberries, tomatoes and other important agricultural products, to see if any inhibition occurs. Local strains of ubiquitous yeasts were also isolated and tested in vitro against B. cinerea. Inhibition of this fungal pathogen from both bacteria and yeasts were observed. Future studies will test the effect of these organisms as PGPR by using them as soil amendments for lab studies as well as at the green house scale with Hickory Grove Farm.*

## ***Has Urbanization Had an Effect on the Spawning Season of Campostoma oligolepis, Largescale Stonerollers?***

Poster Presentation

Graduate Student(s): Kelly Linz

Research Mentor(s): William Ensign

*There are two main factors that contribute to the beginning of a fishes spawning season, water temperature and amount of day light. The temperature for peak spawning of the Largescale Stoneroller is between 12° C and 14° C, so we predict that the environment that reaches this temperature range first would have an earlier spawning season. Furthermore, water temperatures are commonly greater in urban environments because they have little tree cover in comparison to a forested environment which consists of a thick canopy over tributaries. We predict that the spawning season for Largescale Stonerollers found in an urban environment will be shifted ahead of the spawning season for Stonerollers found in a forested environment. To predict the beginning of the spawning season we will explore the peak GSI for each gender by location.*

*Additionally, since male Stonerollers build nests for female Stonerollers to initiate spawning, we predict that male Campostoma will reach their peak gonadosomatic index prior to females in both the urban and forested environments.*

*To test these hypotheses male and female Largescale Stonerollers were sampled from two streams in Paulding County and Cobb County over an eight-month span.*



## Statistics and Analytical Sciences

### ***Mitigating the Effects of Class Imbalance Using SMOTE and Tomek Link Undersampling in SAS®***

Poster Presentation

Graduate Student(s): Jonathan Boardman, Kyle Biron

Research Mentor(s): Xuelei Ni

*Many standard learning algorithms have trouble adequately learning the underrepresented class in imbalanced datasets. Altering the training data with sampling methods can make it easier for classifiers to learn the class of interest. Two such methods are SMOTE, which generates synthetic minority class examples, and Tomek link undersampling, which clears majority class examples from class boundaries. Both methods were implemented in SAS® along with a combination of SMOTE followed by Tomek link undersampling (SMOTE+Tomek). Using a dataset of credit card fraud transactions where the class of interest was either fraud (minority class) or not fraud (majority class), the efficacy of these techniques was tested by training four classifiers – a random forest, a neural network, a support vector machine, and a rule induction classifier – on training datasets processed using each method and testing them on a validation set. The performance of the classifiers on the validation set was assessed using the ROC index, precision, recall, and the ratio of false negatives to false positives (FN/FP). SMOTE and SMOTE+Tomek were the most effective preprocessing methods for improving the detection of fraudulent transactions in the credit card dataset. Both methods improved recall and lowered the FN/FP for every classifier, indicating improved sensitivity to fraud. At the same time, SMOTE and SMOTE+Tomek improved the ROC index, indicating an improved ability to distinguish fraud from non-fraud.*

### ***Investigating Predictors of Hypoglycemia***

Poster Presentation

Undergraduate Student(s): Thomas Holmes

Research Mentor(s): Louise Lawson, Nicole Ferguson

*The research focuses on analyzing incidence of hypoglycemia in preterm infants in various neonatal intensive care units (NICUs) around the United States to determine patterns and find methods of identifying or diagnosing infants with hypoglycemia. There are various definitions for diagnosing hypoglycemia based on blood glucose levels. The researchers were interested in determining (1) whether or not it matters which blood glucose definitions for diagnosing hypoglycemia is chosen for prediction models and (2) which predictors affect the incidence of hypoglycemia. The original dataset used is from Pediatrix Medical Group contains 1,273,277 infants from neonatal intensive care units in 33 facilities.*

### ***Comparison of BMI and Weight-for-Age as a Growth Assessment of Preterm Infants***

Poster Presentation

Undergraduate Student(s): Anna Deeb, Julian Payne, Thomas Holmes, Rebecca Fowler

Graduate Student(s): Jonathan Boardman

Research Mentor(s): Louise Lawson, Nicole Ferguson

*Objective: To evaluate BMI as a complementary measure of growth to weight-for-age for infants in the NICU (neonatal intensive care unit).*

*Study Design: This was an analysis based on Olsen 2009 study of infants (n = 211,237) of gestational age 22 to 42 weeks at birth, born from 2013-2016, having growth data at birth and discharge. Both measurements weight-for-age and BMI were categorized as small (<10th >percentile), appropriate (10th-90th percentile), and large (> 90th percentile).*

*Results: The percentage of infants classified as large-for-age by BMI greatly increased between birth and discharge for infants at gestational age classification of extremely, very and moderately preterm. There was a decrease in agreement from birth to discharge between weight-for-age and BMI. At birth, there was a moderate agreement (K=0.55) while at discharge there was fair agreement (K=0.34). When comparing the percentage of infants categorized as large from birth to discharge, BMI showed a notable increase not seen with weight-for-age. There was moderate agreement for both weight-for-age at birth and discharge (K=0.60) and BMI at birth and discharge (K=0.52).*

*Conclusions: Weight-for age does not classify infant growth the same as BMI. Specifically, it underestimates size for gestational age classification for extremely, very, and moderately preterm infants.*

## ***A Comparison of Intrauterine Growth Chart's Classification of Infants Birth Weight in the NICU***

Poster Presentation

Undergraduate Student(s): Daniel Waskiewicz, Bryan Yockey, Amanda Mendoza

Graduate Student(s): Cooper Jannuzzo, Kyle Biron

Research Mentor(s): Louise Lawson, Nicole Ferguson

*Intrauterine growth charts are a visual representation of a cross section of infants achieved size at birth and represents their optimal growth pattern (Fenton, 2003). In addition, they aid in the categorization of preterm infants as small for gestational age (SGA), large for gestational age (LGA), or appropriate for gestational age (AGA). Currently, there are multiple growth charts to choose from; each slightly varying in the way they classify preterm infants. This is troublesome, because it is vital to correctly classify a preterm infant. When incorrectly categorized, infants may not receive the necessary nutritional treatment, which can lead to additional health related consequences (Olsen et al., 2015). The aim of this study was to compare how curves developed from different populations classify male and female infants when stratified by sex, and gestational age. Our study is based on an initial sample of 357,289 infants admitted over a 3 year period ranging from 2013 to 2016. Our sample was restricted to 299,408 inborn infants admitted within 2 days of birth. In addition, infants were excluded if they had missing gestational age, missing gender, all missing measurements or were transferred. With all exclusion criteria in place, the final sample contained 258,510 infants ranging from 22 to 42 gestational weeks. The infants were then classified using the different percentile curve cut points as defined by Lubchenco, Olsen, Fenton, Villar and Yunis. SAS software was used for data processing and Tableau was used to create data visualization.*

## ***An Optimized Route for Q100's Bert and Kristin to Visit all Jersey Mike's Subs in Atlanta for Charity***

Poster Presentation

Graduate Student(s): Sanjoosh Akkineni, Andrew Henshaw, Jessica Rudd, Lauren Staples

Research Mentor(s): Joe DeMaio, Lin Li

*The Bert Show is a popular morning show on Atlanta's Q100 radio station. They host a non-profit organization that provides a "magical, all-expenses-paid, five-day journey to Walt Disney World for children with chronic and terminal illnesses and their families" called "Bert's Big Adventure." On March 28th, 2018, thirty-seven locations of Jersey Mike's are participating in their Jersey Mike's Day of Giving to support Bert's Big Adventure. The goal is to have two popular radio show hosts visit each of these locations for some photos and presence to draw in more customers! But how do we get two radio hosts through Atlanta traffic to visit a similar number of locations each, in 9 hours????*

*We developed a novel approach to the Multiple Traveling Salesman Problem (mTSP) that combines a genetic algorithm (GA) with a combinatorial optimization solver. The objective of the mTSP is to assign a tour of cities to each of  $m$  salesmen such that the maximum of the travel times for each salesman is minimized. In our program, the GA determines the assignment of cities to each salesman, while the combinatorial solver generates an optimal TSP route for each assignment. The maximum time for all single-TSP solutions provides the cost function for the GA. The genetic algorithm provides an efficient search of the solution space and we show that this metaheuristic approach provides significant performance benefits over the use of the constrained combinatorial optimization solver alone.*

*Our final solution routed the two hosts through Atlanta, originating from the radio station, in a pin-wheel fashion. Total estimated drive time for each radio host ranged from 5.54 to 5.68 hours for 18 and 19 locations each. With a budget of ten minutes at each location, these two hosts should be able to complete the circuit in the nine hours the Jersey Mike's are open. This route will be validated in real life on March 28th, 2018!*

## ***Improved Regional Sports Scheduling using SAS Optgraph***

Poster Presentation

Graduate Student(s): Andrew Henshaw

Research Mentor(s): Joe DeMaio

*My project improves upon the manual cluster method of state interleague scheduling used by the Georgia State Soccer Association by use of an automated multi-round linear assignment algorithm.*

*Currently, interleague schedules are formed by manually grouping teams according to placement on a map. Typically, ten teams are assigned to a group and each team plays all of the others once per season (nine games). This approach has two flaws: 1) distance on a map does not always correlate with travel time, and 2) assigning teams to clusters precludes teams from playing teams from other groups. The*

*second flaw becomes particularly apparent when the ideal boundaries between clusters are not obvious, but they must be drawn based on a ten-team cluster.*

*The improved system uses travel time between venues as the edge weight and multiple rounds of linear-assignment mapping to generate a full schedule. As Optgraph only supports bipartite linear mapping, the nodes are randomly partitioned between an A and a B subgraph, which is shuffled after each round. This approach is also compared to a non-bipartite matching algorithm written in Python.*

### ***A Graph Theoretic Analysis of the Vector Space Model of Research Papers Similarity***

Poster Presentation

Graduate Student(s): Mohammad Masum

Research Mentor(s): Joe DeMaio

*A great number of research papers are published in the different field each year in different conferences proceedings and journals. Conferences proceedings and journals have categories and subcategories within categories that contain similar papers. These papers contain inter-class and intra-class similarities among them. This project aims in constructing a network of papers and rigorous model using text mining algorithms and graph theoretical measures to analyze the relationships among a focused section of scientific papers that are published in a limited time duration. We are interested in discovering most common as well the least common topics that are being researched in the focused subsection. In the first phase of the project, we have used Term Frequency-Inverse Document Frequency and Vector Space Model like cosine similarity to build a network and categorize research papers. In the second phase, we use graph theory techniques to find connectivity of the network. Finally, our goal is to realize what makes the network connected or disconnected.*

### ***Social Network Analysis in Supreme Court Case Rulings by Precedence Using SAS***

***Optgraph/Python***

Poster Presentation

Graduate Student(s): Symon Kimitei

Research Mentor(s): Joe DeMaio

*With the emergence of social media networks such as LinkedIn, Facebook, Twitter and many more, greater research attention is currently channeled towards social networks analysis (SNA). In this project, we investigate an important question relating to law and legal development. In particular, we want to investigate the role of precedence in supreme court rulings. Our goal is to show that graph theoretical network measures can be used to define the importance of a case and thus support their rank as a landmark case in the judicial case rulings. This work is based on the research work of James H. Fowler and Sangick Jeon and in their research paper: "The authority of Supreme Court precedent."*

### ***Worker Safety in Energy Production in America: A Comparative Analysis of Fuel Sources and Accompanying Occupational Risk***

Poster Presentation

Undergraduate Student(s): Alyssa Venn

Research Mentor(s): Joe DeMaio

*The world runs on energy. From light bulbs to cell phones to cars, energy is essential. In our increasingly technology-based society, its importance, too, is increasing. As our reliance on energy increases, the need to find safe and sustainable energy production sources only becomes more urgent. In the United States as of 2016, coal energy makes up about 30% of electricity generated, while hydroelectric provides about 7% (U.S. Energy Information Administration, 2017). Coal has a reputation as one of the more dangerous fields to work in. In 2007, the rate of fatal injuries for coal miners was almost six times the rate of fatal injuries in private industry (Bureau of Labor Statistics, 2010). There are more deaths in the coal industry per-year than in hydroelectric, which might lead one to the conclusion that coal is a much more dangerous way to produce power. However, while hydroelectric has lower fatalities overall, when deaths are standardized relative to power production, we find that hydroelectric power fatalities were relatively higher than those of coal in 2005 and 2006. This project gathers data on injuries (fatal and non-fatal) from the U.S. Bureau of Labor Statistics' website, and data on energy produced from the U.S. Energy Information Administration, comparing the two across the years. In this poster, we provide preliminary results comparing worker safety in coal, hydroelectric, and other energy production fields in the United States.*

## College of the Arts

### Music

#### ***Unfinished Women***

Performance

Undergraduate Student(s): Rachel Rabeneck

Research Mentor(s): Laurence Sherr

*The most significant activity for a composer is to create new compositions of substance and meaning and to have them performed and heard by audiences. After taking the 2016 KSU class Music in the Holocaust, I was inspired by the suppression of Jewish and "othered" musicians and decided to write a piece dedicated to all the women who have been silenced from the ancient past to the present day. This 2017 work is a collection of songs for mezzo-soprano and piano. Each of its four movements sets the text of female poets describing their experiences as women.*

#### ***The Development of the Saxophone***

Oral Presentation

Undergraduate Student(s): Jonathan Steltzer, Matthew Hodgetts

Research Mentor(s): Edward Eanes

*The saxophone is currently experiencing a renaissance with the creation of new solo repertory as well as in the dramatic increase in the level of virtuosity of today's performers. This presentation will provide an overview of its creation by Adolph Sax, it's technical advancements, it's uses by composers such as Hector Berlioz, as well as its prominence in Jazz. The presentation will also address the development of*

*the saxophone as a solo and chamber instrument with which it has become an important presence in today's musical culture.*

### ***The Wagner Tuba***

Oral Presentation

Undergraduate Student(s): William Hancock, Hayden McAfee

Research Mentor(s): Edward Eanes

*The Wagner Tuba is a brass instrument designed by 19th century opera composer Richard Wagner. This presentation will address the reasons for its development, its intended use by Wagner, its distinctive timbre (as opposed to similar brass instruments), as well as the debate over its technical classification.*

## **Theatre and Performance Studies**

### ***Formalist Analysis in Acting***

Oral Presentation

Undergraduate Student(s): Annaliese Bauer

Research Mentor(s): Margaret Baldwin Pendergrass

*Actors and scholar-artists alike, in pursuit of creating a sense of believability in their performances, need to be able to understand the character from the play that they are performing. However, without the knowledge of the various tools you have at your disposal, you cannot achieve the desired affect from your performance. This is why reliable methods that can be used in a variety of dramatic texts are necessary and useful.*

*James Thomas, in Script Analysis for Actors, Directors, and Designers, introduces readers to Formalist Analysis, a tool that actors can apply to better their performance. It is a method of analysis based on six dramatic elements: play, character, idea, language, spectacle and music. Another name for this method is Aristotelian Analysis because it was first identified and put into use by Aristotle. In my presentation, I will explore formalist analysis and critical thinking as it pertains to the actor; using this methodology to analyze the circumstances that surround a monologue. I will define and break down my research into three components from Aristotle's method: given circumstances, dialogue, and character. I will give an example for each, demonstrating the research behind the effectiveness of the acting tools. My presentation will clearly demonstrate the Formalist approach in acting analysis. To support my arguments, I will perform a monologue from Rebecca Gilman's Boy Gets Girl. By adopting the tools of Aristotelian Analysis, I can verbally and physically demonstrate how it improves performance in the monologue.*

### ***Acting Like A Woman: Patriarchy and the Performance of the Female Athlete***

Oral Presentation

Undergraduate Student(s): LaTauscha Carter

Research Mentor(s): Angela Farr Schiller

*According to the U.S. Anti-Doping Agency sports play a major role in American life. More than three-fifths of U.S. adults, approximately 162 million people, claim some relationship to sports-related activities, including 25% who are actively engaged in sports as participants, parents of children in sports, coaches, or volunteers. Although women are breaking barriers, shattering records and winning titles across a multitude of sports, they are still seen as inferior, incompetent and expected to perform within the patriarchal boundaries of gender. Meryl Streep argues, "We're viewed as equals — but we're still not there yet. [...] The challenge for our girls, I think, is dealing with that resistance." While much progress for gender equality has been achieved the continued existence of patriarchy show that women are still fighting to be seen as equals to their male counterparts. Using Erving Goffman's theory of the "performance of the everyday", Acting Like A Woman: Patriarchy and the Performance of The Female Athlete examines gender inequality by analyzing the social responses towards professional American athletes Ronda Rousey and Serena Williams. This project takes up Rousey and Williams as a way of understanding the intersectional dynamics of gender, race, and sexuality. In conclusion, this project exposes the overwhelming ways that patriarchy normalizes the cultural thinking that women are not allowed to BE more, SAY more, or PLAY more outside of gender expectations.*

### ***I'm a Real Girl! - Patriarchy and the Dehumanization of Fat Women in Theatre***

Oral Presentation

Undergraduate Student(s): Amy Reynolds

Research Mentor(s): Angela Farr Schiller

*Historically, American society has rooted itself in patriarchy, a system in which men dominate and police female bodies in order to control and define the social value of women. This extends into the present American media that support dominant expectations of proper femininity created by patriarchy. Fat women do not adhere to the standards of womanhood created by men for male pleasure; therefore, fat women exist as "others" in American culture due to their fatness. This project, The Dehumanization of Fat Women in Theatre, seeks to examine this issue in the landscape of American theatre and emphasize theatre's othering of fat women through a close reading of the Off-Broadway play Fat Pig by Neil Labute. The project argues that in Fat Pig, Labute crafts Helen as a victim of her own fatness and a subhuman "other" to all those around her; the ultimate message of the play reinforces fat oppression and rejects fat women as humans. This project concludes that American culture must relinquish its grasp on patriarchal beauty standards in order to acknowledge fat women's true humanity and dismantle the barriers between women of all sizes.*

### ***The 1/8th Rule: An Exploration of Race, Sex, and Dion Boucicault's The Octoroon***

Oral Presentation

Undergraduate Student(s): Truman Griffin

Research Mentor(s): Angela Farr Schiller

*In 2009, 42 years after anti-miscegenation laws were ruled unconstitutional, a Justice of the Peace in Louisiana, Keith Bardwell, refused to grant a marriage license to an interracial couple. Bardwell argued, "I'm not a racist. I just don't believe in mixing the races that way". As evidenced in Bardwell's quote,*

laws around race and sex are still being challenged today in support of a fundamental idea that whiteness should remain pure. Many white americans, such as those who participated in the Charlottesville rallies in 2017, continue to fight for the exclusion of diversity in the name of white supremacy and the idea of white purity. This movement, in the name of white lives matter, erodes the progress we have made with regards to equality. Former President Barack Obama suggests that as a nation, “[W]e have a shared responsibility to look directly into the eye of history and ask what we must do differently to curb such suffering again”. *The 1/8th Rule: An Exploration of Race, Sex, and Dion Boucicault’s The Octoroon* looks directly into the eye of history by considering Boucicault’s 1859 play *The Octoroon*. Via a close analysis, this project considers the relationship between two of the play’s central characters: Zoe, a woman who is 1/8th black, and George, a white man. Examining these two characters for this project highlights the harsh laws of miscegenation and brings to the forefront the ideology of the ‘one drop rule’ which states “that any person who has even a drop of black blood would be considered black according to American law”. By looking closer at the institution of marriage, this project points out how the laws of miscegenation were commissioned to keep white supremacy in place; by stripping the humanity and legal rights from all bodies not considered white.

### ***A Theatrical Perspective Inside of the U.S. Armed Force’s Silent Voice Dealing with Military Homeless Veterans***

Oral Presentation

Undergraduate Student(s): Byron Clemons

Research Mentor(s): Angela Farr Schiller

As of 2017, according to the National Alliance to End Homelessness there are currently over 40,000 homeless military veterans in the United States. The governmental abuse of military veterans often contributes to the growing homelessness population in the veterans’ community. Via a compare and contrast analysis *Homeless Military Veterans: A Theatrical Perspective from the Inside of the Armed Forces’* looks at the similarities between military veteran’s treatment at the turn of the 18th century and the 21st century in order to reveal a long, systematic, and sustaining legacy of abuse at the hands of the government. Focusing on PTSD, depression, financial issues, low self-esteem, and lack of motivation combined with a close analysis of George Buchner’s theatrical play *Woyzeck*, my project highlights how the government’s abuse of military veterans leads to homelessness. Performance studies scholar, Diana Taylor, reminds us that, “theatre [...] can change the ways in which people envision social conflict; it can help spectators identify issues that had not seemed apparent before; it can energize populations around and so on.” Using theatre as one of my research tools to reach a wide variety of audiences gives voice to the abusive situations homeless veterans face when dealing with the governmental programs that are designed to assist in making the military veterans life better. This project is designed to make audiences reflect on how homeless veterans are treated by the government, which will enhance their participation in diminishing the rate of homeless veterans throughout the United States.

### ***The Modern American Woman’s Performance of Gender***

Oral Presentation

Undergraduate Student(s): Rachel Novak

Research Mentor(s): Angela Farr Schiller



*In May of 2016, I began a job dressing up as princesses and attending little girls' birthday parties. Since then, I have performed in front of hundreds of children, all witnessing the performance of hyper femininity that comes with being a traditional princess. Recently I asked myself, why are princesses sculpted this way? If being the perfect woman means wearing poofy dresses, speaking in a higher registrar, and falling for prince charming; then how are girls and young women treated when they defy expressions of traditional binary gender? The way women are sculpted is deeply rooted in society's investment of patriarchy. We can see examples of women investing in performances of gender in restaurants like Hooters, reality television shows like The Bachelor, and how this investment restricts women from obtaining access to power without the help of a powerful man. Using gender theory and the work of performance studies scholars, this project The Modern American Woman's Performance of Gender explores the performance of everyday life in relation to how women are constantly policing their performance around others in hopes that they are deemed desirable in the eyes of men. Ultimately, it has come to a point that our society views oppressive gender performance as normal, instead of taking a stand for gender equality.*

### ***Udea: Fairytales and Human Trafficking***

Performance

Undergraduate Student(s): Dylan Carter

Research Mentor(s): Angela Farr Schiller

*In September of 2017, the International Labor Organization (ILO) reported an estimate of 24.9 million victims of human trafficking worldwide. According to the United Nations Office on Drugs and Crime, human trafficking is defined as "the recruitment, transportation, [...] or receipt of persons, by means of the threat or use of force or other forms of coercion, [...] or the abuse of power, [...] for the purpose of exploitation." The ILO also reports that 71 percent of these victims were women and girls. Udea: Fairytales and Human Trafficking questions how our global disposition towards patriarchy and the subjugation of women allows this issue of trafficking women and girls to grow. My adapted fairytale performance "Udea" questions and rejects the patriarchal norm of traditional fairytales wherein a princess is rescued by a prince, or a girl is given away by her father. By definition the women and girls in these stories that we tell our children are being trafficked. Through pointing out the workings and systems of these fairytales, "Udea" allows us to see how these stories told around the world, reinforce the oppression of women and girls. Ultimately my project concludes that the patriarchal systems within fairytales play a part in the larger issue in the global oppression and trafficking of women and girls, and it is the job of all persons, princess or performer, to push against these systems.*

### ***The Octoroon: Homophobia in the Antebellum American South***

Oral Presentation

Undergraduate Student(s): Dylan Carter

Research Mentor(s): Angela Farr Schiller

*Historical plays act as records of past social belief systems, sometimes without an awareness of what they are recording. Analyzing Dion Boucicault's 1859 play "The Octoroon, or Life in Louisiana," which*

*presents a picture of sexism, racism, and slavery in the antebellum American south, "The Octoroon": Homophobia in the Antebellum American South argues that the play's text reveals how homophobia, and a willingness to incriminate homosexuals over heterosexuals, present in the antebellum period, still exists today. This continuation is significant as the subtle homophobia within Boucicault's text existed at a time when the "American Identity" was being crafted. Queer theory scholar Michael Ferguson and psychology and education scholar George Drazenovich lend support to my research through their studies on the understanding of sexuality in nineteenth century American culture. Through a close analysis of the play "The Octoroon", my research concludes first that the criminalization of homosexuality, although not specifically stated in the text of the play, is existent within the story, and that this existence indicates a rapidly growing homophobia that we see in the demonization of homosexuality today.*

## **Southern Polytechnic College of Engineering & Engineering Technology**

### **Civil and Construction Engineering**

#### ***Multiple Criteria Evaluation of the Proposed Bus Rapid Transit System***

Poster Presentation

Undergraduate Student(s): Yunji Kim

Research Mentor(s): Jidong Yang

*As a response to surfacing transportation issues, the State of Georgia proposed Connect Cobb Corridor project in 2015 to improve the existing transit system. Connect Cobb Corridor project ranges from Kennesaw State University, Kennesaw, to MARTA Arts Center station. Introducing bus rapid transit (BRT) in Metro-Atlanta region is one of the key features of the project. Although the BRTs have many benefits over traditional bus systems, to further increase the efficiency, a new concept vehicle is introduced. Slim Modular Flexible Electric Bus Rapid Transit (SMFe-BRT) is a new concept vehicle with innovative components.*

*With the new concept vehicle, the network performance will be evaluated. The objectives for this project are to evaluate different alternatives of the proposed Cobb Corridor project by using analytical hierarchy process method, and to incorporate traffic flow analysis software Vissim to create evaluation criteria.*

### **Electrical Engineering**

#### ***Cell Quantification Using Microfluidics***

Oral Presentation

Undergraduate Student(s): Michael Nolan, Nicholas Foster, Danyal Haider, Fang-Chen Lin, Joseph Lee

Graduate Student(s): Achevi Kuri

Research Mentor(s): Hoseon Lee

*For cancer patients, the quantity of white blood cells is of utmost importance for survival. A current method for blood cell quantification involves using a laser source that emits fluorescence. In this study, we investigate a novel method of discretely quantifying white blood cells (WBC) using a microfluidic device with channels (around 100 $\mu$ m in diameter) wrapped with conductive coils and magnetized beads that bond to the proteins of WBC. As the magnetized WBC passes through the coil, it induces a change in the magnetic field, which serves as an indicator of a presence of the WBC. We simulated this action using COMSOL, which is software that will enable simulation of various aspects of the fluid flow in the channel, such as charge density, cell concentration, etc. To create the microfluidic device, liquid silicon, or Polydimethylsiloxane (PDMS) is used by molding it in a 3D-printed block with optical fiber submerged in the PDMS, in which the fiber is removed to create the mold of the microfluidic channels within the PDMS block after it is heated to a solid state. This method of counting WBC is a more accurate and lower-cost method of cell quantification that is battery-powered, portable, and can be used in point-of-care diagnosis at home.*

### ***Slim-Modular-Flexible-Electric Bus***

Poster Presentation

Undergraduate Student(s): Heath Sinclair, Chixiang Zhang

Graduate Student(s): Corey Brown

Research Mentor(s): Bill Diong

*Cobb County's Department of Transportation is proposing a BRT system which is defined as a system using rubber-tired vehicles operating on dedicated guideways, HOV lanes, or in mixed traffic. A major contributor to the costs of a BRT system is acquiring the right-of-way and construction of the dedicated lanes. The Slim-Modular-Flexible-Electric bus (SMFe-bus) concept is a greener, modular, slimmer (so dedicated lanes can be narrower), and adjustable-length vehicle. The SMFe-bus consists of a lead module with a driver, and then driverless follower modules, which will follow the lead module by virtual coupling; hence the bus is semi-autonomous.*

*The construction of a prototype's lead and follower modules were completed at the end of 2017. The lead module is operated by remote control and the follower module uses a camera and a 2D laser scanner to acquire data regarding separation and (mis-)alignment of the 2 modules that an intelligent controller uses to enable the follower module to track its lead counterpart. This controller runs an algorithm that processes the data and sends speed and steering commands to a Linux server that interfaces with the follower module's steering and acceleration systems. The advancements made during the 2017-2018 academic year have led to the successful testing of the lead module at speeds of up to 15 mph. Testing of the follower module and its intelligent controller is in progress, with a recent test demonstrating appropriate acceleration and deceleration of the autonomous follower module, in concert with the lead module ahead of it.*

### ***Development of a WiFi-Enabled Radiation Detector***

Poster Presentation

Undergraduate Student(s): MaKayla Jacobs, Neil Grimsley

Research Mentor(s): Eduardo B. Farfan

*In this study, an ionizing radiation detector was developed to be capable of transmitting data over WiFi that is critical for radiation safety including count rate, dose rate, total counts and total accumulated dose. This information is crucial for the safety of individuals exposed to radiation, as the data will serve as a guide for the next steps required for protective actions or an exposed person's treatment following radiation exposure. The developed detector is sensitive to beta and gamma radiation. It was calibrated and tested using a rate meter and radioactive sources including P-32, Co-60, Cs-137, thorium, and natural uranium. The detector is compact and robust, allowing for the portability needed to complete field measurements. The wirelessly-transmitted data allows for uncomplicated user interaction and interpretation on a computer to quickly gather information regarding radioactivity in the test area while not requiring any further exposure to perform measurements. Using this detector, a responder in a situation involving radioactivity will lessen their doses while gathering data by spending less time near the source and being able to collect data from a distance. The simplicity and low cost of the detector make it an ideal detection device for use in radioactively contaminated areas while allowing the monitoring of dose rates and accumulated dose levels from a safe distance due to its wireless capabilities.*

### ***Distributed and Connected Dosimeter***

Poster Presentation

Undergraduate Student(s): Michael Jerrell, Joshua Johnson

Research Mentor(s): Eduardo Farfan

*Depending on where on the earth someone is the amount of background radiation can vary significantly. The scientific community measures background radiation on a micro scale. The information that is collected does not allow analysis of changes on the macro scale. For example, if a mining operation starts ejecting dust with a higher than natural average level of potassium 40 then it may not be detected or only be detected by coincidentally close measuring equipment. Radu Motisan developed an open software/hardware package known as "URAD" to allow DIY Geiger-Muller detectors to measure background radiation on a macro scale via an initial open hardware design that users can modify. This research was conducted to determine the initial accuracy and precision of the open hardware design and develop improvements to the design to enhance both the accuracy and expand potential use cases the detector. The additional utility optimizations of the detector include reduced size, integrated battery power and charging, wireless connectivity, and direct sub system integration. Reduced size and system integrations also reduced the overall cost of the detector design. A high purity germanium detector was used to test and refine the accuracy and precision of the design while a reference Geiger-Muller detector verified these results. A multi-channel oscilloscope was used to analyze electrical characteristics of the detector including, but not limited to, high voltage stability and battery system performance. By calibrating and verifying the detector's accuracy and precision the scientific community can more readily rely on the collected data for research.*

## **Mechanical Engineering**

***A Design Study on Modular Transportation for Instructional Durston Mill***

## Poster Presentation

Undergraduate Student(s): Alain J. Santos, Christopher Roper, Franklin Woods, Alexander Bryant

Research Mentor(s): Valmiki Sooklal

*Novelis Inc. sought an innovative redesign of an existing Durston Rolling Mill as an instructional apparatus. This newly retrofitted device would provide hands-on experience of the cold-rolling process for creating aluminum sheeting. The objective of this project - A Design Study on Modular Transportation for Instructional Durston Mill, involves designing a prototype product that will be implemented into Novelis Inc. This project will revitalize the functionality of the Durston Mill, address several safety concerns, and easily to transport the instructional device. Through a collaborative effort, each author is tasked with creating a design solution to meet the specified design constraints and a design matrix is constructed to evaluate the respective designs. To serve as an interactive teaching tool, the final design of the rolling mill is designed for demonstrating several parameters that influenced the rolling process. Through various design studies and analyses, a refined model will be generated. Calculations are done on components crucial to the functionality of the design with considerations to ergonomics, safety, and manufacturability. Using methods, theories, and practices in machine design, verification of design considerations are evaluated and compared to computational methods such as finite element analysis. In addition to the design parameters, the device created will involve a detailed assembly plan and implementation plan. The final developed product will be utilized and reviewed by Novelis Inc. for the development of teaching various rolling methods and practices.*

## **Wireless Geiger Counter Development and Verification of Radiation Principles**

### Poster Presentation

Undergraduate Student(s): Scott Michael

Research Mentor(s): Eduardo B. Farfán

*In this study, a fully functional Wireless Geiger counter was developed, calibrated, and tested using various beta and gamma radiation sources including cobalt-60 and cesium-137. The calibration was completed using a calibrated rate meter. The developed Geiger counter is sensitive to background radiation. A digital meter adapter was included to enhance the Geiger counter by providing counts per minute and dose in micro-sievert. The counter also produces an audible click and blinks a LED each time it detects radiation particle such as beta particle, x-ray or gamma ray. Radiation dose limits can be set and the audible click becomes continuous when a limit, set by the user, has been reached. In addition, two principles of radiation protection were verified using the developed Geiger counter: distance and shielding. Radiation intensity decreases as the distance between a person and a radioactive source increases. This intensity reduction follows the  $1/r^2$  law, where  $r$  is distance. Several shielding materials including water, aluminum, and lead were used to demonstrate the principle of radiation shielding.*

## **CFD Simulation of Pebble Bed Reactor for Various Gases**

### Poster Presentation

Undergraduate Student(s): Daniel Bain, Julian Spangler, Andrew Jones

Research Mentor(s): Tien Yee, Eduardo Farfan, Justin Park

*Pebble bed reactors (PBR) are a generation IV reactor type that offer notable advantages over traditional reactors in size, safety, and cost of construction. This makes PBRs a very attractive alternative to the more complex reactors designs currently operating while also offering a possible solution to increasing energy demands. In PBRs, the coolant is typically gaseous helium (He). The behavior of the fluid coolant is essential for understanding heat transfer in the PBR core. However, helium is not the only fluid that can be used. Analysis of different fluids, particularly carbon dioxide (CO<sub>2</sub>), are being undertaken by various research groups, but initial data on heat transfer efficiency is unavailable for varying different pebble sizes. The primary goals of this research to provide initial data for CO<sub>2</sub>'s heat transfer efficiency and compare that to data found using He. CO<sub>2</sub> will be compared to Helium for differences in temperature, velocity, and pressure distribution. Fixed initial inlet velocities will be considered and compared between He and CO<sub>2</sub>. For all the above objectives, an idealized cubic packing arrangement of fuel pebbles will be used and only a column of 9 by 3 pebbles will be studied using computational fluid dynamic analysis.*

### ***Simulation of Flow in a Pebble-Bed Reactor with a Staggered Pebble Arrangement***

Oral Presentation

Undergraduate Student(s): Julian Spangler, Daniel Bain

Research Mentor(s): Tien Yee, Eduardo Farfan, Justin Park

*In a pebble-bed reactor, optimizing heat transfer involves the analysis of complex flow. Previously, computational fluid dynamics was used to simulate fluid movement in a structured cubic packing arrangement with a purpose in finding an optimal size of pebbles that will yield the fastest rate of heat transfer. However, in this study fluid flow was simulated for a more complex arrangement of pebbles using a center-staggered pattern with no adjustment in the size of pebbles and with no change of fluid. The primary purpose of this work was to observe the effect of pebble arrangement on the temperature, velocity, and pressure distribution around the pebbles. In order to study only the effects from the arrangement of pebbles, the simulations consisted of the standard 6-centimeter pebbles in different arrangements with a fixed inlet velocity and a fixed pebble surface temperature. Helium acted as the coolant fluid, which is the typical gas used in pebble bed reactors. The center-staggered arrangements were compared to the known cubic arrangement characteristics of the 6-centimeter pebbles. The comparisons observed provided more information on the optimization of pebble-bed reactors as well as information in order to estimate the head loss as fluid goes through the two different arrangements for the simulated flow rate.*

### ***The Effects of Point Defects on Thermal Conductivity in ThO<sub>2</sub>, PuO<sub>2</sub>, and UO<sub>2</sub>***

Oral Presentation

Undergraduate Student(s): Katherine Mitchell

Research Mentor(s): Jungkyu Park, Eduardo Farfan, Tien Yee

*Uranium, a common element that can be found across the world, can be used in nuclear reactors as UO<sub>2</sub> or a mixture of UO<sub>2</sub> and PuO<sub>2</sub>. Plutonium, created in reactors as a by-product, is responsible for more*

than one third of the energy production coming from nuclear power plants. Thorium is three times more abundant than uranium in the earth's crust and is an easily exploitable resource in several countries. It is found primarily as fertile Th-232. This isotope of thorium has an enormous potential for breeding fissile U-233 in fast nuclear reactors. Although ensuring efficient thermal transport in these actinide oxides has been considered to be one of the most important agenda items for improving the safety and efficiency in nuclear reactors, the microscopic understanding on the thermal transport phenomenon is very limited. In this research study, the detailed phonon scattering by point defects in ThO<sub>2</sub>, UO<sub>2</sub>, and PuO<sub>2</sub> are investigated using classical molecular dynamics simulations. Across all fuels, it is observed that oxygen vacancy defects, even at lower defect concentrations such as 0.1%, have a detrimental effect on the phonon scattering, comparable to the effect of large vacancy sites such as uranium and plutonium vacancies in spite of their significantly small sizes. The strong negative impact of small vacancy sites such as oxygen vacancies implies that the major phonon transport mechanism in actinide oxides largely depends on their lattice vibrations and any alteration to their lattice vibration degrades thermal conductivity of actinide oxides significantly.

### ***PuO<sub>2</sub> and ThO<sub>2</sub> Thermal Conductivity Sensitivity to Various Defects***

Oral Presentation

Undergraduate Student(s): Alex Resnick

Research Mentor(s): Jungkyu Park, Eduardo Farfan

Plutonium is considered to provide more than one third of a pressurized water reactor's energy output. Pu-239 is most commonly formed by neutron capture and beta decays from U-238. Thorium is an easily exploitable resource in many countries and is three times more abundant in nature than uranium. It is often found as fertile Th-232 with the potential for creating U-233 isotope within nuclear reactors. The conversion to Th-232 can also be achieved by the incineration of weapons grade plutonium. Recently, the growing demands for improving the safety margin and efficiency during nuclear power cycles push researchers to investigate how to improve the thermal conductivities of these actinide oxides. In this research study, the detailed thermal transport in PuO<sub>2</sub> is explored by using reserve non-equilibrium molecular dynamics, and is then compared to ThO<sub>2</sub> thermal transport from a previous study. Thermal conductivities are evaluated for different defect concentrations, i.e. 0.1%, 0.5%, 1%, 2%, and 5% concentrations of plutonium, thorium, and oxygen vacancies. Finally, the thermal conductivities of PuO<sub>2</sub> and ThO<sub>2</sub> are compared when uranium substitution is introduced into the molecular structure. The results show that larger vacancy sites degrade the thermal conductivity of the actinide oxides more, and the size effect becomes bigger when the sample length becomes larger. Furthermore, the main element vacancies degrade the thermal conductivity most, followed by oxygen vacancy and then uranium substitution with the least effect on thermal conductivity.

### ***Take Home Control Laboratory Equipment Design***

Poster Presentation

Undergraduate Student(s): Jason Choo, Mitchell Bearden, Aaron Nauert

Research Mentor(s): Ayse Tekes

*Take home lab equipment and hands-on learning tools are still in demand for control theory and vibrations courses. The existing equipment are extremely expensive and require wide lab space. The aim of this research is to build mechanical and electrical systems that are compact, modular and small scale so that each student can work on their setup and take it home if necessary. For this purpose, in this study, we designed several mechanisms to be utilized in systems control and vibrations courses which would enhance the understanding of students by using experimental demonstration of the theoretical systems taught in class. The superiority of the designs over commercially available equipment are their low cost and simplicity. The designs include modeling a crank attached to a stepper motor, and a dual parallel arm mechanism consist of flexible links that are driven by a dwell typed cam. The mechanisms are designed in Solidworks and the prototypes are built using 3D printer and machining. The mathematical models of each systems are obtained using Euler's equations. The simulations are performed using Matlab Simulink and Simmechanics. The prototypes are made available to vibrations and control lab students and their feedback will be collected through a survey and the mechanisms will be modified based on their suggestions.*

### ***Novel Vibratory Mechanism Designs for Vibrations and Controls Laboratories***

Oral Presentation

Undergraduate Student(s): Kevin Van Der Horn, Zach Marr, Chong Tian

Research Mentor(s): Ayse Tekes

*The study of machine dynamics, vibrations and control theory are essential courses for mechanical engineering students. The general objectives of these three related courses are mainly to model, analyze, simulate and control the oscillatory response. The key element that makes the theoretical understanding of the courses difficult is the conceptual models used to represent the device, machine or mechanism. Therefore, the mathematical model of the systems should provide a good correlation between the experimental system and the simulated model. The applications of the theoretical concepts are mostly demonstrated in laboratories. The number of equipment, sensors, and the tools made available to students is limited due to their cost. This study proposes novel low cost, interchangeable, compact, small scale, flexible and rigid oscillatory mechanisms produced by 3D printing to be employed in vibrations and control labs. The proposed mechanisms allow students or the instructor to change the equivalent stiffness, damping or the inertia of the system to observe the effect of the modified parameter on system response. The equations of motion of each mechanism is derived, Matlab gui code is written for visualization purposes, and a Matlab Simulink model is created to compare the actual and the simulated outputs. Free vibration experiments are conducted to find the parameters of the system and forced vibrations (employing DC motor, magnetic actuation, pulley-weight system, and cam designs) are used for control applications and the frequency analysis.*

### ***Compliant Swashplate Design for Model Helicopters***

Oral Presentation

Undergraduate Student(s): Niko Giannakakos, Alexander Bryant, Megan Masters

Research Mentor(s): Ayse Tekes, Adeel Khalid



*The swashplate of a model helicopter consists of stationary and the rotating plates separated by ball bearings. This mechanism enables the swashplate to tilt in all directions and move vertically as one unit. The lower stationary plate is mounted on the main rotor mast and connected to the cyclic and collective controls by a series of pushrods. There are similar pushrods known as pitch links connected to the upper rotating plate. These pitch links are connected to the pitch horns and control the pitch of individual blades. In this study, the pitch links of the model helicopter are replaced by the semi compliant mechanism. This mechanism is directly connected to the pitch horns to control the pitch of the individual blades. The actuation of the bars can be achieved by using high torque stepper or servo motors. These precise low and high amplitude outputs are specifically required for the cyclic and collective controls of the helicopter swashplate. The compliant swashplate mechanism can be fabricated as a single piece using an injection molding technique or by 3D printing. The mechanism is modeled by two similar vector loops in two different planes. The mathematical model of the plate motion and the forces on the mechanism links are developed and simulated using MATLAB and Simulink, and the results are discussed in this paper. This mechanism would be applied to the helicopter directional control where the plate in the pitch-roll mechanism would serve as the swash plate of the helicopter.*

### ***Adjustable Compliant Mechanism Load Deflection Test Bench Design***

Oral Presentation

Undergraduate Student(s): Franklin Woods, Alexander Bryant

Research Mentor(s): Ayse Tekes, Kevin McFall

*Two adjustable compliant mechanism load deflection test benches are presented in this study. Both test bench mechanisms enable testing the deflection of flexible links. The modularity of the designs provides to test various link forms such as fixed-fixed and pinned-pinned joints. The load deflection test benches consist of a linear actuator, an amplifier rod, a linear rail, and a sliding car. The measurement setup is equipped with force and displacement sensors for the linear actuator, various clamps to attach the compliant member, and image processing software to measure member deflection. A displacement controlled loading using a linear actuator and step loading with a pulley can be applied as an input to the system.*

*There are several limitations placed on the design. The length of the test object should be between 5 cm to 30 cm, and low cost linear actuator with a low extension velocity to obtain quasi static deflection curves of the compliant members is required. The design should also have the capability of providing various types of boundary conditions with interchangeable attachments. The applied load can be applied either parallel or perpendicular to the test object. Input load deflection is measured with the displacement sensor, and the resulting member displacement measured visually using image processing software. This software synchronizes data from the displacement sensor and a calibrated camera image to automatically detect deflection using a perspective transform model and known dimensions of the test apparatus.*

### ***Compliant Translational Double Exact Dwell Mechanism***

Poster Presentation

Undergraduate Student(s): Hongkuan Lin

Research Mentor(s): Ayse Tekes

*A novel compliant translational double exact dwell mechanism incorporating the buckling motion of an initially straight flexible member as its members is introduced. This partially compliant five bar mechanism consists of two rigid links as the crank and the slider, and two flexible links as the coupler and last link. The emphasis is placed on the dynamic response of the double exact dwell motion profiles. The simulation results are studied using Solidworks, Matlab and Comsol. The working principles and the conceptual contribution of the mechanism are also verified from the prototype experimentally.*

### **Simulation of a Geiger Counter using MCNP**

Undergraduate Student(s): Paul Schwan, David Wall

Research Mentor(s): Eduardo Farfan, Tien Mun Yee, Jungkyu Park

*Geiger counters are extensively utilized for measuring ionization radiation from alpha-particle, beta-particle, and gamma-ray sources. Geiger counters are used for radiation monitoring and field characterization in areas such as radiological protection, experimental physics, and nuclear industry. In this study, Monte Carlo simulations of a Geiger counter were completed using a Monte Carlo N-Particle Transport Code (MCNP). The Geiger counter system simulated in this work was built by a group of research students at Kennesaw State University. The purpose of this study was to verify the proper functionality of the developed Geiger counter and compare the results from the simulation and those from the developed counter.*

### **Investigation of Cell Damage in Porcine Heart Tissue Irradiated by a 808-nm Wavelength Laser Source**

Poster Presentation

Undergraduate Student(s): Daniela Rodriguez, Elaine Bradley, Jamey Ackley (graduated)

Research Mentor(s): Valmiki Sooklal, Sathish Gurupatham

*Although there are many medical applications of laser therapy such as dermatological purposes or cancer treatment, there are also applications of lasers in surgery. Despite the current use of lasers for medical applications, there is insufficient data relating cell necrosis to exposure time and power levels. This research aims to quantify cell damage using histology data. The long term goal of this project is to develop a numerical model to allow better predict of cell necrosis due to laser irradiation due to dwell time and energy deposition.*

### **Live Gamma Ray Camera**

Oral Presentation

Undergraduate Student(s): Joshua Johnson, Michael Jerrell

Research Mentor(s): Eduardo Farfan

*The only detection technologies currently available that generate an image offer either only a still image whose film must be removed and developed or a video image using a cost-prohibitive camera, the weight*

*of which can limit its portability and functionality. No cost effective and reasonably mobile solutions for gamma imaging exist. Such a technology has wide range of possible applications including, but not limited to, shipping container safety scanning, nuclear contamination evaluation, nuclear medicine, non-destructive testing, and general nuclear physics research. By leveraging the existing technology such as digital dental X-ray sensors, a live video gamma detector could be developed using a pinhole camera construction. The pinhole camera must be constructed of a material that would not permit gamma radiation to penetrate the camera structure outside the pinhole. The material of choice for this use is tungsten. Considering tungsten's cost prototyping would be extremely budget-limited. Therefore, simulation and refinement of the design is essential. The physical characteristics of a tungsten pinhole camera structure, including the wall thickness, pinhole shape, seam type, alloy type, and more as well as the energy level, total flux, and distribution of radiation sources will all be varied in simulation software known as MCNP (Monte Carlo N-Particle Transport Code). Research was conducted to determine and refine parameters like the highest angle of the pinhole that results in an acceptable amount of 'leakage' through the thin portion of the hole while still maintaining reasonable front panel thickness, back and side plane thickness, and different seam types.*

## **Systems and Industrial Engineering**

### ***Learning While Flying – A Simulation Based Case Study***

Poster Presentation

Undergraduate Student(s): Alain J. Santos, Christopher Roper, Andrew Pirrello

Research Mentor(s): Adeel Khalid

*In this study, student learning and retention is assessed using a motion-based fixed wing flight simulator. Students are given an introduction to the principles of flight, fly the aircraft flight simulator, and complete a pre-defined mission. Points are given for successfully completing several legs of the mission. Four separate and independent groups of students are recruited for the study. Group A is presented with written literature to review before the flight. Group B is given a short presentation which describes flight controls, basic instruments, and the mission. Group C is presented with both the literature for review ahead of time and is given a short presentation before the flight. Group D, is presented flight information through video. All four groups are asked to fly the exact same mission. Students are graded based on their flight performance, handling and control of the aircraft during the flight. The flight is composed of starting a single engine land-based aircraft, taking off while staying centered on the runway, going upwind to an altitude of 1,000ft above the ground level, performing a left traffic pattern including crosswind, downwind, base and final legs. Scores for these four groups are compared. If it is observed that any one of the chosen modalities e.g. lectures, pre-reading or hands-on training is more effective than others, then it can be concluded that instructors teaching material similar to the ones used in this study could apply that modality more often than other modalities to improve learning.*

### ***Next Generation Supersonic Candidate Engine and Aircraft Design***

Oral Presentation

Undergraduate Student(s): Alain J. Santos, Christopher Roper, Jordan Fraser

Research Mentor(s): Adeel Khalid

*The objective of this design study/competition - Next Generation Supersonic Candidate Engine and Aircraft Design, is a response to a proposal and is motivated by NASA's National Research Announcement in 2006. The requirements of this design study are provided by AIAA (American Institute of Aeronautics and Astronautics). The aircraft designed is a private business class where the aircraft engine and design perform at a maximum speed of Mach 1.8 at 55,000 feet with a range of 4000 nmi. A generated mission profile through considerations in flight regime will drive the design involved in the development of aircraft characteristics. Interior cabin configurations are expected to support seating for up to 100 passengers. Using parametric cycle analysis, computational fluid dynamics, and system modeling/experimentation, a refined aircraft, and engine design will be produced. Detailed analyses to meet the baseline requirements involve interpretation of trends of current generation aircraft engines are considered for the finalized design. The performance of the aircraft engine will involve calculations on wave drag, supersonic turbulent flow, and integrated methods of design of the nacelle enveloped within the aircraft fuselage. Through these various iterative methods, considerations in supersonic aircraft propulsion and aircraft design are presented. Projected technical specifications are to be implemented for the next generation of supersonic aircraft expected to be debuted in 2025. A robust composition of advanced material composites, methods of manufacturing, and forecasted advancements in technology are utilized to develop a proposal for the next generation of supersonic aircraft.*

### **Cyber Security of American Nuclear Facilities**

Oral Presentation

Undergraduate Student(s): Jake L. Massingill

Research Mentor(s): Eduardo Farfan, Jungkyu Park, Tien Mun Yee

*In June 2017 the automatic radiation monitoring system at the Chernobyl Nuclear Power Plant (ChNPP) located in Ukraine was compromised by a worldwide cyberattack, forcing the plant workers to conduct radiation monitoring manually. The ChNPP was the site of the worst nuclear reactor disaster when Unit 4 exploded in 1986. Ukrainian authorities indicated that the monitoring system's operating system was breached by the cyberattack. This study presents: 1) the past and current cyberattack threats and their potential consequences for stakeholders in the U.S. nuclear industry and the public, 2) systems currently in place to defend against such threats, 3) specific measures that should be considered to improve the quality of cyber defense systems, and 4) government regulations regarding cybersecurity in the nuclear industry. Analysis was conducted from a holistic, systems-thinking approach and considerations were entertained for all stakeholders, system elements, signifiers, and affordances.*

## **Undergraduate Research Club**

### **Perceptions of Phubbing: A Comparison of Self, Friends, and Romantic Partners**

Poster Presentation

Undergraduate Student(s): Sarai Bauguess, Robbie Cronin

Research Mentor(s): Amy Buddie

Research has shown that with growing social media presence, the consequences can be both negative and positive. One of the negative consequences of social media is phubbing. Phubbing is a relatively new term that was introduced in 2012 during a political campaign (Ugur & Koc, 2015). The word comes from the blending of the words phone and snubbing. Phubbing means snubbing others during social interactions by instead focusing on a smartphone. Very little research exists on this topic given the newness of the word, and research is starting to explore the negative effects of social media. The existing literature focuses on addiction issues (e.g., Internet addiction), and phubbing's relationship to depressive symptoms. We wanted to expand on the existing literature by examining the extent to which participants perceive phubbing differently when responding to their own versus others' behavior. In addition, we were interested in examining differences in phubbing by friends versus relationship partners. We also plan to expand the literature by looking at different populations. In the current study, we are asking questions about different types of social media usage as well as what types of technology are most commonly used. We are also asking questions about phubbing in relation to themselves (e.g., "I send texts or emails during face-to-face conversations"), their friends (e.g., "My friends send texts or emails during face-to-face conversations"), and their romantic partners (e.g., "My partner sends texts or emails during face to-face conversations"). We will be recruiting through social media, introductory psychology courses, and a faculty announcement system. We expect to find negative correlations between social media usage and taking offense to phubbing. Analyses will include repeated measures ANOVA by using the same target questions asked in four different ways. Our research will contribute to the broader conversation of how social media is changing relationships.

### **Health Behaviors in College Students**

#### Poster Presentation

Undergraduate Student(s): Sharonjeet Kaur, Alyssa Venn, Hannah Bauguess, Eun Sol Chang, Lauren Rohde, Fatma Aldihri, Ryan Page, Shawyun Khoshneviszadeh, Amna Glissa

Research Mentor(s): Amy Buddie

College students are prone to facing health issues, and understanding the factors related to these health issues is crucial for developing new measures such as campus resources to support students. The purpose of this study is to collect and analyze data on how students' classification (for example, first-year students versus seniors) is related to student health. Past research has primarily focused on only one type of health behavior, such as physical health (e.g., Ferarra et al., 2013). In addition, there is little research on the extent to which health behaviors change across students' years in college (Racette et al., 2008). The present study was designed to address these research gaps. A sample of students' various aspects of health, which includes sleep habits, diet, exercise, illnesses, and mental health, will be examined to investigate trends across gender, GPA, employment, family, classification, etc. In this study, students in different year classifications will be given an online survey to collect insight on different behaviors that potentially could affect students' health. The students will be asked several questions on demographics, such as what their classification is, and the survey will include questions related to physical, emotional, and social health. We expect to see a more comprehensive picture of what specifically in each classification is affecting college students' health. The conclusions drawn from this

*study will provide insight and contribute to the literature into how to better serve the unique student health needs based on their classification.*

### ***Student Perceptions of GMOs***

Poster Presentation

Undergraduate Student(s): Tatiana Smithson, Amy Graham, Charlene Quainoo, Shae Sams, Jasmine Lopez, Samantha Swartzendruber

Research Mentor(s): Amy Buddie

*Currently, a vast majority of agricultural products' ingredients have come under harsh scrutiny by both consumers and the agricultural industry due to genetically modified organisms (GMOs). The ongoing debate concerns the health risks and economic impact of GMOs in modern society about whether they are safe to consume or if they create agricultural monopolies through the companies that produce, promote, and market their genetically modified products. There have been studies done regarding the effects of GMOs on animals and the benefits and risks associated with them, but there is little research on college students' perceptions of GMOs as well as the efficacy of educational videos in shaping students' perceptions about GMOs. The present study seeks to address this research gap. Students will be asked several questions about their knowledge of GMOs (e.g., "What do you believe is the purpose of GMOs" and "Are you more likely to purchase food that has a label indicating 'non-GMO'?"), then they will be shown an informative video on the pros and cons of GMOS, what GMOs are, and how GMOs play a role in impacting our environment. Participants will then be asked follow-up questions regarding their knowledge of GMOs as well as whether their understanding and opinions have changed about GMOs. The results are expected to show an increase in general knowledge and awareness of GMOs. In conclusion, if our results are as hypothesized, it should show that society and universities are not effectively educating students about this important local, national, and global current issue.*

### ***Gender Differences in STEM Courses at KSU***

Poster Presentation

Undergraduate Student(s): Emma Evans, Kaelyn Spiers, Jummy Nipo, Zeljka Zec, Ayo Awodu

Research Mentor(s): Amy Buddie

*Women are less likely to enter STEM (Science, Technology, Engineering, and Mathematics) fields, and they are less likely to feel like they belong than their male counterparts (Simon, Wagner, & Killion, 2017). This study seeks to identify the presence or absence of such issues at Kennesaw State University, as well as their primary causes and impact. We will approach the issue by asking about both the individuals' experiences as well as what they perceive the gender gap in different fields to be. We want to see in which STEM fields the discrepancies between genders is the greatest. This study focuses on courses taken by the participant; we want to see how factors within the classroom affect women's likelihood to enjoy and enter a STEM field. The data will be gathered by surveying students from STEM student organizations and Introduction to Psychology classes. Both STEM and non-STEM majors will be able to take the survey for the sake of comparison. The responses to the survey will be compared with preexisting institutional data on gender ratios in STEM departments. The conclusions drawn from this project will help the university better understand its student body and its*

current handling of gender issues. No matter the results, we will gain insight into what causes women to pursue or not to pursue a STEM career and what can be done about it.

## WellStar College of Health and Human Services

### Exercise Science and Sport Management

#### ***Comparison of Predicted and Measured Resting Metabolic Rate Methods Among CrossFit-Trained Athletes***

Poster Presentation

Undergraduate Student(s): Aylisis Rodriguez, Isabel Fabacher, Kathryn Brown

Graduate Student(s): Alyssa J. Holmes

Research Mentor(s): Yuri Feito, Trisha VanDusseldorp, Gerald Mangine, Tiffany Esmat

*ABSTRACT: The use of prediction equations and machinery estimation for the assessment of resting metabolic rate (RMR) has grown in popularity. While RMR is crucial when assessing dietary intakes, the accuracy may be dependent on the distinct characteristics of the individual.*

*PURPOSE: To compare RMR assessed by indirect calorimetry with estimates obtained from three predictive equations for a group of advanced CrossFit-trained athletes.*

*METHODS: RMR was estimated for six-experienced CrossFit-trained athletes [3 men (27.5 ± 6.5 yrs.; 87.5 ± 5.9 kg; 179.2 ± 2.2 cm), and 3 women (27.7 ± 1.5 yrs.; 67.8 ± 3.3 kg; 168.1 ± 5.3 cm)] using the ParvoMedics 2400 metabolic system (PV) following established protocols. Additionally, RMR was calculated using the Harris-Benedict (HB), Mifflin-St. Jeor (ME) and Nelson (NE) prediction equations. All data is presented as mean ± standard deviation (M ± SD).*

*RESULTS: Repeated measures analysis of variance revealed significant differences among the four models ( $F(3) = 7.1$ ,  $p = 0.003$ ,  $\eta^2 = 0.59$ ), where a greater ( $p = 0.01$ ) predicted RMR was observed in ME (1646 ± 241 Kcals) was lower compared to HB (1733 ± 271 Kcals,  $p = 0.01$ ) and ME & NE (1839 ± 322,  $p = 0.04$ ). No differences were observed between the equations and PV. Moderate intra-class correlations were found PV and HB (ICC = 0.63, 95%CI = -0.10 - 0.94), ME (ICC = 0.52, 95% CI = -0.14-0.91), and NE (ICC = 0.73, 95%CI = 0.07 - 0.96).*

*CONCLUSION: These results suggest that even though significant differences exist between each of the predictive equations, individually, each equation has good agreement with the values measured by indirect calorimetry.*

#### ***Mid-Thigh Pull Force-Time Characteristics in Elite and Recreational High-Intensity Functional Training (HIFT) Athletes***

Poster Presentation

Undergraduate Student(s): Christian Almeda

Research Mentor(s): Gerald Mangine, Yuri Feito, Trisha VanDusseldorp, Tiffany Esmat

*To compare mid-thigh pull force-time characteristics, seven elite (EA;  $27.1 \pm 4.4$  years;  $169.6 \pm 12.3$  cm;  $81.6 \pm 13.2$  kg) and eight recreational (RA;  $33.0 \pm 8.2$  years;  $171.8 \pm 13.5$  cm;  $76.3 \pm 19.5$  kg) HIFT athletes volunteered for this study. Following a standard warm-up, athletes completed three maximal-effort mid-thigh pull (IMTP) assessments while standing on a portable force plate. Peak force (PF), peak RFD from the highest IMPT effort ( $RFD_{Peak}$ ), average RFD ( $RFD_{AVG}$ ), and RFD at specific time bands from 0 to 30, 50, 90, 100, 150, 200, and 250 milliseconds were recorded for analyses. Separate independent samples t-Tests revealed no differences ( $p > 0.05$ ) in PF (EA:  $1871 \pm 503$  N; RA:  $1636 \pm 449$  N),  $RFD_{Peak}$  (EA:  $1295 \pm 709$  N; RA:  $810 \pm 421$  N), average RFD (EA:  $1346 \pm 1553$  N; RA:  $575 \pm 421$  N), and  $RFD_{30}$  (EA:  $11800 \pm 10915$  N; RA:  $7680 \pm 7624$  N),  $RFD_{50}$  (EA:  $9839 \pm 7733$  N; RA:  $6522 \pm 6223$  N),  $RFD_{90}$  (EA:  $7867 \pm 4658$  N; RA:  $5465 \pm 4246$  N),  $RFD_{100}$  (EA:  $7618 \pm 4069$  N; RA:  $5285 \pm 3814$  N),  $RFD_{150}$  (EA:  $7183 \pm 2961$  N; RA:  $4974 \pm 2785$  N),  $RFD_{200}$  (EA:  $6643 \pm 2524$  N; RA:  $4837 \pm 2523$  N), and  $RFD_{250}$  (EA:  $5787 \pm 2028$  N; RA:  $4460 \pm 2109$  N). Force production and RFD may be relevant to HIFT, but IMTP force-time characteristics do not appear to distinguish between elite and recreational-level athletes.*

### ***The Impact of Communitas and Liminality on Team Identification: What Should a New College Football Team's Game Include to Attract More Students?***

Poster Presentation

Graduate Student(s): Davetta Lackey

Research Mentor(s): Kyu-Soo Chung

*The inaugural season of Kennesaw State's football program was in 2015. Each season since then the team has been successful in athletic competition but has been struggling with the number of event attendees. A collegiate football game is a festival at which university students embrace and celebrate their culture and easily bond together without regard to one another's ordinary social statuses. Such experiences can be explained by the twin concepts of liminality and communitas (Chalip, 2006; Lee et al., 2015). Liminal spaces are outside and in between the normal structures of everyday life and experience something undefined (Gennep, 1960). Communitas, meanwhile, is a strong sense of community associated with liminal experiences (Hayton, 2017). This strong sense of community promotes team identification—sport fans' tendency to connect to a favorite team and to identify themselves with the team's successes and failures (Heere & Katz, 2014). Liminality and communitas are unique experiences that fans are much more likely to experience when they are together participating as spectators in a live sporting event. Such an atmosphere may be especially critical for a new collegiate football team that needs to establish team identity among university students. Thus, the main purpose of this study was to identify the impact of liminality and communitas on team identification. Data was collected over the KSU's six home games in 2017. The final sample consisted of 434 attendees. The 35% of them made their first visit to the home game. The results and discussions will be presented.*

### ***National Football League's Protests and its Effects on NFL Viewers***

Poster Presentation

Undergraduate Student(s): Jacqueline Kisthardt

Research Mentor(s): Kyu-Soo Chung



*In the 2016 season of the National Football League (NFL), a few players have begun to protest the national anthem prior to their games in arguing police brutality and the inequality of people of color (see Earl, 2018). This protest had a tremendous focus on mass media not only by the controversy of patriotism but by a favorite player, Colin Kaepernick. There was both national backlash and support for these athletes. Several sport consumer studies have suggested that athletes' scandals affect sport fans shaping negative perceptions of the sport and the athletes (Brown, 2016; Hwang & Chung, 2018; Washington, 2015). While the negative impact of athletes' misbehaviors, such as doping, domestic violence or illegal gambling, has been revealed, we still have much to learn about how sport fans perceive athlete's scandals that are related to social agenda or political proclaim. Thus, the primary purpose of this study is to determine how the professional sports protests, namely NFL, are impacting viewer's attitudes towards the leagues, players, and their viewing activities. Knowing this would reveal a dimension of how sponsors and sport entities should repair their images tarnished by political scandals when necessary. One hundred sixteen participants responded to self-administered questionnaires online. Ten questions were asked regarding their view of the protest and their watching behaviors. The study concludes that NFL's fans are highly polarized of the protest, reflecting their political belief and values into the sport context. More details on results will be presented.*

### ***Relationships Between Sprint Acceleration and Broad Jump Kinetics in NFL Draft Prospects*** Poster Presentation

Undergraduate Student(s): Jacob McNabb

Research Mentor(s): Gerald Mangine, Yuri Feito, Trisha VanDusseldorp

*To determine the relationships between during 40-m sprinting acceleration and a standing broad jump (SBJ) kinetics, twenty-seven NFL prospects ( $22.7 \pm 0.9$  years;  $109.1 \pm 23.4$  kg;  $185.8 \pm 7.9$  cm) completed pre-training assessments at the beginning of their off-season. Following a standardized warm-up, the athletes were tethered to a robotic sprinting device (RSD) at minimal resistance (1-kg) and completed a maximal 40-m sprint trial. Sprinting time, distance, as well as peak (PK) and average (AVG) velocity (V), force (F), power (P), and peak rate of force development (RFD) during the first five strides of the 40-m sprint (SPR5) were recorded by the RSD's software for analysis. Following the sprinting assessment, the athletes completed a maximal SBJ trial while tethered to the RSD at 1-kg of resistance. The RSD's software recorded VPK, VAVG, FPK, FAVG, PPK, PAVG, and RFD during the SBJ. Pearson correlation analysis revealed positive relationships ( $p < 0.05$ ) between SBJ distance and SPR5\_VPK ( $r = 0.47$ ), SPR5\_FAVG ( $r = 0.45$ ), and SPR5\_PAVG ( $r = 0.55$ ). Negative relationships ( $p < 0.05$ ) were observed between SPR5 time and SBJ\_VPK ( $r = -0.72$ ) and SBJ\_PPK ( $r = -0.58$ ). Additionally, negative relationships ( $p < 0.05$ ) were found between SBJ\_RFD and SPR5 distance ( $r = -0.39$ ), SPR5\_FPK ( $r = -0.40$ ), and SPR5\_RFD ( $r = -0.44$ ). Greater sprinting velocity, force, and power during acceleration are positively associated with broad jump distance, while broad jump velocity and power are positively related to faster sprint acceleration. Interestingly, broad jump RFD was inversely related to the distance travelled, as well as force and RFD produced during sprint acceleration.*

### ***Effects of Short-Term Resistance Training on Maximal and Rapid Torque Characteristics in Older Males***

## Oral Presentation

Graduate Student(s): Alex Olmos

Research Mentor(s): Garrett Hester

*Purpose: To identify the effects of short-term resistance training (RT) on maximal and rapid torque characteristics in older males. Methods: Eighteen untrained older males were randomly assigned to a training (TG; n = 9, age =  $64.70 \pm 6.91$  yrs) or control (CG; n = 9, age =  $65.56 \pm 11.56$  yrs) group. The TG performed 3 sessions per week of isokinetic RT for 4 weeks. RT sessions consisted of maximal concentric knee extensions at  $45^\circ\text{-s}^{-1}$  with an emphasis on ballistic intent for 4 sets of 10 repetitions. Maximal voluntary isometric contractions (MVICs) of the knee extensors were performed before (PRE) and after week 4 (POST) of RT on a dynamometer. Peak torque (PT), rate of torque development from onset to 30 ms and 100-200 ms, impulse from onset to 30 ms and 100-200 ms were recorded for analysis. Muscle activation via surface electromyography of the vastus lateralis was also recorded during the MVICs. Two-way (group  $\times$  time) repeated measures ANOVAs were used to examine changes between groups across time. Results: No differences were present between groups for any of the dependent variables at PRE ( $p > 0.05$ ). PT increased in the TG compared to the CG (17%;  $p = 0.034$ ) at POST, while no other dependent variables changed. Conclusion: Four weeks of RT increased strength, but not rapid torque characteristics in older men.*

## **Age Does Not Attenuate Maximal Strength and Acceleration Adaptations to Unilateral Resistance Training**

### Poster Presentation

Undergraduate Student(s): Alyssa Bailly, Blakely Epperson

Graduate Student(s): Alex Olmos

Research Mentor(s): Garrett Hester

*Purpose: To identify the effects of unilateral resistance training (RT) on peak torque (PT) and acceleration (ACC) at low and high velocities in the trained and untrained limb of young and older males. Methods: Twenty-two untrained, young (YG; age =  $21.43 \pm 2.29$  yrs) and nineteen older (OG; age =  $65.78 \pm 9.83$  yrs) males performed unilateral RT of the knee extensors for 3 sessions/week for 4 weeks. RT consisted of maximal concentric knee extensions at  $45^\circ\text{-s}^{-1}$  with an emphasis on ballistic intent for 4 sets of 10 repetitions. Three maximal contractions were recorded before (PRE) and after week 4 (POST) to measure PT and ACC at  $45^\circ\text{-s}^{-1}$  (PT45 and ACC45, respectively), and  $300^\circ\text{-s}^{-1}$  (PT300 and ACC300, respectively).*

*Results: No group  $\times$  time interactions existed, so the main effects for time were examined. For the untrained leg, PT45 (+3.7%;  $p = 0.227$ ) remained unchanged whereas ACC45 (+2.7%;  $p = 0.021$ ), PT300 (+6.2%;  $p = 0.008$ ), and ACC300 (+3.8%;  $p = 0.016$ ) increased at POST. For the trained leg, PT45 (+7.4%;  $p = 0.050$ ), ACC45 (+4.0%;  $p = 0.009$ ), PT300 (+6.3%;  $p = 0.001$ ), and ACC300 (+2.3%;  $p = 0.007$ ) improved at POST.*

*Conclusion: Age had no effect on the adaptations in the trained leg. The untrained limb only saw increases in PT at  $300^\circ\text{-s}^{-1}$  and ACC at the low and high velocity. Unilateral RT involving a ballistic*

*attempt may be more conducive to cross-education of rapid or high velocity contractile parameters as compared to changes in low velocity strength.*

### ***Relationships Between 40-M Sprinting and Vertical Jump Kinetics in National Football League (NFL) Draft Prospects***

Poster Presentation

Undergraduate Student(s): Gannon Hampton

Research Mentor(s): Gerald Mangine, Trisha VanDusseldorp, Yuri Feito

*To determine the relationships between 40-m sprinting and vertical jump (VJ) kinetics, twenty-six NFL draft prospects (22.7±1.0 years; 186.5±7.9 cm; 109.3±23.6kg) completed assessments at the beginning of their off-season. After a standardized warm-up, the athletes completed a maximal 40-m sprint trial while tethered to a robotic sprinting device (RSD) at 1-kg resistance, and a second, untethered trial for time (in seconds). Subsequently, three maximal VJ trials were completed while tethered to a linear position transducer. Peak (PK) and average (AVG) velocity (V), force (F), and power (P) were measured during the 40-m sprint and VJ, as well as VJ displacement and average partial power (PPAVG) and force (PFAVG). Pearson's correlation analysis revealed VJ displacement was related ( $p<0.05$ ) to sprinting time ( $r = -0.47$  to  $-0.63$ ), VAVG ( $r = 0.70$ ), FAVG ( $r = 0.45$ ) and PAVG ( $r = 0.62$ ). VJ VPK was related ( $p<0.05$ ) to sprinting time ( $r = -0.48$ ), velocity ( $r = 0.50 - 0.52$ ), force ( $r = 0.42$ ), and power ( $r = 0.48$ ). VJ PAVG was related ( $p<0.05$ ) to sprinting time ( $r = 0.63$ ), velocity ( $r = -0.44$  to  $-0.58$ ), force ( $r = -0.39$ ) and power ( $r = -0.51$ ). VJ PPAVG was related ( $p<0.05$ ) to sprinting time ( $r = 0.46$ ) and PFAVG ( $r = -0.45$ ). VJ PFAVG was related ( $p<0.05$ ) to sprinting time ( $r = 0.49 - 0.63$ ), VAVG ( $r = -0.55$ ) and PAVG ( $r = -0.43$ ). No other relationships were observed. VJ displacement and velocity positively influence 40-m sprinting performance, while VJ force and power may have a negative impact.*

## **Health Promotion and Physical Education**

### ***The Double Burden Phenomenon: A Much Needed Status Check***

Poster Presentation

Undergraduate Student(s): Ngozi Hart

Research Mentor(s): Mari-Amanda Dyal

*BACKGROUND: The double burden is a well-known concept affecting individuals in developing countries, especially African countries where environmental and cultural factors exacerbate the issue. The double burden phenomenon has been well documented and discussed, but what are the action steps being taken to minimize the burden? Current efforts target either the communicable disease or the non-communicable disease in the double burden scenario but not both. Further, the double burden diseases are not often associated with affected populations. There are many reasons as to why real change is ineffectual: 1) double burden diseases are rarely discussed in unison, which means they are not targeted as such and 2) double burden diseases are associated with general regions, which provides little direction for targeted intervention and implementation. Therefore, current efforts and recommendations lack the focus needed to minimize the double burden impact.*

*METHODS: An extensive review and ranking of double burden diseases and their affected countries will provide the necessary focus. In addition, current efforts and recommendations will be compiled and collated specific to the double burden ranking.*

*RESULTS OR ANTICIPATED RESULTS: A range of double burden diseases will be established to identify severity and susceptibility in specific African countries. The range will be designed based upon African countries but can be easily applied to other developing countries that are plagued by the double burden.*

*CONCLUSIONS: The double burden is a worthy discussion, but it is time to quit talking. It is time to take action that is focused and directs real change.*

***The Intersection of Mental Health Literacy and Mental Health Stigma: A Literature Review***  
Poster Presentation

Undergraduate Student(s): Sefina Haque, Abeer Osman

Research Mentor(s): Mari-Amanda Dyal

*BACKGROUND: Any discussion of health should involve a discussion of health literacy, as it is a critical factor in the acquisition and application of health-related information. One specific area is mental health literacy (MHL), which refers to knowledge and beliefs about mental disorders. MHL has experienced improvement in the areas of recognition, management, and prevention; however, current efforts for MHL development and improvement have a one-sided focus. MHL efforts do not address the issue of stigma in terms of reduction or awareness setting the stage for the current research.*

*METHODS: A review of the literature explored the intersection of MHL and stigma specific to mental health and mental health disorders. Moreover, MHL efforts for improvement and development were reviewed to better understand the health literacy strategies (plain language, written and verbal communication, and cultural competence) that are employed for mental health.*

*RESULTS OR ANTICIPATED RESULTS: MHL research is associated with stigma specific to attitude assessment, which was related to mental health and mental health issues (i.e., depression and schizophrenia). MHL efforts for improvement and development involved altering attitudes as a directive with little direction provided in terms of health literacy strategies.*

*CONCLUSIONS: The MHL struggle is alive and well because efforts for improvement and development are one-sided with no direction for reducing stigma using confirmed health literacy strategies such as cultural competence, which could prove to be a game changer by opening the two way street to improving MHL and reducing stigma when it comes to mental health issues.*

***A Diagnostic Direction for Workplace Health Promotion***  
Poster Presentation

Undergraduate Student(s): Abeer Osman

Research Mentor(s): Mari-Amanda Dyal

*Background: Worksite health promotion (WHP) seeks to improve employee health outcomes on several levels: promotion, prevention, diagnostic, etc.. The diagnostic level, specific to cancer, is of particular interest, as it is essential for early detection and intervention but does not receive emphasis in research and practice due to a model that offers screenings annually with inadequate follow-up efforts. An improved approach for WHP diagnostic programming takes employees through the entire process of early detection and intervention. This approach 1) partners with clinical practitioners to build an awareness/knowledge base of cancer prevalence, 2) stresses and offers on-going, convenient screening opportunities, and 3) facilitates treatment and/or prevention post-screening.*

*Methods: The approach was evaluated to assess cost effectiveness and WHP diagnostic program direction. Health risk appraisals and health insurance claims data were analyzed to determine the 1) cancer risk levels, 2) cancer related medical procedures/prescriptions, 3) medical costs avoided per affected employee (FY 2008-2016).*

*Results: Risk levels were typical of the general population (i.e., breast, colon, and prostate), which provided the basis for WHP diagnostic programming. Fiscal year analyses revealed that general WHP programming (i.e., health promotion) ensured savings from avoided costs totaling over \$500,000. WHP diagnostic programming doubled that number with early detection and intervention offsetting medical costs with savings of over \$1,000,000.*

*Conclusions: WHP should consider this approach for diagnostic programming for both employee health and employer investment. Moreover, this approach offers the support that employees need during this sensitive process.*

### ***The Study Abroad Model in Public Health: Are We Doing More Harm than Good?***

Oral Presentation

Undergraduate Student(s): Christen Robinson

Research Mentor(s): Mari-Amanda Dyal

*Introduction: Public health initiatives have made great strides in the health outcomes of vulnerable populations in developing countries. Of these initiatives, study abroad programs afford students the opportunity to get an inside look at how public health is viewed in juxtaposition to the world that they see every day. Even though public health related study abroad programs focus on enrichment activities, there is a critical problem with the design of those programs. This problem is related to student ignorance entering a culture with limited preparation, time, and experience. Even though these programs are well intentioned, they disrupt lives and introduce hope and compassion, which is stripped once the program concludes. Most program policies are solely focused on the students' safety and experience with little regard for the populations that are served.*

*Methods: Public health related study abroad programs were identified across several University System of Georgia institutions (n=6) in which eight individual study abroad program policies were examined for language devoted to the populations receiving program activities.*

*Results: The analysis found that the majority of program activities took place in developing countries in which vulnerable populations were identified and recruited as program partners. Very few program policies considered the population impact of engagement outside of student cultural sensitivity.*

*Discussion: A policy focus on all parties involved will build awareness and initiate action that is beyond that of good intentions. Further, students and populations will benefit from a rich connection that is developed before, during, and after the study abroad experience.*

## **Nursing**

### ***The Lived Experience of Afghan Women Refugees in Three Metropolitan Areas of the Southeastern US: A Phenomenological Study***

Oral Presentation

Graduate Student(s): Brenda Brown

Research Mentor(s): Mary de Chesnay

*The global refugee crisis has reached epic proportions. Statistics from the United Nations High Commissioner for Refugees (UNHCR, 2016) reported that in 2015 a record 65.3 million people worldwide, or 39,976 people per day, were displaced, either within their native countries or as asylees and refugees. Afghanistan, from 1980-2014, was the country with the largest number of outgoing refugees and it now ranks third in the world. At the opposite end of the continuum the United States remains the primary host country for refugees, asylees, and resettled refugees from all countries, including Afghanistan. The refugee experience is fraught with challenges from life in the native country to the decision to leave to the resettlement process in the US. The author has had a longstanding interest in Afghanistan and the Afghan refugees. Understanding the lived experience of the women refugees is important for nurses and other healthcare professionals who will eventually care for the women. This study used a phenomenological approach to make sense of and find meaning in this experience. The study also used the intersectionality feminist theory to explore ways in which the Afghan women refugees may be marginalized in the US. The author will present a few of the findings to help the audience appreciate the refugee experience. The women have demonstrated resilience and strength in coping with this traumatic life event and their stories deserve to be heard.*

### ***Reducing the Risk: Effects of Different Educational Interventions on College Students' Knowledge of HIV/AIDS***

Poster Presentation

Undergraduate Student(s): Adaeze Okere

Research Mentor(s): Rachel Myers, Doreen Wagner

*The purpose of this study is to evaluate the HIV/AIDS knowledge of undergraduate college students before and after two different types of educational interventions – lecture-style or an interactive game. It is anticipated that students who receive content via the interactive game will obtain greater HIV/AIDS knowledge than those students who obtain equivalent content via lecture.*

*I will use an introductory level course from any college to recruit students by coming during a scheduled class time of two or more sections of the course and conducting my study with permission of the instructor(s). In the classroom setting, after explaining the study to the students, I will distribute the informed consent form, followed by a questionnaire packet. Those students who do not agree to participate in the study will be invited to leave the classroom. Those who do agree to participate and who sign the consent form will be asked to stay in the classroom and do the following:*

- Complete the Demographic Data Sheet*
- Complete the Brief HIV Knowledge Questionnaire (pre-test)*
- Receive the educational intervention (lecture or interactive game, depending on the course section)*
- Complete the Brief HIV Knowledge Questionnaire (post-test)*

*Benefits include increased knowledge on HIV/AIDS prevention and another step in decreasing the rate of HIV infection.*

### ***Cultural Competency towards the Middle Eastern Population as Seen Through the Lens of Middle Easterners***

Poster Presentation

Undergraduate Student(s): Tania Jajeh

Research Mentor(s): Mary Beth Maguire, Doreen Wagner, Rita Bailey

*This research will provide insight into the culture of Middle Eastern people and how healthcare providers, especially nurses, can provide culturally competent care toward this population by understanding their lifestyles. There are many misunderstandings about the Middle Eastern culture and people that derive from unfortunate historical events. Middle Eastern people are forced to deal with discriminatory consequences because of their ethnicity. The purpose of this research project is to provide education about this culture and therefore inform nurses of what is important to remember when caring for a Middle Eastern patient. Photovoice is the primary research methodology and uses photography to capture the essence of and raise awareness for a group of people that are discriminated against, in this case Middle Easterners. The research focuses on the healthcare perspective, noting health patterns, cultural patterns, and themes within the photos. The final product will consist of a research paper that reviews those themes and provides patient health education specifically catered to this population. A slideshow of the collection of photos that is received from the participants will also be created to present the work to healthcare professionals and attendees of the symposium. By healthcare providers learning and understanding more about the Middle Eastern culture, it is anticipated an indirect break down of the walls of discrimination will occur so that Middle Eastern patients can receive the equal care that they deserve.*

### **Social Work and Human Services**

#### ***Building and Sustaining the Feminist Future: Planned Giving***

Poster Presentation

Undergraduate Student(s): Dartricia Rollins

Research Mentor(s): Darlene Xiomara Rodriguez

*Planned giving, also known as legacy giving, are estate contributions given to a nonprofit organization by a donor. Most planned gifts come from longtime donors that want to see the organization remain healthy after their passing. Planned gifts are defined as “a contribution that is arranged in the present and allocated at a future date” (Planned Gifts: The Introductory Guide, n.d.). Planned giving is a ‘growing intergenerational transfer’ James, forthcoming; Radcliff, 2002 (as cited in Russell, Lauderdale & Robb 2009). Planned gifts are important for the sustainability of organizations, but not all organizations know how to implement this resource diversification strategy.*

*The purpose of this deliverable is to create a planned giving program for Charis Circle. Charis Circle, the nonprofit programming arm of Charis books and more has been providing community space and education to the community for more than forty years. “Together with Charis Books, the nation’s oldest feminist bookstore, Charis Circle encourages the expression of diverse and marginalized voices, fosters sustainable feminist communities, and works for social justice.” This organization spans three generations, therefore an intergenerational approach was necessary. A planned giving program and manual was created for both the board of directors and the potential donors. It is important to sustain the future of Charis Circle and a planned giving program will give Charis Circle an opportunity to have meaningful conversations with their donors about how their legacy can continue to build the feminist future.*

### ***“Secure the Bag”: Collaborations***

Poster Presentation

Undergraduate Student(s): Danita A. Austin

Research Mentor(s): Darlene Xiomara Rodriguez

*Government funding has been declining since the beginning of the 2008 economic downturn (Mintz, 2015). Nonprofit organizations have experienced cuts to core programs but were offered money for other initiatives less central to their mission. In response to this decline in government funding and resource scarcity nonprofit collaborations have increased. “In the nonprofit world, increased demand for services often means an increase in costs (to provide those services) with no associated change in revenue. This scenario leaves an organization scrambling for funding to keep up with demand” (Paik, 2012). In 2015, the BridgeSpan Group and the Patterson Foundation revealed that 91 percent of nonprofits engage in collaboration based on their surveys of 237 nonprofit CEO’s and 101 foundation officers in 2014 (Neuhoff, 2014). There are many perspectives on defining what collaboration is. However, they all share the concept of a relationship between two entities that communicate, share information, and work together to reach an organizational goal, benefit the organization and satisfy the needs of the population they serve. In the nonprofit industry there are different types of collaboration. Most nonprofits are collaborating on an intersectoral level. This means that they are collaborating with other organizations that are either public, for-profit, or other nonprofits. Seeking collaborations with organizations in other sectors opens the door for more resources. The most common theory behind this increase in collaborations is resource dependency. Resource dependency was built on the notion that organizations’*



*survival depends on their ability to acquire critical resources from the external environment (Pfeffer & Salancik, 1978).*

*Considering the intersectoral collaboration trend, The Center Helping Obesity in Children (C.H.O.I.C.E.S.), a 501 (c) (3) agency, is seeking to continue intersectoral collaborations, so they can continue to accomplish their mission of fighting childhood obesity. The organizations accomplish their mission by collaborating with other organizations and individuals that can offer healthy cooking, nutrition, and physical activity education. To create a more responsive system of governance C.H.O.I.C.E.S. is seeking to implement a standard operating procedure (SOP) for collaboration that all staff can follow when encountering potential collaborative opportunities. The collaboration SOP will include the following sections: an overview of what collaborations are, the type of collaborations the organization is seeking, an hierarchy of collaboration responsibility, a step by step procedure for securing collaborations, a community outreach coordinator job description, procedure on how to terminate a collaboration, and a community outreach directory that the community outreach coordinator or program director can use to stay connected to other agencies and resources in the community. Implementing an SOP for collaboration can educate new and current staff and help C.H.O.I.C.E.S. to continue securing effective and efficient collaborations.*

### ***Volunteer Management: An Event Planning Manual***

Poster Presentation

Undergraduate Student(s): Victoria McCormick

Research Mentor(s): Darlene Xiomara Rodriguez

*There are many gratifying roles that play into executing a special event for an organization. This can be challenging when there is miscommunication within the organization, and roles are not clarified. Veteran Empowerment Organization for the first time is producing a local benefit concert for veterans. Veterans Empowerment Organization is a nonprofit organization in Atlanta whose mission is to provide full wrap around services to the homeless veterans in the metro Atlanta area.*

*The process of putting on a special event can be simplified by creating an event manual. A special event has the ability to benefit an organization by raising the organization's profile, recruit volunteers, and acquire potential donors. Through literature review articles, evidence was found that volunteers and their roles make a great impact and can even lead to potential donors.*

*Therefore, the base for the project research contained a detailed analysis for effectively managing and utilizing volunteers up to their full capacity. Referring to several scholarly peer reviewed articles, organizational interviews, and existing agency documents, a detailed Special Events Manual was created. The following Special Events Manual will contain document samples, planning schedules, and other tools the Veterans Empowerment Organization can use to remain organized. With this manual, the organization will be able to plan a benefit concert that will greatly impact the organization and represent its' clients accordingly.*

### ***Volunteers Across the Generations, They are Not all the Same***

## Poster Presentation

Undergraduate Student(s): Lennetta Graham

Research Mentor(s): Darlene Xiomara Rodriguez

*As the nonprofit sector is evolving, so is the way volunteers are being recruited. Volunteers and their retention are the driving force behind nonprofit organizations. In light of this, it is essential for organizations to strategically recruit new volunteers. Volunteerism is often seen as a group of individuals offering their time to a specific organization for a specific reason. In reality, volunteerism consists of many different segments of people offering their time for various reasons. To accurately recruit volunteers, organizations must understand generational motivations. They also need to organize volunteer experiences to maximize each generation's benefits.*

*Baby boomer volunteers are a particular interest because they are so large in number. Consequently, organizations are trying to target this group. The March of Dimes is one such group. As a result, a Generational Recruitment Guide was created to provide strategies for the recruitment and retention of prospective volunteers. The guide consists of the Baby Boomers, however, it also includes Generation X, Millennium, and Generation Z groups. To obtain accurate information for this deliverable, professional interviews were conducted, academic and practitioner research, and field observations were completed. The information presented in this guide can be transferable in other settings.*

## **Nonprofit Who? Using Storytelling as an Online Marketing Strategy**

### Poster Presentation

Undergraduate Student(s): Norma Zúñiga

Research Mentor(s): Darlene Xiomara Rodriguez

*Nonprofit organizations often struggle with adequately communicating the issues or problems that they are facing. As a result they have a difficult time in demonstrating the impact that they are making in the community. A method to overcome this is to develop a marketing strategy. Researchers across many disciplines have widely recognized and implemented the power of storytelling in marketing strategies (Gilliam & Flaherty, 2015). A literature review on storytelling was completed that showcases studies of brain synchronization, brain chemical change, narrative transportation theory, and the result of using high arousal emotions in stories. These studies' findings demonstrate how storytelling captures attention, creates a connection, and persuades its audience.*

*Nonprofit organizations such as Good Samaritan Health Center of Cobb have an opportunity to use storytelling as a marketing strategy. Nonprofit organizations have access to different mediums and communication channels for storytelling, such as a website and through social media. Currently, Good Samaritan lacks a strong online presence through its website and social media accounts. Additionally, it does not have an online marketing strategy. This deliverable consists of first developing a Social Media Strategy Plan in order to create a Social Media Practices Manual. This practices manual also contains step-by-step guidelines on maintaining and updating their website and social media accounts, as well as tips on how to integrate stories into the different communication channels.*

## ***Listening Sessions: A Bridge to Trust and Change***

Poster Presentation

Undergraduate Student(s): Kaleigh Raulerson

Research Mentor(s): Darlene Xiomara Rodriguez

*Constituent relationships, both beneficiaries and contributors alike, are integral for nonprofit success. When these relationships do not occur within the area of service, organizations are built upon fragile foundations and therefore lack the ability to develop trust with established residents and community members. A way to create trust and community participation is to gain an understanding of what potential clients need or desire. A technique that is often used is Listening Sessions. Listening Sessions are a type of public forum that allow a safe space for open dialogue where community members are able to use their voices and unique perspectives to reveal positive and negative aspects within the community and in turn help pilot positive change.*

*Bartow Family Resources Kingston branch implemented Listening Sessions to bridge the gap between foundational community involvement and the perceived need of services. Research from a literature review concluded that community development does not exclusively depend on the knowledge of resources and services that are available, but “more in the development of concrete capabilities and positive freedoms” that allow community members an avenue of participation in “social, economic, and political transactions”. By providing this space for individuals to state their own priorities and values, it would “lead to their increased ownership of the process of change, making it more sustainable and relevant to their realities” (Moreno, Noguchi, & Harder, 2017).*

*This project reports on the pilot Listening Session produced by Bartow Family Resources Kingston branch before it was formally introduced to the community in April. To inform this project, data was retrieved and analyzed from surveys given to the organization beneficiaries, a Kingston Community Leaders meeting, and the Listening Sessions. By recognizing the community members as the experts, empowering their voices, and learning each of their unique passions and capabilities, this will produce essential and fundamental relationships in the community, while determining what kind of programs and resources Bartow Family Resources Kingston branch should offer.*

## ***Blurred Lines: Mission vs. Money***

Poster Presentation

Undergraduate Student(s): Vanessa Lanier

Research Mentor(s): Darlene Xiomara Rodriguez

*The purpose of this project is to demonstrate that a nonprofit’s mission statement is susceptible to change due its funder. And as a result, their mission and the organizational culture may change. A lack of transparency and trust could overcome the organization. However, they are accountable for achieving the mission for which they have been established and granted special benefits (Young, 2002). A youth organization in Marietta, GA has been experiencing this issue since they are largely dependent on one funder. And this has directly changed the mission and services of this organization. To evaluate this a survey was done of the students who benefit from the program to understand their perception. After*

*performing a sample survey of fourteen (14) teenagers, the project reports the preliminary findings and makes recommendations on how to work in the current conditions with the organization's original mission.*

***Sustaining the Future: Creating an Endowment Fund for Our Nonprofit Management Program***

Poster Presentation

Undergraduate Student(s): Christina Loud, Whitney Doss, Lenetta Graham, Kaliegha Pierce, Anna Hamilton

Research Mentor(s): Jennifer Wade-Berg

*This applied research project created a set of best practices and procedures for creating an endowment fund for postsecondary institutional use. To answer the questions that guided the project research, both qualitative and quantitative data were used. An annotated bibliography was developed along with a content analysis of web resources on the topic of endowments. Face-to-face interviews with key leaders from the Kennesaw State University Foundation were also conducted. The interviews were conducted using a funnel approach that expounded on information specific to Kennesaw State University Foundation policies and procedures regarding endowment funds. Findings yielded a set of best practices and procedures that were placed into a tool kit for the Dean of WellStar College of Health and Human Services, Department of Social Work and Human Services faculty and staff to use for the development of a fund to support academic programming in the area of Nonprofit Management and Social Innovation. The expected impact of this project is that this tool kit will provide insightful information that results in the successful solicitation and procurement of gifts for an endowment.*

# Poster Session #1 Placement Assignment

## 2:00pm – 3:00pm

### **1:** *Between the Lines and Out of the Box: Critical Literacy*

Poster Presentation

Undergraduate Student(s): Kinsey Shrewsbury

Research Mentor(s): Virginie Jackson

### **2:** *Translanguaging in Content Classes: A Study of a Trilingual Preschooler*

Poster Presentation

Undergraduate Student(s): Shakira Bell, Mari Heimlich

Research Mentor(s): Jayoung Choi

### **3:** *Nitrogen Cycling in Seagrass Systems: Do Macroalgae Alter Sediment Conditions?*

Poster Presentation

Undergraduate Student(s): Stephen Jones, Kelly Nguyen, Daniel Lord, Lina Tran

Research Mentor(s): Troy Mutchler

### **4:** *Influence of Chinese Privet on Riparian Soil Decomposition*

Poster Presentation

Undergraduate Student(s): Victoria Romero

Research Mentor(s): Matthew Weand

### **5:** *Gender Differences in STEM Courses at KSU*

Poster Presentation

Undergraduate Student(s): Emma Evans, Kaelyn Spiers, Jummy Nipo, Zeljka Zec, Ayo Awodu

Research Mentor(s): Amy Buddie

### **6:** *Student Perceptions of GMOs*

Poster Presentation

Undergraduate Student(s): Tatiana Smithson, Amy Graham, Charlene Quainoo, Shae Sams, Jasmine Lopez, Samantha Swartzendruber

Research Mentor(s): Amy Buddie

### **7:** *Health Behaviors in College Students*

Poster Presentation

Undergraduate Student(s): Sharonjeet Kaur, Alyssa Venn, Hannah Bauguess, Eun Sol Chang, Lauren Rohde, Fatma Aldihri, Ryan Page, Shawyun Khoshneviszadeh, Amna Glissa

Research Mentor(s): Amy Buddie

**8: *Worker Safety in Energy Production in America: A Comparative Analysis of Fuel Sources and Accompanying Occupational Risk***

Poster Presentation

Undergraduate Student(s): Alyssa Venn

Research Mentor(s): Joe DeMaio

**9: *Il Silenzio***

Poster Presentation

Undergraduate Student(s): Kenneth Samuel Presley

Research Mentor(s): Federica Santini

**10: *How Giulia Niccolai has Changed Italian Contemporary Literature***

Poster Presentation

Undergraduate Student(s): Santiago Meneses

Research Mentor(s): Federica Santini

**11: *The Globalization of Korean Pop Music: An Analysis of the Cultural and Social Effects***

Poster Presentation

Graduate Student(s): Isla Baldrige

Research Mentor(s): Jeongyi Lee

**12: *Year of India Study Abroad Seminar: The Attitudes Towards Mental Illnesses and Accessibility to Mental Health Services in Rural and Urban India***

Poster Presentation

Undergraduate Student(s): Celessia Cannon, Brooke Satterfield

Research Mentor(s): Ginny Zhan

**13: *The Role of Diagnostic Labels on Perceptions of Behavior***

Poster Presentation

Undergraduate Student(s): Madison Bodenhamer, Haley Smith, Alisanne Jensen, Sarah Deveau, Kenya Morgan, Kelly Watson, Morgan Moore, Bethany Shields

Research Mentor(s): Tracie Stewart

**14: *Gender Differences are Disappearing: Attitudes on Sex Trafficking Tactics and Rape Victimization***

Poster Presentation

Undergraduate Student(s): Meghean Teefy, Mandy Losito, Elizabeth Perry, Jonathan McFarland

Research Mentor(s): Dorothy F. Marsil, Corinne McNamara

**15:** *The Relationship Between Attitudes on Institutional Responses and Sex Trafficking Awareness and Myth Acceptance*

Poster Presentation

Undergraduate Student(s): Jonathan McFarland, Alexandria Goldstein, Elizabeth Perry, Mandy Losito, Meghean Teefy

Research Mentor(s): Dorothy F. Marsil, Corinne McNamara

**16:** *The Relationship between Sexual Assault Beliefs and Understanding of Consent*

Poster Presentation

Undergraduate Student(s): Abrian Poole, Amber Wallace, Shelby Benson, Tommy Hampton

Research Mentor(s): Corinne McNamara, Dorothy F. Marsil

**17:**

**18:** *Watch Me Give: A Look at Narcissism as a Moderator to Donating to a Non-Profit*

Poster Presentation

Undergraduate Student(s): Austin Prewett

Research Mentor(s): Paul Story

**19:**

**20:** *The Relationship between Motion Offset and Neural Inhibition with respect to EEG*

Poster Presentation

Undergraduate Student(s): Shawyun Khoshneviszadeh

Research Mentor(s): Tim Martin

**21:** *The Lateralized Readiness Potentials and the Psychological Refractory Period*

Poster Presentation

Undergraduate Student(s): Amir T. Woods, Kevin Smith

Research Mentor(s): Tim Martin

**22:** *Connectivity Analysis of Regions of Interest Between Regional Accents*

Poster Presentation

Undergraduate Student(s): Brandon Mitchell

Research Mentor(s): Tim Martin

**23:**

**24: *Self-Reported Willingness to Let Friends Falsely Take the Blame***

Poster Presentation

Undergraduate Student(s): Dara Latimer, Karina Gartavel, Stephen Gilcrease

Research Mentor(s): Jennifer Willard

**25: *The Intergroup Sensitivity Effect Among Racial Groups***

Poster Presentation

Undergraduate Student(s): Scarlet Hernandez, Amilynne McLeroy, Caleb Lang

Research Mentor(s): Katherine White

**26: *Using Fear Potentiated Startle Rate to Examine African American Women with Childhood Trauma Exposure: Are They at Higher Risk for Post-Traumatic Stress Diagnosis?***

Poster Presentation

Undergraduate Student(s): Kayla Herren, Olivia Lauzon, Jesse Edmond, Bianca Sarrecchia, Royce Alfred, Olivia Tyler

Research Mentor(s): Ebony Glover

**27:**

**28: *The Effects of Personality on the Stress Response***

Poster Presentation

Undergraduate Student(s): Kristina Thursby

Research Mentor(s): Sharon Pearcey

**29:**

**30: *Namaste in the USA: The Growing Pains Yoga Faces in American Culture***

Poster Presentation

Undergraduate Student(s): Clay Wilderman, Tammy Le, Daniel McNabb, Autumn Richardson, Jake Vasquez

Research Mentor(s): Mona Sinha

**31: *The Jungle of e-Commerce: Why Amazon is Failing in China***

Poster Presentation

Undergraduate Student(s): Kamila Daza, Susana Diaz, Devin Mann, Sinan Nurdogan, Adam Stasevich, Alexys Wilson

Research Mentor(s): Mona Sinha



**32: *Vodafone: Digitizing India's Cash to Code with MPesa***

Poster Presentation

Undergraduate Student(s): Jackson Lott, Eady Connally, Kelly Herrera, Michael Phillips, Tyler Black, Tyler Bohn

Research Mentor(s): Mona Sinha

**33: *The Great Wall of AirBnB China***

Poster Presentation

Undergraduate Student(s): Abbie Hillis, Gavin Cagle, Ryan Calhoun, Chris Wingate, Kaleigh Young, Alexis Tremble

Research Mentor(s): Mona Sinha

**34: *AirBnB: Facing Late Entrant Disadvantage in China***

Poster Presentation

Undergraduate Student(s): Ryan Patel, Wes Davis, Drew Boles

Research Mentor(s): Mona Sinha

**35: *Disney's Bollywood Battle***

Poster Presentation

Undergraduate Student(s): Nikita Patel

Research Mentor(s): Mona Sinha

**36: *Ola v. Uber: The Blaring Battle between India's Locally Trusted Transportation Company and Their New, Infamous Rival***

Poster Presentation

Undergraduate Student(s): Elizabeth Beall, Kevin Testerman, Alexa Baumgartner, Anasasia Krunk, Greg Chafin, Kevin McKay

Research Mentor(s): Mona Sinha

**37: *Toto: A Game of Thrones Taking Place in the U.S.***

Poster Presentation

Undergraduate Student(s): Georhton Correia do Carmo, Gabrielle Bordelon, Rachael Amatriain, Lauren Benson, Erin Lutz, Lauren Welch

Research Mentor(s): Mona Sinha

**38: *How Advertisers Can Use Social Media to Release More Dopamine to Improve the Affect on the Consumer Purchase Decision***

Poster Presentation

Undergraduate Student(s): David Carter  
Research Mentor(s): Sandra Pierquet

**39: *New bis(amidine) ligands for highly luminescent copper<sup>I</sup> complex array***

Poster Presentation

Undergraduate Student(s): Alvaro Calderón Díaz, Nattasith Siwabut  
Research Mentor(s): Michael Stollenz

**40: *A Conserved Role for ETS Genes in Paired Appendage and Urogenital Development***

Poster Presentation

Undergraduate Student(s): Kira Monell  
Research Mentor(s): Marcus Davis, Amanda Cass

**41: *Tactile versus Electrical Sensory Input to Stimulate the Zebrafish (*Danio rerio*) Escape Response***

Poster Presentation

Undergraduate Student(s): Kayla Vargas, Ashley Turcios  
Graduate Student(s): Victoria Mendiola  
Research Mentor(s): Lisa Ganser

**42: *Characterization of CRISPR- mediated Gene Regulation in *Myxococcus xanthus****

Poster Presentation

Undergraduate Student(s): Maya Maarouf, Tiajah Sherman  
Research Mentor(s): Ramya Rajagopalan

**43: *The Hangry Behavior of Myxobacteria: Transcriptome Analyses of Starving Cells***

Poster Presentation

Undergraduate Student(s): Sarah Joie Beauvais  
Research Mentor(s): Ramya Rajagopalan

**44: *The Development Inhibitor and its Playmates***

Poster Presentation

Undergraduate Student(s): Kara Kelley, Tiajah Sherman  
Research Mentor(s): Ramya Rajagopalan

**45: *Does *ngn-1* regulate the expression of *daf-18* in the context of AIY axonal outgrowth?***

Poster Presentation

Undergraduate Student(s): Alexandra Beasley  
Graduate Student(s): Elyse Christensen  
Research Mentor(s): Martin Hudson

**46: *Does Neurogenin Control the Expression of cnd-1 in Caenorhabditis elegans?***

Poster Presentation

Undergraduate Student(s): Jessica Radchuk

Graduate Student(s): Elyse Christensen

Research Mentor(s): Martin Hudson

**47: *srw-85 expression is controlled by the basic-helix-loop-helix transcription factor cnd-1/NeuroD1***

Poster Presentation

Undergraduate Student(s): Derrica McCalla

Research Mentor(s): Martin Hudson

**48: *What is the Relationship between Neurogenin and Ephrin during Neuronal Development?***

Poster Presentation

Undergraduate Student(s): Benjamin L. Crews

Research Mentor(s): Martin Hudson

**49: *Does ngn-1 regulate the expression of daf-18 in the context of AIY axonal outgrowth?***

Poster Presentation

Undergraduate Student(s): Alexandra Beasley

Graduate Student(s): Elyse Christensen

Research Mentor(s): Martin Hudson

**50: *Does Neurogenin regulate vab-1 during neurogenesis?***

Poster Presentation

Undergraduate Student(s): Omar Daouk

Graduate Student(s): Elyse Christensen

Research Mentor(s): Martin Hudson

**51: *The Transcription Factor ztf-29 is Required for C. elegans Nervous System Development***

Poster Presentation

Undergraduate Student(s): Ciara Hosea

Research Mentor(s): Martin Hudson

**52: *The role of EphR/ephrin Signaling in a Food-Seeking Sensorimotor Neural Circuit***

Poster Presentation

Graduate Student(s): Miranda Arnold

Research Mentor(s): Martin Hudson

**53: *Differential Analysis of Individual Centruroides vittatus Venom***

Poster Presentation

Undergraduate Student(s): Isabella S Batallas, Kelci R Knight, Whitney Smith

Research Mentor(s): Eric Albrecht, C. Neal McReynolds, Thomas McElroy

**54: *Survey and Analysis of Georgia's Most Contaminated Environmental Sites***

Poster Presentation

Undergraduate Student(s): Sean Fletcher

Research Mentor(s): Melanie C. Griffin

**55: *The DNA Regulator Lrp is involved with the Pseudomonas quinolone signal (PQS) quorum sensing network***

Poster Presentation

Undergraduate Student(s): Sheereen AbdulKabir

Graduate Student(s): Mareena Pitts

Research Mentor(s): Melanie C. Griffin

**56: *Generation of new antibiotic selections for prokaryotic CRISPR gene editing***

Poster Presentation

Undergraduate Student(s): Rick Liebold, Ashley Hicks

Research Mentor(s): Melanie C. Griffin

**57: *Preparation and Comparative Analysis of DNA Competence Among Enteric Bacteria***

Poster Presentation

Undergraduate Student(s): Matthew Seth Oxford

Research Mentor(s): Melanie C. Griffin

**58: *Understanding the Regulation and Activity of Hyaluronidase Produced by Aeromonads***

Poster Presentation

Undergraduate Student(s): Monica Sowder

Research Mentor(s): Donald McGarey, Pyeongsug Kim

**59: *Identifying Cadmium-Resistant, Probiotic Bacteria for Potential Protection Against Cadmium Toxicity in Drosophila Melanogaster***

Poster Presentation

Undergraduate Student(s): Pardis Madjidi, Olivia Brooks

Research Mentor(s): Donald McGarey, Pyeongsug Kim, Anton Bryantsev

**60: *The role of the Rbf1 tumor suppressor in the differentiation and maintenance of Drosophila muscles***

Poster Presentation

Undergraduate Student(s): Kaveh Kiani

Research Mentor(s): Anton Bryantsev, Maria Chechenova

**61: *Absorbing epithelium of the midgut as the model to study toxicity mechanisms of the heavy metal cadmium***

Poster Presentation

Undergraduate Student(s): Olivia Brooks, Brandi Huggins, Hannah Stratton

Research Mentor(s): Anton Bryantsev

**62: *Effects of Hemocytes and Hemocyte Signaling on Longevity in Drosophila***

Poster Presentation

Undergraduate Student(s): Allyson Sams

Research Mentor(s): Anton Bryantsev

**63: *Expression of Telomerase mRNA in Nile Tilapia Tissues***

Poster Presentation

Undergraduate Student(s): Alexis Smith, Kristina Howard

Research Mentor(s): Jennifer Louten

**64: *Thermal Stabilities of Foodborne Pathogen Salmonella enterica serovar Thompson and Bacteriophage  $\Phi$ Ent***

Poster Presentation

Undergraduate Student(s): Samantha Thompson, Andrew Marchant

Research Mentor(s): Jean Lu

**65: *Microbial Voltage-gated Ion Channels***

Poster Presentation

Graduate Student(s): Kevin Bennett

Research Mentor(s): Tsai-Tien Tseng

**66: *Quantification of Human-, Dog-, and Total Animal-associated Bacteroides in Cobb County Creeks***

Poster Presentation

Undergraduate Student(s): Jay Detillo

Research Mentor(s): Mike Beach

**67: *Development of TAT-CaM CPP Technology in *Cryptocodium cohnii****

Poster Presentation

Undergraduate Student(s): Joshua Falkowski

Research Mentor(s): Jennifer Cooper

**68: *Computational Study of Protonated Nitrogen Dimer and Interpretation of Infrared Spectra***

Poster Presentation

Undergraduate Student(s): Reagan Hooper, Dalton Boutwell

Research Mentor(s): Martina Kaledin

**69: *Comparison of BMI and Weight-for-Age as a Growth Assessment of Preterm Infants***

Poster Presentation

Undergraduate Student(s): Anna Deeb, Julian Payne, Thomas Holmes, Rebecca Fowler

Graduate Student(s): Jonathan Boardman

Research Mentor(s): Louise Lawson, Nicole Ferguson

**70: *Determination of the Cognitive Load of Modeling Tasks in Organic Chemistry***

Poster Presentation

Undergraduate Student(s): Lisa Bateganya, Aana Hampton-Ashford,

Graduate Student(s): Jenifer Calvert

Research Mentor(s): Kimberly Cortes, Adriane Randolph

**71: *Determination of the Cognitive Load of Serine Protease 3-Dimensional Models***

Poster Presentation

Undergraduate Student(s): Lana Aleuy

Research Mentor(s): Kimberly Cortes, Adriane Randolph

**72: *Determining the Interaction of Pex5 with Kinases and the Phosphorylation Status of Peroxisome Proteins***

Poster Presentation

Undergraduate Student(s): Christina Nguyen, Joshua Sukumar, Thomas Potts, Ki Dae Kim

Research Mentor(s): Rajnish Singh, Carol Chrestensen

**73: *Multiple Criteria Evaluation of the Proposed Bus Rapid Transit System***

Poster Presentation

Undergraduate Student(s): Yunji Kim

Research Mentor(s): Jidong Yang

**74: *Development of a WiFi-Enabled Radiation Detector***

Poster Presentation

Undergraduate Student(s): MaKayla Jacobs, Neil Grimsley

Research Mentor(s): Eduardo B. Farfan

**75: *Distributed and Connected Dosimeter***

Poster Presentation

Undergraduate Student(s): Michael Jerrell, Joshua Johnson

Research Mentor(s): Eduardo Farfan

**76: *Niche Partitioning for an Assemblage of Bats in the Piedmont of Paulding County Georgia***

Poster Presentation

Undergraduate Student(s): Sarah Mashburn, Shaleah Daye

Research Mentor(s): Thomas McElroy

**77: *Slim-Modular-Flexible-Electric Bus***

Poster Presentation

Undergraduate Student(s): Heath Sinclair, Chixiang Zhang

Graduate Student(s): Corey Brown

Research Mentor(s): Bill Diong

**78: *Digold bis(amidine) complexes upon insertion into NH...N' hydrogen bonds: Synthesis, structures, and molecular dynamics in solution***

Poster Presentation

Graduate Student(s): Omar Ugarte Trejo

Research Mentor(s): Michael Stollenz

**79: *Cross Cultural Perspectives of the Display of Human Remains***

Poster Presentation

Undergraduate Student(s): Alicia Karrick

Research Mentor(s): Alice Gooding

**80: *Hematogenous Osteomyelitis in Juveniles: An Examination of Pathophysiology and Variation in Occurrence in the Archaeological Record and Contemporarily***

Poster Presentation

Undergraduate Student(s): Hannah Bauguess

Research Mentor(s): Alice Gooding

**81: *Using Geospatial Data to Determine a Least Cost Path Analysis of a Public Transport System for Atlanta***

Poster Presentation

Undergraduate Student(s): Carly D'Allen

Research Mentor(s): Robert Allen

**82: *Biological Control by Plant-Growth Promoting Rhizobacteria***

Poster Presentation

Undergraduate Student(s): Brooke Warres

Research Mentor(s): Christopher T. Cornelison

**83: *Comparison of Photosynthetic Rates for Two Evergreen, Temperate Species of Different Growth Forms (Tree versus Herb)***

Poster Presentation

Undergraduate Student(s): Sarah Andrews, Sean Caton, Shaila Sabusa

Research Mentor(s): Paula C. Jackson

**84: *Relationships Between 40-M Sprinting and Vertical Jump Kinetics in National Football League (NFL) Draft Prospects***

Poster Presentation

Undergraduate Student(s): Gannon Hampton

Research Mentor(s): Gerald Mangine, Trisha VanDusseldorp, Yuri Feito

**85: *The Double Burden Phenomenon: A Much Needed Status Check***

Poster Presentation

Undergraduate Student(s): Ngozi Hart

Research Mentor(s): Mari-Amanda Dyal

**86: *The Intersection of Mental Health Literacy and Mental Health Stigma: A Literature Review***



Poster Presentation

Undergraduate Student(s): Sefina Haque, Abeer Osman

Research Mentor(s): Mari-Amanda Dyal

**87: *A Diagnostic Direction for Workplace Health Promotion***

Poster Presentation

Undergraduate Student(s): Abeer Osman

Research Mentor(s): Mari-Amanda Dyal

**88: *The People of the Cumberland Plateau: Yesterday, Today and Tomorrow***

Poster Presentation

Undergraduate Student(s): Macey Hurst

Research Mentor(s): Katherine Perrotta

**89: *Sustaining the Future: Creating an Endowment Fund for Our Nonprofit Management Program***

Poster Presentation

Undergraduate Student(s): Christina Loud, Whitney Doss, Lenetta Graham, Kaliegha Pierce, Anna Hamilton

Research Mentor(s): Jennifer Wade-Berg

**90: *Blurred Lines: Mission vs. Money***

Poster Presentation

Undergraduate Student(s): Vanessa Lanier

Research Mentor(s): Darlene Xiomara Rodriguez

**91: *Listening Sessions: A Bridge to Trust and Change***

Poster Presentation

Undergraduate Student(s): Kaleigh Raulerson

Research Mentor(s): Darlene Xiomara Rodriguez

**92: *Nonprofit Who? Using Storytelling as an Online Marketing Strategy***

Poster Presentation

Undergraduate Student(s): Norma Zúñiga

Research Mentor(s): Darlene Xiomara Rodriguez

**93: *Volunteers Across the Generations, They are Not all the Same***

Poster Presentation

Undergraduate Student(s): Lennetta Graham  
Research Mentor(s): Darlene Xiomara Rodriguez

**94: *Volunteer Management: An Event Planning Manual***

Poster Presentation

Undergraduate Student(s): Victoria McCormick  
Research Mentor(s): Darlene Xiomara Rodriguez

**95: *"Secure the Bag": Collaborations***

Poster Presentation

Undergraduate Student(s): Danita A. Austin  
Research Mentor(s): Darlene Xiomara Rodriguez

**96: *Building and Sustaining the Feminist Future: Planned Giving***

Poster Presentation

Undergraduate Student(s): Dartricia Rollins  
Research Mentor(s): Darlene Xiomara Rodriguez

**97: *Cultural Competency towards the Middle Eastern Population as Seen Through the Lens of Middle Easterners***

Poster Presentation

Undergraduate Student(s): Tania Jajeh  
Research Mentor(s): Mary Beth Maguire, Doreen Wagner, Rita Bailey

**98: *Reducing the Risk: Effects of Different Educational Interventions on College Students' Knowledge of HIV/AIDS***

Poster Presentation

Undergraduate Student(s): Adaeze Okere  
Research Mentor(s): Rachel Myers, Doreen Wagner

# Poster Session #2 Placement Assignment

## 3:00pm – 4:00pm

**1: *Mitigating the Effects of Class Imbalance Using SMOTE and Tomek Link Undersampling in SAS®***

Poster Presentation

Graduate Student(s): Jonathan Boardman, Kyle Biron

Research Mentor(s): Xuelei Ni

**2: *Analysis of novel heart defects in akirin mutants***

Poster Presentation

Undergraduate Student(s): Hayley Milner, Madison Hupp

Graduate Student(s): Austin Howard

Research Mentor(s): Scott J. Nowak

**3: *Improved Regional Sports Scheduling using SAS Optgraph***

Poster Presentation

Graduate Student(s): Andrew Henshaw

Research Mentor(s): Joe DeMaio

**4: *An Optimized Route for Q100's Bert and Kristin to Visit all Jersey Mike's Subs in Atlanta for Charity***

Poster Presentation

Graduate Student(s): Sanjoosh Akkineni, Andrew Henshaw, Jessica Rudd, Lauren Staples

Research Mentor(s): Joe DeMaio, Lin Li

**5: *A Comparison of Intrauterine Growth Chart's Classification of Infants Birth Weight in the NICU***

Poster Presentation

Undergraduate Student(s): Daniel Waskiewicz, Bryan Yockey, Amanda Mendoza

Graduate Student(s): Cooper Jannuzzo, Kyle Biron

Research Mentor(s): Louise Lawson, Nicole Ferguson

**6: *Investigating Predictors of Hypoglycemia***

Poster Presentation

Undergraduate Student(s): Thomas Holmes

Research Mentor(s): Louise Lawson, Nicole Ferguson

**7: *A Graph Theoretic Analysis of the Vector Space Model of Research Papers Similarity***

Poster Presentation

Graduate Student(s): Mohammad Masum

Research Mentor(s): Joe DeMaio

**8: *Social Network Analysis in Supreme Court Case Rulings by Precedence Using SAS Optgraph/Python***

Poster Presentation

Graduate Student(s): Symon Kimatei

Research Mentor(s): Joe DeMaio

**9: *Shh/Gremlin/Fgf regulatory network genes are expressed during both fin and urogenital development in paddlefish***

Poster Presentation

Undergraduate Student(s): Liz Osburn, Bonnie McKinnon

Research Mentor(s): Marcus Davis, Amanda Cass

**10: *Characterization of the Molecular Defects of 9p Deletion Syndrome using CRISPR Technology***

Poster Presentation

Undergraduate Student(s): Anna Gaede, Divine Forteh-Ngochi, Leilani Manera

Research Mentor(s): Xueya Hauge

**11: *Detection of Chitinase and  $\beta$ -1, 3 Glucanase Genes Against Aspergillus flavus in Transformed Peanuts***

Poster Presentation

Undergraduate Student(s): Rilwan Solarin, Glodi Bokanya, Roxie Lazo-Gonzalez

Research Mentor(s): Premila Achar

**12: *Effects of Essential Oils as Antifungal agents against Aspergillus flavus and Aspergillus parasiticus and detection of Aflatoxin B1***

Poster Presentation

Undergraduate Student(s): Yawa Zolome, Shideh Khorsandi

Research Mentor(s): Premila Achar

**13: *Real-Time Analysis of Cellular Trafficking of APE1 in Cancer Cells***

Poster Presentation

Undergraduate Student(s): Steven Ho

Research Mentor(s): Jonathan McMurry, Julia LeCher

**14: *Mitochondrial targeting of protein cargos exogenously delivered via a novel cell-penetrating peptide adaptor system***

Poster Presentation

Undergraduate Student(s): Hope Didier

Research Mentor(s): Jonathan McMurry, Julia LeCher

**15:**

**16:**

**17: *Designer Cell-Penetrating Peptides for the Treatment of Cervical Cancer***

Poster Presentation

Undergraduate Student(s): Juana C. Bejarano

Research Mentor(s): Jonathan L. McMurry, Julia C. LeCher

**18: *Kinetic Characterization of Cellular Entry, Trafficking and Cargo Release by a Novel TAT-Derived Cell-Penetrating Peptide***

Poster Presentation

Undergraduate Student(s): Hannah Moorman

Graduate Student(s): Robert L. Dickson

Research Mentor(s): Jonathan McMurry, Julia LeCher, Daniel Morris

**19: *Characterization of Candida auris a novel drug resistant fungal pathogen***

Poster Presentation

Undergraduate Student(s): Ruby Rizvi, Carlye Lapham

Graduate Student(s): Ryan Parker

Research Mentor(s): Christopher Cornelison, Kyle Gabriel

**20: *Evaluating Volatile Organic Compounds for Contact-Independent Antagonism of Pseudogymnoascus destructans***

Poster Presentation

Undergraduate Student(s): Ashley McDonald

Research Mentor(s): Christopher Cornelison, Kyle Gabriel

**21: *Leveraging Gene Disc® Real-Time PCR Technology for the Targeted Production of Unique Barrel-Aged Beer***

Poster Presentation

Undergraduate Student(s): Michael Monsees

Research Mentor(s): Chris Cornelison, Kyle Gabriel

**22: *New Developments in the Chemistry of polyNHCs: Synthesis and Coordination***

Poster Presentation

Undergraduate Student(s): Alexander Mason, Reagan Hooper

Graduate Student(s): Richard Justice

Research Mentor(s): Daniela Tapu

**23: *New Cerberus-type N-Heterocyclic Carbenes: Synthesis and Coordination***

Poster Presentation

Undergraduate Student(s): Reagan Hooper, Natalie Harris, John Malone

Graduate Student(s): Maleek Montgomery

Research Mentor(s): Daniela Tapu

**24: *Toward the Development of a New tris-NHC. Coordination to Coinage Metals***

Poster Presentation

Undergraduate Student(s): Shawn Allison, Andrew Duenas

Graduate Student(s): Maleek Montgomery

Research Mentor(s): Daniela Tapu

**25: *Synthesis of alpha-Alkynyl- and Aziridinyl-phosphonates from alpha-Phosphonovinyl Triflates***

Poster Presentation

Graduate Student(s): M. Tanner Dawson, David Kercher

Research Mentor(s): Christopher W. Alexander

**26: *Silicone Wristbands as a Passive Personal Detection Device and the Creation of Calibration Curves using SAS***

Poster Presentation

Undergraduate Student(s): Francisca L Small

Research Mentor(s): Christopher R. Dockery

**27: *Content of Diphenhydramine in Various Over-the-Counter Medications Using Ultraviolet/Visible Spectrometry***

Poster Presentation

Undergraduate Student(s): Dalton Boutwell, Brianna Nicole Woolery

Research Mentor(s): Huggins Z. Msimanga

**28:**

**29: *Specific Histidines Play A Role in pH Sensing***

Poster Presentation

Undergraduate Student(s): James Scott, Emily Onyekwere

Research Mentor(s): Susan Smith

**30: *Evaluation of Leadership Styles and Teachers' Self-Efficacy Among a Cohort of Chemistry and Physics Teachers***

Poster Presentation

Undergraduate Student(s): Sarah Ake, Jared Long

Research Mentor(s): Michelle L. Head

**31: *Design of Silicone Based Composite Materials Consisting of Zinc Oxide Nanorods and Gold Nanoparticles: Photocatalytic Activity***

Poster Presentation

Undergraduate Student(s): Kristi Moncja

Research Mentor(s): Bharat Baruah

**32: *Design of Graphene@Sand Composites for Water Purification***

Poster Presentation

Undergraduate Student(s): Connie Wei

Research Mentor(s): Bharat Baruah

**33: *Design of Binary Composite Materials Containing Nanostructured TiO<sub>2</sub> and Plasmonic Nanoparticles on Cotton Fabric: Photocatalytic Applications***

Poster Presentation

Undergraduate Student(s): Latanya S. Downer

Research Mentor(s): Bharat Baruah

**34: *Understanding Voltage-gated Sodium Channel Auxiliary Subunits via Bioinformatics***

Poster Presentation

Undergraduate Student(s): Nathaly Maia, Daisy McGrath, Nicholas Revelas

Research Mentor(s): Tsai-Tien Tseng

**35: *Design of CF@AgNPs Composite Materials by in-situ Synthesis of AgNPs on Cotton Fabric: SERS Detection***

Poster Presentation

Undergraduate Student(s): Michael Woods

Research Mentor(s): Bharat Baruah

**36: *Active Learning— The Key to Students' Academic Success Within Science and Mathematics Courses?***

Poster Presentation

Undergraduate Student(s): Cynney Walters

Research Mentor(s): Kadian M. Callahan, Scott A. Reese

**37: *A Data-Driven Framework for the Advancement of Disabled Persons***

Poster Presentation

Undergraduate Student(s): Mizzani Walker-Holmes

Research Mentor(s): Meng Han

**38: *A Mathematical Model for the Effect of Domestic Animals on the Basic Reproduction Number of Human African Trypanosomiasis (Sleeping Sickness)***

Poster Presentation

Undergraduate Student(s): Sagi Shaier

Research Mentor(s): Meghan Burke

**39: *Efficient Plant Arrangements***

Poster Presentation

Undergraduate Student(s): Winston Smith

Research Mentor(s): Jennifer Vandenbussche

**40: *Inquiry on the Accuracy of Grades on Representing Acquired Knowledge***

Poster Presentation

Undergraduate Student(s): Sourav Debnath

Research Mentor(s): Paola Spoletini

**41: *Animal Detection Using R-CNN***

Poster Presentation

Undergraduate Student(s): John Jajeh, Masood Abdul Salam

Research Mentor(s): Mignon Kang

**42: *Food for Thought***

Poster Presentation

Undergraduate Student(s): Mizzani Walker-Holmes

Research Mentor(s): Carl DiSalvo



**43: *A Design Study on Modular Transportation for Instructional Durston Mill***

Poster Presentation

Undergraduate Student(s): Alain J. Santos, Christopher Roper, Franklin Woods, Alexander Bryant

Research Mentor(s): Valmiki Sooklal

**44: *Wireless Geiger Counter Development and Verification of Radiation Principles***

Poster Presentation

Undergraduate Student(s): Scott Michael

Research Mentor(s): Eduardo B. Farfán

**45: *CFD Simulation of Pebble Bed Reactor for Various Gases***

Poster Presentation

Undergraduate Student(s): Daniel Bain, Julian Spangler, Andrew Jones

Research Mentor(s): Tien Yee, Eduardo Farfan, Justin Park

**46: *Investigation of Cell Damage in Porcine Heart Tissue Irradiated by a 808-nm Wavelength Laser Source***

Poster Presentation

Undergraduate Student(s): Daniela Rodriguez, Elaine Bradley, Jamey Ackley

Research Mentor(s): Valmiki Sooklal, Sathish Gurupatham

**47: *Compliant Translational Double Exact Dwell Mechanism***

Poster Presentation

Undergraduate Student(s): Hongkuan Lin

Research Mentor(s): Ayse Tekes

**48: *Take Home Control Laboratory Equipment Design***

Poster Presentation

Undergraduate Student(s): Jason Choo, Mitchell Bearden, Aaron Nauert

Research Mentor(s): Ayse Tekes

**49: *Learning While Flying – A Simulation Based Case Study***

Poster Presentation

Undergraduate Student(s): Alain J. Santos, Christopher Roper, Andrew Pirrello

Research Mentor(s): Adeel Khalid

**50: *[Re]Defining Chandigarh***

Poster Presentation

Undergraduate Student(s): Dhruvee Patel

Research Mentor(s): Ameen Farooq, Peter Pittman

**51: *Atlanta BeltLine: Ecological Utopia or Aestheticized Uneven Development?***

Poster Presentation

Undergraduate Student(s): Griffin Matthews

Research Mentor(s): Sarasij Majumder

**52: *Indus Civilization in High School World History Textbooks***

Poster Presentation

Undergraduate Student(s): Aubree Martin

Research Mentor(s): Teresa Raczek

**53: *A Spatial Analysis of Factors Influencing Beer Locations***

Poster Presentation

Undergraduate Student(s): Erick Owens

Research Mentor(s): Mark Patterson

**54:**

**55: *The Art and Production of Maya Eccentrics***

Poster Presentation

Undergraduate Student(s): Ellie Stanley

Research Mentor(s): Terry Powis

**56: *How Students Feel Their Academic Performance is Impacted by Their Housing Situation***

Poster Presentation

Undergraduate Student(s): Ryan Seedorf

Research Mentor(s): Brandon D. Lundy

**57: *Support for the Preservation of Cultural Heritage***

Poster Presentation

Undergraduate Student(s): Lydia Wood

Research Mentor(s): Brandon D. Lundy

**58: *Energy Consumption at Kennesaw State University and Potential Conservation Strategies***

Poster Presentation

Undergraduate Student(s): Rachel Langkau

Research Mentor(s): Brandon D. Lundy

**59: *To Be or Not to Be Effective: Negotiating NAGPRA Law in the Southeastern United States***

Poster Presentation

Undergraduate Student(s): Alexandra Beckett

Research Mentor(s): Brandon D. Lundy

**60: *Dungeons and Dragons: Social Needs met through Gaming?***

Poster Presentation

Undergraduate Student(s): Cassidy Steele

Research Mentor(s): Brandon D. Lundy

**61: *Historic Preservation in North Georgia: Effectiveness in Financial and Visitor Sustainability***

Poster Presentation

Undergraduate Student(s): Camille Coe

Research Mentor(s): Brandon D. Lundy

**62: *Effects of Violent Entertainment Imagery on U.S. Society***

Poster Presentation

Undergraduate Student(s): Kenya Cummings

Research Mentor(s): Brandon D. Lundy

**63: *Diversity in Video Games: The Personal Experience of Gamers***

Poster Presentation

Undergraduate Student(s): Rebecca Ruggles

Research Mentor(s): Brandon D. Lundy

**64: *Factors that Affect Veteran Employment and Reintegration***

Poster Presentation

Undergraduate Student(s): Jeff Roberts

Research Mentor(s): Brandon D. Lundy

**65: *Many Faiths, One Beginning: Universality in Norse, Maya, Greek and Celtic Faiths***

Poster Presentation

Undergraduate Student(s): Adam Cusick

Research Mentor(s): Terry Powis

**66: *Innovation of Design: Early Ceramic Vessel Traditions In The Southeast***

Poster Presentation

Undergraduate Student(s): Gary Owenby

Research Mentor(s): Terry Powis

**67: *"And the Point Is?" An Analysis of Intact Projectile Points from a Middle Woodland Period Site***

Poster Presentation

Undergraduate Student(s): Will Heflin

Research Mentor(s): Terry Powis

**68: *Geography of Birders: Spatial Connections Through the Lens of Birdwatching***

Poster Presentation

Undergraduate Student(s): Nicki Smith

Research Mentor(s): Ulrike Ingram

**69: *HopeWorks***

Poster Presentation

Undergraduate Student(s): Matthew Henning

Research Mentor(s): Ulrike Ingram

**70: *The Spatial Relationship between Water Quality and Roads/Traffic in Northern Georgia, USA***

Poster Presentation

Undergraduate Student(s): Emily Aust

Research Mentor(s): Jun Tu

**71: *Where We Get Our Information: Gender Representation in Archaeology Textbooks***

Poster Presentation

Undergraduate Student(s): Chelsea Smith

Research Mentor(s): Teresa P. Raczek

**72: *Discovering Ierapetra: Arthritis in Roman Crete***

Poster Presentation

Undergraduate Student(s): Alexandra Beckett

Research Mentor(s): Susan Kirkpatrick Smith

**73: *The Effect of Surface Runoff on the Water Quality of a Creek Located on the Campus of Kennesaw State University***

Poster Presentation

Undergraduate Student(s): Benjamin Nwadike, Ben Harner  
Research Mentor(s): Lisa Adams

**74: *Using Ion Competition to Evaluate the Collapse of Vermiculite Interlayers***

Poster Presentation

Undergraduate Student(s): Samantha Swartzendruber

Graduate Student(s): James Thornhill

Research Mentor(s): Daniel Ferreira

**75: *The Effect of Biased Media on Degree of Opinion Change Concerning Nuclear Energy as a Function of Education Level***

Poster Presentation

Undergraduate Student(s): Reed Walker

Research Mentor(s): Daniel Ferreira

**76: *Has Urbanization Had an Effect on the Spawning Season of *Campostoma oligolepis*, Largescale Stonerollers?***

Poster Presentation

Graduate Student(s): Kelly Linz

Research Mentor(s): William Ensign

**77: *War over Water. The Battle That Has Been Simmering for Decades.***

Poster Presentation

Graduate Student(s): Kelly Linz

Research Mentor(s): Nancy Pullen

**78: *Call It Love or Call It Reason: The Rhetoric of Phil Ochs***

Poster Presentation

Undergraduate Student(s): Annie Doragh

Research Mentor(s): Letizia Guglielmo

**79: *Tracing Misogyny in American Culture***

Poster Presentation

Undergraduate Student(s): Jeremy Hall, Brayden Milam

Research Mentor(s): Letizia Guglielmo

**80: *"Corn and Tomatoes" – An Edible History Project Examining Their Historical Role in Southern Foodways***

Poster Presentation

Graduate Student(s): Suzie McWhirter

Research Mentor(s): Tom Okie

**81: *Is it Stereotypical? The Language and Tone Presented by the Female Characters in "The Office"***

Poster Presentation

Undergraduate Student(s): Chinonye Nwachukwu

Research Mentor(s): Jeanne Bohannon

**82: *Silently Struggling in a New World: Exploring English Language Learners with Language Disabilities***

Poster Presentation

Undergraduate Student(s): Cindy Andrea Terrey

Research Mentor(s): Jeanne Bohannon

**83: *A Study on Social Media's Influence Upon the Evolution of Slang***

Poster Presentation

Undergraduate Student(s): Mary Kate Sturgeon

Research Mentor(s): Jeanne Bohannon

**84: *Dialectal Differences in Literature***

Poster Presentation

Undergraduate Student(s): Katarina Kocsisova

Research Mentor(s): Jeanne Bohannon

**85: *First-Year Student Comprehension of Graphic Textbooks***

Poster Presentation

Undergraduate Student(s): Matthew Tikhonovsky

Research Mentor(s): Amy Buddie

**86: *"Girls Are Such a Drag": A Sociolinguistic Analysis of Misogynistic Lyrics in Pop Punk Music***

Poster Presentation

Undergraduate Student(s): Ash Scarborough

Research Mentor(s): Jeanne Bohannon

**87: *To Believe or Not to Believe? A Linguistic Analysis of Twitter Users' Responses to Sexual Assault Allegations Against Prominent Male Figures***

Poster Presentation

Undergraduate Student(s): Madison Bodenhamer

Research Mentor(s): Jeanne Bohannon

**88: *What's Not to "Like"? University Police Departments' Facebook Outreach***

Poster Presentation

Undergraduate Student(s): Brittany Brewer, Landon Carver, Kathryn Deaton, Tequila Jackson, Kelly Neal, Aimee Ouellet, Leah Reilly, Danielle Teemer

Research Mentor(s): Beverly Crank, Heidi Scherer

**89: *Eliminating Drug Use: A Comparative Analysis of the Efficacy of Substance Abuse Intervention Programs***

Poster Presentation

Undergraduate Student(s): Karen Perdue, Debria Duggens, Kendell Kievit, Lindsay Sears

Research Mentor(s): Evelina Sterling

**90: *Cyberbullying Victimization and Psychological State***

Poster Presentation

Graduate Student(s): Mark Walker

Research Mentor(s): Gang Lee

**91: *Criminal Activity in America's Sanctuary Cities***

Poster Presentation

Undergraduate Student(s): Alyssa Ross

Research Mentor(s): April Johnson

**92: *Uncovering the Truth Behind Chemical Weapons in the Syrian War***

Poster Presentation

Undergraduate Student(s): Brandon Christopher Vines

Research Mentor(s): (not submitted)

**93: *Comparison of Predicted and Measured Resting Metabolic Rate Methods Among CrossFit-Trained Athletes***

Poster Presentation

Undergraduate Student(s): Aylisis Rodriguez, Isabel Fabacher, Kathryn Brown

Graduate Student(s): Alyssa J. Holmes

Research Mentor(s): Yuri Feito, Trisha VanDusseldorp, Gerald Mangine, Tiffany Esmat

**94: *Mid-Thigh Pull Force-Time Characteristics in Elite and Recreational High-Intensity Functional Training (HIFT) Athletes***

Poster Presentation

Undergraduate Student(s): Christian Almeda

Research Mentor(s): Gerald Mangine, Yuri Feito, Trisha VanDusseldorp, Tiffany Esmat

**95: *The Impact of Communitas and Liminality on Team Identification: What Should a New College Football Team's Game Include to Attract More Students?***

Poster Presentation

Graduate Student(s): Davetta Lackey

Research Mentor(s): Kyu-Soo Chung

**96: *National Football League's Protests and its Effects on NFL Viewers***

Poster Presentation

Undergraduate Student(s): Jacqueline Kisthardt

Research Mentor(s): Kyu-Soo Chung

**97: *Relationships Between Sprint Acceleration and Broad Jump Kinetics in NFL Draft Prospects***

Poster Presentation

Undergraduate Student(s): Jacob McNabb

Research Mentor(s): Gerald Mangine, Yuri Feito, Trisha VanDusseldorp

**98:**

**99: *Age Does Not Attenuate Maximal Strength and Acceleration Adaptations To Unilateral Resistance Training***

Poster Presentation

Undergraduate Student(s): Alyssa Bailly, Blakely Epperson

Graduate Student(s): Alex Olmos

Research Mentor(s): Garrett Hester

**100: *Perceptions of Phubbing: A Comparison of Self, Friends, and Romantic Partners***

Poster Presentation

Undergraduate Student(s): Sarai Bauguess, Robbie Cronin



Research Mentor(s): Amy Buddie

# Oral Presentation Schedule

## Oral Session 1 (9:30am – 10:45am)

### Bagwell Education Building 219

9:30am – 9:45am

*Feminist Bookstores and Gender and Women's Studies Activism*

Oral Presentation

Undergraduate Student(s): Dartricia Rollins

Research Mentor(s): Letizia Guglielmo

9:50am – 10:05am

*Misogyny in American Culture: A Case Study on Radio and Journalism*

Oral Presentation

Undergraduate Student(s): Jordan Hawthorn, Laine Magaletta, Andrea Putala

Research Mentor(s): Letizia Guglielmo

10:10am – 10:25am

*Microaggressions of Gender Towards Women in the Gaming Community*

Oral Presentation

Undergraduate Student(s): Girard Young Jr

Research Mentor(s): Jeanne Law Bohannon

10:30am – 10:45am

*Potential for Change: The Power of Instagram as Space for Rhetorical Discourse on Disability*

Oral Presentation

Undergraduate Student(s): Jade Rivers

Research Mentor(s): Letizia Guglielmo

**Oral Session 1 (9:30am – 10:45am)**

**Bagwell Education Building 221**

9:30am – 9:45am

*Effects of Short-Term Resistance Training on Maximal and Rapid Torque Characteristics in Older Males*

Oral Presentation

Graduate Student(s): Alex Olmos

Research Mentor(s): Garrett Hester

9:50am – 10:05am

*Assessing Gender Differences in Sexual Trafficking Attitudes and Myth Acceptance*

Oral Presentation

Undergraduate Student(s): Elizabeth Perry, Jonathan McFarland, Mandy Losito, Meghean Teefy, Alexandria Goldstein

Research Mentor(s): Dorothy F. Marsil, Corinne McNamara

10:10am – 10:25am

*Individuals with Higher Education Levels Increase Voter Turnout Rates*

Oral Presentation

Undergraduate Student(s): Lauren Wilhite

Research Mentor(s): April Johnson

10:30am – 10:45am

*Public's Perception of Legitimacy Regarding the US Supreme Court*

Oral Presentation

Undergraduate Student(s): Justin Kelley

Research Mentor(s): April Johnson

## **Oral Session 1 (9:30am – 10:45am)**

### **Bagwell Education Building 222**

9:30am – 9:45am

*Flight and Jump Muscles Respond Differently to Experimental Cachexia and Impaired Insulin Signaling*

Oral Presentation

Graduate Student(s): Matthew Giedd

Research Mentor(s): Anton Bryantsev

9:50am – 10:05am

*Confirming the Functional Roles of the Ortholog Genes *ahpB* of *Aeromonas hydrophila* and *hap* of *Aeromonas salmonicida**

Oral Presentation

Undergraduate Student(s): Rahiq Rahman

Research Mentor(s): Donald McGarey

10:10am – 10:25am

*Identification of a novel *C. elegans* CAMSAP/patronin allele via RNAseq*

Oral Presentation

Undergraduate Student(s): Wendy Verola

Graduate Student(s): Wendy Aquino Nunez

Research Mentor(s): Martin Hudson

10:30am – 10:45am

*Next Generation Supersonic Candidate Engine and Aircraft Design*

Oral Presentation

Undergraduate Student(s): Alain J. Santos, Christopher Roper, Jordan Fraser

Research Mentor(s): Adeel Khalid

10:45am – 11:00am

*Cell Quantification Using Microfluidics*

Oral Presentation

Undergraduate Student(s): Michael Nolan, Nicholas Foster, Danyal Haider, Fang-Chen Lin, Joseph Lee

Graduate Student(s): Achevi Kuri

Research Mentor(s): Hoseon Lee

## **Oral Session 1 (9:30am – 10:45am)**

### **Bagwell Education Building 327**

9:30am – 9:45am

***Dialect of The Coen Brothers***

Oral Presentation

Undergraduate Student(s): John Samuel Mecum

Research Mentor(s): Jeanne Bohannon

9:45am – 10:00am

***Hard and Brittle: Subversive and Subjective Language in The Glass Menagerie***

Oral Presentation

Undergraduate Student(s): Jennifer Frykman

Research Mentor(s): Jeanne Bohannon

10:00am – 10:15am

***The Semantics Behind Saltwater Geechee***

Oral Presentation

Undergraduate Student(s): Sophia Dammann

Research Mentor(s): Jeanne Bohannon

10:15am – 10:30am

***Epiphanius's Condemnation of the Nazarenes: When Orthodox Christian Theology is Threatened by Jewish Practice***

Oral Presentation

Undergraduate Student(s): Erik Mattson

Research Mentor(s): Brian Swain

10:30am – 10:45am

***Christian "Atheism": A New Perspective in Light of Second Temple Judaism***

Oral Presentation

Undergraduate Student(s): Jonathan Mann

Research Mentor(s): Brian Swain

**Oral Session 1 (9:30am – 10:45am): College of the Arts  
Wilson Building 114**

9:30am – 9:45am

***Unfinished Women***

Performance

Undergraduate Student(s): Rachel Rabeneck

Research Mentor(s): Laurence Sherr

9:50am – 10:05am

***The Development of the Saxophone***

Oral Presentation

Undergraduate Student(s): Jonathan Steltzer, Matthew Hodgetts

Research Mentor(s): Edward Eanes

10:10am – 10:25am

***The Wagner Tuba***

Oral Presentation

Undergraduate Student(s): William Hancock, Hayden McAfee

Research Mentor(s): Edward Eanes

10:30am – 10:45am

***Do You Speak Twin?***

Oral Presentation

Undergraduate Student(s): Coty Peltonen

Research Mentor(s): Jeanne Bohannon

## **Oral Session 2 (11:00am – 12:15pm)**

### **Bagwell Education Building 219**

11:00am – 11:15am

#### ***The Process of Developmental Editing***

Oral Presentation

Undergraduate Student(s): Courtney Bradford

Research Mentor(s): Lara Smith-Sitton

11:20am – 11:35am

#### ***Why Students Should Story Themselves: The Benefits of Autoethnographic Writing***

Oral Presentation

Undergraduate Student(s): Stephen Oweida

Research Mentor(s): Lara Smith-Sitton

11:40am – 11:55am

#### ***Imprimatur: A Poetry Reading***

Oral Presentation

Graduate Student(s): Valerie Smith

Research Mentor(s): Tony Grooms, Ralph Wilson, JoAnn LoVerde-Dropp

12:00pm – 12:15pm

#### ***Write it Out: Reflective Writing in Writing Centers***

Oral Presentation

Graduate Student(s): Emily Deibler

Research Mentor(s): Lara Smith-Sitton

## **Oral Session 2 (11:00am – 12:15pm)**

### **Bagwell Education Building 221**

11:00am – 11:15am

*I'm a Real Girl! - Patriarchy and the Dehumanization of Fat Women in Theatre*

Oral Presentation

Undergraduate Student(s): Amy Reynolds

Research Mentor(s): Angela Farr Schiller

11:15am – 11:30am

*A Theatrical Perspective Inside of the U.S. Armed Force's Silent Voice Dealing with Military Homeless Veterans*

Oral Presentation

Undergraduate Student(s): Byron Clemons

Research Mentor(s): Angela Farr Schiller

11:30am – 11:45am

*The 1/8th Rule: An Exploration of Race, Sex, and Dion Boucicault's The Octoroon*

Oral Presentation

Undergraduate Student(s): Truman Griffin

Research Mentor(s): Angela Farr Schiller

11:45am – 12:00pm

*Formalist Analysis in Acting*

Oral Presentation

Undergraduate Student(s): Annaliese Bauer

Research Mentor(s): Margaret Baldwin Pendergrass



## **Oral Session 2 (11:00am – 12:15pm)**

### **Bagwell Education Building 222**

11:00am – 11:15am

*Defining “Healthy”: Changing Food Trends Over The Past 150 Years*

Oral Presentation

Undergraduate Student(s): Hannah Carter, Sarai Bauguess, Caitlin Streetman, Simon Gipson

Research Mentor(s): Evelina Sterling

11:15am – 11:30am

*College Students Who Are Parents: Opportunities and Barriers for Success*

Oral Presentation

Undergraduate Student(s): Tequila Porter

Research Mentor(s): Evelina Sterling

11:30am – 11:45am

*Factors Influencing Dog Adoptability*

Oral Presentation

Undergraduate Student(s): Sarai Bauguess

Research Mentor(s): Amy Buddie

11:45am – 12:00pm

*The Study Abroad Model in Public Health: Are We Doing More Harm than Good?*

Oral Presentation

Undergraduate Student(s): Christen Robinson

Research Mentor(s): Mari-Amanda Dyal

12:00pm – 12:15pm

*The Lived Experience of Afghan Women Refugees in Three Metropolitan Areas of the Southeastern US: A Phenomenological Study*

Oral Presentation

Graduate Student(s): Brenda Brown

Research Mentor(s): Mary de Chesnay

## **Oral Session 2 (11:00am – 12:15pm)**

### **Bagwell Education Building 204**

11:00am – 11:15am

*The Peace Corps and Youth Development: Returned Volunteers' Perceptions of Practice*

Oral Presentation

Graduate Student(s): Gianni Bisio

Research Mentor(s): Darina Lepadatu

11:15am – 11:30am

*Adaptability: The Role of Conflict Managers in Crises*

Oral Presentation

Graduate Student(s): Joshua Hill

Research Mentor(s): Darina Lepadatu

11:30am – 11:45am

*Black and Blue Lives Matter - Improving Relations by the Police and the African American Community by Addressing Perceptions*

Oral Presentation

Graduate Student(s): Brenda L. Cleaver

Research Mentor(s): Darina Lepadatu

11:45am – 12:00pm

*Using Biometric Tools to Understand the Relationship Between Individual Characteristics and Cognitive Abilities*

Oral Presentation

Graduate Student(s): Solome Mekbib

Research Mentor(s): Adriane B. Randolph, Kimberly Cortes

12:00pm – 12:15pm

*The Experience of Being Hungry*

Oral Presentation

Graduate Student(s): Almuth Merkel

Research Mentor(s): Darina Lepadatu

12:15pm – 12:30pm

*The Relationship Between Law and Dispute Resolution: Assessing the Level of Mediation Enculturation in the Legal Community*

Oral Presentation

Graduate Student(s): Vittorio Indovina

Research Mentor(s): Darina Lepadatu



## **Oral Session 2 (11:00am – 12:15pm)**

### **Bagwell Education Building 402**

11:00am – 11:15am

#### ***Live Gamma Ray Camera***

Oral Presentation

Undergraduate Student(s): Joshua Johnson, Michael Jerrell

Research Mentor(s): Eduardo Farfan

11:15am – 11:30am

#### ***PuO<sub>2</sub> and ThO<sub>2</sub> Thermal Conductivity Sensitivity to Various Defects***

Oral Presentation

Undergraduate Student(s): Alex Resnick

Research Mentor(s): Jungkyu Park, Eduardo Farfan

11:30am – 11:45am

#### ***Compliant Washplate Design for Model Helicopters***

Oral Presentation

Undergraduate Student(s): Niko Giannakakos, Alexander Bryant, Megan Masters

Research Mentor(s): Ayse Tekes, Adeel Khalid

11:45am – 12:00pm

#### ***Cyber Security of American Nuclear Facilities***

Oral Presentation

Undergraduate Student(s): Jake L. Massingill

Research Mentor(s): Eduardo Farfan, Jungkyu Park, Tien Mun Yee

12:00pm – 12:15pm

#### ***Adjustable Compliant Mechanism Load Deflection Test Bench Design***

Oral Presentation

Undergraduate Student(s): Franklin Woods, Alexander Bryant

Research Mentor(s): Ayse Tekes, Kevin McFall

### **Oral Session 3 (12:30pm – 1:45pm)**

#### **Bagwell Education Building 219**

12:30pm – 12:45pm

*The Modern American Woman's Performance of Gender*

Oral Presentation

Undergraduate Student(s): Rachel Novak

Research Mentor(s): Angela Farr Schiller

12:45pm – 1:00pm

*ACCEPTANCE: Training Peer Mentors Using Evidence Based Practices*

Graduate Student(s): Jasmine V. Ennis

Oral Presentation

Research Mentor(s): Kate Zimmer

1:00pm – 1:15pm

*Udea: Fairytales and Human Trafficking*

Performance

Undergraduate Student(s): Dylan Carter

Research Mentor(s): Angela Farr Schiller

1:15pm – 1:30pm

*The Misconceptions of Native Americans in Education's Past*

Oral Presentation

Undergraduate Student(s): Erin Tinnell

Research Mentor(s): Sohyun An

1:30pm – 1:45pm

*The Octoroon: Homophobia in the Antebellum American South*

Oral Presentation

Undergraduate Student(s): Dylan Carter

Research Mentor(s): Angela Farr Schiller

### **Oral Session 3 (12:30pm – 1:45pm)**

#### **Bagwell Education Building 221**

12:30pm – 12:45pm

*Sociolinguistic Analysis of Asian American English*

Oral Presentation

Undergraduate Student(s): Jin Jo, Madison Palmer

Research Mentor(s): Jeanne Bohannon

12:50pm – 1:05pm

*Phil Elverum and American Transcendentalism*

Oral Presentation

Undergraduate Student(s): Emmanuel Castillo

Research Mentor(s): Jeanne Bohannon

1:10pm – 1:25pm

*From Social Media to KSU: The Language and Presence of the Far Right*

Oral Presentation

Undergraduate Student(s): Annie Doragh

Research Mentor(s): Jeanne Bohannon

1:30pm – 1:45pm

*Me, Myself, and They: The Use of Non-Binary Gender Language in Steven Universe*

Oral Presentation

Undergraduate Student(s): Samantha Rotunno

Research Mentor(s): Jeanne Bohannon

### **Oral Session 3 (12:30pm – 1:45pm)**

#### **Bagwell Education Building 222**

12:30pm – 12:45pm

*Characterizing SpNox Enzyme Chimeras*

Oral Presentation

Undergraduate Student(s): Brittany Notice, Emily Onyekwere

Research Mentor(s): Susan Smith

12:45pm – 1:00pm

*Determining the Cognitive Load of a Virtual Substrate Docking Activity in Biochemistry*

Oral Presentation

Graduate Student(s): Jenifer Calvert

Research Mentor(s): Kimberly Cortes, Adriane Randolph

1:00pm – 1:15pm

*Use of Biometric Techniques to Determine Differences in Exposure to Content when Reading and Processing Metabolic Pathways*

Oral Presentation

Graduate Student(s): Kimberly Kammerdiener

Research Mentor(s): Kimberly Cortes, Adriane Randolph

1:15pm – 1:30pm

*Linking Spatial Distributions of Injury on Seagrass Blades of *Thalassia Testudinum* to Sea Urchin *Lytechinus Variegatus* Grazing Patterns*

Oral Presentation

Graduate Student(s): Adrianna L. Parson

Research Mentor(s): Joseph M. Dirnberger

1:30pm – 1:45pm

*Acting Like A Woman: Patriarchy and the Performance of the Female Athlete*

Oral Presentation

Undergraduate Student(s): LaTauscha Carter

Research Mentor(s): Angela Farr Schiller

### **Oral Session 3 (12:30pm – 1:45pm)**

#### **Bagwell Education Building 204**

12:30pm – 12:45pm

*Reparations for Conflict Based Sexual and Gender Based Violence: Victims' Narratives from the DRC, the Rape Capital of the World*

Oral Presentation

Graduate Student(s): Brittany Foutz

Research Mentor(s): Darina Lepadatu

12:45pm – 1:00pm

*Negotiation and Conflict Resolution Strategies of Millennials in the Workplace*

Oral Presentation

Graduate Student(s): Cynthia P. LeMay

Research Mentor(s): Darina Lepadatu

1:00pm – 1:15pm

*Female Labor in the Arab Gulf: Towards a Feminist and Intersectional Understanding of Women's Empowerment in Oman*

Oral Presentation

Graduate Student(s): Hania Bekdash

Research Mentor(s): Darina Lepadatu

1:15pm – 1:30pm

*In What Ways and Under What Conditions are Internet and Communication Technologies (ICTs) Managing Election and Ethnic Violence in Kenya*

Oral Presentation

Graduate Student(s): Kevin A. McMahon

Research Mentor(s): Darina Lepadatu

1:30pm – 1:45pm

*The Space for Uncertainty: U.S. Mediators' Experience with Ambiguity and Self-Awareness During Mediation*

Oral Presentation

Graduate Student(s): Jessica Hill

Research Mentor(s): Darina Lepadatu



### **Oral Session 3 (12:30pm – 1:45pm)**

#### **Bagwell Education Building 402**

12:30pm – 12:45pm

*Simulation of Flow in a Pebble-Bed Reactor with a Staggered Pebble Arrangement*

Oral Presentation

Undergraduate Student(s): Julian Spangler, Daniel Bain

Research Mentor(s): Tien Yee, Eduardo Farfan, Justin Park

12:45pm – 1:00pm

*The Effects of Point Defects on Thermal Conductivity in ThO<sub>2</sub>, PuO<sub>2</sub>, and UO<sub>2</sub>*

Oral Presentation

Undergraduate Student(s): Katherine Mitchell

Research Mentor(s): Jungkyu Park, Eduardo Farfan, Tien Yee

1:00pm – 1:15pm

*Novel Vibratory Mechanism Designs for Vibrations and Controls Laboratories*

Oral Presentation

Undergraduate Student(s): Kevin Van Der Horn, Zach Marr, Chong Tian

Research Mentor(s): Ayse Tekes

1:15pm – 1:30pm

*Does CPP Delivered Catalase have Measurable Physiological Effects?*

Oral Presentation

Undergraduate Student(s): Beryl Khakina

Research Mentor(s): Susan Smith, Jonathan McMurry, Julia LeCher

1:30pm – 1:45pm

*Biocontrol of Foodborne Pathogen Salmonella Using Bacteriophage  $\Phi$ Ent*

Oral Presentation

Undergraduate Student(s): Andrew Marchant

Research Mentor(s): Jean Lu

# Acknowledgements

*The Office of Undergraduate Research and the Undergraduate Research Club extend deep appreciation to all those who have made the Symposium possible this year.*

## 2018 Symposium of Student Scholars Coordinators

- Dr. Amy Buddie, Director of the Office of Undergraduate Research
- Dr. Christopher Cornelison, Associate Director of the Office of Undergraduate Research

## Student Volunteers

- Anjie
- Adeyemo
- Chidinma
- Adiele
- Nneamaka
- Agu
- Fatma Aldihri
- Sarai
- Bauguess
- Sally Cho
- Zoe Crisp
- Delphine Diallo
- Emma Evans
- Kristina Gifford
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- Sujin Kang
- Sharon Kaur
- Jasmin Lopez
- Kelly Lutsch
- Adedamiola Ojo
- Viki Pancheva
- Pingd'Wende Hyacinthe Rouamba
- Tatiana Smithson
- Jay Strickland
- Troy Wu

## The Office of Research

- Dr. Donald McGarey, Interim Vice President for Research
- Jennifer Harb, Administrative Associate
- Kaeyln Ireland, SALT Scholar for the Office of Undergraduate Research

## Horace W. Sturgis Library

- Dr. David Evans, Dean and Assistant Vice President of Library Services
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- Ashley Hoffman, eLearning Librarian and Librarian Assistant Professor
- Carey Huddleston, Research & Instruction Librarian and Librarian Assistant Professor
- Sarah Kantor, Reference Services Coordinator and Librarian Assistant Professor

## The Graduate College

- Dr. Mike Dishman, Dean of the Graduate College
- Dr. Jeffrey Chastine, Interim Associate Dean of the Graduate College
- Nikki Palamiotis, Assistant Dean of the Graduate College
- David Baugher, Senior Assistant Dean of the Graduate College
- Sanjoosh Akkineni, President, Graduate Student Association

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