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ORAL PRESENTATIONS 9:15-9:35

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BSC 102W

**A Historical Look into the Chemistry Department at Agnes Scott College**

**Author: Kellina Price**

**Advisor: Professor T. Leon Venable**

Since the college was founded in 1889, chemistry has been a part of the curriculum and culture at Agnes Scott. Who was here at the beginning and how has the department changed over the last 128 years? The first faculty member with a PhD at Agnes Scott Institute was a chemist, and he was one of the leading voices in getting ASC its collegiate accreditation. The history has included a time of 30+ chemistry majors a year during WWII to a campus that shut down between graduation and orientation; the grass grew knee-high and few faculty were on campus while one of our own chemistry professors taught summer classes at Berkeley. From beloved instructors to a dean with a distinctive voice, this presentation will look back at some of the instrumental players in the history of ASC and the chemistry department.

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BSC 103W

**The Environmental Sustainability & Advocacy Theme House**

**Authors: Taelyn Reid, Jasmine Torres, Kai Flores-Wong, Hadley Lyon, Erika McDonnell, Ayanna Akobundo, Margaret Haisty, Olivia Bowman**

**Adviser: Professor Iris Levin**

The Environmental Sustainability & Advocacy Theme House, also known as the Green House, has a purpose to make environmental advocacy, self-sustainability, and collective accountability a driving force in the way we experience and interact with the world. Furthermore, we aim to empower members of the Agnes Scott community and beyond to be active and conscious global citizens by providing model resources and engaging in thought-provoking activities that are applicable to day-to-day life as a college student. Having hosted events concerning compost, landfills, and recycling, this semester we have received funding from the Green Fee Fund to set up a hydroponics project and revitalize the on-campus greenhouse. Having a small urban garden with a hydroponic element is an innovative project which, as a general approach, can grow and adapt as the climate warms further. Additionally, with this project being housed at Agnes Scott College, it is geographically convenient for the college's consumers and it will help cut down on the emissions caused by transporting produce to Evans. We have started out small, with a goal of growing lettuce, which is the most common plant to be grown hydroponically. This presentation will address our experiences in our theme house, and the potential impacts of our signature project on the Agnes Scott College community.

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BSC 112W

## **Bringing Up the Past: The Future of the National Archives**

**Authors: Xiabon Zhou, Sierra Beasley, Katie Curtin,  
Mariama Konneh**

**Adviser: Professor Amy Patterson**

First-year Anxiety Campus Education, or FACE, is a health communication campaign at Agnes Scott College to tackle anxiety on our campus. Previous research has shown that the determinants of anxiety for college students are in personal, interpersonal, organizational, societal levels, including socioeconomic status negative thinking, parental involvement, campus environment and resources... (Farrer et al, 2016, Shadach & Ganor-Miller, 2012, Straten et al, 2007) At Agnes Scott College, 104 students come to counseling for anxiety issues last year and 125 students this year, and first-year students are the highest utilizers of counseling for recent two years (CAPS, 2018). Based on the evidence regarding determinants of anxiety on U.S. college campuses and at Agnes Scott College specifically, and informed by Social Cognitive Theory, FACE is conducted with the assistance of Accessible Education, the Summit Advising Office, and Counseling and Psychiatric Services. FACE aims to increase knowledge about the differences between stress, normal anxiety, and anxiety disorders in order to increase students' ability to identify resources on campus, initiatives to take action when they feel anxiety or to share resources they know to students around them. During this campaign, a process evaluation was conducted through direct observations, short oral surveys, and interviews with the faculty in various resource centers to track dose delivered and implementation and to test dose received and fidelity. This presentation will present the campaign components, developing process, and results of process evaluation.

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BSC 209W-A

## **The Impact of United World Colleges (UWC) on Mental Health, Social Life, and Professional/Academic Trajectory**

**Author: Erika McDonnell**

**Adviser: Professor Janelle Peifer**

The United World Colleges (UWC) is an educational movement involving 17 international schools worldwide to nurture the world's next change-makers (UWC, n.d.). Tsumagari's (2010) autoethnography highlights the profound impact UWC has on students through intense social relationships and a culture of academic excellence. This study investigated the impacts of UWC on recent graduates regarding their mental health, social life, and professional/academic trajectory, hypothesizing that graduate would experience a low quality of mental health, social

isolation, and an uncommitted professional/academic trajectory. Participants surveyed were graduates from UWC in the last three years. Preliminary analyses showed that graduates scored high on self-efficacy relative to the international average and overwhelmingly valued the friendships formed at UWC. Using linear regressions, valuation of UWC friendships was a significant predictor of social support and self-efficacy. Satisfaction with UWC academics was significant predictor of attending university following graduation. Furthermore, whether or not UWC graduates were currently attending university significantly predicted overall self-reported satisfaction with current professional/academic situation. The findings will expand knowledge on the efficacy and success of United World Colleges to inform its various stakeholders, and what is needed to support the future growth of these schools.

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BSC 210E

## **Does incubation behavior influence nestling telomere length? An egg cross-foster experiment in barn swallows**

**Authors:** Jazz Stephens, Vaughn Wicker, Alina Ibrahim

**Adviser:** Professor Iris Levin

Nuclear energy and nuclear science have been growing fields within physics. The presentation will review the energy efficiency of nuclear energy compared to other forms of energy production. Currently, nuclear energy production is accomplished by nuclear fission. The presentation will compare the energy efficiency of fusion and fission and compare their environmental impact. It is theoretically possible to produce energy from nuclear fusion, but a nuclear fusion energy reactor is not yet physically possible. Current research centers on developing containment strategies, which could make nuclear fusion a realistic form of nuclear energy production. This presentation focuses on understanding these containment strategies, particularly magnetic containment. The presentation will discuss where the research for nuclear fusion currently is, especially with regards to containment, and where it's heading. Computational techniques and programming software are used to investigate energy efficiency and model nuclear reaction chains.

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BSC 304E

## **Crystal Eastman: The Last Ten Years**

**Author:** Grayce Jones

**Adviser:** Professor Katharine Kennedy

This presentation concerns the final decade of American socialist and feminist Crystal Eastman's career spanning from 1917 until her death in 1927. Though today Eastman is almost exclusively known for her activism during the pacifist and suffrage movements of the 1910s, over the last ten years of her life she sustained her tireless pursuit of equality for women and the working class as a journalist, contributing to various progressive publications throughout this time. This essay (presentation) examines the continued development of Eastman's social and political ideology as revealed by articles written for *The Liberator* and *Equal Rights* in which she covered topics from the criminalization of

American Socialists to the Equal Rights Amendment and the rights of married women. Eastman's writing reveals her attempt to negotiate her socialist and feminist values and enact radical change from within movements facing stagnation and internal division. This presentation also considers Eastman's legacy, questioning her erasure from both feminist and socialist historical narratives. Her radical perspective often put Eastman at odds with party leadership. Unlike most Socialists, Eastman did not believe gender oppression could be dismantled through class revolution alone. Meanwhile, contemporary feminists were predominantly members of the (upper class) and prioritized advocating for the Equal Rights Amendment over addressing women's economic inequality directly. Despite facing opposition from conservative and liberal activists alike, Crystal Eastman maintained an uncompromising vision of a future in which justice, equality, and peace were a reality.

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## ORAL PRESENTATIONS 9:40-10:00

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BSC 102W

### Revising the Structure of the First Frog Fluorophore

Author: Gabreilla Chebli

Adviser: M. Thomas Morgan

The first known example of fluorescence in amphibians was published in March, 2017 for the frog species *Hypsiboas punctatus*. The compounds responsible for the fluorescence, named hyloins, were isolated and structurally characterized by researchers in Argentina and Brazil. The published molecular structure, however, does not readily account for the observed fluorescence properties. We identified an alternative arrangement of atoms that could also account for the published data and synthesized two truncated analogs corresponding to both possible structures for the fluorescent core of the hyloin molecule. We analyzed the analogs via NMR, UV-vis, fluorescence spectroscopy, and X-ray crystallography to determine which was more consistent with the substance actually isolated from *H. punctatus* frogs. These results proved that our alternative structure is correct. This unconventional structure, which has a charge separation that allows for aromaticity, may be a useful platform for development of synthetic fluorophores. Additionally, there was no hypothesis for the biosynthetic pathway of the hyloins in the original publication. However, our revision suggests that these molecules may be biosynthesized through the catecholamine pathway. Our determination of the correct structure may aid in identification of other fluorescent biomolecules.

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BSC 103W

### Food For Thought Theme House

Authors: Sylvia Marshall, Courtney Godwin, Abigail Brueker,  
Alaina Bandanza, Jessa Rhea, Sophia Elize, Clarke Henderson,

Adviser: Professor Catherine Scott

## **Sigal Khan**

This presentation will examine our work in expanding on what we learned in our SUMMIT Global 101 sections about food as a global issue and explain how we constructed a living-learning community in which food serves as a catalyst for conversation and reflection. House members shared an affinity for culinary pursuits and come from a wide variety of geographic, socioeconomic, ethnic, and religious/spiritual backgrounds. Members of the house shared their knowledge of kosher, vegan, sustainable/fair trade, and vegetarian meals as well as cultural dishes. We created an environment in which meals are a time for discussion and cultural awareness. The Food for Thought House worked to enrich campus community life by hosting events each month to boost awareness of cultural and global issues surrounding food. In addition, our goal was to promote a safe atmosphere to explore each other's cultural identities through food. We strive to create a positive conversation surrounding the issue of food through our varied spheres of influence on campus.

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BSC 112W

## **Reducing Agnes Scott's Carbon Emissions through Behavioral Change Intervention**

**Authors: Hannah Martin, Sonia Patel, Jordan Kessler, Callicot Pierce**

**Adviser: Professor Amy Patterson**

According to information provided by the Center for Sustainability, Agnes Scott's electricity use accounts for approximately 65% of our carbon emissions. Survey data collected from the general population suggest that there is a knowledge gap between being concerned about climate change and knowing how to change behavior accordingly. Additionally, results from the same study indicate that those who are concerned about the environment do not believe that their behavioral change will make a meaningful impact on reducing carbon emissions (Semanza et al. 2008). The objective of our campaign was to help close the knowledge gap and change attitudes about the individual's impact on climate change in addition to raising concern for climate change for those in earlier stages of behavioral change. As such, we conducted a social media campaign on snapchat and instagram culminating with a planting day on April 18 where students can pledge to reduce carbon emissions and plant a succulent for their dorm. The social media campaign is meant to appeal specifically to students on platforms that they often view and interact on. The pledge to be more sustainable is an act of commitment, which has been shown to encourage behavioral change, especially when made in public and paired with an incentive (Lockhorst et al. 2013). The success of the campaign was gauged by whether students were able to remember information presented in messages, student engagement in social media posts, and student participation.

BSC 209W-A

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## Influence of Anti-Bayesian Integration on Color and Cold-Pain Tolerance

Authors: Mengayo Li, Anna Tan

Adviser: Professor Barbara J. Blatchley

It is common knowledge that cooler colors, such as blue, indicate cooler temperatures; whilst warmer colors, such as red, indicate warmer temperatures. Prior literature in this area, particularly a study done by Ho, Iwai, Yoshikawa, Watanabe, and Nishida (2014), found results that suggest otherwise. The participants in Ho et al.'s study rated red objects as slightly cooler than blue objects—a finding that contradicts common belief. Ho et al. speculate that these results support Anti-Bayesian integration, which conjectures the *contrast* between visual and tactile expectations as it relates to perceptions of an object. More specifically, participants already had expectations for the temperatures of blue and red objects due to common belief, and because of these expectations, rated red objects as cooler than expected. This pilot study builds upon Ho et al.'s findings. In particular, we intend to examine the relationship between color (visual) and cold-pain tolerance (tactile). We hypothesize that, with respect to Anti-Bayesian integration, bluish colors will result in lower cold-pain tolerance, while reddish colors will result in higher cold-pain tolerance. The study will additionally utilize self-report measures for depression to examine the complex relationship between depression and pain tolerance and contribute to the current literature by specifically focusing on cold-pain tolerance.

BSC 210E

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## Characterizing and comparing plant-associated bacteria on two host plants

Author: Mahal Bugay

Adviser: Professor John Pilger

There is a limited understanding of host microbial community acquisition and how certain factors, such as diet, can impact community structures that can play a role in disease resistance. In insects, the gut microbiome, or bacteria and their associated genomes, is less diversified than in mammalian hosts. A less diversified gut makes insects more tractable model systems to study microbiome dynamics and the diet's impact on the gut bacterial community in the form of resistance to parasitic infection. Monarch butterflies (*Danaus plexippus*) are an appealing model system to study bacterial microbiome dynamics because of their relatively simple gut microbiome, larval consumption of milkweed plants with medicinal properties, and naturally occurring protozoan parasites. I have previously cultured and sequenced bacteria isolated from medicinal and non-medicinal milkweed plants. To determine if the monarch butterfly gut microbiome is plant-driven or is driven by its resident microbiota, I have cultured and sequenced bacteria from the medicinal and non-medicinal milkweed plants. I will use these isolated bacteria to determine if they play a role in reducing parasite growth and infection in caterpillars. The isolated bacteria from the medicinal milkweed will be fed to infected caterpillars, whose parasitic spore load and adult lifespan will be measured. Our results will provide insights about the colonization of supplemented environmental microbes in the monarch-milkweed system.

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BSC 304E

## **The Anonymity of the Woman: The Role of Gender and Female Spies During the American Revolution**

**Author: Cameron Mitchell**

**Adviser: Professor Mary Cain**

This paper examines the way patriot women during the American Revolution used society's expectations of their gender to act as spies for Washington's army. The study looks at three famous female spies (Anna Strong, Lydia Darragh, and Agent 355), their spying tactics, and their tactics' connections to the ideas surrounding female gender identity at the time. Due to the nature of secrecy in spying, primary sources for this topic are difficult to find; as a result, most of the resources used in this study were secondary sources, including books and articles on female gender identity in early America as well as biographies on the three main women of the study. Books on spy methods and spying operations of the American Revolution were also used for a better understanding of the way spying operations worked. Many studies of the American Revolution look at the battlefield fighting or the women's contribution to the war through traditional female roles. Those that do touch on spying usually focus on the men, such as the participants in the Culper Spy Ring. Not many scholars or readers remember the heroes behind the scenes, the women who worked right under the noses of the English to get vital information to Washington and his army.

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BSC 308

## **Modeling Attenuation of Solar Energy Through a Tree**

**Author: Aysha Rahman**

**Adviser: Professor Amy Lovell**

Solar panels in urban areas or in home and business settings are often surrounded by trees so that sunlight is blocked at certain angles during the day. This greatly reduces the output energy of the solar panels. To assess the attenuation of light through a dormant tree, Monte Carlo simulations of a randomly branching tree are run. Tree branching is simulated under the following assumptions: that the tree branches in ten iterations, that it branches into two each time, that each new branch is a fraction of the length of the previous one, that the total thickness or volume of all branches in an iteration is equal to the thickness of the trunk, and that the angle of branching is no more than 90 degrees. After simulating the structure of the tree, a path of sunlight is integrated through the tree's branches to determine the fraction of light blocked for a given range of angles.

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ORAL PRESENTATIONS 10:05-10:25

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BSC 102W

### Developing a Universal Fluorescent pH Indicator

Author: Grace Ferguson

Adviser: Professor M. Thomas Morgan

Universal pH indicator and test strips are widely used for qualitative monitoring of pH in a laboratory setting. Compared to a standard pH indicator, a fluorescent pH indicator would be more useful for determining the pH of dilute solutions due to its high sensitivity. We have developed a multiphasic fluorescent dye that appears orange, green, or colorless depending on the number of protons attached to the molecule. The indicator can be synthesized in two steps with inexpensive starting materials. When combined with the blue fluorescent dye 4-methylumbelliferone and excited at 395 nm, the fluorescent shifts from orange to green to blue as the pH increases from 3 to 11. Given the low cost of starting materials and ease of synthesis, we hope to develop the experiment into a lab activity for organic chemistry students.

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BSC 103W

### Sexual Violence on College Campuses

Authors: Madelyn Kent, Ayanna Akobundu, Esha Clements,  
Lara Moran

Adviser: Daisy Bourassa

Sexual violence on college campuses in the United States is a longstanding societal issue that has increasingly reached the public eye in recent years. RespectCon, an annual national conference held at Emory University, is designed to create a space for colleagues, professionals and students to connect in the movement to end violence. Themed: "*Understanding sexual violence through a social justice lens*", the spring 2018 conference presented new programs, showcased student activism, and explored anti-violence work. Many of the panels featured representatives from around the country introducing lessons from their campuses, including: techniques to improve programming, tools for better communication, and innovative approaches to incorporating justice and intersectionality into the work. Five Scotties with a passion to learn more and make a difference to end violence attended this two day conference. With the hope to raise awareness around the intense reality of sexual assault that exists in our society, these students would like to share what they have learned with the Agnes Scott community.

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BSC 112W

## **HIV/STI Testing Communication Campaign on the Agnes Scott College Campus**

**Authors:** Samiha Ross, Hope Ramsey-Curtis, Bethel Wondwossen,  
Jesseca Venters, Andrea Martinez

**Adviser:** Professor Amy Patterson

STI/HIV testing numbers are still low on the Agnes Scott campus amongst students due to perceived judgment, stigma, low self-efficacy or lack of awareness of resources. The goal of our campaign is to increase testing in the Wellness Center amongst students. Karen Barth found that 61% of women have negative perceptions of testing and were less likely to get tested unless they exhibited symptoms. By providing a positive experience, we will increase and emphasize the importance of testing. Our intervention is based on the Transtheoretical Model; which focuses on individual motivation and readiness to change problematic behaviors through a process of five stages: precontemplation, contemplation, preparation, action, and maintenance. The model can help change behavior around HIV/STI testing because it values behavior change as a process. The flexibility of the model allows for the unpredictability of human behavior when it comes to testing. When the Wellness Center conducted their own "Get Yourself Tested Day" 32 students were tested. From the dates 08/01/17-02/01/18 46 students received gonorrhea, and chlamydia testing and 17 were tested for HIV. When they collaborated with AID Atlanta (11/28/17), 18 tests were performed. By working with the Wellness Center we hope to increase these number of students who get tested for HIV/STI, using a buddy system will reduce anxiety furthermore we will increase flyers across campus and use the camaraderie of the buddy system to determine if they have an impact on increased testing at the Wellness Center.

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BSC 209W-A

## **The Effect of Priming on Sour Taste Perception**

**Authors:** Sidney Marie Joines, Taylor Hayes

**Adviser:** Professor Barbara J. Blatchley

At the mention of sour foods, one's mouth might begin to salivate automatically. The anticipation of knowing the taste of something before it reaches the taste buds may have an affect on an individual's perception of that taste. We hypothesize that priming an individual with both a verbal description of a sour candy and a visual cue of its wrapping will increase their perception of its sourness. We intend to have 4 experimental groups: control 1 (C1), experimental 1 (E1), control 2 (C2), and experimental 2 (E2). In each control group, the participants will not receive any priming information; C1 will be administered a sour hard candy, and C2 will receive a sweet hard candy. Each experimental condition group will receive exactly the same sour-priming; afterwards, E1 will be administered a sour hard candy, and E2 will be

administered a sweet hard candy. After administration in all 4 groups, participants will rate their taste perception from 1 to 10 via 4 aspects of taste: sweetness, sourness, bitterness, and saltiness. This experiment seeks to understand the relationship between priming and taste perception with regards to sour tastes both congruent and incongruent with priming. We predict that the E1 group will have the highest reported perception of sourness due to its preceding pairing with visual and verbal cues of sour taste.

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BSC 210E

## Coloring the Galactic Center to Observe Activity

Author: Allison Hunter

Adviser: Professor Amy Lovell

A color analysis of the galactic plane will be performed to show our relative location within the galaxy using 0.7m SARA-S telescope (Cerro Tololo, Chile) or 0.9m SARA-N telescope (Kitt Peak, Arizona, USA). Those telescopes will be used to collect the data in R, B, and V filters and the images will be processed and mosaiced in MaximDL. Red, blue, and green colors will be assigned to the filtered images to simulate natural color for analysis. The galactic center will show a bright red from the old material located there, while the edges of the galactic plane will be of a blue hue.

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BSC 304E

## The Enlightened Pirate

Author: Zoe Katz

Adviser: Yael Manes

*The Enlightened Pirate* is a digital research project conducted in History 309: The Enlightenment in Europe. *The Enlightened Pirate* examines the Golden Age of Piracy (1700-1750) as an actualization of Enlightenment ideals. My research examines primary sources such as accounts, Captain's accords, and historical texts as evidentiary support to the claim that men and women of the 16th century became pirates as an expression of enlightenment ideals. Supplemented by secondary sources such as *Villains of All Nations: Atlantic Pirates in the Golden Age* by Marcus Rediker, *The Enlightened Pirate* crafts a thorough argument that combines the excitement of the Golden Age of Piracy with the revolutionary ideals of the great Enlightenment thinkers such as Kant, Rousseau, and Locke.

**The role of anti-psychotic medications on N2A cells with knock-down of the schizophrenia susceptibility factor, dysbindin**

**Authors: Anner Harris, Crystal Burgess, Karina Leung, Susan Cordero**

**Adviser: Professor Jennifer Larimore**

Schizophrenia is a neurodevelopmental disorder characterized by hallucinations, paranoia, reduced motivation and alterations in learning and memory. Individuals with schizophrenia have reduced levels of dystrobrevin-binding protein 1, or dysbindin, in the prefrontal cortex and hippocampus. Dysbindin is a subunit of the BLOC-1 complex that regulates endosomal trafficking of key membrane proteins and receptors, such as the D2 dopamine receptor. Reduction of dysbindin has been implicated in abnormal neuronal morphology and synaptic functioning. In this study, standard antipsychotic medications used in the treatment of schizophrenia were tested on a mouse neuroblastoma cell line with reduced dysbindin protein levels to determine their impact on neurite outgrowth and morphology. This data will help us better understand how antipsychotic medications impact neuronal morphology in patients with schizophrenia.

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**10:30-11:15**

**WELCOME FROM PRESIDENT ELIZABETH KISS  
POSTERS, EXHIBITS AND REFRESHMENTS  
WOOLFORD B. BAKER ATRIUM, BULLOCK SCIENCE CENTER**

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ORAL PRESENTATIONS 11:20-11:40

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BSC 102W

### **The Languages of Martinique**

**Authors:** TiaSamone Haygood, Autumn Philpot, Kyra Allen, Zoie Moore,  
Thao Duong

**Adviser:** Professor Philip Ojo

Based on research conducted before, during, and after our *Journey's* trip to Martinique, this presentation is intended to inform about the language situation in the French Caribbean island. Although French is the official language of Martinique, Creole plays a major role in the culture and communication of Martinicans. We will examine the history of languages in Martinique, the influence of French colonization on the language situation, as well as the role of artistic, literary, and cultural movements such as *Négritude* and *Créolité*, which promoted the multi-cultural identities of Martinique. The presentation will then focus on the birth of Martinican (Antillean) Creole as an offspring of the coexistence of diverse peoples, cultures, languages, processes, and systems, which fall within the framework of globalization.

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BSC 103W

### **A Closer Look at the Milestones of Becoming an Experienced Tutor**

**Author:** Theresa Melo, Abigail Breuker, Estephania Hernandez,  
Michelle McGuire, Shriya Bhattacharya

**Adviser:** Professor Christine Cozzens

The Center for Writing and Speaking (CWS) at Agnes Scott College is known for its impact on student growth since it consists of a diverse group of tutors who work with students at every stage in the writing and speaking process. While the CWS encourages individuality in its tutoring approach, we are also interested in learning what characteristics align a unique group. In gathering input on transitional phases during a tutor's career, we will outline significant developments that new tutors can look forward to and experienced tutors can reflect on. We will be using the CliftonStrengths assessment from GALLUP as well as interviews to gain overall insight about the transition from beginner to intermediate level tutor, and intermediate to experienced tutor in order to address how the center can further develop or begin to facilitate such transitions. These methods will help us better understand the two transitions by providing what individual qualities and what experiences have best served the development of tutors and the tutoring process. The result will be a categorized list of common markers of the transition from tutor to "experienced" tutor along with descriptions of any personal developments made to gain the confidence in

identifying with being “experienced.” In this study, we hope to answer what it means to go from tutee to tutor to “experienced” tutor with concrete and discrete evidence provided by our own tutors.

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BSC 112W

## **Are they listening? An exploration of attitudes of African American young women feeling about interactions with primary health care providers**

**Author: Lenora Ealy**

**Adviser: Professor Rachel Hall-Clifford**

This research sought to gain knowledge about the perceptions of young African American women about their interactions with medical professionals. This project was motivated by my own experiences of communication challenges while dealing with medical providers, and I wanted to better understand the experiences of other African American women. Young women in the African American community have grown up with an understanding of the medical system, informed by their family, community, and their own experiences. I wanted to explore potential barriers and facilitators to seeking health care for African American women, with a focus on client-provider interactions.

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BSC 209W-A

## **The Effect of Parental Influence on Career Choice of College Students**

**Authors: Amie Mbye, Dr. Janelle Peifer**

**Adviser: Professor Janelle Peifer**

When researching first generation college students emphasis is placed on surveying the group as a whole instead of independently investigating the experience of the immigrant ethnic minority population (Dennis et. al, 2005). Researching first generation college students is important, however exploring this group independently needs to be of interest due to the varying factors such as culture and social support that play into choosing a career path and major in college. Within a specific ethnic culture, a definition of success may exist which includes selecting a career from limited options. Past research has shown that individuals with collectivistic orientations are motivated to work in order to meet the demands and expectations of family members, while an individualistic orientation are more likely to be motivated for the own personal gain (Markus, Kitayama, 1991). The participants will complete a survey possessing in-depth questions on individual and parental demographics, parental attachment (PAQ), parental support, and mental health (PHQ-4). A section will also be included to identify personal career preferences in comparison to that of participant’s parents. It is hypothesized that individuals that fall into the first generation criteria will overall feel pressured to choose a career based off of cultural definitions of success. It is also hypothesized that individuals that experience pressure will score low on the parental attachment measure, give varying responses on the career preferences, and have an

indication of mental health. This study invites a discussion on what it means to be an immigrant first generation college student, and the implications in terms of career choices and contributions to U.S. society. The results of this study will also add to the understanding of the ever changing landscape of the American Dream.

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BSC 210E

## **Look, Touch, Learn: A Hands on Approach To Clitoral Education**

**Authors: Callie Pierce, Aliyah Bryan, Rachel Baum-Smirnov, Ashley Redmond,  
Peace Grace Muhizi**

**Adviser: Professor Stacey Dutton**

Although women make up approximately 50% of the world's population, there is very little research and information on female sexual anatomy. In fact, the first scholarly article written about the clitoris, a purely sexual organ, was not published until 1998. Even today many textbooks, popular websites, medical journals, etc. do not include accurate representation or information of the clitoral structure. This lack of information can cause miseducation, unnecessary surgeries, and can be potentially disempowering to female sexuality. Our goal for this LDR 200 course Representation of Sexual Anatomy, led by Dr. Stacey Dutton, is to create a three-dimensional anatomical model of the clitoris. To provide detailed information, we will design a website that will entice people to purchase the model, supply information such as scholarly articles and teaching tools that focus on the clitoris. This will contribute to the greater effort to combat the lack of qualified education, ignorance and archaic ideas pertaining to female sexual anatomy. Our presentation will demonstrate the process, timeline, budget, perceived outcome and explanation of our full proposal.

## **Adventureland: Race, Image, and Florida's "Golden Age" of Tourism, 1940-1975**

**Author: Allison Dupuis**

**Adviser: Professor Robin Morris**

Although the 1950s and 60s are often seen as a “golden age” for roadside tourism in Florida, these decades were also defined by the racial turmoil that engulfed the state. This project explores the intersection of the tourism industry and the Civil Rights movement in Florida, particularly in regards to the well-publicized St. Augustine Movement of 1964, as well as the Seminole struggle for national identity and recognition throughout the mid-twentieth century. While the state grappled with both of these issues on the national state, it also hoped to promote several competing images-- Southern and tropical, comfortable and futuristic-- for the benefit of its tourism industry. By viewing Florida’s these images through the lenses of these lesser-examined narratives, this project aims to showcase a side of the “golden age” of tourism that is often forgotten. It also examines the end of this “golden age.” The final portion of the presentation focuses on the effects that the introduction of Walt Disney World had on Florida’s tourist industry and the attractions that made it famous in the first place. For many of these businesses, Disney’s arrival signaled the beginning of their decline, and this project explores whether this effect was positive, negative, or somewhere in between.

## **Gravitational Equilibria of Rotating and Revolving Rods**

**Author: Anna Tompkins**

**Adviser: Professor Amy Lovell**

This presentation addresses the dynamics of three massive line segments interacting gravitationally. Generalizing both Euler and Lagrange’s famous exact three body solutions for solving for the forces of three interacting point masses, results are extended to numerical exact solutions for rods. With this technique, numerical solutions simulate the gravitational interaction of three slashes which all rotate and revolve around one another at the same rate. Newton's laws enable calculation of the force and torque between the three slashes, which then enables calculation of the angular frequencies and period of each different orbit. The study is extended to include potential energy of the systems, and to investigate stability of each individual configuration with rotating the rods in small angular displacements, for both the two-slash cases and three-slash cases. Understanding the configurations helps explore and increase understanding of which of these configurations will occur naturally. Stability concerns include not only the angular stability, but also the positional stability. That is, if there is a slight shift in the positions of the slashes, in each configuration, then the potential energy of the system must also be addressed.

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PRESENTATIONS 11:45-12:05

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BSC 102W

### **Fashion and Food in Martinique**

**Authors:** Arionna Moss, Musumaulai Galoia, Taylor Ellis, Tasida Webster

**Adviser:** Professor Philip Ojo

Martinique, an overseas department of France, is one of the most culturally diverse island in the Caribbean, a diversity resulting from centuries of encounters with various colonial powers, peoples, and cultures. This conglomeration of cultures, which has experienced transformation, adaptation, and appropriation, is reflected in every aspect of Martinican society, including language, religion, cuisine, and fashion. This presentation will focus on fashion and food, which are deeply rooted in African, European, and Indian cultures, and which cannot be fully understood or appreciated without first-hand experience. Based on research before, during and after our *Journey's* trip to Martinique, we will highlight the island's unique fashion and cuisine, the complexities of their origins and transformations, their relevance to the concept of globalization, and their effects on locals as well as tourists in contemporary Martinique.

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BSC 103W

### **The Childhood of "The Great Artificer:" An Examination of Mary McCarthy's Memoir "Memories of a Catholic Girlhood"**

**Author:** Margaret Rose Hunt

**Adviser:** Professor Nicole Stamant

When we think of coming-of-age memoirs we have hopes that the memoirist will represent their personal growth accurately and completely. This creates a subject who is well-rounded and human, allowing us to see pieces of ourselves in their narrative that create a relationship between the subject and the reader. What happens when this trust is broken? Mary McCarthy in her coming-of-age memoir, *Memories of a Catholic Girlhood*, charts her personal development from her earliest memories through her time as a student at the Annie Wright Seminary. What McCarthy does not do is very telling about her own growth: she does not give a perfect glossy narrative. She tells the perfect story and then pokes holes in it and wavers as to what exactly happened. She goes as far as to say "This account is highly fictionalized" rather than leaving her audience to believe her lies (97). This makes it simultaneously easier and harder to find those moments of true connection. If the audience feels as if McCarthy is lying to us to make herself better then it calls into question the validity of the growing up displayed in her memoirs. However, when McCarthy confesses to her lies she becomes less like a literary figure and more of a human being, providing more

ways for her audience to see her as a person. McCarthy's lies hinder a perfect reading of her self but then increase the humanity of her narrative.

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BSC 112W

## **Is A Dorm A Home?: Discovering the Black Student Experience in Agnes Scott Residence Halls**

**Author: Yaninna Sharpley-Travis**

**Adviser: Professor Rachel Hall-Clifford**

This study aims to explore whether the common experience of Black students facing discrimination and microaggressions in their residence halls at their traditionally White institutions is representative of the majority Black student experience within Agnes Scott College's residence halls. This study includes survey responses from 105 Agnes Scott students that identify as Black, on the topic of their Black student experience within Agnes Scott residence halls. Additionally, this study includes qualitative data from three focus group discussions, with a total of fifteen Agnes Scott students that identify as Black. Furthermore, this data is compared to a literature review and analyzed through the lens of symbolic interactionist theory.

Results from this study demonstrate that majority of Black Agnes Scott students feel that they belong in the residence halls; however, they find stereotyping of Black people to be persistent within the halls. This research is imperative due to Agnes Scott College being a private traditionally White women's institution with a history of being racially discriminatory. Agnes Scott was established in 1889, yet did not admit their first Black student until 1965. Now that it has been 53 years since the first Black student was admitted to Agnes Scott, we must uncover whether the climate within Agnes Scott's residence halls is more inclusive to Black students. This research will increase the knowledge on the Black student experience within Agnes Scott residence halls, and may lead to policy changes within them.

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BSC 209W-A

## **Importance of mentorship in spiritual growth of adolescents**

**Author: Alexis Smith**

**Adviser: Professor Janelle Peifer**

Many of the articles show how the role of a mentor is very influential in the lives of adolescents. For example, a long-term benefit from mentorship is higher psychological well-being while a short-term benefit is gradual religious conversion of an adolescent while at a Christian summer camp. This presentation highlights the importance of an adult's presence in the life of an adolescent. Mentorship is a big time investment where a mentor devotes time, advice, guidance, and patience to a mentee in hopes of contributing positively to the growth of

this mentee. This presentation examines the importance of mentorship in the spiritual growth of adolescents. It reflects on my experience of mentorship before my internship and after starting my internship, the benefits of mentorship, and how Young Life provides mentorship to its students.

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BSC 210E

## **An Overdue Revolution: Clitoris Education through Infiltration of Public Spaces**

**Authors: Nikki Slogar, Dais Johnston, Jazmine Green,  
Chantel Chandonia**

**Adviser: Professor Stacey Dutton**

There is a lack of both accurate representation of and information about clitoral anatomy in textbooks, medical journals, and media. This is harmful to people with clitorises in our society because they are denied access to accurate medical information concerning an important part of their own bodies when those without this organ do not experience similar difficulties. We have developed a dual-tiered approach dedicated to raising awareness of and spreading accurate information about the clitoris to both local and global communities. Firstly, we target local communities by creating and publishing our own zine containing information on the history of the clitoris, its purpose, its structure, information about artificial clitorises, how clitorises on testosterone are affected, and other important information. Additionally, we will create and locally distribute stickers depicting the correct anatomy of the internal structures of the clitoris in order to help this knowledge become commonplace, as is the basic image of a heart or brain. The other tier of our project deals with outreach to our national and global communities. We will create a website containing all of the information in our zine plus added action items for activists, such as petitions to textbook companies and a printable pamphlet they can distribute in their own communities. Ultimately, by targeting both local and global communities, we hope to change how the clitoris is represented both publicly and in academia by spreading education about clitorises.

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BSC 304E

## **“Be Like Daddy”: The Culture and Transformation of West Virginia’s Coal Towns**

**Author: Zoe Howard**

**Adviser: Professor Katharine Kennedy**

Until coal’s decline in the 1960s and 1970s, West Virginia had a thriving network of hardworking coal communities that supported the United States’ coal industry. The coal industry’s decline in the 60s and 70s had a detrimental effect on coal towns; as mines began to close, miners and their families, who had been living and mining coal in the West Virginia mountains for generations, were forced to move away from their

communities, searching for work. Unfortunately, these coal communities and their important role in American history have been largely left out of the historical narrative; women's and children's stories have been neglected in favor of stories about coal barons, strikes, and mining disasters. This research intends to contribute to filling the gap in the historical literature by discussing the effect of the coal industry on the coal communities and their inhabitants, focusing on education, marriage, and work for both men and women. While public perception about rural Appalachian people and their culture is mostly negative, these stories about living in coal communities and trying to forge a life out of what they have been given highlight the strength, resilience, and perseverance of West Virginians.

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BSC 308

## Listening to Jupiter

**Author:** Sarah Reid

**Adviser:** Professor Amy Lovell

This presentation is about observing Jupiter's radio waves with a Radio JOVE telescope. In order to listen to these radio waves, one needs to build to the receiver and antenna for the project. Over the course of the semester, the antenna and receiver have been built, and are ready to listen to Jupiter. These radio bursts happen on a regular basis, but are not always predictable. The purpose of this project is to determine if there is a significant increase in bursts when the Galilean moons of Jupiter pass in front of it.

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## ORAL PRESENTATIONS 12:10-12:30

BSC 102W

## Religion in Martinique

**Authors:** Melody Simmons, Annenicole Jonaitis, Hannah Brendell, Adena Adams

**Adviser:** Professor Philip Ojo

The presentation provides information and statistics about religion in the French West Indies, more specifically the island of Martinique. The topics highlighted include: the religious demographic and holy places on the island; origins of the popular beliefs; unique adaptations within Christianity; practices in Quimbois; Creolization; and persecution and prevalence of Afro-Caribbean religion. The presentation includes several pictures, citations, and lots of informative text.

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BSC 103W

## "Clamour in Drunken Frenzy for the Moon:" Intertemporal Poetic Personae in Li Po and W. B. Yeats

Author: Tiantian Zhang

Adviser: Professor Christine Cozzens

Although W. B. Yeats's Japanese Noh experiments are sometimes regarded as his foremost intercultural works, the major imagery in the 1918 poem "The Cat and the Moon" strongly evokes a Chinese source that Ezra Pound translated in 1915, "Amongst the flowers is a pot of wine" by Chinese poet Li Po (703-762). The speculation of this potentially intertemporal poetic conversation not only reflects the shared creative struggle and affirms the rooted cosmopolitanism of Yeats as a modern poet, but also overlays another cultural identity over *The Cat and the Moon*, a poem-play compound piece that ostensibly bears heavy Japanese influences. Primarily a poet, Yeats clearly adopted a minimalistic, picturesque approach – known as the Imagist approach – to his poetry, though he never acknowledged its Chinese origin, which were translated and transmitted by Pound. While both the public events and Pound's poetics were jointly influential on Yeats's re-shaping of his poetry, the poem "The Cat and the Moon" responds more explicitly to the latter than the former. In a similar way to Li Po's "Amongst the flowers is a pot of wine," "The Cat and the Moon" abstracts the poetic persona into a black cat while the former does so with the poet's own shadow; these abstractions, while differentiable in respect to the presence of the poet himself, reflect respectively the contemplation of poetic ideals of their times, constructing a intertemporal dialogue that informs Yeats's transition into the later phase of his career.

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BSC 112W

## Museum Visitor Expectations and Perceptions of Museum Purpose

Author: Sarah Dickinson

Adviser: Professor Rachel Hall-Clifford

This research focuses on the role museums play in their communities and the expectations visitors have when they visit museums. It also uncovers whether visitors have different expectations when they visit different museum types, and whether the expectations of visitors align with the ways in which museum staff cater to their audience. The participating institutions were an art museum, a history museum, and a museum of natural history all within the Atlanta perimeter. The research methods constituted of anonymous paper surveys of visitors about their expectations and the reasons they visit and interviews with staff members on what role they believe their museum is playing in the community and for their visitors. The data was analyzed using the theoretical frameworks of Professional Civility and Interpretivism. This research will help museums to better understand the expectations of their visitors and the reasons for which visitors attend the museums and allow the chance for visitors to see their comments reflected in the future practices of their local museum. This research will also help museums to understand the role that museums are playing in 2017 and the expectation of the modern museum visitor.

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BSC 209W-A

## **Belongingness of Multiracial individuals: Different methodologies used to explain a social construct**

**Author: Julianna Faletra**

**Adviser: Professor C. Peeper McDonald**

With the exponential growth of the Multiracial population (Shih & Sanchez, 2009), it is important to explore the complexities of their unique experience. Additionally, literature had shown that *belongingness* is an especially salient construct to study in Multiracial individuals. As a result, this presentation seeks to summarize the literature surrounding belongingness in Multiracial individuals and to explore different methodologies as a means to study this construct. Both qualitative and quantitative methodologies will be discussed with specific regard given to what kinds of questions related to belongingness in Multiracial people can be explored. Finally, the strengths and weaknesses of these different methodologies and the implications thereof will be discussed.

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BSC 210E

## **Expectations vs Reality: #lettuce-end-it (Theme House 3)**

**Authors: Adedayo Ajanaku, Jordyn Krumm, Ny Jia Lott, Kalah Kennebrew**

**Adviser: Daisy Bourassa**

Life is full of expectation versus reality moments. Although we enjoyed our theme house experience, living in the House of Demeter, was no exception to this phenomenon. Our initial purpose and mission statement was “To unify and educate the Agnes Scott community on the many benefits and challenges that gardening can bring while showing how sustainable and simple it can be to garden”. Looking back at our initial proposal, we realized that we had a healthy mix of accomplishments and disappointments during our year in the house. In our ambitious spirit, we proposed several collaborations, events, and services that we found rather difficult to implement while also balancing school and our personal social lives. In a more communal sense, new relationships were formed and exciting Agnes staff relationships were born. In this presentation, we will discuss how living in the House of Demeter had its ups and downs in the most raw, realistic way in order to give incoming residents a realistic view on what living in community really entails.

## **Mongol Adaptability and Empire Building**

**Author: Cassandra Munnell**

**Adviser: Professor Katharine Kennedy**

The presentation **Mongol Adaptability and Empire Building** focuses on the ways that the government and leadership structures of the Mongol Empire adapted their rule in order to successfully expand and conquer those around them. It focuses specifically on the period from the rule of Chinggis to the rule of Kublai Khan, or from the end of the 12<sup>th</sup> to the beginning of the 14<sup>th</sup> centuries. The two main sections of the presentation focus on Mongol rule in China and in Russia and the differences between Mongol involvement in the government of the two countries, as well as differences in the way that citizens of each of the conquered countries were brought into and made a part of the new empire. There is also a small section on the history of the empire in general, including maps of each of the conquered areas and important figures in the Mongol Empire during the time period covered by the presentation. All of this will come together to support and explain the nature of adaptability in this empire.

## **Computer Simulation of a Hydrogen Bubble Chamber**

**Author: Julena Negrón**

**Adviser: Professor Amy Lovell**

Developed by physicist Donald Glaser and later refined by Luis Alvarez, the hydrogen bubble chamber allowed physicists the opportunity to visually see subatomic particles. This is achieved by filling a cylinder, subjected to a strong magnetic field, of liquid (mostly liquid hydrogen) that is then heated just below its boiling point. As particles enter the chamber, a piston is released which then decreases the pressure within the chamber causing the liquid to become superheated. The electrically charged particles create ionized tracks in the liquid leaving behind microscopic bubbles. From the patterns the particles left behind, physicists could deduce from the radius the charge to mass ratio, velocity, and momentum. As a result, the hydrogen bubble chamber led to the discovery of previously unknown particles that have helped further nuclear physics. To learn nuclear physics in the classroom, it's vital to incorporate lessons through the use of interactive experiments. However, many institutions lack funding to perform such an experiment; however, with the advancement of technology, computer simulations can provide effective means for teaching or demonstrating concepts to students within the classroom. By making this method of learning accessible and inexpensive, students can better understand the behavior and interactions of a system at different levels of abstraction. With the use of mathematical models, computer simulations and data analysis which were gathered from a variety of sources

**regarding the apparatus and previous experiments done, this research will examine and replicate particles and their interactions through a hydrogen bubble chamber.**

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## PERFORMANCES 12:30-1:30

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### Dance Performance

Gaines Chapel, Presser Hall  
Adviser: Professor Bridget Roosa

This performance showcases three student-choreographed works set on performing members of Studio Dance Theatre, Agnes Scott College's dance company. The title of the first piece is "Feather and Flight", choreographed by Jules Wilder '21. It is a two-section piece focusing on the duality of birds. The first section, approximately two minutes, is about the soft side of birds. The graceful, airy, movements that we observe in nature. The second section is about the more hard side of birds, focusing on the idea of birds preparing for attack. The dancers in this piece are Madeline Brasgalla '20, Jennifer Byrd '21, Abbie Cox '21, Jane Krause '21, Alaska Matthews '19, Anoushka Pant '20, Lane Pigford '21, Katalin T Stupek '18, and Elizabeth Watkins '20. The second piece is "Crossroads", an ensemble work by Katalin T Stupek '18. "Crossroads" explores the idea of 'the road less travelled' and the fear that comes with having a chance to take the uncommon path that leads away from others' expectations. The dancers bringing the piece to life are Madeline Brasgalla '20, Jane Krause '21, Anoushka Pant '20, Brittany Randall-Neppl '20, Elizabeth Watkins '20, and Jules Wilder '21. The third piece is "Untitled". The choreographer is Lane Pigford '21, and the dancers are Abigail Cox '21, Jane Krause '21, Alaska Matthews '19, Brittany Randall-Neppl '20. The piece addresses their struggle of differentiating between their inner emotions and outward image, they aren't a single emotion but different parts of what make them human.

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### Theatre Performance Pathways

Mclean Auditorium, Presser Hall

Author: Zoe Katz

Adviser: Professor Christine Cozzens

Pathways is a one-act play that follows the lives of a recent high school graduate, James, and his girlfriend, Sarah, as they navigate the murky waters of future after high school. At the crux of their relationship, James cannot pay for college and is planning to enter the army instead, while Sarah is both financially and academically able to stay home and attend school. When James joins the army and prepares for his departure, the audience sees Sarah become desperate to make him stay. She proposes losing her virginity to James, and he disagrees, and their relationship dissolves into argument just days before he leaves. This play explores the notions of virginity in adolescent sexuality, as well as toxic masculinity within teenager's lives, and enters into a new genre of playwriting rarely explored, a juncture of theatre and adolescence.

A directed reading utilizes a cast and direction to bring a play to life without traditionally staging it. By staging a reading of *Pathways*, the Spring Annual Research Conference allows important sociological and psychological phenomena to take stage in a non-traditional presentation of experience, research, and craft. *Pathways* utilizes the traditional one-act format and linear narrative alongside a small cast and engaging dialogue to present common yet under-discussed themes of adolescence. *Pathways* is a finalist in the One-Act category of the 47th Annual Agnes Scott Writers' Festival Writing Contest, and is Zoe Katz's first play.

12:45-1:50	SCOTTIE MATH BOWL, TEASLEY LECTURE HALL, BULLOCK G-15
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**PRESENTATIONS 2:00-2:20**

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BSC 102W

### **Race and Identity in Martinique**

**Authors:** Esha Clements, Loanni Del Monte, Sydni Perry, Bre Rogers

**Adviser:** Professor Philip Ojo

This presentation explores the different, modern-day, identification of Martinique's citizens. Martinique is an island that is a territory of France, yet even with this French title it is a melting pot of many different identities. In Martinique, one may find someone from a vastly diverse heritage. One may be of Asian descent, European descent, Indian descent, or African descent. There is a large mulatto population, as well as a small white supremacist group of families, on the island. Upon visiting Martinique, we realize that most people on the island identify as Martiniquais, and do associate with the French identify within their own identity.

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BSC 103W

### **Engaged Buddhism: the idea of compassion and Emptiness in addressing environmental challenges**

**Author:** Jialin Chu

**Adviser:** Professor Abraham Zablocki

This paper aims to assess the practical value of compassion and emptiness in Buddhist doctrine in combating the increasing problems of climate change. By practicing and embracing the truth of compassion and emptiness, people can realize the interconnectedness of suffering and the ultimate nature is the emptiness in all living things, everything exists by dependence upon other factors. Human's irresponsible activities of consumerism are the cause of climate change. By engaging a mindful consumption in all aspects of life is the path of solving the problem of climate change. Instead of following the trend of habitual consumerism or advocating for a plant-based diet revolution, each individual has the choice to make a difference. The doctrine of Buddhism, Four Noble Truths, tells us the cause of suffering lies in ignorance, craving, and hatred. This applies to the cause of climate changes as well. Awakening the connection between the self and the environment and seeing the ignorance, craving, and hatred that arise when making a decision are critical to making a change. The goal of this paper is to help people see the internal realization of the universal responsibilities towards climate changes arise from compassion and awareness of the emptiness of nature. The future path of addressing the problem of climate change starts from the individual path to enlightenment.

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BSC 112W

## **Social Segregation at Agnes Scott College**

**Author: Kisha Simpson**

**Adviser: Professor Rachel Hall-Clifford**

Movies about college tend to give people the impression that student athletes and non-athletes are severely divided. They like to label groups of students by their similarities. Typically, there are the "jocks", the "nerds", and other different groups like "skater-dudes" or "hipsters", etc. Agnes Scott is a liberal arts women's college and unlikely to reflect all of the stereotypes we see in movies. In this project, I researched how socially segregated student athletes and non-athletes really are. I conducted participant-observations in the cafeteria, Evans, and at the student grill, Mollie's. I took notes on who students sat with, and whether or not they spoke to their opposites. For example, if I was observing a group of non-athletes, I paid attention to if they spoke to students athletes, and vice versa. I also emailed an online survey to the student population, asking them who they roomed with, and if they were friends with student/non athletes in general. I also asked about students' game attendance, to see if the student athlete were supported by their counterparts. I used the symbolic interactionism theory to guide me through my analysis because students, especially student athletes, tend to ritualize their everyday actions. Therefore, since they have the same rituals, they tend to stick together because they understand one another. The information from my research could be used to help improve the student/non-athlete social experience.

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BSC 209W-A

## **Evaluation of Strategies for Auditory Display of Social Media**

**Author: Mengyao Li**

**Adviser: Professor Jennifer Hughes**

This presentation will show the results of an evaluation study of the effects of novel and dynamic auditory displays of social media. Social media, as multimodality platforms that function as learning and communicating tools, is largely visually based and thus is challenging for visually impaired individuals to access. In order to examine the accessibility and experience of social media, I conducted an evaluation study of the for four types of auditory displays (i.e., speech, sonification, auditory scenes, and music) with five self-reported experience variables (i.e., enjoyment, engagement, confidence, imagery, and understandability). This study was completed online by 200 undergraduate students. Microsoft Cognitive Service APIs were used to analyze high-level data contained in pictures (i.e., face, gender, emotion, celebrities, and captions), and was then converted into four auditory displays. A 4 (auditory displays) x 5 (experience factors) x 3 (trials) within-subjects design was used to test the audio-only social media experience. A significant difference was found in the mean values of the experience score between the four display groups. The music display score was significantly higher than the combination of music and auditory scene, including specific enhanced factors of understandability and engagement. These findings show that by designing dynamic auditory displays, particularly the music-type display, the accessibility and experience of social media can be greatly enhanced.

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BSC 210E

## **Both Sides of the Story: Illustrating the Confederate Narrative in the City of Decatur**

**Authors: Candace Spates, Garis Grant, Jeana Edne,  
Khyla Morgan, Jahmeelah Nash-Fuller**

**Adviser: Professor Katharine Smith**

This team presentation, the capstone for the project-based leadership course (LDR 200-A) on Decatur's Confederate Monument, presents the history of the monument and makes a proposal for the site, after the monument is removed per the vote by the DeKalb County Commission in January 2018. Decatur's Confederate monument was one of many monuments that began to emerge all over the country to challenge the political rights that African Americans gained during the Reconstruction Era. We propose to install a new monument, a plexiglass cube on a limestone base that represents two sides to the story of Confederacy by including statements from a slave, a slave master, a Union soldier, and a Confederate soldier.

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BSC 304E

## **Why are peacocks long tails as long as they are?**

**Author: Huiming Zhang**

**Adviser: Professor Alan Koch**

The male peacock has an elaborate tail to attract mates. A longer tail would result in more opportunities to have offspring but also lead to a shorter lifespan. This presentation will determine the optimal tail length based on a modeling the competition between two male peacocks as a two-player game. By applying game theory to this scenario with different numbers of strategies and establishing a generalized process, we will determine Nash Equilibria, including scenarios where having no tail optimizes mating.

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BSC 308

## River, Rebirth, and Rituals: Water as a Cross-Cultural Element in Tan Dun's *Water Passion After St. Matthew*

Author: Evie Edmundson

Adviser: Professor Tracey Laird

*Water Passion After St. Matthew* is a multi-movement work by Chinese-born composer Tan Dun that commemorates the 250th year of the death of Johann Sebastian Bach. Based on the passion oratorio tradition, the composition narrates the death and resurrection of Jesus Christ. However, Tan Dun alters the narrative structure of the Passion to incorporate Jesus' baptism and features water throughout the work. In *Water Passion*, water is used as both a performance medium and a symbol for various meanings. This paper explores the sounds of water in relation to the performance techniques used in the production of *Water Passion*, and contextualizes water in Eastern spiritualities as well as Western Judeo-Christian traditions. Through analysis of the score and audio-visual recordings, and exploration of the symbolism of water, I will demonstrate cultural and musical ways in which *Water Passion* bridges the East and the West.

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## PRESENTATIONS 2:25-2:45

BSC 102W

## Holidays, Traditions & Culture

Authors: Jessica Bernal, Lydia Cash, Lauryn Singletary,  
Amy Yarin

Adviser: Professor Philip Ojo

Martinique, an overseas department of France located in the West Indies, has a blend of African, Caribbean, French and Indian roots and traditions. This presentation will examine the impact of these diverse racial, ethnic and cultural backgrounds on the socio-cultural life of Martinicans, especially in terms of traditions, celebrations, ceremonies, music, dance, sports, and holidays. The presentation will argue that the combination of African, Caribbean, French and Indian roots have given birth to a rich, unique culture that is today called *culture martiniquaise*.

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BSC 103W

## **Education Under Occupation: How Israel's Occupation of the West Bank Affects Palestinian Education**

**Author: Emma Fischer**

**Adviser: Professor Lesley Coia**

This presentation examines the effects of the decades long military occupation of the West Bank on Palestinian youths' educational experiences. It argues that the prolonged military occupation has a demonstrably negative effect on the abilities of Palestinian youths to obtain a quality education and live up to their full educational potential. This presentation will provide a brief historical overview of the conflict, an analysis of the circumstances of the past ten years, and specific examples of the ways that living under Occupation has and continues to have negative effects on Palestinian education in the Occupied West Bank.

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BSC 112W

## **Public Historic Objects and Markers in Decatur Square and Community Identity**

**Author: Jordan Lucier**

**Adviser: Professor Rachel Hall-Clifford**

This research considers how, if at all, do the historic objects and signs located in Decatur Square interact with community identity and memory in Decatur, GA across generations and racial identities? I was initially drawn to this topic in an effort to understand the sheer number of public objects with in Decatur Square and the ways people interpret them. Participant observation was done in order to determine how the passerbys of Decatur interact with these historic objects and signs. Interviews were conducted with professionals related to the history and tourism of the area as a means of gaining in depth knowledge of the range of opinions and narrative represented by these objects. The varying levels of awareness of the Square's historic objects and signs have also been recorded through a mapping activity attached to the survey given to passerby in Decatur Square. The survey also tested whether or not individuals believe the historic objects represent the community of Decatur and the participant's beliefs. Research design and implementation was influenced by Symbolic Interactionism and Collective Memory as a means of understanding how words and imagery may interact with individuals on a personal level to create meaning. This information will be helpful towards ascertaining what effect historic figures, plaques, and objects currently have and will have on individuals and communities in the future as we continue to create and celebrate history.

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BSC 209W-A

## **Defining "acting white"**

**Authors: Samantha Zheng, Caiwei Tang**

**Adviser: Professor C. Peeper McDonald**

The intent of this presentation is to explore the numerous indicators of being accused of "acting White" for minority persons. The current literature has reported multiple definitions of "acting White", some contradictory. Therefore, this presentation will discuss the history behind this phrase and circumstances in which it is used, the multiple indicators of "acting white" as overarching themes, and the implications of condensing these indicators into one definition. The point of the condensed definition is to bring discussion to the accuracy of the literature and to help guide future research.

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BSC 210E

## **Remembering the Decatur Confederate Monument**

**Authors: Ladream Taylor, CJ Montgomery, Avalon Bonlie,  
Catherine Fan**

**Adviser: Professor Katherine Smith**

This presentation is the capstone for LDR-200-B Decatur's Confederate Monument. Through this course, we examined how to contextualize the history of the Confederate monument on the Decatur Square and decided what to put in the Decatur Confederate Monument's place. By researching Confederate and Georgia's early Twentieth Century history, we established the circumstances that lead to the creation of the Decatur Confederate Monument. Through art historical research, we developed replacement for the monument that is both a memorial and an artwork in response to the Decatur Confederate Monument. We plan to use our allotted time present our research findings, survey information that demonstrates public attitude toward the Decatur Confederate Monument, and our replacement idea.

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BSC 304E

## **Sink Your Teeth into Algebra: Left Braces on $2p$ Elements!**

**Authors: Audrey Goodnight, Laura Stordy**

**Adviser: Professor Alan Koch**

Braces are a relatively new construction in abstract algebra, introduced in 2014 to find solutions to the Yang-Baxter equation. A left brace is a set  $B$  with two binary operations,  $+$  and  $\bullet$  such that  $(B, +)$  and  $(B, \bullet)$  are groups (the former abelian), and for all  $a, b, c$  in  $B$ ;  $a \bullet (b + c) + a = a \bullet b + a \bullet c$ . We characterize braces of order  $2p$ , for  $p$  prime.

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BSC 308

## God in da Streets: Rappers Find Redemption through Faith in God

Author: Victoria Wallace

Adviser: Professor Tracey Laird

Historically, Christian music has conformed to genres such as Christian Contemporary Praise and Worship, and Gospel that exist in a musical world apart from secular styles of popular music. However, more recent decades have seen popular rappers such as Kanye West, Chance the Rapper, Kendrick Lamar, and even Snoop Dogg profess their faith through music. For example, Chance the Rapper demonstrates a transformation in his lyrical content from more typical hip-hop themes like drugs and sex, toward exploration of salvation and redemption through his Christian belief in Jesus. These examples signal a new musical approach that bridges themes that formerly existed as separate realms of the sacred and profane. In that way, the music of these rappers likewise bridges audiences of believers and non-believers. The music embodies the perspective of Pope John Paul II, who asserted that "In song, faith is experienced as vibrant joy, love, and confident expectation of the saving intervention of God." In a more historical perspective, these rappers bridge a gap that characterizes experiences of many millennials today, between a struggle with spirituality as demonstrated narrowly within the confines of church rather on the streets and in everyday life.

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## PRESENTATIONS 2:50-3:10

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BSC 102W

## It's These Two Grace Jones Lookin' Chicks: Placing a Black Feminist Lens on Black Panther

Author: Avanti Lemons

Adviser: Professor Willie Tolliver

This presentation focuses on the iconic 2018 film *Black Panther* directed by Ryan Coogler. It will engage *Black Panther* through a Black feminist lens and situate its representations of Black women against the works of contemporary Black women's science fiction writers as primary reference points.

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BSC 112W

## **Empowering Refugee Students: How Intercultural Education and Intercultural Competence Help the Students of the Global Village Project Succeed**

**Author: Daphne Siwajek-Spence**

**Adviser: Professor Rachel Hall-Clifford**

In recent years, the number of refugees coming into the United States has steadily increased. A great number of them are school aged children, and this has created issues in the education system. Often the education system is incapable of integrating or supporting these refugee students properly. It is necessary, however, that these refugee students are given a complete education. The Global Village Project in Decatur, Georgia accepts young refugee girls into their specialized school to assist them in strengthening their academic and English language skills. Through interviews and participant/observation, this research focused on the teaching strategies and confidence building employed by the Global Village Project to assist their students. Bourdieu's theory of capital is used to look at the skills acquired by the students and how they assist the students with success by increasing their social and cultural capital. Then Foucault's theories of the creation knowledge through cultural discourses will be used to look critically at the curriculum and discussions of assimilation. This research could potentially inform teachers or schools in the creation and implementation of beneficial teaching strategies, activities, or programs to encourage and engage their refugee students for education and success in the future.

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BSC 209W-A

## **An Ecological, Developmental Psychopathology Model of Posttraumatic Stress Symptomatology Severity**

**Author: Abigail Camden**

**Adviser: Professor Janell Peifer**

Not all trauma-exposed individuals develop posttraumatic stress disorder (PTSD; Breslau et al., 1998). Of those who do develop PTSD, severities differ and the symptoms may be subclinical. It is therefore imperative to explore what factors lead to the development of PTSD and its severity, or protect against it. Although much previous research (e.g., Kleim et al., 2007) has addressed this aim, to our knowledge, previous work has not considered risk and resilience factors in conjunction with an ecological (Bronfenbrenner, 1979), developmental psychopathology model of PTSD. *Ecological systems theory* views individuals within the context of their multiple, interacting environments (Bronfenbrenner, 1979), and *developmental psychopathology* recognizes disorders as complex products of development (Sroufe, 2009). Glackin and Gray (2016) recommended conceptualizing psychopathology through ecological, developmental psychopathology models. Thus, the present study aimed to evaluate this model of PTSD, using variables at multiple levels of ecology in addition to risk and resilience factors. Participants comprised 116 individuals who had experienced a trauma in the past five years. Measures included the

Posttraumatic Diagnostic Scale (Foa, 2013) and the Adverse Childhood Experiences questionnaire (Bynum et al., 2009), among others. Using multiple hierarchical regression controlling for gender and race/ethnicity, we found that the model was significant,  $F(30, 56) = 4.42, p < .001$  and accounted for 70.3% of variance in PTSD symptomatology. In the final model, adverse childhood experiences, resilience, depression, and cognitive reappraisal remained significant, independent predictors of PTSD. Group differences by PTSD symptom severity group are reported, and clinical implications are discussed.

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BSC 210E

## Reimagining Classic Power Structure Theories: Development Actors in a Gentrified Decatur

Author: Margaret Poore

Adviser: Professor Cathy Scott

Since the late 1950s, sociologists and political scientist alike have grappled with one simple question: Who governs in a local city? For decades, two major theories ruled: Elitism and Pluralism. Floyd Hunter's keystone theory of elitist power argues that only a small cluster of social elites determines policy agendas within local government. In contrast, Robert Dahl's pluralistic approach to community power structure focuses on democratic participation in the locality, with policy outcomes flowing from open interest networks. Although meritorious in their own right, the popularity of these two classic power structure theories faded in the late twentieth century as cities changed with rapid development. However, development in urban communities, like the City of Decatur, produced unforeseen consequences (i.e. mass displacement, affordable housing shortages, whiter communities, etc.). To better understand the causes of gentrification in the city, we must determine *who* dictates development policies in the local city. This presentation re-introduces two classic theories of local power structure to examine *which* groups determine development outcomes, and consequently patterns of gentrification, in the City of Decatur.

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BSC 304E

## Symplectic Representation of Superelliptic Covers

Author: Laura Stordy

Adviser: Professor Alan Koch

We study a 3-fold cyclic branched covering of a surface of genus 2 – denoted  $S_2$  – over a sphere. We show that the image of the normalizer of the deck group in the mapping class group of  $S_2$  under the symplectic representation is the full centralizer in  $\text{Sp}(4, \mathbb{Z})$  of the image of the deck group, addressing a special case of a question of McMullen.

## **Billy Joel's Turnstiles: A Way Home**

**Author: Grace Downs**

**Adviser: Professor Tracey Laird**

*Turnstiles* (1976) is an eclectic and resonant body of songs which indefinitely preserve Billy Joel's states of mind during personal and political distress in the mid-1970s. He captures the uncertainty, fears, and future for his home throughout the record's eight tracks, inviting his listeners through a trail of what he has lived, what he has learned, and where his greatest worries lie. It is through these lyrical reflections that Joel's longing for home is evident. *Turnstiles'* production, artwork, tracks, and Joel's personal experiences shape his dynamics of home. Joel explores the idea of home as a person, place, or internal state, through the music, the album's title and its artwork. New York is Joel's geographic home, where the subway serves as the main arteries and veins nourishing and connecting communities that would otherwise be divided. People from varying cultures, ethnicities, socio-economic statuses, and spiritualities call New York home per the American Dream. Through the subway's turnstiles you travel to different areas and pass by many different people, yet all of the tracks lead you to the same New York. This city provides Billy Joel with steadiness and security for his career and a physical home to acknowledge the past, present, and future. Taken as a whole, *Turnstiles* confirms Billy Joel's path home.

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### PRESENTATIONS 3:15-3:35

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## **In the Aftermath of the Civil War: Failed Reconciliation Efforts in Nepal**

**Author: Sara Belbase**

**Adviser: Professor Eleanor Morris**

In 1996, the Communist Party of Nepal (Maoists) launched a civil war that aimed to transform Nepal's 200-year-old monarchy by ushering a new democratic form of governance. After the war, reconciliation was promised by the transitioning government and non-state actors with the goals of healing, educating and integrating the members of society. My research studies the literature on international reconciliation and examines the commitments of reconciliation made, as well as, the socio-economic and political expectations that existed in post-conflict Nepal. I conclude that even after a decade, the reconciliation efforts taken in Nepal by the state and non-state actors have been minimal. In my presentation, I will reveal how this lack of reconciliation effort continues to centralize resources and power among the elites, while oppressing the historically marginalized communities.

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BSC 103W

## **Idiopathic Hypersomnia: Necessity for New and Specific Treatments**

**Author: Anling Kaplan**

**Adviser: Professor Stacey Dutton**

Research indicates that sleep is a restorative function, that it enhances synaptic connections between neurons, and is likely important in the consolidation of memories. Sleep is necessary for survival – however, its mechanism remains a mystery. Despite years of research, the current understanding of this process is incomplete. Both sleep deprivation and excessive sleep are common in many sleep disorders, and sleep itself plays a role in many diseases. The most well-known sleeping disorder is narcolepsy; however as it was better defined, it became apparent that there were many patients who were excessively sleepy but did not fit the diagnostic criteria for narcolepsy. In 1979, the first classification of sleep disorders was developed; at that time idiopathic hypersomnia (IH) was differentiated as a specific disease entity. Under the most recent classification of the International Classification of Sleep Disorders (ICSD), IH is considered a Central Disorder of Hypersomnolence (CDH). IH is not well understood due to it being difficult to define and diagnose. The prevalence and lack of familiarity with the disease limits the number of pharmaceutical companies willing to invest in new therapeutic developments. There are currently no US Food and Drug Administration (FDA) approved treatments available for IH, leaving IH patients with few resources to help manage their symptoms, resulting in a substantial morbidity and impaired quality of life. This review will address IH, current treatments, new treatments, and the potential of experimentation with cannabis as an effective treatment option.

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BSC 112W

## **Why So Stressed?**

**Author: Sarah Murray**

**Adviser: Rachel Hall-Clifford**

Stress, as it is experienced in the environment of undergraduate education in the United States, has become a well-researched topic over the past decade. The review of the relevant literature showed that most studies on stress fail to address how stress is experienced by overlapping minority groups such as highly diverse women's colleges like the student population of Agnes Scott College located in Decatur, GA. Populations such as this could have separate, and outlying stress causes and effects than the conclusions that have been drawn from previous research. The intent of this research is to interpret the stressful environment of Agnes Scott College and how stress impacts conversation and interactions among students, and how stress as it is experienced forges the institution's competitive culture. Surveys were administered and a total of three focus groups were conducted with the upper class women of Agnes Scott College. The collected data has shown that stress, as

it is experienced by a vast majority of Agnes Scott students, is symbolic of accomplishment, providing students with a sense of validation when fellow peers or the institution itself fail to recognize their abilities and efforts as academics.

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BSC 209W-A

## Exploring Identity in Interracial Couples: A Qualitative Study

Author: Erika McDonnell

Adviser: Professor C. Peeper McDonald

Individual identity formation and conservation has moderate research attention in the context of romantic relationships (Luyckx, Seiffge-Krenke, Schwartz, Crocetti, & Klimstra, 2014; Wangqvist, Carlsson, van der Lee, & Frisen, 2016; Joshi & Deuskar, 2016). Further studies have investigated identity in interracial couples, with some finding that being in an interracial couple further magnifies one's own identity and encourages people to ensure their culture and race is a prominent aspect of their romantic relationship (AhnAllen & Suyemota, 2011). Skinner and Hudac (2017) also found that interracial couples might be more subject than same-race couples to negative affective bias. Such research points to the experiences and struggles that are possibly unique to interracial couples. Another study discussed that interracial couples were actually likely to partially forgo their racial identity and heritage for the greater good of the relationship (Afful, Wohlford, & Stoelting, 2015), and this leads to the need for more research to understand the potential for the formation of a unified interracial couple identity. Based on interpretative phenomenology, this study seeks to understand the experienced identity of interracial couples. Couples will be interviewed together in order to gain a better understanding of the shared experience as an interracial couple. The importance and relevance of this study is highlighted by the diverse demographic climate of the United States in the 21<sup>st</sup> century, and will provide insight into the growing immigrant and multiracial population.

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BSC 210E

## Modeling Food Quality in a Supply Chain

Author: Alexa Chang

Adviser: Professor Amy Lovell

A supply chain is a network of companies, and their suppliers and consumers, involved in the production and distribution of goods. In terms of supply chain design and logistics, the food industry is unique because of perishability and its relation to food quality and waste. This presentation will discuss the modelling of food supply chains, focusing on the factors that influence the quality of perishable foods while also considering environmental sustainability and cost efficiency. Furthermore, this presentation aims to help consumers make responsible and educated decisions as participants in a food supply chain.

BSC 304E

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## Inverse Eigenvalue Problem for Graphs on Six Vertices

Author: Audrey Goodnight

Adviser: Professor Rachel Rossetti

For a graph  $G$ , we associate a family of real symmetric matrices,  $S(G)$ , where for any  $M$  in  $S(G)$ , the location of the nonzero off-diagonal entries of  $M$  are governed by the adjacency structure of  $G$ . The ordered multiplicity Inverse Eigenvalue Problem of a Graph (IEPG) is concerned with finding all attainable ordered lists of eigenvalue multiplicities for matrices in  $S(G)$ . For connected graphs of order six, we offer significant progress on the general IEPG, as well as a complete solution to the ordered multiplicity IEPG.

BSC 308

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## Elementary, My Dear: Schoolhouse Rock! Revolutionized Children's Educational TV Programming

Author: Natalie Spruell

Adviser: Professor Tracey Laird

*Schoolhouse Rock!* was a breakthrough in children's television programming because it was a new approach to teach subjects like multiplication, grammar, American history, and science. This was one of the first shows to use catchy pop and folk tunes to help children learn academic subjects that stick with them well into adulthood. *Schoolhouse Rock!* originally aired from 1973 to 1985, was revived from 1993 to 1999, and then in 2009 came back and released new music videos directly on DVD. In this paper, I will delve into the background of *Schoolhouse Rock!* and the circumstances of its emergence, as well as reasons some researchers criticize its approach. In the end, I will explore how and why the combination of music, lyrics, and visuals on *Schoolhouse Rock!* made it an especially effective tool for learning. Insights from the creators and performers, as well as an analysis of the songs, will help to gain understanding for its pioneering role in music and education.

3:40-4:00

CLOSING RECEPTION AND FINAL RAFFLE DRAWING - WOOLFORD B. BAKER ATRIUM, BULLOCK SCIENCE CENTER

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## POSTERS AND EXHIBITS

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### Expression of KCNQ2 in MeCP2 mutated cells and Dysbindin deficient cells

**Authors:** Jasmine Berry, Fatima Garba, Cecilia Garza, Resa Knott

**Adviser:** Professor Jennifer Larimore

Seizures and epilepsies are the result of an imbalance in excitatory and inhibitory neuronal activity that leads to hyperexcitability. These bursts of neuronal activity are regulated by a series of voltage gated potassium channels. KCNQ2 is a gene responsible for the KCNQ2 potassium channels that play an important role in the overall function of neurons and the generation of afterhyperpolarization. Previous research indicates that the loss of function in this gene results in increased membrane excitability in neurons and muscular cells which is associated with the occurrence of seizures. Studies have demonstrated that mutations in methyl CpG binding protein 2 (MeCP2) are the primary cause of the neurodevelopmental disorder Rett Syndrome (RTT). This gene has been observed to play an important role in the synapse, and regulate the synaptic expression of dysbindin. Dysbindin is a neurodevelopmental factor required for GABA interneuron development. Down regulation in dysbindin has been observed in patients with schizophrenia and RTT both with the reported occurrence of seizures. This suggests that down regulation of dysbindin and the loss of KCNQ2 channels could contribute or play a role in patients with epilepsy and seizures. mRNA levels for the KCNQ2 gene were measured in cells transfected with the MeCP2 mutation and cells with dysbindin knockdown in order to identify a relationship between dysbindin and KCNQ2. Altered RNA levels of KCNQ2 in mutant MeCP2 cells demonstrate the importance of dysbindin and the expression of KCNQ2 in excitatory/inhibitory balance. These findings provide evidence that KCNQ2 is an important component in characterising seizures in patients with RTT and schizophrenia.

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### Efficacy of prescription grazing for controlling invasive English Ivy (*Hedera helix*)

**Authors:** Elizabeth Borum, Gillian Sayre, Mahal Bugay, Gabriella Chebli, Hannah Pasch, Sydney Popsuj, Kristin Root, Tatiana Santiago, Johali Sotelo, Ladream Taylor, Vaughn Wicker, Dr. Iris Levin, Department of Biology  
Kevin Mink, Trees Atlanta

**Adviser:** Professor Iris Levin

Non-native species introduced by humans can negatively impact the ecological communities into which they were introduced. These species can become invasive due to a lack of natural predators or pathogens, ultimately outcompeting species native to the area. English ivy (*Hedera helix*) is an invasive species that is common in the Southeastern US. Human interventions to manage invasive species are costly and vary in success, and include harmful chemical or biological controls that can cause further damage to an ecosystem. Prescription grazing, where livestock are used to reduce invasive plant density, is an alternative method that could be useful for controlling invasive plants. In this study, four sites (two experimental, two control) surrounding the Agnes Scott campus were studied using transect sampling, recording the percent English ivy cover, and the number of other native and introduced plants in each quadrat. These sites were sampled prior to the introduction of 24 goats, that grazed for 16 days in late January and early February, and resampled two and a half weeks after the goats were removed to record the re-emergence of native species and other invasives, such as chocolate vine (*Akebia quinata*), and the return of English Ivy. Grazing by goats did significantly reduce English ivy cover, but one site showed early evidence of turnover in plant community composition, with an increase in chocolate vine following the reduction in ivy cover. An additional sampling day nine weeks post-grazing will provide additional information about the long-term efficacy of prescription grazing by goats.

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## Aesthetics Over Functionality: A Systematic Cliterature Review

Authors: Crystal Burgess, Zuri Ngoz; Gabrielle Moore,  
Audrey Weber

Adviser: Professor Stacey Dutton

The stigma of female sexuality transcends social perspective and negatively affects research concerning female sexual arousal and anatomy, specifically its structural components and function. The mammalian clitoris is the only known organ purposed for sexual pleasure. Upon careful examination of the research done during 1811-2017, we analyzed 2,021 papers and categorized them into one of the following topics: anatomical anomaly, anatomy/physiology, cancer/tumor, chromosomes, diseases/disorders, development, evolution, genital mutilation, hormones, intersex, miscellaneous, protein expression/ion channels, reproduction, sexual arousal, sexual behavior, sex differentiation, sexual dysfunction, sexually transmitted diseases (STIs), surgery, theory, transgender, or vagina/vulva. We found that the majority of the papers focused on diseases/disorders, surgery, and intersexuality (15.9%, 13.6%, and 9.5%, respectively). This data shows a research focus on abnormalities either directly or indirectly related to the clitoris opposed to functionality under normal circumstances. Only 190 (9.4%) of the articles mention normal anatomy and physiology. Of the articles in the surgery category, there was a greater focus on aesthetic surgical improvements (40% cosmetic surgery and 33% reconstructive surgery) compared to functionality (27% functional surgery). This data highlights the need for more research that explores the anatomical and physiological characteristics of the clitoris to more effectively treat disorders such as female sexual dysfunction (FSD).

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## Interpersonal Trauma and Noninterpersonal Trauma: A Differential Effect on Romantic Relationship Functioning?

Author: Abigail Camden

Adviser: Professor Jennifer Hughes

Interpersonal and noninterpersonal traumas have differing effects. Because interpersonal trauma is intentionally perpetrated, it is detrimental to the survivor's safety, intimacy, and trust (Janoff-Bulman, 1992) and results in more complex and severe symptomatology than noninterpersonal trauma (Briere & Jordan, 2004; Ford et al., 2006, as cited in Wamser-Nanney et al., 2013). Therefore, it may also be the case that interpersonal and noninterpersonal traumas differentially affect romantic relationship functioning, though this is an understudied area of research. In the present study, we sought to fill in this gap. Previous research has found that those experiencing interpersonal trauma have lower trust (Janoff-Bulman, 1982). Interpersonal trauma (Cook et al., 2004; Lassri et al., 2018) and PTSD (Cox et al., 2017) have been shown to negatively affect relationship satisfaction. Interpersonal trauma may also affect commitment; Cook et al. (2004) found that ex-prisoners of war with PTSD were more likely to have considered marital separation. Therefore, we hypothesized that interpersonal trauma would predict lower trust, satisfaction, and commitment in romantic relationships. We were also curious if romantic relationship functioning would be affected by trauma in general. Results of linear regressions indicated that interpersonal trauma was not a significant predictor of trust,  $F(1, 148) = 1.04, p = .31$ , satisfaction,  $F(1, 153) = 0.03, p = .87$ , or commitment,  $F(1, 154) = 1.14, p = .29$ . Trauma in general also did not predict trust, satisfaction, or commitment. The results contradict previous research (e.g., Cook et al., 2004), yet corroborate others (e.g., Rhatigan et al., 2011).

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## What predicts adult telomere length and dynamics in barn swallows?

Author: Gabriela Chebli

Adviser: Professor Iris Levin

Relative telomere length is emerging as an important indicator of organismal quality, and has been found to be correlated with many aspects of phenotype and reproductive success. This study investigates whether aspects of adult phenotype and behavior of barn swallows (*Hirundo rustica erythrogaster*) predicts telomere length and telomere dynamics (shortening between years). We investigated telomere length in adult barn swallows by first exploring the relationship between telomere length and age using a known-aged population of barn swallows. Next, we asked whether reproductive success, social interactivity, hormones, measures of phenotype, and measures of oxidative stress explain individual differences in relative telomere length and change in telomere length between years for returning birds. Birds were studied during the breeding season over three years and relative telomere length was measured using quantitative polymerase chain reaction (qPCR). This

dataset is unique in that it is rare to have so much information about each individual in the entire population, enabling a fine-scale correlational study of telomeres and various aspects of morphology, physiology, behavior, and reproductive success.

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## Reduced Expression of AP-3 Complex $\sigma$ Subunit Found in Dysbindin Knockdown N2A Cells

**Authors:** Susan Cordero Romero, Anjiya Aswani, Alina Vadsaria,  
Alicia Meredith, Dr. Jennifer Larimore

**Adviser:** Professor Jennifer Larimore

Rett Syndrome and schizophrenia are both neurodevelopmental disorders associated with the BLOC-1 complex, with the former characterized by trouble coordinating muscle movements, difficulties in communication, and anomalous breathing and the latter characterized by hallucinations, disorganized behavior, and social isolation. Mutations of the MECP2 gene---involved in Rett Syndrome, have been linked to changes in proteins of the vesicle trafficking AP-3 complex and the vesicle trafficking BLOC-1 complex. Deficiency of dysbindin, a subunit of the BLOC-1 complex, has been observed in studies of schizophrenia. Both the BLOC-1 complex and AP-3 complex interact, specifically with the BLOC-1 complex binding to the  $\mu$  subunit of the AP-3 complex. While Rett Syndrome and schizophrenia are both associated with cooperating complexes in vesicle trafficking, the effects of dysbindin deficiencies and MECP2 mutations on subunits of the AP-3 complex are still uncertain. We looked further into the effects of the MECP2 mutation and dysbindin knockdown in N2a cells on the  $\sigma$  subunit of the AP-3 complex, anticipating a decrease in its expression. Results confirmed a decrease in expression for the  $\sigma$  subunit in dysbindin knockdown cells.

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## Effects of dysbindin deficiency and MECP2 mutation on FOXP2 regulation of mice N2A neuroblastoma

**Authors:** Jessica Costero, Morgan Pearson, Caitlynn Croft,  
Zoey Perchaluk

**Adviser:** Professor Jennifer Larimore

Neurodevelopmental disorders impact the development of the central nervous system leading to deficits in learning, speech, and motor development. Rett's Syndrome, a rare, sex linked disorder within the Autism Spectrum Disorder consistent with 8 to 18 months of normal child development followed by sudden developmental regression characterized by loss of meaningful hand movement as well as speech and motor deficits, and Schizophrenia, a chronic psychiatric disorder characterized by an altered perception of reality and abnormalities in

behavior such as aggression, compulsions and disorganized speech are two neurodevelopmental disorders. To discover the commonalities between these disorders, this study analyzes effects of Rett's Syndrome and Schizophrenia on the regulation of the Foxhead box protein P2 gene, *FOXP2*, which is associated with speech and language development. It was hypothesized that mice neuroblastoma (N2A) cells lacking dysbindin and *MECP2* would exhibit a downregulation of *FOXP2* in comparison to control cells with healthy levels of dysbindin and *MECP2*. *FOXP2* expression was from control, dysbindin, and *MECP2* knock-down N2A cells. We hypothesized that *FOXP2* would be downregulated in both cells which lack dysbindin and *MECP2* contributing to the speech and language development deficits observed in Rett's Syndrome and Schizophrenia. It was determined that *FOXP2* was downregulated in dysbindin- knock down and *MECP2* knock-down N2A cells, which could be the contributing factor to the speech deficits observed in these neurodevelopmental disorders. progesterone protected the cells from the neurotoxic effects of L-Glu.

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## Colorblind Racial Ideology in Monoracial and Multiracial Populations

Author: Alice Edwards

Adviser: Professor C. Peeper McDonald

Multiracial identities are becoming more prominent in the United States. This study sought to compare the Colorblind Racial Ideology of individuals who identified as multiracial to that of individuals who identified as monoracial. An analysis of the Colorblind Racial Attitudes Scale (CoBRAS) scores of 488 participants found that as a whole Multiracial individuals scored lower on the CoBRAS than their Monoracial peers. When broken down into ethnic groups, a significant difference in scores was found between Multiracial individuals and Monoracial European Americans and Monoracial Asian Americans/Pacific Islanders. Monoracial individuals who identified as partially European American/White were found to score higher on the full scale CoBRAS and the Unawareness of Blatant Racial Issues subscale than Multiracial individuals who did not identify as partially white, but not on the Unawareness of Institutional Discrimination and Unawareness of Racial Privilege subscales. Comparisons of the different monoracial group's scores found that African Americans scored lower than both European Americans and Monoracial Asian Americans/Pacific Islanders. These results indicate that there is a relationship between multiracial identity and an individual's Colorblind Racial Ideology.

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## Observing and Analyzing Stellar Content in Interacting Galaxies

Authors: Abigail Harden, Mihika Rao

Adviser: Professor Amy Lovell

Observations of several sets of merging galaxies will allow color comparisons of galaxies, both with their companion and with those of other interacting pairs. The Southeastern Association for Research in Astronomy (SARA) 0.9m telescope on Kitt Peak was used to observe the Antenna Galaxies, the pair comprising of NGC 2207 and IC 2163, Centaurus A, the Whirlpool Galaxy and its companion, while the SARA 0.7m telescope at Cerro Tololo was used to observe NGC 5679 and NGC 6872. After creating true color images using red, blue, and green filters, a galaxy color-magnitude diagram will be created. This diagram plots the absolute magnitude against the color index of the stars in each sample. Interacting galaxies tend to have a higher than average star forming rate. This is because the large gravitational forces between the galaxies disrupt gas clouds, resulting in star formation. Merging galaxies, one of the more extreme forms of interacting galaxies, tend to have exceptionally high rates of star formation. These galaxies are called Starburst galaxies, a prime example being the Antennae Galaxies. Less extreme forms of interacting galaxies, such as the Whirlpool galaxy, only have slightly higher than average star forming rates. By looking at both the luminosity, and therefore star forming rates, of interacting galaxies, and how disrupted the dust lanes look, it can be determined how advanced the galactic interaction is.

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## **Preliminary Study on Exploring Students' Perception of Gender Identity on Campus**

**Author: Anner Harris**

**Adviser: Professor Janelle Peifer**

While there is an increasing number of gender-nonconforming youth among college students in the U.S., lack of knowledge of the experiences these individuals face is lacking among the majority of college students, professors, and even administrators (Beemyn & Rankin, 2012). Moreover, literature available to examine the unique experiences of gender-nonconforming students often analyze the combined experiences of non-heterosexual (LGB) students rather than independently investigating gender identity. The aim of this pilot study was to explore students' perception of their gender identity on campus. I hypothesized that the school's focus on promoting inclusivity and providing students with access to information pertaining to gender diversity allows students to explore descriptors that more accurately express their identity. To test this, junior and senior students completed a demographics survey in order to identify willing gender nonconforming participants, after which were interviewed and asked questions pertaining to their gender identification prior to attending college, and how they perceived their gender identification after attending Agnes Scott. All participants were audio recorded and data was transcribed to scan for themes. As a result, students perceived their peer group in high school largely consisted of students who identified as cis gendered, but felt there was more variety in gender expression among their peers at Agnes Scott. While these results could imply that Agnes Scott College provides students with more opportunities to explore gender identity in ways that may not be possible in high school, recruiting more participants in the future could provide more support for this implication.

## **It Takes a Village: Addressing autism stigmatization Changing Attitudes and Behavior Towards Autism in Urban Settings utilizing community influencers to impact the education of the general public**

**Authors: Madeleine Hoffman, Chynna Golding, Callie Stezar**

**Adviser: Professor Janelle Peifer**

Public perception plays an integral role in the formation of stigma. Past research involving marginalized groups revealed that stigmatization is a tool to force out people who do not fit society's norm. Education and community involvement was a key aspect in the success of weakening these stigmas. Therefore, there is a critical need to catalyze community awareness and understanding of Autism Spectrum Disorder by using community influencers as established from past movements this study will target Washington D.C residents in a longitudinal study. The goal is to have an indirect impact on the general public via direct interaction with community influencers by developing evidence-based training modules that leverage psychological practices to address social perception and behavior regarding ASD within the District of Columbia. Increasing a community's knowledge of and exposure to Autism Spectrum Disorder (ASD) will decrease social stigma surrounding ASD and increase acceptance of ASD, resulting in community-wide behavior change. This change will create a social environment that will positively impact quality of life for individuals on the spectrum. This hypothesis has been based on published reports and journal articles that show stigma has a causal factor in quality of life for both individuals on the spectrum and their families who experience years of misunderstanding. It takes a village to raise awareness, foster acceptance, and incite action towards decreasing stigma within everyday social environments that would allow members of the ASD community to attain new found levels of autonomy.

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## **Predicting Work Effort and Organizational Citizenship Behavior Using Positive Psychology**

**Authors: Dr. Jennifer Hughes, Abigail A. Camden, May J. Hu,  
Erika R. C. McDonnell**

**Adviser: Professor Jennifer Hughes**

The purpose of this study was to evaluate whether positive psychology variables predicted both work effort and organizational citizenship behavior (OCB) of full-time employees. The participants lived in the United States and consisted of 71 men and 107 women. After IRB approval, we used snowball sampling via e-mail, flyers, and social media posts to recruit individuals to take our online survey. Another 60 participants were recruited using Amazon's Mechanical Turk program in order to have more men represented in the sample. To examine our first hypothesis, whether positive psychology characteristics (i.e., gratitude, job satisfaction, and positivity) would predict greater work effort, we conducted a two-stage hierarchical multiple regression. Gratitude and job satisfaction were predictors of work effort and accounted for

40.0% of the adjusted variance in work effort. To examine our second hypothesis, whether positive psychology characteristics (i.e., gratitude, job satisfaction, and positivity) would predict greater OCB, we again conducted a two-stage hierarchical multiple regression. Like work effort, gratitude and job satisfaction were predictors of OCB and accounted for 30.2% of the variance in OCB. Our results showed that those who reported experiencing gratitude and job satisfaction also reported putting in more effort at work and being more likely to display OCB. Surprisingly, positivity was not a predictor of work effort or OCB.

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## The Effect of Temperature On the Location of Giant Otters

Authors: Hamda Hussein, Naaki Moweta, Dr. Bonnie Perdue

Adviser: Professor Bonnie Perdue

Previous research has shown that the activity level of animals is related to circadian rhythms and environmental changes (Aschoff, 1966). Giant otters are social species and they defend territories. Depending on the competition level, their activity patterns changes accordingly (Mourao, 2015). Another factor that affects the overall interactivity of the otters is seasonal shifts. However, there is not much know about Giant Otters in captivity and their location in relation to temperature increase. This is why this study aims to explore if there is relationship between where Giant Otters at Zoo Atlanta spend most of their time in relation to the change in temperature. Thus, it was hypothesized that the otters would spend more time in certain areas of the enclosure during higher temperatures. We recorded data on two adult Giant Otters housed at Zoo Atlanta. Keywords: Sun bears, animal welfare, observational research

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## The effects of sex and growth rate on variation in nestling telomere length

Author: Alina Ibrahim

Adviser: Professor Iris Levin

Telomeres are caps made up of non-coding repeats on the ends of chromosomes that protect the coding regions from damage. Data from a number of taxa indicate that longer telomeres are related to higher survival rates and better organismal performance; however, factors that affect telomere length are not well understood. In this study, we examined the effects of nestling sex and growth rate on the relative telomere length of North American barn swallow (*Hirundo rustica erythrogaster*) nestlings. We aimed to characterize environmental factors, including those linked to nestling development, such as sex and growth rate, to quantify their contribution to variation in telomere length. Our study uses a cross-foster design, where half of the eggs in each nest were switched with synchronously-laid eggs from another nest. This was done in order to decouple genetic and environmental effects on telomere length. Nine days after hatching, nestlings were measured for body size and mass, and blood samples were taken for molecular sexing, quantification of relative telomere length (via qPCR), and for

parentage analysis using microsatellite markers. On day twelve of life, nestlings were measured again to calculate growth since day nine. We did not find an effect of nestling sex on telomere length; however, we are still investigating the influence of growth rate.

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## **Religion, Political Ideology, and Acceptance at Agnes Scott College**

**Author: Kristina Kimball**

**Adviser: Professor Janelle Peifer**

The current study seeks to explore the relationships between religiosity, political ideology, acceptance or lack thereof felt by religious individuals at Agnes Scott College. A cross sectional survey has been conducted and data on political ideology, religious affiliation, levels of religiosity, feelings of acceptance and perceptions of campus political climate has been collected. The poster will explore the relationship between political ideology, perceived campus political climate, and levels of acceptance felt by religious individuals. The relationship between respondent's political ideology, religious affiliation, and views of religious peers will also be examined.

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## **Hedgehog Enrichment Behavioral Analysis**

**Authors: Resa Knott, Dr. Bonnie Perdue**

**Adviser: Professor Bonnie Perdue**

Zoo Atlanta provides an enriching and healthy environment for the animals housed at the zoo. There are many active observational and experimental studies on species of animals such as the hedgehog that otherwise are not widely studied and may be hard to locate or track in the wild. Previous research studies have successfully uncovered certain environmental factors that influence behavior in the hedgehog species. Previous research has found that factors such as land use practices, resource distribution, habitat characteristics and population density that influence 'home range' size in hedgehogs. Furthermore, individual hedgehogs may alter their exploratory searching behavior in direct response to introduction of food supplementation. Using the data and literature available from subsequent studies in combination with observational data collected from this experiment involving a single hedgehog at Zoo Atlanta. We hypothesized that the hedgehog will increase its movement and exploratory behavior in the enclosure over time, making most use of the hide and the food supplementation enrichments. Our data will help to reveal the behavior patterns and enrichment interaction during the night in the hedgehog and provide cues for how to optimize welfare.

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## Relationship Between Engagement, Satisfaction, and Extraversion in College Students

Author: Mahala Lewis

Adviser: Dr. Janelle Peifer

Increasing levels of college satisfaction is an issue that colleges and universities always striving to improve. One way that institutions have investigated satisfaction is through the lens of personality traits. Personality traits have been a strong predictor of people's life satisfaction and job choices (Herringer, 1997). Additionally, students who reported higher levels of engagement had higher levels of college satisfaction (Bauer Kylow, Webber, & Zhang, 2013). The hypothesis of this study is that there is a relationship between a student's extraversion, institutional satisfaction, and institutional engagement. The current study included variables of extraversion, engagement, and satisfaction. A total of six linear regressions were run. The only significant relationship was between satisfaction and engagement. An implication for this study is knowing the traits that make students the most successful and satisfied can aid the institution in developing programs to further aid in student well-being and success.

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## Sexuality and Body Image

Author: Hannah Martin

Adviser: Professor Janelle Peifer

The question as to whether non-heterosexual women have different sexual preferences from those of heterosexual men's requires further research in order to be determined. The sexual selection preferences of men, especially in terms of waist-to-hip ratio (WHR) and body mass index (BMI) whereas the sexual selection preferences of non-heterosexual women are relatively under-researched. Past research suggests that non-heterosexual females prefer a .7 WHR, which conforms to the preferences found in heterosexual men, but prefer figures with a heavier BMI than heterosexual men. This is speculated to be related to body image as some research has shown that non-heterosexual females have a more positive body image compared to heterosexual females'. However, the research on this has yielded conflicting results. The current study examines the results of a two-part survey that consists of the Multidimensional Body-Self Relations Questionnaire (MBSRQ) and an evaluation of images with varying BMI's and WHR's. Both non-heterosexual women and heterosexual women were surveyed in order to determine whether body image is related to sexuality. Body image and attraction to varying WHR's and BMI's were measured in order to directly examine the relationship between physical attraction and body image in non-heterosexual women.

## **The Effect of Visitor Density on Stereotypic Behavior of the Giant Panda**

**Authors:** Amie Mbye, Dr. Bonnie Perdue

**Adviser:** Professor Bonnie Perdue

While the zoo going experience may be positive for visitors, previous studies have shown that crowd size may have an effect on the behavior of animals. Noise level, which is not always related to crowd size, has been found to be related to increased stereotypic behavior. This study aims to explore the effect of crowd size and noise pollution on the stereotypic behaviors of the giant panda. It was hypothesized that crowd size and noise pollution would relate to increase in the exhibit of stereotypic behaviors. Two adult pandas on exhibit at Zoo Atlanta will be the primary participants of focus. Instantaneous and all-occurrence sampling methods were used to collect data on pre-determined behaviors on an ethogram.

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## **Agnes Scott Undergraduate Research Teams: Experiences and Benefits**

**Authors:** C. Peeper McDonald, Alice Edwards, Julianna Faletra,  
Erika McDonnell, Iris Tang, Samantha Zheng

**Adviser:** Professor C. Peeper McDonald

This poster presentation examines the existing literature around research teams and aims to shed light on personal experiences of Agnes Scott students and faculty regarding research teams using personal quotes and testimonials. Literature has shown that being a member of an undergraduate research team has many benefits to the student, faculty member, and the school at large. Additionally, the format and general expectations of research teams will be highlighted to help encourage students to learn what to expect from a research team. This in turn, will help students to consider joining a research team in the future based on their professional goals.

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## **The Effects of Emotional Primers on Global Precedence**

**Authors:** Erika McDonnell, Emma McKeon

**Adviser:** Professor Barbara Blatchley

Global precedence describes a person's attentiveness to global features (the whole) of a stimulus as opposed to local features (the details) (May, Gutierrez, & Harsin, 1995). Emotional priming has proven to be a valuable factor in a person's global precedence, with one study by

Baumann and Kuhl (2005) finding that positive affect increases cognitive flexibility when participants were exposed to positive words. A similar study conducted by Fredrickson and Branigan (2005) used films to investigate global and local attention processing, and found that exposure to positive emotions led to a broadened scope of attention in a global-local visual processing task. This study will investigate the effects of emotional primers, specifically positive and negative images, on a person's global precedence, as measured by the Navon task. We hypothesize that emotional priming will have an effect on global precedence, and specifically predict that the positive primers will encourage focus on global features while negative primers will encourage focus on local features. Participants will be randomly divided into groups and will be either negatively or positively primed through exposure to image slides. Immediately thereafter, participants will complete the Navon task online. Due to the nature of the study, we will conduct an independent samples *t*-test.

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## **VLA Observations of Flux Density Variations at 3.6 cm in the Massive Star Formation Region W49A**

**Authors:** Theresa Melo, Jennifer Bates, Brynn Presley-Marshall

**Adviser:** Professor Chris DePree

In recent years, a number of ultracompact Galactic star forming regions have been detected to vary in flux density on short timescales of 10-20 years. This variation has been theoretically predicted, and occurs when the accretion flow that feeds a young massive stars becomes unstable and clumpy. High-density clumps interacting with stars can temporarily boost the local recombination rate. As a consequence, the H II region surrounding the star shrinks. Once the clump is accreted by the star, the H II region expands again. Here we focus on the massive star-forming region W49A, which was observed with the Karl G. Jansky Very Large Array (VLA) at 3.6 cm with the B-configuration in February 2015. These high resolution (0.8'') observations were compared with B-configuration observations of the same region made with the VLA in August 1994, almost 21 years earlier. As expected, most of the sources in the crowded field of ultracompact (UC) and hypercompact (HC) HII regions exhibit no significant changes over this time period. One source, however, W49A/G2, has decreased by 28% in peak intensity, from  $72 \pm 5$  mJy/beam to  $56 \pm 5$  mJy/beam. We present the 1994 and 2015 images of the W49A region, the difference images that indicate the position of the flux density decrease, and discuss possible explanations of the detected flux density decrease near the position of W49A/G2c.

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## **Effects of the Seasons on Giant Panda Preference of Environmental Enrichment**

**Authors:** Gabrielle Moore, Amie Mbye

**Adviser:** Professor Bonnie Perdue

Animal welfare is important for researchers to ensure that the animals are able to cope with their living conditions. Environmental enrichment includes sensory stimuli that can lower aggression or stereotypic behavior, or behavior that is repetitive and seemingly without a

particular purpose. Giant pandas, the species in focus, are native to cooler, higher elevations in China. Zoo Atlanta houses four pandas, a male adult, a female adult, and twin cubs that are on loan from research facilities in China. This zoo utilizes environment enrichment in the form of balls; climbing structures; hammocks; and olfactory cues that include hot sauce, lavender, mint mouthwash, and vanilla extract. Some panda behaviors have been known to vary from season to season, such as reproductive and feeding behaviors. The current study focused on whether preference of environmental enrichment depends on the season. The two adult pandas were the participants of the study. It was hypothesized that if provided a selection of enrichment, there would be an seasonal effect on preference.

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## Vocalization and Behavioral Interaction in Relation to Weather

**Authors:** Naaki Moweta, Hamda Hussein, Dr. Bonnie Perdue

**Advisor:** Professor Bonnie Perdue

Previous research has studied giant otter behavior and vocalizations in the wild but giant otter vocalization in captivity, specifically in relation to weather, have been less well studied and may shed light on giant otter welfare in captivity. Giant otters are native to warmer climates like that of South America and are a social species. The main focus of this study was to determine if vocalization levels and behavioral interactions are affected by temperature variance. It was hypothesized that not only does the weather affect otter vocalization behavior, but also other behavioral interactions due to the climate difference. In order to test this hypothesis, the all-occurrence sampling method (AO) and instantaneous method were used for recording observations.

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## Lack of Dysbindin down-regulates GABA receptor Chloride channels

**Authors:** Audrey Owusu Ansah, Ruvimbo Dzvurumi, Jael Lockett

**Adviser:** Professor Jennifer Larimore

Rett syndrome and schizophrenia are two neurodevelopmental disorders in which the proper development of the central nervous system is impaired. Rett Syndrome is a disorder primarily affecting females; they develop normally in their first 6 months but their development regresses from 12 - 16 months. Studies have shown that Rett syndrome is caused by a mutation in the gene, methyl-CpG binding protein 2, MECP2 whilst schizophrenia has no known cause. Both disorders have been characterized by reduced levels of neurotransmitters gamma-aminobutyric acid (GABA) and glutamate, resulting in an excitatory/inhibitory (E/I) imbalance. The importance of this study it to investigate how dysbindin or MECP2 may cause this imbalance, and specifically, how they affect GABA<sub>A</sub> receptor chloride channels, as such a discovery will give drug developers a better target to reduce the effects of these disorders. In this study, we knocked down dysbindin and inserted MECP2 mutations in neuroblastoma (N2A) cells in order to investigate their effects on mRNA levels for GABA<sub>A</sub> receptor chloride

channels. The knockdown of dysbindin-1 resulted in a decrease in mRNA levels for the GABA<sub>A</sub> receptor chloride channels, but the MECP2 mutation had little to no effect on these channels and, hence, partially supported our assumption that both treatment would result in a decrease in GABA<sub>A</sub> receptor chloride channels. These findings suggest that dysbindin deficiency might be responsible for the observed inhibitory/excitatory imbalance examined in patients with these neurodevelopmental disorders, due to decreased levels of GABA receptor chloride channels.

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## **The Measurement of Empathy Towards Virtual Avatars of Different Gender and Race.**

**Authors: Vivian Phillips, Dr. Barbara Blatchley**

**Adviser: Professor Barbara Blatchley**

For video games to be enjoyed a player has to be emotionally invested in their virtual avatar to retain their interest. Avatars play a key role in maintaining a sentimental bond between the player and the game. In this context, empathy refers to the projection of oneself onto a virtual avatar. An avatar's looks are crucial and are often the first impressions video game consumers consider when purchasing a game. Because 76% of developers are white males, humanoid protagonists are typically also white males. These recurring characteristics suggest that the average video game consumer is a white male between the ages of 16-35. Research has shown this assumptions are false. It's been observed that white males within this demographic tend to be the most outspoken towards developers which may explain this dominating trope among video game protagonists. The purpose of this experiment is to measure the empathy of white male gamers for two virtual avatars, one that differs in race (black male) and one that differs in gender (white female). I predict that participants will feel the most empathy for white male avatars that most closely resemble them. I hope to also measure the degree of empathy felt for dissimilar avatars to help game developers create more diverse protagonists without alienating their consumer base.

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## **Evaluation of Renal Markers of Type 1 Diabetes in Sprague Dawley Exposed to 2-Aminoanthracene**

**Author: Tanya Pierre**

**Adviser: Professor Worlanyo Gatto**

The incidence of type 1 diabetes (T1D) as well as its associated risk of developing chronic kidney disease (CKD) or end stage renal disease (ESRD) are on the rise. T1D is an autoimmune disease in which insulin producing beta cells are destroyed. T1D is manifested as increased expression of inflammatory proteins, elevated glucose concentrations, and decreased insulin levels. Increased incidence of T1D has been suggested to be a result of environmental factors such as exposure to polycyclic aromatic hydrocarbons (PAH). 2-aminoanthracene (2AA) is a PAH that has been associated with the onset of early diabetic symptoms. This study was conducted to identify if 2AA dietary ingestion would induce T1D renal injuries. To accomplish the research objective, three weeks old male Sprague Dawley rats were assigned into three

2AA dietary ingestion groups (0 mg/kg, 50 mg/kg and 100 mg/kg) for twelve weeks. Animals were evaluated for their food intake, body weight, total body and kidney weight after euthanasia. Further experiments involving the analysis of serum glucose, creatinine concentration, albumin-creatinine ratio, and expression of inflammatory and renal injury gene markers were performed. The Sprague Dawley rats in the 100 mg/kg group lost 5% less weight than the other treatment groups and converted roughly 3% more of their food intake into body mass. Renal histopathology indicated no significant difference between groups. The kidney weight per body weight of the 100 mg/kg treatment group was 30.1% greater than the control group. Creatinine concentration of the 100 mg/kg group was 46.2% greater than the control group. Serum glucose levels were significantly elevated in rats exposed to 2AA. On the contrary, albumin concentration was significantly reduced in 2AA-treated rats. T1D and renal markers of injury genes such as FABP1, SPP1, IL-1B, IL-7 were elevated in treated groups. These results suggest that 2AA may induce the early diabetic renal injuries of hyperfiltration and microalbuminuria.

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## Characterizing Corallivory in Stoplight and Princess Parrotfish

Author: Sydney Popsuj

Adviser: Professor Lock Rogers

Parrotfish are considered vital to the health of the Mesoamerican Barrier Reef based on their large consumption of algae. After the rapid and somewhat unexplained die-off of *Diadema antillarum*, or the long-spined sea urchin, responsible for much of the algal grazing on the reef, parrotfish (Scaridae) replaced the urchins as the primary algal grazer. However, many studies have noted corallivorous habits in the parrotfish diet. With teeth capable of biting through rock, an impressive appetite, and roaming behavior, these parrotfish can damage the corals within their territories. This topic has led many scientists to wonder if parrotfish truly are vital to reef health and has sparked discussion on their trophic status. Previous research has suggested reproductive phase and habitat could affect corallivory among parrotfish. Parrotfish species vary drastically in size, and this could impact interspecies variation in corallivory. Reproductive phase could also drastically impact diet. To better understand corallivorous behavior among parrotfish, more comprehensive study including phase, habitat, and different species is an absolute necessity. Two species with noticeable size variation were selected for this study. *Sparisoma viride*, and *Scarus taeniopterus* of different phases were monitored during feeding at twelve different sites. In specific, the purpose of this study was to elucidate the following questions vital to understanding parrotfish diet and behavior: (i) does habitat impact corallivory? (ii) is there interspecies variation in corallivory? (iii) does phase of parrotfish impact corallivory?

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## Observations of the 18 cm OH lines of 23 comets

**Authors:** Brynn Presler-Marshall, Aysha Rahman

**Adviser:** Professor Amy Lovell

Comets provide a unique opportunity to study the early solar system. Understanding comets, which are made of roughly 80 percent water ice and 20 percent silicate dust and other materials, is critical to understanding the formation of the solar system. Ground-based observations using the 100 meter Green Bank Telescope and 305 meter Arecibo telescope allowed for mapping and modeling of the gas production rates and outflow velocities of 23 comets as they neared perihelion. Presented here are preliminary results regarding gas production rates and velocities of OH molecules in a typical comet based on data that spans 16 years and over 30 comets. The molecule velocities range from 0.47 km/s to 3.273 km/s, while the gas production rates cover three orders of magnitude from 0.36 to  $123.9 \times 10^{28}$  molecules per second.

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## Rab8, a substrate of the Parkinson's disease kinase LRRK2, is mobilized under cellular metabolic stress

**Author:** Stephanie Sanchez

**Adviser:** Professor Stacey Dutton

**Research Mentors:** Adamantios Mamais and Mark R. Cookson

Parkinson's Disease (PD) a progressive neurodegenerative disorder, characterized by atypical alpha-synuclein deposition and neuronal loss in the substantia nigra. PD has been shown to be both sporadic and genetic, with a mutation in the gene encoding for leucine-rich repeat kinase 2 (LRRK2) being the most common cause of inherited Parkinson's. Mutations linked to Parkinson's affect the enzyme activity of this protein in vitro and in vivo. This is important because LRRK2 has been linked to numerous cellular processes including vesicular trafficking through interactions with Rab GTPases. In 2016, a small GTPase, Rab8, which is a part of intercellular trafficking from the endoplasmic reticulum to the trans-Golgi and the plasma membrane, was identified as main LRRK2 substrate (Steger et al, 2016). We have previously shown in our lab that metabolic stress induces dephosphorylation of LRRK2 in culture (Mamais et al, 2014). These conditions mimic the biochemical effects of PD-linked mutations. We use acute ATP depletion as a model of metabolic stress associated with aging and neurodegenerative diseases. Preliminary data from our lab suggests that expression of LRRK2 carrying PD-linked mutations induces sequestration of Rab8 in cellular cytoplasmic inclusion. Suggesting that mutant LRRK2 can alter physiological functions of Rab8a via phosphorylation, which could induce Rab8 GTP binding and activate the protein (Steger et al., 2016)

## One-Bit Sensing: Phase Transitions for the RIP Property

Authors: Emily Smith, Amadou Bah, Bryson Kagy

Adviser: Professor Rachel Rossetti

We study dimension reduction in the One-bit context. We take a finite collection of  $n$  high dimensional vectors and map them into an  $m$ -dimensional Hamming cube. Through this map, we are able to assess the effectiveness of One-bit sensing after concluding that it is possible to reduce the volume of data, while maintaining the structural integrity of the original set. We show that the probability of satisfying the Restricted Isometry Property is a phase transition within tight bounds form. Finally, these bounds for One-bit sensing are essentially the same as those in Linear compressive sensing, even though the One-bit case only uses a few bit measurements.

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## Investigating the Effects of Environmental Noise on African Elephants in a Zoo Setting

Author: Alice Van Derveer

Adviser: Professor Bonnie Perdue

African elephants (*Loxodonta africana*) are complex animals with good hearing and the ability to communicate via low-frequency seismic signals. However, little research has been done on the impact of environmental noise, particularly construction noise, on the welfare and behavior of the African elephant. Zoo Atlanta is currently remodeling the land and building next to the African elephant exhibit, creating another layer of noise on top of the sounds from zoo visitors and traffic. Due to the elephants' sensitivity to low-frequency sounds, we hypothesized that the sounds coming from the construction zone may be affecting the elephants' wellbeing and inducing stereotypic behavior indicative of stress in the animals. We used the Audacity software program to measure the amplitude and frequency of the sounds around the elephant enclosure, as well as an ethogram to keep track of normal and stereotypic behaviors.

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## The Role of MeCP2 and Dysbindin on AP-3 Expression in N2A cells

Authors: Jhodi Webster, Christin Coppin, Daija Dennis, Rachel Thompson,  
Dr. Jennifer Larimore

Adviser: Professor Jennifer Larimore

BLOC-1, a protein trafficking complex, and MeCP2, a transcription factor, are both important for proper brain function and the mutations of these will lead to adverse effects. BLOC-1 functions to traffic proteins from endosomes to lysosomes and more specifically, in neurons, it assists in the trafficking of synaptic vesicles to the axon terminal. The complex is made up of 8 subunits - including dysbindin and palladin - that serves as directors for the vesicles. MeCP2 transcribes and regulates over 2000 genes. Mutations in BLOC-1 (dysbindin knockdown) and MeCP2 (R255X) are noted in schizophrenia and Rett's syndrome patients, respectively. One of the proteins that MeCP2 regulates is AP3 which is the binding partner of dysbindin. In this experiment, mouse neuroblastoma (N2A) cells will be used to host the MeCP2 mutation, the dysbindin knockdown and a mixture of the MeCP2 mutation and dysbindin knockdown. These will allow us to decipher in which of the aforementioned the mRNA levels will be different by analyzing resulting AP3 levels. It is expected that there will be reduced AP3 and mRNA levels with the R255X along with in the mixture of the R255X and the dysbindin knockdown. For the dysbindin knockdown only, however, it is expected that there will be high levels of AP3. These results will allow us to further investigate the effect and function of the BLOC-1 complex and transcription factors such as MeCP2 as well as their role in neurodevelopmental disorders.

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## The effects of nest mites on variation of telomere length in nestling barn swallows

Authors: Vaughn Wicker, Alina Ibrahim, Jazz Stephens

Adviser: Professor Iris Levin

Telomeres are caps on the ends of chromosomes that protect coding regions from damage and shortening due to replication. In addition to their function in DNA replication, telomere length is an important predictor of fitness and organismal performance. While previous research has demonstrated that telomere length is heritable, sources of environmental variation and their effects on telomere length remain largely unexplored. In this study, we examined the effects of nest parasites on the relative telomere length of North American barn swallow (*Hirundo rustica erythrogaster*) nestlings. We utilized an egg cross-foster design (switching eggs between synchronously laid nests) in order to separate the genetic and environmental factors influencing nestling telomere length. All nests were sterilized with a heat gun to remove nest parasites and then 100 nest mites were added to half of the nests. The other half of the nests were left sterile as a control. A blood sample from nine day old nestlings was used for molecular sexing, quantification of relative telomere length, and for parentage analysis using microsatellite markers. We hypothesized that nest mites affect the quality of the nest environment, and predicted that nestlings in parasitized nests would have relatively shorter telomeres compared to nestlings raised in sterile (mite-free) nests; however, our data did not support our hypothesis. This could be due to low mite intensity in parasitized nests and some mites in nests that had been sterilized.

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## **Team Global Challenge: Food Waste**

**Authors: Sydney Yeh, Stephanie Sanchez, Nyjia Lott, Adriana Diaz  
Relebohile Masitha**

**Advisers: Regine O. Jackson and Susan  
Kidd, Director of Sustainability**

This presentation will describe our proposal for Team Global Challenge 2018. The topic of this year's Challenge was "Food Waste/ Wasted Food." Our project site was Renfroe Middle School, which is part of the City Schools of Decatur. Food loss is a critical global challenge in our world today, and various sectors of our society are engaged in debates about how to reduce food waste and provide healthy food for a growing population. Not only does every country in the world contribute to the problem, food waste occurs at the consumer level, the retail level, and the production level. In addition to the economic and environmental consequences, there are also a range of health and social problems related to food waste. Yet the benefits of fighting food loss are easy to see. Our goal was to consider how to recover wholesome excess food, conserve natural resources, and help engage our community partners at Renfroe Middle School in solving this problem. While there are a number of unique challenges that schools face which complicate this issue -- such as reduced price meal plans and limited lunch periods -- we argue that schools have a special role in not only reducing, recovering, and recycling food waste on their premises, but also in educating the next generation. Our proposal promises to reduce costs and greenhouse emissions, and support broader efforts to eliminate hunger.

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## **A Brief Overview of Telescopes: Comparing the Hubble Space Telescope and The Very Large Array**

**Author: Theresa Melo**

**Adviser: Professor Amy Lovell**

Similar to a microscope allowing humans to look at very small objects like minerals or cells, telescopes are our lens to the cosmos. As a result, we have been able to map, study, and look back at the history of our universe. The difference between the world's first telescope and the many "world-renowned" telescopes we know of today highlights a development in both the technology and physics behind an instrument. The vast array of telescopes help us answer different questions, such as what is the orbital period of the smaller star in a binary system or how fast is the universe expanding. The construction of a telescope is altered to be able to address such questions. By comparing the Very Large Array (VLA) and the Hubble Space Telescope (HST), this presentation will address what makes them fundamentally different by looking at the scientific contribution and the design aspects; highlight accomplishments thus far; and conclude with what observers and enthusiasts can look forward to. This will be accomplished by a scientific literature review, gathering of any public information on how the telescope works, such as user guides or educational outreach materials, and an interpretation of the final results.