

# 19<sup>th</sup> Annual Symposium of Student Scholars

## Undergraduate Research/ Creative Activity Reception

April 17, 2014  
Convocation Center

### Program

4:00pm – 5:00pm

Undergraduate Research Reception

Remarks by

Dr. Dan Papp, President

Dr. Ken Harmon, Provost, Vice President for Academic Affairs

Names read by Dr. Amy Buddie, Associate Director for

Graduate Student Support and Undergraduate

Research/Creative Activity - Center for Excellence in Teaching

and Learning, Associate Professor of Psychology

5:00pm – 6:00pm

Poster Session

6:00pm – 9:15pm

Oral Presentations and Performances

April 17, 2014

Dear Mentors and Mentees,

We wish to thank you for attending this special ceremony in honor of all of you for your engagement in scholarship activities in 2013-2014. We hope that your experience has been significant and trans-formative. Your journey has only begun. The two of you will interact for years to come and become professional colleagues. At KSU we believe that undergraduate scholarship is an essential component of our mission to mentor students and provides an opportunity to deepen your learning and ultimate post-graduate success. This mentoring relationship will not only increase retention, progression, and graduation success but will also create a pool of committed, successful, and active alumni. We thank you for engaging in the process of discovery, not only in research and creative activities, but also in the professional relationship.

Sincerely,



Michele DiPietro, Ph.D.  
Associate Professor of Statistics and  
Executive Director of CETL



Amy Buddie, Ph.D.  
Associate Professor of Psychology and  
CETL Associate Director for Graduate Student Support and Undergraduate Research/Creative  
Activity

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Reception Honorees

## Bagwell College of Education

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*Why Do I Have To Take This Class? - A Proposed Study Of How Mathematics Content Courses Affect Pre-Service Teachers' Beliefs*

Caitlin Walkey

Faculty Mentor: Susanna Molitoris Miller

## Coles College of Business

### **Accountancy**

*The Effect Of Social Media Usage On Physical Health*

Samantha Slicker, Sean Whealton, William Tyler, Therese Stanley

Faculty Mentor: Amy Buddie, Ken Hill, Phillip Poskus

### **Economics, Finance and Quantitative Analysis**

*Internet Governance*

Sarah Moore, Natasha Hunte, Sarah Kelsey, Krista Whatley

Faculty Mentor: Amy Buddie, Ken Hill, Phillip Poskus

*Is Social Media Making Me Dumber?*

Stephanie Miller, Rebecca Duckworth, Jessica Grindley, Jessica Zurheide

Faculty Mentor: Amy Buddie, Ken Hill, Phillip Poskus

*Math Phobia And Metacognition In Calculus 1*

Erica Moody

Faculty Mentor: Nancy Burney

### **Management and Entrepreneurship**

*The Influence Of Social Media On College Students In Brazil And The United States*

Stephanie Miller, Rebecca Duckworth, Jessica Grindley, Jessica Zurheide

Faculty Mentor: Amy Buddie, Ken Hill, Phillip Poskus

# College of Humanities and Social Sciences

## **Communication**

*Who Wants to Join the Fast? A Thematic Analysis of an Anonymous "Pro-Ana" Twitter Account*

Stephanie Hovis

Faculty Mentor: Erin Ryan

## **English**

*Put Out The Flame: Moving Forward To A Tobacco-Free Generation*

Claire Bohrer

Faculty Mentor: Letizia Guglielmo

*"Sideways With A Sunflower Ribbon": Developing A Ten-Minute Play*

Jennifer Butler, Andrew Harrison, Ashley Schomburg, Anna Lee, Natalie Corbin

Faculty Mentor: Margaret Baldwin, Aaron Levy

*"The Answer My Friend Is Blowin' In The Wind"*

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Mary Scannavino  
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Faculty Mentor: John Moran

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Faculty Mentor: Lauren Tagliatela

*Infants' Age-Specific Changes In Object-Oriented Social Referencing*

Anna Rosenhauer, Savannah McGrath, Adrienne Achille, Lindey Maza, Jade Wilson

Faculty Mentor: Nicole Martin

*Differences In Mental Health Perception In KSU And USIL Students*

Jennifer Smith, Victoria Sowell

Faculty Mentor: Gail Scott

*Food Preferences And Influencing Factors Across Cultures*

Yanmin Sun

Faculty Mentor: Sharon Pearcey, Ginny Zhan

*Efficacy Of Student-Led Study Groups*

Allison Venoy, Elizabeth Grissom, Amanda Watkins, Jessica Dean

Faculty Mentor: Gail Scott

*What Would You Do? Factors Affecting Blame-Taking Behavior*

Geena Washington, Oscar Mendez

Faculty Mentor: Jennifer Willard

# College of Science and Mathematics

## **Biology and Physics**

*Analyzing Embryo Morphology On Day 3 And Day 5 Post-Fertilization With Comparative Genomic Hybridization*

Katie Allgood

Faculty Mentor: Melanie Griffin

*Different Methods In Calculus: Effect On Students*

Coretha Antchouey

Faculty Mentor: Nancy Burney

*Doing Diversity: Three Years Of N/A\**

Gaius Augustus, DiAngele Augustus

Faculty Mentor: Nicole Martin

*Does The Aristaless/Arx Transcription Factor Control Kal-1/Anosmin Gene Expression?*

Joy Chibuzo

Faculty Mentor: Martin Hudson

*The A-Class Ephrin Efn-4 Is Required For Axon Outgrowth*

Cory Donelson, Alicia Schwieterman, Danielle Ereddia

Faculty Mentor: Martin Hudson

*Measuring Zinc Trafficking In Response To Hemorrhagic Venom*

Veronica Garbar

Faculty Mentor: Eric Albrecht

*Crushing Resistance Of Elimia Modesta And E. Carinocostata In Lower Etowah River Basin Tributaries*

Ashlee Grimm

Faculty Mentor: William Ensign

*Arbuscular Mycorrhizal Fungal Colonization In The Black Willow (Salix Nigra) And American Sycamore (Platanus Occidentalis)*

Joshua Hashemi, Barbie Hawkes

Faculty Mentor: Paula Jackson

*Quantifying Potential Differences In Trophic Relationships Across Freshwater Streams Of Varying Urbanization*

Daniel Hoffman

Faculty Mentor: Troy Mutchler, William Ensign

*Exploring The Impacts Of Urbanization On Stream Food Webs: Does Urbanization Affect Periphyton Abundance And Composition?*

Katharine Horning

Faculty Mentor: Troy Mutchler, William Ensign

*Developing An RNA-Interference Assay To Knockdown Eph Receptor Gene Expression In Developing Neurons*

Bryan Lynn

Faculty Mentor: Martin Hudson

*Univariate And Multivariate Assessment Of Habitat Preferences Of Stream Fishes*

Casey Quade, Beth Drobinski

Faculty Mentor: William Ensign

*Growth Rate Of Tipulidae On Ligustrum Sinense And Liriodendron Tulipifera*

Donna Saylor

Faculty Mentor: William Ensign

*Urbanization And Gut Length In Campostoma Oligolepis*

Michael Schooling

Faculty Mentor: William Ensign, Troy Mutchler

*Spatial Delineation Of Monoclonal Geneotypes In The Seagrasses Thalassia Testudinum And Halodule Wrightii In The Gulf Of Mexico's Florida And Alabama Coastlines*

Whitney Smith

Faculty Mentor: Thomas McElroy, Troy Mutchler, Joseph Dirnberger

*Kal-1 Dependent Axon Branching Is Caused By Multiple Heparan Sulfate Proteoglycans*

Alyse Steves, Austin Howard, Alicia Schwieterman

Faculty Mentor: Martin Hudson

*Comparison Of Protein Purification Systems For Supporting Fermentation Development In The Biologics Industry*

Ezibobiara Umejiego

Faculty Mentor: Melanie Griffin

*The Role Of NeuroD In The Transcriptional Control Of Kal-1/Anosmin Gene Expression*

Taylor Voyles

Faculty Mentor: Martin Hudson

## **Chemistry and Biochemistry**

*Creativity In Mathematics: Stimulating Students' Creativity To Affect Long-Term Knowledge*

Aqsa Adnan

Faculty Mentor: Nancy Burney

*Using Calculus To Find The Average Value Of Kennesaw State University Available Monetary Funds From 2008 To 2013*

Michael Baker, Tony Guzman, Chelsea Harrod, Abdelsalam Sharkasi

Faculty Mentor: Flor Espinoza

*New MaloNHCs And Their Corresponding Anionic Thiones: Synthesis And Coordination*

Chance Boudreaux, Bradley Norvell

Faculty Mentor: Daniela Tapu

*Role Of The Steroid And Xenobiotic Receptor (SXR) And The Constitutive Androstane Receptor (CAR) In ABCB1 Expression*

Marina Chesnokova

Faculty Mentor: Jennifer Powers

*Saponification Value And GC Analysis Of Olive Oil*

Daniel Corella

Faculty Mentor: Marina Koether

*How Calculus Proves Liquid Courage Works, Finding The Average Number Of Drinks Needed To Receive The Maximum Phone Numbers From People We Would Like To Ask Out*

Cody Goss, Skyler Mize, Niloufar Mehrjerdian, Kyle Sekellick

Faculty Mentor: Flor Espinoza

*The Effects Of Protonated Pyrrole Isomers Tagged With Argon*

Christopher Harper

Faculty Mentor: Martina Kaledin

*Alternative Reductants For The Catalytic Oxacyclization Of A 1,4-Dihydroxy-5-Alkyne To A 3-Hydroxytetrahydropyran*

Chelsea Harrod

Faculty Mentor: Frank McDonald, John Haseltine

*Understanding Proteases Through Molecular Orbital Interactions*

David Kercher, Krupa Patel

Faculty Mentor: John Haseltine

*Towards The Synthesis Of Tris(N-Heterocyclic Carbenes)*

David Lee

Faculty Mentor: Daniela Tapu

*Ac-Sar-Sar-Pro-Oet Tripeptide Multi-Step Synthesis*

Santiago Mestre Fos, Christina Taylor

Faculty Mentor: John Haseltine

*Tripeptide Solvolysis As A Model For Proteolytic Enzymes*

Cody Padgett, Sarah Knapp

Faculty Mentor: John Haseltine

*Investigation Of The Role Of The Vitamin D Receptor And The Farnesoid X Receptor In Expression Of ABCB1*

Kirt Ronig

Faculty Mentor: Jennifer Powers

*GC-MS Method Development for  $\alpha$ -Pinene in Juniper Leaves*

Ivana Turner

Faculty Mentor: Marina Koether

## **Mathematics and Statistics**

*Improving Existing Tumor Growth Models*

Victoria Awokunle

Faculty Mentor: Philippe Laval

*Applying Queuing Theory To Traffic Modeling*

Zachary Carter

Faculty Mentor: Anda Gadidov

*Mathematical Analysis For An HIV/AIDS Model*

Ana Cienfuegos

Faculty Mentor: Liancheng Wang

*The Impact Of Learning Assistants In The Classroom*

Ana Cienfuegos

Faculty Mentor: Nancy Burney

*Independent Bishop And Bouncing Bishop 'Armies' On Various Chessboards*

James Eubanks

Faculty Mentor: Ken Keating

*Cyclic Dominating Sets In Cayley Graphs*

Matt Force, Jon Woltz

Faculty Mentor: Joe DeMaio

*Student Study Networks: Does Size Matter?*

Matt Force

Faculty Mentor: Nancy Burney

*Can Zombies Be Stopped?*

Luke Forkner, Evan Moore

Faculty Mentor: Meghan Burke, Flor Espinoza

*A Study On Terroristic Populations And Their Activity*

Henry B. Grimes

Faculty Mentor: Flor Espinoza

*The Generalized Viète Formulas*

Benjamin Hoffman

Faculty Mentor: Josip Derado

*Control Of Carbon Dioxide Gas In The Atmosphere: Preliminary Results*

Joshua Howard

Faculty Mentor: Ana-Maria Croicu

*Frog On A Log: Do Visual Tools Help Students Learn?*

Michael Magruder

Faculty Mentor: Nancy Burney

*The Cold Blue Flame: An Analysis Of The Relationships Between Temperature And The Price Of Natural Gas*

Galen Maret

Faculty Mentor: Lewis VanBrackle

*Tree Decompositions Of Cayley Digraphs On Word-Degenerate Connection Sets*

Evan Moore

Faculty Mentor: Erik Westlund, Mari Castle



*Interpolation Of Quadratic Functions By Linear Splines*

Maice Muallem

Faculty Mentor: Yuliya Babenko

*Modeling Traffic At An Intersection*

Dennys Rosales, Roger Hu

Faculty Mentor: Anda Gadidov

*The Card Collector Problem*

Michael Thomas

Faculty Mentor: Anda Gadidov

*Dominating Sets in Cay( $\mathbb{Z}_n, \{\pm 1, \pm 3, \dots, \pm 2k-1\}$ )*

Jon Woltz, Matt Force

Faculty Mentor: Joe DeMaio

*Exam Performance In A Calculus Class With Learning Assistants*

Jon Woltz

Faculty Mentor: Nancy Burney

## **Mathematics Education**

*Extracurricular Study Sessions And Student Achievement*

Casey Belli

Faculty Mentor: Belinda Edwards

*Student Proximity To Professor And Presence Of A Learning Assistant As Factors Of A Test Grade*

Erika Jaeger

Faculty Mentor: Nancy Burney

*Pinpoint The Midpoint: A Focus On The Parabola*

Caroline Johnson

Faculty Mentor: Belinda Edwards

*Grieving Through Probability*

Erin Talley

Faculty Mentor: Belinda Edwards, Wendy Sanchez

# College of the Arts

## **Art and Design**

*Disassembling The Roman Mosaic: The Roles Of Indigenous Peoples In The Roman Mosaic From Ancient Uthina, Tunisia*

Lauren Bearden

Faculty Mentor: Kristen Seaman

*Augmented Reality (AR) Design Research For Connecting Print And Interactive Media In Graphic Design*

Tyler Derek Behl, Anna Frances Clemens, Darren Lance Shonyo, Selina Walker

Faculty Mentor: Kristine Hwang

*Mosaics At The Baths Of Neptune*

Monisha Bernard

Faculty Mentor: Kristen Seaman

*Queer Identity In Alan Moore's Watchmen*

Shannon Broome

Faculty Mentor: Diana McClintock

*An Approachable God: Hermes In The Temple Of Hera At Olympia, Greece*

Jane Custer

Faculty Mentor: Kristen Seaman

*Ancient Egyptian Cosmetics: More Than Meets The Eye*

Ashley Hazel

Faculty Mentor: Jessica Stephenson

*Connections*

Mariah Heilpern

Faculty Mentor: Diana McClintock, Daniel Sachs

*The Mughal Marvel That Is The Taj Mahal: Symbolic And Nostalgic Use Of Past Tomb Architecture*

Mariah Heilpern

Faculty Mentor: Kristen Seaman

*Wonder Woman: Feminist Icon Of The 1940s*

Angelica Perez

Faculty Mentor: Diana McClintock

## **Music**

*Vincent Bach And The Modern Trumpet*

John Thomas Burson

Faculty Mentor: Edward Eanes

*Richard Wagner's Influence On Adolf Hitler*

Lisa Mason

Faculty Mentor: Edward Eanes

## Wellstar College of Health and Human Services

### **Exercise Science and Sport Management**

*The Relationship Between Sensory Integration, Balance, And Reaction Time In Older Adults*

Courtenay Hicks, Ashlyn Schwartz, Sara Morris, Jon Garrett, Elizabeth Thomas

Faculty Mentor: Tiffany Esmat, David Mitchell

*Teaching Beyond The Classroom: Supplemental Video Study*

Jacobi Mapp

Faculty Mentor: Nancy Burney

*The Relationship Between Blood Pressure, Cardiovascular Function, And Executive Function In Older Adults*

Ashlyn Schwartz, Courtenay Hicks, Sara Morris, Jon Garrett, Elizabeth Thomas

Faculty Mentor: Tiffany Esmat, David Mitchell

### **Health Promotion and Physical Education**

*Technology and Health: Sickle Cell Disease ... Is There an App for That?*

Gina Mills, Kaylynn Ewaskiew

Faculty Mentor: Jasmine Ward

### **Nursing**

*Foreign Direct Investment: Attitudes About The Economy And The Effects Of Foreign Investment*

Matthew Buxton, Kaylee Rodenstine, Shannon Mayo

Faculty Mentor: Amy Buddie, Ken Hill, Phillip Poskus

*Comprehensive And Alternative Health Courses In Health Programs Of Georgia's Colleges And Universities*

Katie Ford, Amara Igboneje-Asor, Ansley Candy, Karterria Finkley, Breyanna Mikel, Khalid Christopher

Faculty Mentor: Jasmine Ward

*The Worldwide Crisis Of Global Aging*

Haley Smith, Jessica Grimes, Briana Olsen, Melissa Turvy

Faculty Mentor: Amy Buddie, Ken Hill, Phillip Poskus

*Awareness And Opinion Of College Students On Resource Waste*

Alexis Traylor, Kellie Walls, Jimmy Gall, Austin Anderson

Faculty Mentor: Amy Buddie, Ken Hill, Phillip Poskus

# Presentation Abstracts

## **Why Do I Have To Take This Class? - A Proposed Study Of How Mathematics Content Courses Affect Pre-Service Teachers' Beliefs**

Caitlin Walkey

Faculty Mentor: Susanna Molitoris Miller

Bagwell College of Education

Elementary and Early Childhood Education

The newly implemented Common Core State standards call for changes in mathematics instruction which may seem very different from what most adults experienced as children. Early childhood education majors often take courses specifically designed to address understanding the kinds of mathematics they will encounter in their future classrooms. It is intended that these courses will both increase student's mathematical knowledge and provide an opportunity for them to experience ways of thinking about mathematics that they may not have encountered in their previous education. This presentation will provide an overview of a proposed study exploring education majors' beliefs at the end of these kind of mathematical content courses. The two main components will be (1) students' beliefs about the teaching and learning mathematics in general and (2) students' beliefs about their own mathematical abilities. The presenters are requesting feedback on the survey instrument they plan to use to collect data at the end of this Spring semester.

## **Math Phobia And Metacognition In Calculus 1**

Erica Moody

Faculty Mentor: Nancy Burney

Coles College of Business

Economics, Finance and Quantitative Analysis

Math anxiety, sometimes referred to as “math phobia,” is a growing occurrence among high school and college level students. Math anxiety is associated with a person’s feelings of inadequacy and lack of confidence in the field of mathematics. To understand the source of math anxiety, it is important to examine the strength of students’ metacognitive skills. Metacognition is commonly defined as “knowing about knowing.” It encompasses two domains—metacognitive knowledge and regulation of cognition. For the purpose of this research, the metacognitive focus is on regulation of cognition, which includes the three subdivisions of planning, monitoring, and evaluation. Participants include students from two consecutive Math 1190 (Calculus I) courses. Students first completed a four-question task consisting of material from the second exam. Then, each participant assigned a value of perceived difficulty through the use of a Likert scale. Finally, they provided information indicative of their confidence level for each question. The purpose of this research is to

examine the students' metacognitive abilities and how those abilities relate to their confidence in, and perception of, mathematics.

### **Who Wants to Join the Fast? A Thematic Analysis of an Anonymous "Pro-Ana" Twitter Account**

Stephanie Hovis

Faculty Mentor: Erin Ryan

College of Humanities and Social Sciences  
Communication

This thematic analysis is an exploration of one "anonymous" twitter user's documentation of her struggles with her eating disorder(s) over the course of nine months. Through an examination of the language and images in her tweets, as well as the interactions with other "anonymous" twitter users who also battle with their own food demons, this paper continues the recent idea that eating disorders are, in fact, a contagious disease. Although eating disorders are not developed quickly through a sharing of germs, the way the media, scholars, the infected, etc. discuss the whys and, most importantly, the hows can spread just as easily. This paper examines the romanticized, competitive, and yet tight knit support system that encourages and enables all eating disordered brothers and sisters to continue on with their journey-- not their recovery. @Anaforlife55, the studied Twitter user, is quickly approaching her tenth year with an eating disorder, but this nine month snapshot of her journey before and after entering rehab for eating disorder leaves readers with much to chew on.

### **Put Out The Flame: Moving Forward To A Tobacco-Free Generation**

Claire Bohrer

Faculty Mentor: Letizia Guglielmo

College of Humanities and Social Sciences  
English

As cigarette smoking kills nearly half a million Americans each year, it remains the leading preventable cause of premature death in the United States. The question as to why people would voluntarily choose to start such a harmful addiction has haunted me ever since I discovered what the act of smoking actually encompassed. This topic becomes more relevant to me when I remember my personal experience with smoking. As both my grandma and grandpa were avid smokers, they died from lung cancer before they reached the age of sixty. Having this personal connection with smoking motivates me to inform others of what this terrible addiction is capable of. Not only does smoking affect the smoker, but tobacco-use affects everyone who genuinely cares for the smoker. What further promoted me to engage

with the topic of smoking cessation, however, was the Surgeon General's latest discoveries citing additional negative effects that smoking has on health. These discoveries have led to an uprising of smoking cessation efforts that have recently been presented in the latest news stories and advertisements. From CVS Pharmacy's decision to ban the sale of tobacco products in their stores, the FDA's new youth tobacco prevention campaign advertisements, and the increased cigarette taxes from the government, these movements have all led up to the current hopefulness that health officials are revealing as they begin to predict the end of cigarette smoking in America. Ultimately, I feel that by specifically targeting the teenagers of today and persuading them against starting this deadly addiction, we will be able to remove this option from their lives, as they are hopefully the future adults who will exist as the future tobacco-free generation. Overall, my research topic aims at the main goal of eliminating the dangerous addiction of smoking through better health decisions and more updated and available health information for teens.

### **"Sideways With A Sunflower Ribbon": Developing A Ten-Minute Play**

Jennifer Butler, Andrew Harrison, Ashley Schomburg, Anna Lee, Natalie Corbin  
Faculty Mentor: Margaret Baldwin, Aaron Levy

College of Humanities and Social Sciences  
English

"Sideways with a Sunflower Ribbon" by Jennifer Butler (English/Professional Writing), was one of seven plays selected for the annual KSU Ten-Minute PlayFest, produced by the Department of Theatre and Performance Studies. PlayFest, open to all KSU students, is an annual interdisciplinary project between the departments of Theatre and Performance Studies and English. Over forty KSU students from TPS, English, and Integrated Studies participated in PlayFest, which was produced on March 8, 2014, in the Howard Logan Stillwell Theater on the KSU campus. In honor of the Year of Japan, all submitting playwrights were challenged to use the famous "frog haiku" written by Bashō, a medieval Japanese haiku master, as the seed of inspiration for their plays. Jennifer began "Sideways" in Dr. Aaron Levy's introductory playwriting course in fall 2013. Once her play was selected for PlayFest, she worked under the guidance of Professor Margaret Baldwin, faculty mentor and director, rewriting through several full drafts of the script and then seeing the play through over hours of rehearsal and production as a staged reading. Andrew Harrison and Ashley Schomburg, both TPS majors with concentrations in acting, originated the roles of Mitchell and Erica respectively, in Jennifer's play. Ashley Anna Lee (TPS), served as the stage manager for "Sideways" and for the entire Ten-Minute PlayFest. Natalie Corbin (TPS) served as Assistant Stage Manager and Sound Technician. As a member of Professor Baldwin's Performance Composition class in spring 2014, Jennifer participated in the development and performance of other short plays for PlayFest. Throughout the process, she avidly supported the work and development of other



playwrights in addition to her own work. Jennifer's enthusiasm, passion, and dedication throughout the entire process modeled the work of a scholar-artist.

### **Survivors Of Intimate Partner Violence: Effective After-Care Implementation**

Sherri-Anne Forde

Faculty Mentor: Letizia Guglielmo

College of Humanities and Social Sciences

English

Intimate partner violence (IPV) can be defined as physical, sexual, or psychological trauma caused by an intimate partner or spouse (CDC, 2013). According to a National Violence against Women Survey conducted in 2002, the American Psychiatric Association notes that approximately 5 million cases of IPV occur each year (APA, 2005). The Center for Disease Control and Prevention (2013) corroborates the ongoing validity of this statistic in their 2011 report. In the fight against violence against women, prevention and intervention are vital aspects in creating success for victims of IPV. Hundreds of programs in the United States have dedicated their services to women's advocacy with programs geared toward prevention and intervention. Even after intervention however, transitioning from "œvictim"® to "œsurvivor"® status has been proven to create multiple challenges for IPV survivors. These struggles can include, but are not limited to, physical manifestations, such as asthma, cardiovascular disease, or pregnancy difficulties; psychological challenges, such as depression, low self-esteem, or anxiety; and social consequences, such as isolation or homelessness (CDC, 2013). The Office on Women's Health (2011) suggests that many victims return to their abusers due to financial difficulties, social isolation, or fear. This research-based study attempts to uncover the components of effective IPV after-care, as well as discover the prevalence and relevance of these components as they exist in after-care programs in the United States today. It is imperative for advocacy programs to recognize the ongoing battle that occurs both after a victim has abandoned an abusive relationship and when on their own post-intervention. For this reason, IPV survivor follow-up and after-care programs must cater to the needs of survivors in specific ways that will encourage more successful transition into society, as well as ongoing stability post-transition.

### **Casting Lines And Casting Spells: Southern Mysticism In Lake Horton**

Brittany Higginbotham

Faculty Mentor: Elizabeth Giddens

College of Humanities and Social Sciences

English

This creative nonfiction piece was written for Environmental Writing and Literature. It chronicles the effects of a long-standing drought on Lake Horton in Fayette County, Georgia, and how it has changed the ways in which I view my home. Growing up on the banks of the lake has drastically influenced my character. Drawing upon personal experience, childhood memories, and extensive research on the lake's history spanning over twenty years, I illustrate the ways in which environmental issues alter both a place and those that are exposed to its effects.

## **Global Library**

Tiffani Reardon

Faculty Mentor: Tamara Powell, Lucie Viakinnou-Brinson

College of Humanities and Social Sciences

English

A few years ago CETL provided funding for a service learning project in Dr. Lucie Viakinnou-Brinson's class in which her students wrote children's book in French and then they were all sent to Bénin, Africa. Last year she came to Dr. Tamara Powell asking about an extension of the project; she wanted to put the books online so that all students could benefit from the books. When they came to me and asked if I could do it, I took the project and made it my own. I created an entirely new website for the books, originally called the "KSU Reader" and recently changed to the "Global Library", and found a program to make the PDF versions into online page-flipping books (Flip PDF Professional). After starting to put the French books online, we had the idea to expand the languages. Currently you will find many French books up, but none in other languages; this will change very soon. We are reaching out to other professors in the Foreign Languages Department at KSU to expand this project to include all other languages and expand this project to benefit students from all over the world. The Sowers of Knowledge group on campus currently provides reading hour in several countries of Africa, including Benin (Bénin), Ivory Coast (Côte d'Ivoire), Senegal (Sénégal), and now Ethiopia (Ethiopie); we will not stop there!

## **The Afro-Cuban Voice in the Poetry of Nicolás Guillén**

Rebeca Amaya

Faculty Mentor: June Laval

College of Humanities and Social Sciences

Foreign Languages

The poetry of Nicolás Guillén combines dance, music, and the rhythm and personality of the Afro-Cuban population in order to create and express not only the words on the page, but also

the actual Afro-Cuban voice. This voice in his “poesía mulata” as he refers to his verses, is expressed in his collection *Motivos de son*. The inspiration of the Afro-Cuban culture and the influence of his own heritage enabled Nicolas Guillén to create a unique “poesía negra”.

### **La Quête de soi – Les relations dans La nausée de Sartre**

Emily Kraus

Faculty Mentor: William Griffin, The Kennesaw Tower Undergraduate Foreign Language Research Journal Editorial Board

College of Humanities and Social Sciences

Foreign Languages

In Sartre’s *La nausée*, a historian, Antoine Roquentin, suffers from a sickness of existence which he calls Nausea. The goal of the paper, which will be visualized on the poster, is to study the self-quest of Antoine, by examining the transformation he undergoes through his relationships with others and himself. This transformation is regressive since he starts out as an adult, but eventually becomes more and more like a kid before finally being reduced to the state of consciousness, the base of human existence. After having gone through this transformation, he is finally able to find what he should do with his existence: write for himself instead of for others.

### **Todos Se Van: A Reflection Of Cuban Reality**

Melissa Meistickle

Faculty Mentor: June Laval

College of Humanities and Social Sciences

Foreign Languages

The novel, *Todos se van* (Everyone Leaves) is based on the life of Nieve, a young girl who lives in Cuba after the Revolution. The author, Wendy Guerra, shows the reality of the struggles of every day life in Castro's Cuba through entries in her diaries during two stages of her life: childhood and adolescence. Most of the people she loves abandon Cuba and leave her behind to face life in present day Cuba. Guerra reflects on the experiences and events that shape her life under Castro's regime without directly condemning his dictatorship and Communism.

### **The "Special Period" In La Nada Cotidiana (The Daily Nothingness) By Zoe Valdes**

Amy Santana

Faculty Mentor: June Laval

College of Humanities and Social Sciences  
Foreign Languages

When the Soviet Union disbanded in the early 1990's, it abandoned Cuba and left the Cuban people to fend for themselves. In the novel, Valdes describes Cuba during the "Special Period" as Castro calls it, that is, the years from 1992 to 2002. This was a time of great deprivation and economic problems from which the country is recovering slowly and with great difficulty. The novel illustrates the suffering of the Cuban people and how they solve their daily problems of just getting by with limited resources.

### **Why Use Complementary And Alternative Medicines?**

Amber Avery  
Faculty Mentor: Brandon Lundy

College of Humanities and Social Sciences  
Geography and Anthropology

People continue to utilize complementary and alternative medicines (CAMs) in the United States, while scientific studies into their effectiveness have mixed findings. Less research has been done on why people continue to use CAMs and how they impact the lifestyle of the consumers. This study explores why people use CAMs and how CAMs impact their lifestyle. This study uses three methods of data collection: participant-observations, four semi-structured interviews, and internet blogs. Through thematic and content analysis, preliminary findings suggest that people use CAMs because they know someone who uses CAMs and they believe it will help them more effectively than western biomedicine. The use of CAMs has largely been found to have changed participants' lifestyles in positive ways. Since people use CAMs in order to improve their health, it can have an impact on the fields of biomedicine and well-being as both preventative and alternative to the established mainstream. This study provides new information on possible ways for the medical establishment to more effectively accommodate this growing CAMs culture.

### **Could Be Decapitation: Comparing Hacking Trauma And Animal Scavenging**

Duncan Balingier  
Faculty Mentor: Susan Kirkpatrick Smith

College of Humanities and Social Sciences  
Geography and Anthropology

When forensic anthropologists examine a skeleton with no cranium, how do they determine if this beheading was a perimortem or postmortem decapitation or the result of animal

scavenging? This research aims to answer this question by comparing the hacking trauma caused by two single-edged bladed weapons (a machete and a meat cleaver) with gnawing and tearing trauma of a scavenger (*Canis familiaris*). This research also aims to improve forensic anthropologists' understanding the decompositional processes of animal scavenging when comparing this form of postmortem damage to hacking trauma which would be very useful for modern forensic cases.

## **The Potential Effects Of Climate Change In The Ahar Banas Cultural Complex**

Blake Bottomley

Faculty Mentor: Teresa Raczek

College of Humanities and Social Sciences

Geography and Anthropology

Since the Industrial Revolution, humans have had an unprecedented effect on global climate change, resulting in cultural paradigm shifts. Likewise, ancient peoples of the past also responded to climate change, and this response can often be seen in the form of culture change. The Ahar Banas Cultural Complex (c. 3rd-2nd millennia BC) of northwestern India was one of these societies. Based on a series of paleoclimate studies in South and West Asia, some scholars have asserted that a climatic shift four thousand years ago could have aided in the collapse of the nearby Harappan Civilization. However, the role that climatic fluctuations played in cultural change within the Ahar Banas Complex has yet to be fully investigated. This paper examines how a decline in the monsoon between 2200 and 2000 BC could have impacted pastoralism in northwestern India, triggering a change in culture. To do so, I assess evidence of cultural shifts at Ahar Banas sites, as well as cultural material and animal remains found there. I argue that assessing this culture from a climatic perspective will provide further insight not only to this region, but surrounding regions as well.

## **Differentiating Blunt Force Trauma: Vehicular Trauma Versus Vertical Fall**

Selene Cannelli

Faculty Mentor: Susan Kirkpatrick Smith

College of Humanities and Social Sciences

Geography and Anthropology

This project has the purpose to understand if it is possible to know what caused specific bone fractures. The project focused on bone fractures caused by being hit by a car and by a fall from a cliff. Two subjects were considered: a dog hit by a car, and a juvenile pig carcass thrown off a cliff. I will examine the bones in order to document the type of fracture caused by the two different types of impact, and determine if they have a specific pattern. I expect this research to

show different kind of trauma from those hits. This project will be helpful in murder cases. Researches can understand if a body found on the bottom of a cliff fell from that cliff, or if it was moved there and the real crime scene is somewhere else.

### **Going...Going..Gone!: Toward A Spatial Analysis Of Baseball Hit Locations Using GIS**

Jeremy Densmore

Faculty Mentor: Nancy Hoalst-Pullen

College of Humanities and Social Sciences

Geography and Anthropology

Locations of baseball hits have been collected for more than a decade and analyzed by statisticians in search of patterns to use in predicting future outcomes. This study will show an alternate method for displaying this data, and various methods of searching through the data for patterns using ArcGIS mapping software. The results of the study show some relative strengths of spatial analyses of baseball data using a GIS approach, which offers a fast method for sifting through large amounts of data to find, display, and analyze patterns. While other software and techniques may be more geared towards high level statistical analysis, a baseball GIS model is a highly versatile and functional tool which may streamline the process of generating and displaying high level baseball statistical information.

### **Skeletal Analysis: Broadhead Arrow Damage To Skulls**

Ashley Estep

Faculty Mentor: Susan Kirkpatrick Smith

College of Humanities and Social Sciences

Geography and Anthropology

With the growing popularity of bowhunting and the sport of archery in the United States, the ease of access to the different types of bows (e.g., compound bows, crossbows) and arrows (e.g., broadheads with different numbers of blades), the noiseless action of the weapon, and the level of accuracy over short distances, it is of forensic importance to study the broadhead effects on humans. Homicides, suicides, and accidents involving the bow and arrow, although rare, have taken place recently in Germany, Sweden, and the United States. In order to investigate the effects of broadheads on bone, I shot two pig heads. Pig 1 was shot with a Muzzy MX-3 100 grain broadhead with three blades while Pig 2 was shot with a Muzzy MX-4 100 grain broadhead with four blades. Both have trocar tips specifically made for penetrating and breaking hard bone. From a distance of ten feet, pig heads were shot using a compound bow and then analyzed for damage caused by the different broadheads. It was found that the three-blade broadhead did more damage than the four-blade broadhead, which only made a

simple starlike entry wound. Forensic anthropologists must become familiar with the effects of bows and arrows on human bone as the rise in popularity of archery and hunting in the United States is growing and may lead to a rise in homicides, suicides, and accidents.

### **Tree Rings As Pictures Of The Past: Dendrochronology Of The Hemlock Legacy Project**

Damon Garges, Robert Bollinger, Bradon Pilcher  
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Geography and Anthropology

The Eastern hemlock (*Tsuga canadensis*) is an indigenous conifer tree species of the United States that has been plagued by the Hemlock woolly adelgid, an insect indigenous to Asia and introduced to the North American circa 1951. Previous research suggests the Hemlock woolly adelgid is killing Eastern hemlocks at a faster than expected rates in the southern Appalachians, and as a result, modifying the carbon cycle within these forests. As such, the Hemlock Legacy Project (out of West Virginia University) is collecting dendrochronology data from these trees to further the archival information of the Eastern hemlock species. For this study, we collected tree cores in July 2013 from Amicalola Falls State Park, located in Dawsonville, Georgia, and Gabes Mountain Trail, located on the eastern side of Great Smoky Mountains National Park in Tennessee. Results include the dating of all sample cores, with the oldest dating back to 1775 AD (d. 2006 AD), and the establishment of marker years - via annual tree rings that are relatively small or large in size due to environmental factors or events - at both sites.

### **Building Houses, Scrubbing Floors: A Look Into The Division Of Labor In The Mennonite Community**

Meagan Gibbs  
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The division of labor within societies has long been a focal point of anthropological investigation. Throughout human history, jobs and responsibilities have been assigned based on differences in age and gender to members of society. This study focuses on how the division of labor is assigned within the little studied religious sect known as the Mennonites, both at the community and household levels. The methods used in this research include direct observation at Mennonite-owned businesses, as well as several semi-structured interviews with Mennonites with varying roles within the community. All data comes from a rural town

in Georgia that has a reasonably-sized population of Mennonites. By highlighting how gender and age influence the ways in which labor is assigned within the Mennonite community, an area that has not previously garnered much attention, the study's findings help demonstrate how the division of labor within the Mennonite community is influenced by economic, familial, and religious factors. These divisions in turn are shown to have a direct influence on the overall Mennonite culture in various ways including how marital status determines the types of roles one has within the community, how children are raised within the community, as well as the likelihood of members having access to higher education. By analyzing the division of labor within the Mennonite community, other aspects of Mennonite culture are revealed, contributing to the overall knowledge and understanding of Mennonite culture as a whole.

### **Estimating The Socioeconomic Condition Through Satellite Imagery Analysis: The Case Of Portland, OR**

Jennifer Heitert

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Geography and Anthropology

Cities today are expanding in size at an increasing rate which has had an effect on the level of 'greenness' or vegetation present in an urban landscape. To address this issue, many cities have instituted development plans which include sustainability policies. The case study city of Portland, Oregon currently operates under a Comprehensive Plan: a long-range 20-year plan, originating in 1980, that sets the framework for the physical development of the city. While there have been state-mandated updates of the Plan since 2000, a new Portland Plan will be implemented which will integrate socio-economic factors into the overall development plan. At this time, however, the highly structured development plan includes strict zoning laws and tree ordinances among other policies. The focus of this study is to use satellite imagery to measure the resulting 'greenness' from strict planning laws to estimate the socioeconomic condition of a city. Methods of data collection include the utilization of the Normalized Difference Vegetation Index (NDVI) and key socio-economic data to determine differences in vegetation levels with Ordinary Least Squares (OLS) and Geographically Weighted Regression (GWR) being applied to geographically model the statistical data.

### **The Effect Of Yoga On The Beliefs And World View Of Practitioners**

Addison Hosley

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College of Humanities and Social Sciences



## Geography and Anthropology

This research examines the effects of yoga practice on the understanding of the philosophical basis of yoga among both students and instructors. Research was carried out through the use of interviews and participant observation of yoga classes in a variety of learning environments, including commercial, private, community organization, and church classes. This allowed for a comparison of the effect of the learning environment on the philosophical comprehension of students and instructors in the study. The data indicates that those people who already view yoga as a spiritual pursuit have their beliefs reinforced and develop a better understanding of the philosophical basis of yoga through practice. Those who do not view it as a spiritual pursuit do not experience increased comprehension of the philosophical basis of yoga through practice.

### **From The Field To The Lab: Artifact Analysis And Flotation From A Mississippian Site In Bartow County, GA**

Emily Longacre, Duncan Balinger  
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Once archaeologists have finished excavating, they are left with the arduous task of examining the material remains from a site. There is an overabundance of data labeled and sealed within copious bags, which holds the key to attributing meaningful information to the artifacts found at a site. In essence, how do archaeologists determine the meaning behind the cultural material recovered? For this research, cultural features from a Mississippian site in Bartow County were excavated. Everything removed was carefully screened and cataloged. Additionally, the majority of the features excavated had soil samples removed from them. Buried within these samples lies the context of the story being told. To uncover the information contained in the soil, the samples are analyzed using an archaeological lab technique known as flotation. The method involves submerging the soil sample in water to allow the lighter organic materials to "float" to the top, which are then collected for further analysis. This procedure is a vital part of any lab work done in archaeology because it allows the researchers to correlate the excavated artifacts with the context of the feature they are excavated from. Laboratory analysis techniques comprise an essential part of archaeological research by making it possible to transform earth into a narrative.

### **What Are The Sustainability Trends Of Regional Craft Breweries In The United States?**

Rebecca Anna Mattord  
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Geography and Anthropology

The study researched regional craft breweries of the United States to identify past, present and future trends as defined by environmental, economic, and social pillars of sustainability. A survey was issued to all 94 regional craft breweries (~15,000 and 6,000,000 US barrels annually), which asked a range of sustainability questions specific to the beer industry. Examples questions included: installation of technologies to reduce water, use of local products, meeting or exceed environmental laws and regulations, and organizing and funding charitable events in their community. Results suggest that most of the regional craft breweries of the United States interviewed are currently active in - or have future plans to adopt - environmental, economic and/or social sustainability practices.

### **Gendered Market Spaces: Vendor Roles And Placement As Socio-Economic Indicators In Guinea-Bissau, West Africa**

Alex O'Neill  
Faculty Mentor: Brandon Lundy

College of Humanities and Social Sciences  
Geography and Anthropology

Guinea-Bissau's market spaces offer an interesting glimpse into gender stratification as it appears in the public sphere and demonstrates how their economic dynamics physically structure their spatial orientation as blueprints for future markets and the national economy. This study identifies the traditionally practiced roles of male and female vendors regarding what commodities they sell and where they are expected to conduct business. Encompassed in this paper are personal accounts recorded within several of Guinea-Bissau's markets over a period of one month and photographs of current and future markets which are under construction. These records were gathered in order to illustrate how gender spatially structures the public sphere. By conceptualizing the placement of vendors within Guinea-Bissau markets, this study emphasizes the part in which women play in furthering the economic flow and development within the country.

### **Post-Fire Differences Between Complete And Fragmented Bone**

Chelsey Schrock  
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Criminal investigation is a hot topic for television shows that are currently on the air. With multiple seasons per show they not only explore murder, but body disposal. One of the most popular ideas of how to get rid of human remains is burning. While burning bones on shows seems to be effective and quick, it begs the question: Can someone actually burn away the evidence of a human skeleton? Human bones are very difficult to burn and are only affected by fifth or sixth degree burns. In this experiment, I will be testing the degree of charring and burning of a bone that is fully intact versus a bone that is fractured or fragmented. I will be using two different femur bones of a pig and using a metal bin to hold each one as it is burned. I expect to see difference breakdowns of the bone structures between the fragmented, exposed bone as opposed to the intact bone and hope to use my finding to shed more light on the morphology of burnt bones.

### **Nontraditional Students In The Driver Seat**

Allison Smith

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College of Humanities and Social Sciences

Geography and Anthropology

It is important that adult learner programs are accessible to nontraditional college students. These adult learning services provide scholarly resources and can shed light into nontraditional students' academic needs. This study investigates and analyzes the success of nontraditional Kennesaw State University students and the services provided on campus. The approach to comprehending the college experience of nontraditional students was evaluated using qualitative research methodology, which consisted of continuous monitoring direct and participant observation and semi-structured interviews. The qualitative research was conducted among nontraditional students and their faculty. Observations were enacted at Kennesaw State University's Lifelong Learning Center. Interviews were carried out with two current nontraditional KSU college students and one nontraditional KSU college graduate. Through thematic analysis, early findings suggest that nontraditional students need added academic, financial, and emotional support to what is already provided by KSU and the students' home environments. The research gathered is anticipated to help facilitate a broader understanding of nontraditional students and the struggles faced by these students. Continued research on nontraditional students' behaviors, preferences, and needs should lead to a more tailored and effective college experience for these adult learners.

### **Don't Judge a Book By Its Medium: The Social Situations That Affect How People Read**

Kaitlin Stotz

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Geography and Anthropology

It is to be expected that with today's culture becoming increasingly focused on new technological advances that books would be affected as well. This study examines the circumstances that determine the medium, electronic or hardcopy, which people choose to read. Understanding these situations will shed light on why readers are choosing the mediums they are choosing, and what the implications of these choices are. The research employed direct, continuous monitoring observation at two local libraries. The research also employed four semi-structured interviews, two with Kennesaw State students and two at an independent bookstore located in downtown Atlanta with a customer and an owner. All of the study participants have been users of both mediums of reading and describe the situations that determine whether they prefer hardcopy or electronic books. The data was analyzed thematically. The preliminary findings show that price and convenience play a large role in determining if a reader will choose an electronic or hardcopy of a book. Electronic books are generally cheaper and more convenient than hardcopy books, while many people still prefer being able to physically hold a book in their hands when reading as opposed to reading it electronically. This research will be used to see the impact of electronic books, if there is one, on libraries and bookstores, and how they are changing to conform to this technology.

### **Examining Correlation Between Shooting Skill [Ballistic] And Osteological Damage**

Danielle Tesina

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Forensic Anthropologists work in close proximity with officers of the law however their union is limited to the 'suspect' individual and even more specifically to the osteologically significant data and observation linked to any particular case. How would a forensic anthropologist fair if a situation arose when they must use ballistic trauma to identify multiple shooters consisting both of officers of the law and civilians? Would the bone react (trauma and fracture) differently based on individual shooter skill? Through this experiment I will test this question. I hypothesize that the bone shot with civilian (lesser) skill will yield significant osteological differences than the results of the trauma recorded on the second bone which will be inflicted with trained (higher) skill.

### **Analysis Of Native American Remains At Dabbs Site, Bartow County, GA**

April Tolley, Anthony Chieffo, Ashley Estep, Eli Smith

Faculty Mentor: Susan Kirkpatrick Smith, Terry Powis

College of Humanities and Social Sciences  
Geography and Anthropology

In the fall of 2013, students from Kennesaw State University participated in Dr. Terry Powis's archaeological excavations at the Dabbs Site. The Dabbs Site is located along the Etowah River about two and a half miles from the Etowah Indian Mounds in Bartow County, Georgia. It is thought to be the remnants of a small village site within the sphere of Etowah, dating from the Early to Middle Mississippian period (AD 1000-1400). During excavations, we unearthed a rectangular pit containing human remains laid out in a flexed position. Cultural features, in addition to the burial, indicate that the Dabbs burial is possibly inside a structure, although the site requires further excavation before we can more confidently conclude this. A piece of charcoal found between the flexed leg bones returned a radiocarbon date of AD 1270-1380 for the burial. Under the supervision of Dr. Susan Kirkpatrick Smith, we used aging techniques involving long bone measurements and tooth eruption analysis to determine a general age of 12 to 14 years of age for the individual in the burial. Determining age for this individual and examining their remains is important because it can help us understand this particular individual's life, as well as the lives of the population in general when studied in conjunction with other remains from the region. There are not many opportunities to analyze bioarchaeological remains in Georgia because of federal regulation; analyzing these remains allows us to gain further insight into the burial practices of the population that occupied the Dabbs Site as well as those of the surrounding regions.

### **Interpreting Evidence Of Carnivore Predation Upon Hominins**

April Tolley

Faculty Mentor: Susan Kirkpatrick Smith

College of Humanities and Social Sciences  
Geography and Anthropology

There is a fair amount of evidence in the fossil record and modern observations of primate and carnivore behavior that suggests that primates, including humans, are a source of prey for large carnivores. Primate predation has historically been a disregarded topic in paleoanthropology because researchers have always thought of humans as the hunter and not the hunted, despite the ample evidence that humans are prey. Because humans are so closely related to other primates, this line of thinking extends to other primate species as well, largely the great apes. Therefore, I examine existing paleoanthropological literature that includes fossil evidence of predation of early human ancestors and analyze the interpretations of this evidence. I also examine animal behavioral literature containing evidence of modern human and nonhuman primate predation to use as an analog for evidence of predation of early

human ancestors. Understanding the behaviors of nonhuman primates as well as the behaviors of carnivores that prey upon primates is largely beneficial in interpreting the behaviors of early human ancestors. I include my interpretations of this data and insights from a different perspective that incorporates more animal behavior studies into the field of paleoanthropology.

### **Skeletal Analysis Of Two Individuals From A Roman Cemetery In Ierapetra, Crete, Greece**

April Tolley

Faculty Mentor: Susan Kirkpatrick Smith

College of Humanities and Social Sciences

Geography and Anthropology

The Greek Archaeological Service excavated a Roman cemetery in Dialektaki, Ierapetra, on the Island of Crete, Greece. Among the tombs was Tomb 22, which contained artifacts and the remains at least two adult individuals. The tomb is oriented east-west and measures 1.25 meters long, .47 meters wide, and .39 meters deep. It is a slightly damaged grave that contained four Corinthian paving stones, one of which was intact, and the other three were fragmentary. The skeleton of Individual 1 is approximately 50% complete, and the individual was buried in a supine position with the head oriented east. The upper arms were parallel to the body, and the forearms were angled inward with the hands resting on the pelvis. Individual 2 is represented by a small number of fragmentary bones. Examining and analyzing these remains allows us to understand the lives of these individual people as well as to gain knowledge of the population as a whole when studied alongside the other remains from this cemetery. This research is part of a larger study of human remains from Roman burials from the Ierapetra area, which will be the first full analysis of Roman burials from Crete.

### **Estimating The Socioeconomic Condition Through Satellite Imagery Analysis: The Case Of New Orleans, LA**

Manuel Velandia

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College of Humanities and Social Sciences

Geography and Anthropology

This research identifies vegetation changes on the landscape of New Orleans, Louisiana, and their relationship to the change in the population, and other socio-economic variables such as household income, and home value, from 1990 and 2011. Satellite imagery from the U.S. Geological Survey, and data from the Census Bureau are used to explore this relationship. During these two decades, natural disasters have struck New Orleans area (e.g. Hurricane

Katrina 2005), resulting in changing vegetation and population patterns. This research utilizes the following computing models: (NDVI) normalized difference vegetation index, (OLS) ordinary or linear least squares, and (GWR) geographically weighted regression.

### **Atlanta Parks - Online Mapping And Site Suitability Analysis**

Matthew Williams

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College of Humanities and Social Sciences

Geography and Anthropology

The city of Atlanta currently lacks any type of interactive online maps or mapping environments for their urban parks and greenspaces. While Atlanta has the locational information related to these greenspaces, there are no spatial representation of these areas in an online mapping environment. To that end, this project created ESRI-based web mapping environments hosting interactive maps of Atlanta's greenspaces for use by individuals (residents and tourists) as well as local to nationally-based communities and organizations interested in the location and geography of greenspaces in Atlanta. To begin, active greenspaces in the city were digitized in an ArcGIS environment. Popups via ArcGIS online were configured to allow the end users the ability to quickly identify parks and other greenspace attributes (for example, hours of operation, accessibility, uses of the area, and so on). Additionally, neighborhoods that surround these parks were incorporated into the final map to allow for spatial reference. Using these maps, further analysis was made via two case studies. The first case study looked at the relationships between crime data and greenspace by way of buffers and heat maps, while the second case study performed a site suitability analysis to determine potential locations for the conversion of brownfields to greenspace. Impervious surfaces, identification of brown lots and socioeconomic indicators were used in the creation of this site suitability analysis. Overall, this mapping project provides local citizens with interactive maps of greenspace, as well as crime analysis and site analysis results that lend toward future opportunities for new and converted greenspaces within the city of Atlanta. Finally, these maps are an example of community partnerships, as they are hosted by Kennesaw State University and seamlessly tie in to the city's website.

### **Spatial And Temporal Dynamics Of A Mature Mixed Oak Forest Remnant In East-Central Indiana**

David Zeh

Faculty Mentor: Nancy Hoalst-Pullen

College of Humanities and Social Sciences

Geography and Anthropology

This research explores how tree dynamics over a period of 36 years has transformed the composition and structure of a 3.6 ha mature *Quercus* (oak) forest remnant in Dobbs Natural Area, a (sub)urban forest preserve located in west-central Indiana. Measurements from 1974, 2000, and 2010 were imported into a geodatabase using ArcGIS software to produce a spatial tree-by-tree analysis of ingrowths (new trees), mortality (dead trees) and survivorship (living trees). Results from the latest census (2010) show a modest change in the canopy composition, a major decline of *Ulmus americana* (American elm) and *Fraxinus* spp (ash species), and an ingrowth of the more shade tolerant *Acer saccharum* (sugar maple), *Fagus grandifolia* (beech), and *Tilia americana* (basswood).

### **Realism And Mysticism In The Art Of Gian Lorenzo Bernini**

Mary Scannavino

Faculty Mentor: Federica Santini

College of Humanities and Social Sciences

History and Philosophy

This research project started as part of a final assignment in Special Topics in Italian (ITAL 4490) during the KSU Italian Immersion Program in Montepulciano, Italy (Fall 2013). During the course of the semester, students explored Italian literature, culture, and art through in class discussions and excursions. Ms. Scannavino focused specifically on the Baroque era and its master Gian Lorenzo Bernini. After completing the course project, Ms. Scannavino has continued researching Baroque art and mysticism, and is currently conducting research with Dr. Santini on the symbolism of blood, light, and shadow in the writings of European women mystics from the 13th century through the 19th century, from Catherine of Siena to Teresa of Avila and Thérèse de Lisieux. This presentation proposes to discuss Bernini's work in Rome through the specific analysis of several of his works and a series of photographs taken personally by the presenter during her study abroad experience. An analysis of Bernini's moving interpretation of Teresa of Avila's biography, the Ecstasy of Saint Teresa, will be included and connected to the presenter's current research.

### **Marx, Rousseau, And The Political Economy Of Alienation**

Plamen Mavrov

Faculty Mentor: John Moran

College of Humanities and Social Sciences

Political Science and International Affairs



Adequate comparison between the works of Marx and Rousseau concerning alienation is lacking in the literature on the subject. To gain a more holistic understanding of the condition, both thinkers need to be analyzed together. I contribute to the literature on this subject an original analysis of the similarities and differences in their thought with regards to alienation and what implications they have on the understanding of the subject. Particular emphasis is directed towards an analysis of the State since it has great influence and at times considerable control over the economic and social landscapes that determine a society's state of alienation. Connections are made to modern examples of alienation to further stress the timely nature of this topic. Questions of Marx and Rousseau as architects of totalitarianism are addressed as well as the thinkers' prescriptions of alleviation and their possibility.

### **Involvement In Government And Education: A Cross-Cultural Comparison Of Students In Brazil And The U.S.**

Elizabeth Sorby, Liza Stepat

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College of Humanities and Social Sciences

Political Science and International Affairs

The purpose of this cross-cultural research is to examine students' involvement in government and their level of education attained. In recent years, voter turnout amongst young adults ages 18-25 has been lower than any other age bracket, according to the Center for Information and Research on Civic Learning and Engagement (CIRCLE). Based on these statistics, research was conducted in 2013 to measure the level of involvement of Kennesaw State University (KSU) students in their school, local, and national government and their enthusiasm towards education. Surveys were distributed to KSU and Brazilian students at UNIFACS (Laureate International Universities), a university in Salvador, Brazil. The research compared and contrasted the opinions of university students from both countries. Past research has indicated that students' education level directly correlates with government involvement. Because of these findings, the data from the surveys were analyzed together to verify whether or not this hypothesis is correct. Findings from this study will serve as a basis for future research to find ways of increasing students' participation in their local and national government through voter turnout based on level of academic education attained.

### **Personality Factors And Whistle-Blowing In Undergraduate Cheating Situations**

Adrienne Achille

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College of Humanities and Social Sciences

Psychology

Cheating is systemic within the university system (McCabe, 1993; Rettinger, Jordan, & Peschiera, 2004), however students witnessing cheating typically choose to not to act. Academic integrity policies have been implemented within the university system, but few follow this academic code of conduct. Because of the lack of reporting behavior and devaluation of academic integrity, a culture has been created that has deterred students from reporting academically dishonest behaviors. This culture gives students the idea that cheating is normal and is not a serious act of academic misconduct, and as a result students who do report the cheating behavior will be reprimanded by their peers. Although ethically the act of reporting cheating should be occurring regularly, reporting is not taking place and therefore the only possibility of report is through blowing the whistle on the cheater performing the dishonest act. This research investigated what factors influence students' choice to whistle-blow. A common reason for keeping quiet is related to a lack of personal investment in the situation (Passow, Mayhew, Finelli, Harding, & Carpernter, 2006; Rennie & Crosby, 2002). Another reason has been related to personality traits. It has been found in a study that the cautious, responsible type of person is less likely to cheat and more likely to whistle-blow (Kisamore, Stone, & Jawahar, 2007). Both personality factors and situational factors are predictors of whistle-blowing in the workplace, but less is known about whistle-blowing in college. Most studies that have been conducted on academic misconduct and whistle-blowing have used different procedures in comparing individuals predicted whistle-blowing behavior. In this study participants first completed a standardized personality inventory (Saucier's [1994] Mini-Marker Big-Five personality scale) that focused on the Big 5 personality traits, and then evaluated scenarios as to how likely they would whistle-blow. Factor analysis grouped respondents into five factor loadings, Factor I (Extroversion), Factor II (Agreeableness), Factor III (Openness), Factor IV (Emotional Stability), and Factor V (Conscientiousness). Pearsons correlation indicated that, there was no significant correlation between whistle-blowing and Big 5 Personality Inventory. These results show that whistle-blowing is not related to personality.

### **Learning Assistants' Facilitation: Student Attitudes And Effects On Summative Assessments**

Siggy Bohannattrawn

Faculty Mentor: Nancy Burney

College of Humanities and Social Sciences

Psychology

The relationship between end-of-class worksheet activities and summative assessments was studied. The relationship between attendance of Learning Assistant tutoring hours and summative assessments was also studied. Fifty-four precalculus student subjects received a regular lecture class format, participated in the activity worksheets and evaluated the

effectiveness of these activities individually. A separate fifty-nine precalculus student subjects only received the regular lecture class and were not exposed to the activity worksheets. Both results were measured using Unit One and Two test grades. The following hypotheses were tested: 1) If students are paired together for immediate review on lecture material, using activity worksheets, then summative assessment grades will increase. 2) If students seek review help from the Learning Assistant program peers, then summative assessment grades of the student will increase. 3) Students' attitudes will reflect the Learning Assistant program's success from the students' perspective through individual evaluation. Implications for inclusion of activity worksheets and tutoring hours in the Learning Assistant Program are discussed.

### **Stress, Personality, And Cognition**

Ashley Boone, T. Lanay Mahaffey, Frederick Caldwell, Anna Rosenhauer, Justin Blackwell,  
Alanna Harney, Carol Redman, Matthew Bishop  
Faculty Mentor: Adrienne Williamson

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Psychology

Prospective memory (PM) refers to remembering to complete a task in the future (Smith, 2003). Researchers have found that stress may affect various types of memory (Mika et al., 2012), but few researchers have examined the effect of stress specifically on PM. In our study, participants in the stress condition completed the Trier Social Stress Task (Kirschbaum, Pirke, & Hellhammer, 1993), which induces a safe but significant level of stress. The nonstress group read magazines. To assess PM, participants were asked to remember to complete a task at the end of the testing session without being prompted. If they did not spontaneously remember to complete the task, they were given increasingly detailed prompts, and their score on the task was based on how much prompting was needed before they remembered to complete the task. Because certain personality traits may influence the effect of stress on PM, we also measured personality traits and assessed the relationship among stress, PM, and personality. Finally, we also assessed the correlation between participants' PM score on the task and their self-report of PM ability. Results will be discussed.

### **Perceptions Of Normative Sexual Behaviors For Self And Others By College Students**

Angela Daniels, Savannah McGrath  
Faculty Mentor: Nicole Martin

College of Humanities and Social Sciences  
Psychology

Our study revisits research on campus norms in regards to sexuality from the frameworks of social learning and development. College students represent a transitory age group, wherein individuals have a pliable self-concept and are exposed to lifestyles different from those with which they are familiar. The campus environment presents novel examples of behavior and the opportunity for individuals to gauge their behaviors in reference to new standards. When behaviors are overt, students will identify with a peer group that most closely fits their values and take on the group's practices as normal. In regards to sexuality, gauging fit with a peer group involves assumptions about the member's covert sexual practices and beliefs. This results in the possibility of discrepancy between behaviors an individual engages in, and what they think is normal. Furthermore, individuals who do not find group membership easily, often underrepresented students, will pull together in a subculture that will serve as the reference group for their behavior.

We investigated the difference between what is acceptable, sexually, for self-engagement, and what is acceptable for one's peer group to engage. Further, we identified any differences in that relationship based on majority or minority identification. It was predicted that students would rate more items as normative for others to engage in than they would for self-engagement, and that major and subcultural identities would differ in their ratings. A sample of 117 college students rated a list of sexually themed opinions, practices, and behaviors on what was normative or non-normative self-engagement, and then rated the same list on what was normative or non-normative for others to engage in. Participants also provided extensive information about their ethnic, gender, religious, and sexual identities.

Using the demographic questionnaire included in the study, the participants were combined into majority and minority groups by ethnic identity, gender identity, religious affiliation, and sexual orientation. Participants rated less items as normative for self-engagement than they did for others' engagement. Participants who did not identify with the majority found more behaviors and attitudes acceptable for others than for themselves. These results imply that college students are willing to accept others' engagement in behaviors that they perceived as unacceptable for self-engagement. Although different items emerged, this was also true for subcultures. Future research on sexual normativity would benefit from the establishment of psychometrics to improve the generalizability of findings.

### **Visitor Behavior In The Reptile House At Zoo Atlanta**

Anna Davis, Heather Holt, Lauren Mitchell, Alexis O'Neal, Samantha Sturdevant, Haley Von Stein

Faculty Mentor: Suma Mallavarapu

College of Humanities and Social Sciences  
Psychology

Two primary goals of modern zoological parks are visitor education and conservation of wildlife. Previous researchers have found that visitors will have a better learning experience if

they are interested in zoo exhibits. This, in turn, may lead to more positive attitudes towards conservation. There has been a growing body of research on visitor behavior, with an emphasis on assessing visitor interest at different exhibits in a zoo. The goal of our study was to measure visitor interest at various exhibits in the World of Reptiles building at Zoo Atlanta. For a 24-week period between June and December 2013, we collected data on 733 visitors. We used Samsung Galaxy® tablets equipped with Noldus Pocket Observer® software, which enabled precise timing and tracking measurements of visitor behavior and time spent at exhibits. We analyzed the data using independent samples t-tests and one-way analysis of variance. The average visit duration in the building was 12.88 minutes. There was a significant difference in visit durations among gender, age group, and social group. Men spent more time in the building, when compared to women. Young adults (20 to 40 years of age) spent the least amount of time in the building, when compared to teenagers (13 to 19 years), middle-aged adults (40 to 65 years), and older adults (> 65 years). Individuals who visited the building in a group consisting of multiple adults without children spent the most amount of time in the building, when compared to solitary visitors and visitors with children. There were significant differences in the way visitors used signage. Women spent more time reading conservation signs, when compared to men. Solitary visitors and visitors without children spent more time reading conservation signs, when compared to visitors with children. There were also significant differences in the time visitors spent watching the animals. Men spent more time watching the animals, when compared to women. Individuals who visited the building in a group consisting of multiple adults without children spent the most amount of time watching the animals, when compared to solitary visitors and visitors with children. Findings from this study can help zoos better understand interests of different kinds of visitors, in order to more effectively deliver conservation and education messages.

## **The Effects Of An Expressive Writing Technique On Several Measures Of Stress**

Madison Hanscom

Faculty Mentor: Sharon Pearcey, Lauren Taglialatela, Doreen Wagner

College of Humanities and Social Sciences

Psychology

The purpose of this investigation was to examine the relationships between stress and expressive writing. More specifically, the researchers were interested in whether or not there would be significant differences in psychological stress and physiological stress in response to an expressive writing technique as compared to a neutral writing group (control group). The researchers used the expressive writing and neutral writing prompts that are consistent with Lepore's (1997) study. In order to obtain a measurement for physiological stress, the investigators examined salivary alpha amylase (sAA). The researchers utilized several instruments to obtain a measure for psychological, perceived stress. These included the Stressor Appraisal Scale (Schneider, 2008), the State-Trait Anxiety Inventory (Spielberger,

2006), and a visual analogue scale (VAS). Although there were no statistically significant relationships between the variables in this study, the information can be used to further the understanding within the field in an area where there are clear under-investigated relationships. It can also be recognized that due to some limitations (e.g., very small sample size) future researchers may likely have the potential to repeat this study with significant results.

## **Relationship Between Gender, Age, Personality, And Religious Affiliation**

Justin Hoenstine

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College of Humanities and Social Sciences

Psychology

The purpose of this research is to investigate the relationship between personality, age, gender, and religious affiliation. It also investigates how religious affiliation could affect individuals in their everyday life as well as their college experience. The researchers examined the relationship between personality, religious affiliation, and whether one has the proclivity to leave his or her fate in the hands of a respective spiritual leader or deity. The researchers measured personality using the Big Five Personality Inventory (BFPI), which measures personality traits and places them into a specific type. To determine participants' religious affiliation and religiosity, researchers developed a questionnaire using a mixture of yes and no questions as well as questions using a 5-point Likert scale. The questionnaire is aimed to measure participants' beliefs and how those beliefs affect their college experience and lifestyles. The researchers will determine a score to represent overall religiosity will present descriptive statistics on these findings. With the information researched and interpreted, future research can be conducted to develop a better understanding of the relationships between personality and religious affiliation, as well as if age or gender has any effect. In addition to this, examining the way participants self-report how their religious affiliation impacts their life and how strongly it impacts their experiences may give a deeper insight into this field of study. Additionally, researchers may look at why there is a relationship between personality, age, gender, and religion once causation is determined. The authors hope that through the research experience participants can gain a deeper insight on their personalities. Additionally, participants may choose to get more involved with their respective religions after considering their religiosity for this study. The participants in this study include approximately 500 students enrolled in the Introductory Psychology course at Kennesaw State University. All information will be collected online and completely anonymous. This study is IRB approved, and data collection was completed in November 2013.

## **The Relationship Between Exposure To Outdoor Environments And Rates Of Depression, Anxiety, And Stress**

Oscar Mendez

Faculty Mentor: Gail Scott

College of Humanities and Social Sciences

Psychology

The purpose of this research is to explore the relationship between exposure to the outdoor environment and rates of anxiety, stress, and depression, which will be measured using the Depression, Anxiety, and Stress Scale (DASS). We will examine the question of whether or not longer time spent outdoors in the past week reduces levels anxiety, stress, and depression. We will also look at the implication of opinions of the outdoors on the levels of depression, anxiety, and stress.

## **Introvert And Extrovert Personality Types And Test Anxiety**

Cristina Migles-Schmitt

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College of Humanities and Social Sciences

Psychology

The authors of this research project are investigating the relationship between the introvert and extrovert personality types and test anxiety. The researcher measured and determined the participants' personality types using McCroskey's Introversion scale. The researchers also measured the levels of anxiety at test time using McCroskey's Test Anxiety Scale. The researchers were also very interested in the participants' self-perceived personality type vs. their friends' views on the participants' personality types. The purpose of this research is for the authors to look deeper into the relationship between personality types and test anxiety. The research measures the differences in test taking anxiety between introverted and extroverted students enrolled in an introductory psychology class at KSU. The researchers measured and determined personality types using an 18-questions introversion scale developed by James McCroskey. The researchers measured the levels of anxiety at test time using a 20-questions test anxiety scale, also developed by James McCroskey. Both scales are ranging from "strongly agree" to "strongly disagree" and are aimed to assess each participant's personality type and test taking anxiety levels. This information will help researchers find out which personality type is more prone to be anxious at test time. Are introverts or extroverts more anxious when preparing for, taking a test, or after a test? The information collected through this study, after being researched and analyzed, upon presentation and publication will extend the knowledge and literature about how different

personality types (introverts and extroverts) cope with test anxiety in college. This research will provide information for future programs that target specific programs for improving test taking anxiety levels for college students. The participants in this research project are students enrolled in an Introductory Psychology course at KSU. All participants are asked to provide a consent form regarding inclusion of their individual data in an aggregate for potential presentations or publications. All information will be collected online through Survey Monkey and SONA and is completely anonymous. Participants are asked to grant researchers permission to use demographic information such as age, sex, class rank, ethnicity and field of study. This study has been IRB approved, and data collection has been completed (488 observations).

### **Recruiting Undergraduate Researchers: Best Practices in Psychology Departments**

Rachel Pack

Faculty Mentor: Dorothy Marsil

College of Humanities and Social Sciences

Psychology

The purpose of this study was to examine online outreach practices by psychology departments for informing and recruiting undergraduate researchers. Data were collected from peer and aspirational university websites on several criteria, including but not limited to, research presence, availability of lab websites, research opportunity instructions, and ease of use. Recommendations for best practices are provided.

### **Social Identity And Religion In Northern Ireland**

Sarah Paris

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College of Humanities and Social Sciences

Psychology

I investigated the potential relationship between social identity and religion in Northern Ireland. This is important, especially in Northern Ireland, because religious affiliation shapes the conflict in that area and, for that reason, a relationship is likely to be evident between one's religious affiliation one's identity. I focused on specific factors such as personal religious affiliation, national religious affiliation, level of religiosity, birthplace, and sociability. Through experiencing the culture of Northern Ireland while studying abroad in Derry/Londonderry for six months I was able to see first-hand how religious affiliation seems to influence the life decisions of people in Northern Ireland. Using an online survey, I collected data from 23 participants ranging in age from 18 - 25. I found that the majority of people living in Northern



Ireland reported being Protestant Christians whereas the majority of people living in Ireland reported being Roman Catholic. There were no differences between Protestant Christian and Roman Catholic participants on religiosity and likelihood of interacting with people of other religious affiliations, and there were too few participants from other religious groups to conduct meaningful analyses with those data. Evaluation of qualitative data indicates that responses were relatively neutral, though intense responses were most likely to be political in nature. This study analyzes specific points within the relationship between social identity and religion and leaves an opportunity for further study expounding on specifics that may then be generalizable to the population.

### **Efficacy Of A Circus Arts Therapy Program To Improve Sociability, Teamwork, And Communication In Young Children**

Rena Roberson

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Psychology

Circus arts therapy (CAT) is a play therapy program that is suitable for children with a variety of problem behaviors. The program consists of 8-week sessions designed to foster teamwork and social skills while incorporating circus elements. The research goal was to determine if children have higher teamwork and sociability scores after the program compared to baseline assessments. We collected data from 27 children (boys=15) who ranged in age from 4-12 years ( $M=6.65$ ,  $SD=1.79$ ). Parents completed a baseline survey at the beginning of their child's first 8-week session and post-session surveys after the first and third sessions. Using a Likert-type scale parents reported their child's sociability, teamwork, and conversation skills. A repeated measure ANOVA indicates a significant increase in teamwork scores from baseline ( $M=5.00$ ,  $SD=2.30$ ) to the end of the first session ( $M=5.77$ ,  $SD=2.58$ ),  $F(1, 25) = 4.55$ ,  $p=.043$ . This pattern was also evidenced when comparing baseline ( $M=3.64$ ,  $SD=1.91$ ) and third session post-tests ( $M=5.18$ ,  $SD=2.40$ ),  $F(1, 10) = 14.03$ ,  $p=.004$ . We also assessed sociability and conversation skills with a peers and parents. The differences between baseline and post-test measures for these variables were not statistically different, however, the scores are moving in a positive direction.

### **Infants' Age-Specific Changes In Object-Oriented Social Referencing**

Anna Rosenhauer, Savannah McGrath, Adrienne Achille, Lindey Maza, Jade Wilson

Faculty Mentor: Nicole Martin

College of Humanities and Social Sciences

Psychology

This study focused on the developmental course of object-oriented social referencing after eight months of age by exploring infants' responses to five different emotions. Research on the emotional life of infants in the first two years of life suggests that intense and rapid changes occur with respect to infants' abilities to recognize, identify, and respond to the emotions of others. Skills such as social referencing allow infants to interpret and respond to others' affective expression.

Because recognition and discrimination of various emotions are observed in infants prior to seven months of age (Leppanen & Nelson, 2006; Nelson, 1987), this cross-sectional study examined 65 infants, between ages 8 and 24 months. Infants were presented with recorded visual and auditory affective messages directed toward one of two objects and experienced six conditions (anger, fear, happy, sad, surprise, and a neutral control) in randomized order with counterbalanced target object locations in a social referencing paradigm. Object preference was calculated by subtracting time touching the targeted objects from time touching the distracter objects in order to determine when infants changed their responses to the objects receiving the affective messages.

Based on age and object preference, a segmented regression model was used to examine how the infants use emotions throughout their first two years. Segmented regression determined the best model for the development of each emotion by fitting the data with either a piece-wise function, showing an age-specific break point (discontinuous development), or a continuous function, showing continuous development. Infants' responses to the neutral condition showed two sloping, segmented lines with a break point at the end of the 12th month. Responses to anger and fear conditions showed a break point at the end of the 15th month with two straight, horizontal lines. At 15 months, infants responded to anger and fear with avoidance of the targeted objects and increased touching of the distracter objects. This corresponds with changes at 15 months related to infants' increased skills of independence, mastery, and autonomous exploration as well as an increase in prohibitive and fear-inducing messages coming from caregivers. Responding to the happy condition did not fit a regression model. The response to the surprise and sad conditions revealed no preference between the target and distracter objects. This lack of responses could be a result of surprise's novelty and ambiguity and sadness' need for contextual information and connection to the emoter, which were not provided in this paradigm.

## **Differences In Mental Health Perception In KSU And USIL Students**

Jennifer Smith, Victoria Sowell  
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College of Humanities and Social Sciences  
Psychology

The Year of Peru Education Abroad program in Lima and Cusco, Peru offered by Kennesaw State University (KSU) provided an integrative service-learning practicum and cross-cultural courses to students over the course of 18 days. This cross-cultural program prompted the researchers to investigate differences in mental health perception of psychology students who attend KSU and Universidad San Ignacio de Loyola (USIL) as measured by the HealthStyles Survey (2006). This data will be used to measure for potential positive change in the students' mental health perceptions of each university. The researchers hypothesized that KSU students will display higher rates of mental health perception than USIL students. The research was made available to KSU students through Sona, which is the KSU online research experience system required for undergraduate PSYC 1101 Introductory Psychology students. SurveyMonkey was used to collect data from USIL students, and also as a facilitator through Sona to collect research responses and further analyze total research results. The HealthStyles Survey (2006) is an 11 question scale. Each question is answered on a Likert-type scale with responses ranging from strongly disagree through strongly agree. Demographic questions were also utilized, including questions regarding family history of mental illness. KSU is located in Kennesaw, Georgia and encompasses multiple disciplines with an emphasis on global engagement and diversity. USIL has two campuses, one in Lima, Peru, and the other in Cusco, Peru with many international students who have assimilated into Peruvian culture along with native students residing in Peru. All research participants were enrolled in a psychology course at the time of survey participation. Studying differences in mental health perception cross-culturally between two higher-education facilities will provide a unique comparison of mental health perception that observation alone would not capture. This research will provide information for future programs and universities that include mental health studies and curriculum.

## **Food Preferences And Influencing Factors Across Cultures**

Yanmin Sun

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Psychology

This research project compared the food choice motivation factors of Chinese and American individuals. The Food Choice Questionnaire (FCQ) consists of nine factors that are perceived influences on food selection including convenience, health, mood, sensory appeal, price, weight control, familiarity, natural content, and ethical concern. A sample of 135 men and women (ages ranged from 18 to 60 years) living in either the U.S. or China completed a questionnaire with the FCQ, demographics, and occupational information. Nine 2 x 2 (Sex x Nationality) ANOVAs were completed for each of the measures of food choice motivation. Results show significant differences between the Chinese and American participants in their

food choices on six of the nine food choice motivation factors. The Chinese participants scored significantly higher in health, natural content, and ethical concern reflecting a higher regard for nutritional information of food by the Chinese participants than predicted. The American participants scored higher in convenience, sensory appeal, and price than the Chinese participants. Regarding sex, females scored higher than males on health, natural content, and weight control. There were notable differences in the ages and occupations between the U.S. and Chinese participants, which led to some difficulties with interpretation.

### **Efficacy Of Student-Led Study Groups**

Allison Venoy, Elizabeth Grissom, Amanda Watkins, Jessica Dean  
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College of Humanities and Social Sciences  
Psychology

This study compares exam scores of students in a structured study group with those not in the study group over the course of two chronological semesters. The study was conducted using both traditional and non-traditional students enrolled in an introductory Psychology course at Kennesaw State University. Participants were enrolled in a voluntary student-led study group that met weekly for one hour and fifteen minutes with mandatory attendance. Students were given study materials to enhance their knowledge of information covered in the Psychology 1101 class. Materials consisted of crossword puzzles, matching forms, fill-in the blank sentences, graphic organizers, and practice tests. All students took three exams and a final exam. It is hypothesized that the study group participants will achieve a higher test score average on all exams than the students in the non-study group. The research further examines the study group's general self-efficacy in relation to exam scores. It is hypothesized that higher exam scores will positively correlate with higher general self-efficacy scores.

### **What Would You Do? Factors Affecting Blame-Taking Behavior**

Geena Washington, Oscar Mendez  
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Psychology

Researchers examined people's willingness to take the blame for another person's misconduct in a 2 (relationship closeness: casual vs. close friend) x 2 (target of investigation: self vs. perpetrator) x 3 (perpetrator misconduct: driver negligence, stealing, shopper negligence) factorial design. Participants (N = 183) were randomly assigned to think of either a causal or a close friend, and then read a scenario that manipulated the above mentioned factors while

thinking about this person. Afterwards, participants' perceptions and their willingness to take the blame, belief in a just world, and locus of control were measured. As hypothesized, participants were more willing to take the blame for a close friend than a causal friend  $F(1,171) = 9.72, p < .05$ . In contrast, there were no significant differences in willingness to take the blame based on who the target of the investigation was and the type of perpetrator misconduct. As participants willingness to take the blame increased, their internal locus of control decreased ( $r = -.32, p < .001$ ). Willingness to take the blame was unrelated to participants' belief in a just world ( $r = -.14, p = .071$ ). These results suggest that both situational factors and individual differences contribute to blame-taking behavior.

### **Different Methods In Calculus: Effect On Students**

Coretha Antchouey  
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Biology and Physics

Learning Assistants help students with time management, organizational skills, and the development or enhancement of study strategies including: note-taking, test preparation, reading, and writing. They help students to set semester, weekly, and daily goals, and to develop a plan of action to meet those goals, in addition to evaluating progress made towards goal-achievement. In calculus, the concept of derivatives is very important to understand and requires a lot of practice to become easier to manipulate. It is important that a student understand not only one, but different methods concerning this concept. In this project, my objective is to see the progression of two different methods: the definition of the derivatives, and the different rules such as product rule, quotient rule and chain rule. I will observe how much more quickly and easily students respond to each method, which one helps them to apply the concept in a proper manner or in an easier way; also which of the two methods helps them to answer questions more successfully. Questions were assigned at the end of exam 2 and a comparison of grade was made to analyze how students respond to the two different methods.

### **Doing Diversity: Three Years Of N/A\***

Gaius Augustus, DiAngele Augustus  
Faculty Mentor: Nicole Martin

College of Science and Mathematics  
Biology and Physics

A college campus is a unique environment, wherein the members of the community share the common goal of learning. People are the most impactfully influenced during their college years, and the lessons learned on campus are easily integrated into life practices. This holds true for academic work and interpersonal life. Many universities in the U.S. have begun to focus on increasing diversity. Due to these efforts, college students are confronted with many practices and beliefs that differ from their own. It is vital that each member of the campus community be informed that they may be presented with novel behaviors and practices, because their first impression often results in a lifelong bias. This makes teaching diversity a necessary element when increasing diversity, for which there is no definite process.

The literature on teaching diversity contains many views on what the best ways are to teach diversity. Included in this information are details on the importance of making diverse communities accessible, visible, and empowered. This will lead to the individuals of the community remaining empowered while efforts are focused on creating opportunities for education. Much of the information on teaching diversity enforces the need to engage those who are learning in a way that promotes them asking questions and generating answers. This can only be done in an environment where they feel safe questioning, dissenting, and processing. After learning takes place it is suggested that access to materials on diversity and efforts to help diverse communities be made available. This allows for rehearsal of the newly acquired knowledge and integration of diverse communities into mainstream communities without assimilation to mainstream culture.

Three years ago every diversity initiative, resource point and committee at Kennesaw State University was led by faculty and staff and had very little student involvement. With research showing that the presence of an authority figure can be silencing for students, this was not the ideal arrangement to foster opportunities for diversity education in students. In the creation of the group Non-normative Anti-Assimilationist Students of Kennesaw State University (N/A\*), we attempted to connect available resources from one location that would be non-threatening to students. N/A\* was created as a hub, with a mission to provide access to community and resources while organizing diversity efforts on campus from a student's perspective.

## **Does The Aristaless/Arx Transcription Factor Control Kal-1/Anosmin Gene Expression?**

Joy Chibuzo

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College of Science and Mathematics

Biology and Physics

Kallmann syndrome (KS) is a human genetic disorder characterized by loss of sense of smell (anosmia) and failure to undergo spontaneous puberty (hypotrophic hypogonadism). Mutations in the KAL-1/anosmin gene lead to X-linked KS with 1:4000 males in the population suffering from this disorder. The nematode *C. elegans* has proven to be a useful model system

for exploring the molecular mechanisms that underlie KS. For instance, a mutation in the *C. elegans* *kal-1* gene causes delayed neuroblast migration prior to epidermal enclosure, and also sensitizes the animal towards other mutations involved in this process.

We hypothesize that genes required for the transcriptional control of *kal-1* may also be candidate KS genes in their own right. We interrogated MODENCODE and protein-protein interaction datasets to identify genes likely to be involved in the transcriptional regulation of *kal-1*. One of these candidates, *alr-1*, is the *C. elegans* homolog of *Aristaless/Arx*. Mutations in *alr-1* lead to gene transcription defects in *C. elegans* although it is not yet known if *alr-1* directly (or indirectly) controls *kal-1* transcription. To determine this, we crossed a *kal-1*-GFP transcriptional reporter into the *alr-1(ok545)* mutant background. We are currently assaying for changes in *kal-1*-GFP expression patterns in this strain, and scoring for orthogonal phenotypes associated with *kal-1* loss-of-function.

### **The A-Class Ephrin *Efn-4* Is Required For Axon Outgrowth**

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Biology and Physics

Ephrins are the canonical ligands for Eph receptor tyrosine kinases (EphRs) and have crucial roles in development and disease. Two classes of ephrin have been identified; ephrin-As, which are anchored to the cell membrane by a glycosyl phosphatidylinositol (GPI) anchor, and ephrin-Bs, which are single-pass trans-membrane proteins. EphR - ephrin interactions have been well characterized as bi-directional, with differential recruitment of downstream effectors in both ligand and receptor-bearing cells. This is easily reconciled in ephrin-Bs as they have a PDZ domain on the intracellular portion of the protein. However ephrin-As attach to the cell membrane via a GPI anchor, hence there is no obvious molecular mechanism for transmission of an ephrin-A dependent reverse signal. Mechanistic evidence of ephrin-A reverse signaling was recently demonstrated when the TrkB neurotrophin receptor was shown to interact in cis with ephrin-A via a conserved cysteine-rich CC2 domain. Also, compelling genetic evidence of ephrin-A reverse signaling was revealed from a kinase-dead mutation in the *C. elegans* EphR *vab-1*, which exhibited a much weaker phenotype than a loss of function mutation in the ephrin-A ligand *efn-1*.

We recently discovered a novel axon outgrowth role for the *C. elegans* ephrin-A, *efn-4*, during nervous system development. Genetic and biochemical analyses indicate that this is not a canonical EphR-mediated role, suggesting the existence of one or more novel receptors for *efn-4*. Nervous system-specific expression of *efn-4* fails to rescue axon outgrowth defects, suggesting that an *efn-4*-dependent interaction between the nervous system and another cell

type is required for axon extension. We hypothesize that efn-4 is required non-cell autonomously in either the pharynx or hypodermis to govern axon outgrowth.

### **Measuring Zinc Trafficking In Response To Hemorrhagic Venom**

Veronica Garbar

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College of Science and Mathematics

Biology and Physics

Edema, local tissue necrosis, and internal hemorrhaging describe early clinical manifestations of *Echis carinatus* (saw scaled viper) envenomation. If allowed to progress, permanent disfigurement or death can result. The venom destroys tissue at the bite site by inhibiting focal contact adhesion. Endothelial cells respond to venom by initiating an acute inflammatory response leading to vasodilation, increased permeability, and cell death. Early work from our lab utilized microarray technology to identify several metallothionein genes (MT2A, MT1X, MT1H, MT1B) up regulated in endothelial cells stimulated with *Echis carinatus* venom. Additionally, endothelial cells stimulated with *Echis carinatus* venom displayed increased reactive oxygen species (ROS) and metal transcription factor 1 (MTF-1) translocation. In this study, we utilized the fluorescent probe FluorZin 3AM to monitor zinc trafficking in human kidney and endothelial cells. Cells preloaded with FluorZin 3AM, then stimulated with crude venom or Echistatin (an isolated protein from crude *Echis carinatus* venom) showed significant increases in fluorescent intensity. Our data suggests zinc trafficking plays an important role in cell survival signaling during *Echis carinatus* envenomation.

### **Crushing Resistance Of *Elimia Modesta* And *E. Carinocostata* In Lower Etowah River Basin Tributaries**

Ashlee Grimm

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College of Science and Mathematics

Biology and Physics

Freshwater snails were investigated to determine how selective forces in an environment influence shell morphology. The study focuses on two freshwater streams with differing water conductivities to determine crushing resistance of snail shells. We investigated resistance to crushing within a species (*E. modesta*) between streams of differing conductivity, and between two species (*E. modesta* and *E. carinocostata*) found in the same stream. Snails were collected from a high conductivity stream, Upper Two Run and a low conductivity stream, Stamp Creek. Size of each snail was measured at the widest point of the aperture using a dial caliper



and slowly compressed using vernier calipers. Compression was quantified as the total distance Compression before fracture was quantified as the distance between the point where the caliper surface came in contact with the shell and the point where the shell fractured. As expected, compression before fracture increased with increasing shell size (ANCOVA , test for slope = 0,  $p < 0.001$ ). Crushing resistance differed among the combinations of species and location (ANCOVA , test for differences among levels of independent variable,  $p < 0.001$ ). Aperture width accounted for 13.8% of the variability in the data (partial  $\eta^2 = 0.138$ ) while the combination of species and location accounted for 29.7% of the variability in the data (partial  $\eta^2 = 0.297$ ). *E. modesta* from the higher conductivity stream had greater resistance to crushing than *E. modesta* from the lower conductivity stream. Within the higher conductivity stream *E. carinocostata* was more resistant to crushing than *E. modesta*. Differences in resistance to crushing may give *E. carinocostata* a selective advantage over *E. modesta* in Two Run Creek. Further research is needed to determine if this is the case.

### **Arbuscular Mycorrhizal Fungal Colonization In The Black Willow (*Salix Nigra*) And American Sycamore (*Platanus Occidentalis*)**

Joshua Hashemi, Barbie Hawkes  
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Biology and Physics

The purpose of this research was to compare the efficacy and complexity of staining methods in the detection of mycorrhizae in roots, with the ultimate objective of using these findings in the detection and quantification of arbuscular mycorrhizal fungi in two riparian tree species, Black willow (*Salix nigra*) and American Sycamore (*Platanus occidentalis*). The study was conducted at Kennesaw State University in Kennesaw, Georgia. Root samples were taken from a riparian area within a patch of forest on the campus. Mycorrhizae are an association between a fungus and a plant root, which may aid the plant in the acquisition of water and nutrients.

Both tree species employed in the study are native to Georgia and may be used to restore river banks. Differential mycorrhizal colonization among species may enhance the ability of survivorship of trees under low water or nutrient conditions.

To examine differences in methods, root samples were stained with either trypan blue or acid fuchsin and observed under two different types of microscope: a compound microscope and a laser scanning confocal microscope (Zeiss LSM 700). The latter scope allows for the production of 3-D images. The comparison of staining methods indicated acid fuchsin was a better stain regardless of microscope. Mycorrhizal colonization was quantified using the "root piece" method, and preliminary results suggest colonization may be higher in the sycamore (*Platanus occidentalis*) root samples.

## **Quantifying Potential Differences In Trophic Relationships Across Freshwater Streams Of Varying Urbanization**

Daniel Hoffman

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College of Science and Mathematics

Biology and Physics

Interactions between terrestrial and aquatic ecosystems play an important role in ecosystem structure and function. For instance, urbanization near watersheds and riparian zones modifies not only the physical landscape, but also alters the linkages to nearby stream habitats through hydrology, sediment transport, and nutrient cycling. Modification to nutrient cycling through the addition or reduction of allocthonous material from surrounding terrestrial ecosystems may alter the nutrient and organic matter composition of the local aquatic system and affect the relative abundance of organisms at different trophic levels. To examine the potential differences in stream food web composition between urbanized and rural environments we selected three streams of similar size from two counties in the metropolitan Atlanta, GA area. Representatives of each trophic level (including periphyton from various substrata, plant material, invertebrates, and fish) were collected from each study site, dried, pulverized, and analyzed for  $^{13}\text{C}$  and  $^{15}\text{N}$  content. Feeding relationships will be identified based on these stable isotope signatures and comparisons will be made to detect changes in various trophic levels between the streams. Additionally, nutrient content of the tissues will be used to assess the differences in nutritional value of food sources across streams.

## **Exploring The Impacts Of Urbanization On Stream Food Webs: Does Urbanization Affect Periphyton Abundance And Composition?**

Katharine Horning

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College of Science and Mathematics

Biology and Physics

Periphyton is a key component of stream food webs because the organisms and detritus within the matrix represent important sources of organic matter for higher trophic levels. The abundance and composition of organisms that constitute periphyton is, in part, a function of water quality and light availability. In many locations, water quality is being modified by urbanization in ways that may impact the quantity and quality of periphyton as a food source. For instance, urbanization typically involves reductions in tree cover and proliferation of impervious surfaces that together may increase irradiance, nutrient inputs, and water temperatures in streams, conditions that commonly favor growth of filamentous

Chlorophytes. Such changes can be important for stream fauna because the community composition also affects the nutritional value and palatability of periphyton. We sampled periphyton along a gradient of urbanization in 12 streams throughout Cobb and Paulding County, GA to detect patterns in standing stock and community structure. We sampled 6 different transects along a reach within each stream and quantified total chlorophyll, biomass, and relative abundance of algal taxa. Preliminary results indicate that algal abundance was dominated by a diversity of species within the Bacillariophyceae, Cyanophyta and Chlorophyta. Comparisons will also be made of the total chlorophyll and biomass among the streams to determine if urbanization affects the quality and quantity of food available along a gradient of urbanization.

### **Developing An RNA-Interference Assay To Knockdown Eph Receptor Gene Expression In Developing Neurons**

Bryan Lynn

Faculty Mentor: Martin Hudson

College of Science and Mathematics

Biology and Physics

During mammalian cortical development, neural stem cells lie adjacent to the ventricle. After each round of cell division, daughter cells migrate radially outwards past the previously born population, creating the layered structure of the cortex in an inside-to-out manner. While the fate specification of cortical layering is beginning to be understood, very little is known about how neuroblasts establish and maintain radial morphology and polarity during cell division.

Stem cells can be differentiated in vitro into cortical neurons and offer an excellent model to examine factors that affect neurogenesis. During in vitro neural differentiation, the Eph receptor tyrosine kinase EphA7 is localized to the apical surface of neuroblasts and co-localizes with apical markers such as zona occludens-1. To further understand the mechanism of EphA7's role in neurogenesis, we are developing a RNA-interference (RNAi) knockdown assay to transiently eliminate EphA gene expression in developing neuroblasts. We anticipate that knockdown of EphA7 expression will cause reduced apoptosis in developing neuroblasts, leading to an increase in the percentage of actively dividing cells in a population.

### **Univariate And Multivariate Assessment Of Habitat Preferences Of Stream Fishes**

Casey Quade, Beth Drobinski

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College of Science and Mathematics

Biology and Physics

Urbanization alters physical habitat in streams and has been implicated as a factor leading to reduced fish diversity in urban streams. Evaluating the importance of habitat alteration requires an understanding of fishes' preferred habitats and the appropriate scale of measurement to use in assessing those habitat features. The purpose of this study is to assess two different approaches for quantifying fish habitat preferences to determine which most adequately characterizes habitat use compared to expected patterns determined from the literature. Fish were collected at 12 sites from streams in the lower Etowah River Basin using backpack electroshockers. At each site, the study reach was divided into six sections of equal length and fish from each section were identified and counted. Water depth, water velocity and substrate composition were assessed at six randomly selected points in each of the six sections. Habitat preferences for three species, *Lepomis auritus*, *Percina nigrofasciata* and *Campostoma oligolepis* were estimated using a univariate approach where depth, velocity and substrate were treated separately and a multivariate approach where the three habitat variables were combined into a series of coded categories. The univariate approach produced habitat relationships that corresponded poorly to literature descriptions of the preferred habitat of the three species. In contrast, the multivariate approach produced habitat relationships similar to those found in literature descriptions of the preferred habitat of the species. Our results suggest that fish are responding to interactions among the measured habitat variables and a univariate approach to habitat description has limited utility.

### **Growth Rate Of Tipulidae On *Ligustrum Sinense* And *Liriodendron Tulipifera***

Donna Saylor

Faculty Mentor: William Ensign

College of Science and Mathematics

Biology and Physics

*Ligustrum sinense* (Chinese Privet) becomes more common in stream riparian zones as urbanization increases. As native deciduous species are replaced and privet takes over, the proportion of privet in the leaf litter increases, changing the food source of invertebrate shredders in the stream.. The main purpose of this study was to determine if invertebrates in the family Tipulidae, a main shredder of leaf litter, will utilize *L. sinense* as a food source. We hypothesize that tipulids will prefer a diet of native *Liriodendron tulipifera* (Tulip Poplar) over a diet of *L. sinense*. To test this hypothesis, we compared the relative growth rates of tipulids on diets of *L. sinense* and *L. tulipifera* . Our prediction was that the growth rate of tipulids on *L. sinense* would be less than the growth rate of tipulids on *L. tulipifera* . Tipulids were maintained in laboratory mesocosms for six weeks and fed an ad libitum diet of either preconditioned *L. sinense* or *L. tulipifera* leaves. Leaves were preconditioned by placing leaf packs into a stream to allow colonization by microbes and fungi. Weights were obtained

weekly and any mortalities recorded. There were no significant differences in growth rates between the treatments, but overall mortality was higher on the *L. sinense* diet.

### **Urbanization And Gut Length In *Campostoma Oligolepis***

Michael Schooling

Faculty Mentor: William Ensign, Troy Mutchler

College of Science and Mathematics

Biology and Physics

Urbanization can dramatically alter watersheds resulting in shifts in autochthonous and allochthonous contributions to trophic pathways. Differences in food quality and algal or periphyton nutritional content have been linked to differences in the gut lengths of herbivorous freshwater fishes. The purpose of this study was to determine if there is a relationship between stream urbanization levels and gut length in *Campostoma oligolepis*, an herbivorous minnow. *Campostoma oligolepis* were obtained from 12 sites in tributaries to the Etowah River in northwest Georgia. Urbanization levels for the sites ranged from heavily impacted by urban development to fully forested. Watershed area also varied at the twelve sites, ranging from 3.6 km<sup>2</sup> to 133.1 km<sup>2</sup>. Twenty individuals were obtained from each site, preserved and returned to the lab where the entire gastrointestinal tract was removed and measured. Standard length of each individual was also measured and a gut length/fish length ratio ( $Q_g$ ) established. There were significant differences in  $Q_g$  among sites (ANOVA  $p < 0.05$ ) with fish from sites with higher levels of urbanization exhibiting lower  $Q_g$  ratios. Also, in watersheds with high levels of urbanization  $Q_g$  increased with decreasing stream size while the pattern was reversed in watersheds with lower urbanization levels. These patterns are consistent with the expected increase in quantity and quality of periphyton that should be found in urbanized watersheds.

### **Spatial Delineation Of Monoclonal Genotypes In The Seagrasses *Thalassia Testudinum* And *Halodule Wrightii* In The Gulf Of Mexico's Florida And Alabama Coastlines**

Whitney Smith

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College of Science and Mathematics

Biology and Physics

The genetic diversity of the seagrasses *Thalassia testudinum* and *Halodule wrightii* collected from three locations (St. George Sound, FL; St. Joseph Bay, FL; and Grand Lagoon, FL) was estimated using microsatellite markers. The objective of this preliminary study was to measure the extent of monoclonal genotypes within sampled sites and to estimate gene flow among

sampled sites for the two species. Seagrass tissue samples were collected at 10 meter intervals along 100 meter transects. The tissues were preserved in silica gel and transported to Kennesaw State University. Genomic DNA was isolated from plant tissue using MOBIO DNA Extraction Kit for plant tissue. Six microsatellite loci for each species were amplified. The amplified samples were electrophoresed using an ABI 310 automated DNA sequencer. The allele sizes were estimated compared to an ROX 500 size standard and the genotypes assigned. Allelic diversity was detected within loci, among individuals, within sites and between sites indicating site specific genetic differences. Monoclonal genotypes ranged from 10 to 100 meters for the two species and varied within and between sampled sites. The observed patterns of genetic diversity and the natural barriers and corridors of recruitment in this system for these species will be interpreted in the context of natural and anthropogenic impacts on seagrass beds. Knowledge of this type will enhance the ability of researchers to predict if and how this species and others will respond to changes in hydrology and disturbance, and the impact these changes may have on community structure.

### **Kal-1 Dependent Axon Branching Is Caused By Multiple Heparan Sulfate Proteoglycans**

Alyse Steves, Austin Howard, Alicia Schwieterman  
Faculty Mentor: Martin Hudson

College of Science and Mathematics  
Biology and Physics

Mutations in the KAL-1/anosmin gene lead to X-linked Kallmann syndrome (KS), a human genetic disorder characterized by loss of sense of smell (anosmia) and failure to undergo spontaneous puberty (hypotrophic hypogonadism). *C. elegans* models of X-linked KS show that KAL-1/anosmin has roles in neuroblast migration and axon branching but the molecular mechanisms behind its function in these processes are poorly understood. Over-expression of KAL-1/anosmin in *C. elegans* AIY interneurons causes highly penetrant ectopic axon branching. This phenotype is strongly suppressed by heparan sulfate (HS) biosynthesis mutants, suggesting a role for heparan sulfate proteoglycans (HSPGs) in KAL-1/anosmin-induced axon branch formation.

The *C. elegans* genome contains five predicted HSPGs: *sdn-1/syndecan*, *gpn-1/glypican*, *lon-2/glypican*, *unc-52/perlecan* and *agr-1/agrin*. Using genetic epistasis experiments, we have shown that *sdn-1/syndecan* mutants do not suppress *kal-1*-dependent axon branch formation but can suppress ectopic branching when over-expressed cell-autonomously. *gpn-1/glypican* mutants actually increase the levels of axon branch formation, but again, over-expression suppresses branching when expressed cell-autonomously. *lon-2/glypican* mutants have no change in the percentage of neurons that exhibit ectopic branching, although cell-autonomous expression of *lon-2* leads to significantly longer branches. *sdn-1/syndecan*, *gpn-1/glypican*, *lon-2/glypican* triple mutants strongly suppress branching but do not fully recapitulate the

phenotypes seen in HS biosynthesis mutants, suggesting that at least one other HSPG is involved in this process. Based on these data, we propose a model where *gpn-1*/glypican and *sdn-1*/syndecan negatively regulate KAL-1 function cell autonomously, where as multiple HSPGs function redundantly as downstream effectors of KAL-1 function in axon branching and branch extension.

## **Comparison Of Protein Purification Systems For Supporting Fermentation Development In The Biologics Industry**

Ezigbobiara Umejiego

Faculty Mentor: Melanie Griffin

College of Science and Mathematics

Biology and Physics

Development of therapeutic proteins, including monoclonal antibodies (mAbs), involves the coordination of a series of activities in the upstream and downstream process development. In the upstream sector, the selection of a candidate amongst a group of mAb clones relies on some important protein parameters, such as purity and titer. This fermentation support is provided by the protein purification group using automated processes, in an efficient and timely fashion, to enable the optimization of the cell culture process development conditions. We hypothesize that the AKTExpress offers a viable purification platform on which to facilitate speedy candidate screening at a representative column scale. First, the AKTExpress modules were prepped and test run using three 40mL proA columns that had been packed and tested. Subsequently, comparison experiments were performed using the same protein loading parameters for the AKTExpress and MEA systems. Results from the analytical HPLC assays showed both processes produced highly comparable and replicable data, as the purity and ion charge variants profile for the purified mAbs had a standard deviation of <1.0%. However, the average yield for both systems differed slightly. These preliminary data suggest that the AKTExpress produce results that are comparable to large scale operations in downstream processing and development.

## **The Role Of NeuroD In The Transcriptional Control Of Kal-1/Anosmin Gene Expression**

Taylor Voyles

Faculty Mentor: Martin Hudson

College of Science and Mathematics

Biology and Physics

Kallmann syndrome (KS) is a human genetic disorder characterized by loss of sense of smell (anosmia) and failure to undergo spontaneous puberty (hypotrophic hypogonadism). Ten

genes have been associated with this disease to date. Despite this, 65% of KS patients have no identifiable lesions in these genes, suggesting that other KS loci remain to be discovered. The nematode *C. elegans* has proven to be a useful model system for exploring the molecular mechanisms that underlie KS. For instance, mutations in the *C. elegans* *kal-1* gene, which is orthologous to the human gene responsible for X-linked KS, exhibit delayed neuroblast migration prior to epidermal enclosure. Also, over-expression of *kal-1* in neurons causes ectopic axon branching. We hypothesize that genes required for the transcriptional control of *kal-1* may also be candidate KS genes in their own right. We interrogated MODENCODE and protein-protein interaction datasets to identify genes likely to be involved in the transcriptional regulation of *kal-1*. One of these candidates, *cnd-1*, is the *C. elegans* homolog of NeuroD, a transcription factor required for specification of neuronal fate early in development. Mutations in *cnd-1* have defects in nervous system development, although it is not yet known if *cnd-1* has any role in *kal-1* transcription. Using genetic techniques, we have generated a *cnd-1* mutant strain bearing a *kal-1*-GFP transcriptional reporter. We are assaying this line for changes in GFP expression patterns and other phenotypes that are consistent with a role for *cnd-1* in the transcriptional regulation of *kal-1*.

### **Creativity In Mathematics: Stimulating Students' Creativity To Affect Long-Term Knowledge**

Aqsa Adnan

Faculty Mentor: Nancy Burney

College of Science and Mathematics

Chemistry and Biochemistry

The purpose of this study is to determine if students benefit from using a learning tool in mathematics. A tool was designed to focus on a key concept taught in class. The tool also came with a phrase that helped produce creative thinking in students, thus enabling the student to increase long term memory and exam scores in the short term.

### **Using Calculus To Find The Average Value Of Kennesaw State University Available Monetary Funds From 2008 To 2013**

Michael Baker, Tony Guzman, Chelsea Harrod, Abdelsalam Sharkasi

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Chemistry and Biochemistry

Over the course of undergraduate study, students learn a variety of concepts, techniques and skills required to solve problems. However, in some math classes, many students believe that



mathematical concepts and equations do not have any significant applications outside their classrooms. Among students, there is a lack of understanding of the problem solving skills and analytical thought processes that are needed for the development and support of our communities. In this work, we used what we have learned in Dr. Espinoza's Calculus class to recognize applications in real life. Using definite integrals, we were able to find the Average Value of Available Monetary Funds of Kennesaw State University from 2008 to 2013. This work resulted in a formula to compute the needed available monetary funds at any time, assuming that the funds continue to increase roughly at a constant rate.

### **New MaloNHCs And Their Corresponding Anionic Thiones: Synthesis And Coordination**

Chance Boudreaux, Bradley Norvell  
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Due to their functional and synthetic diversity, as well as a high affinity toward a wide range of main group and transition metal, archetypal nucleophilic carbenes, namely N-heterocyclic carbenes (NHCs), have shown remarkable utility as ligands for organometallic catalysts and as organocatalysts. Our investigations into the transition-metal coordination chemistry of new maloNHCs and their corresponding thiones will be presented.

### **Role Of The Steroid And Xenobiotic Receptor (SXR) And The Constitutive Androstane Receptor (CAR) In ABCB1 Expression**

Marina Chesnokova  
Faculty Mentor: Jennifer Powers

College of Science and Mathematics  
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P-glycoprotein, encoded for by the gene known as ABCB1, is a multi-drug resistant protein responsible for transporting numerous xenobiotics and other highly hydrophobic compounds, such as steroid hormones, out of the cell. This ATP-binding cassette transporter prevents many therapeutic agents from crossing the blood brain barrier, rendering them ineffective. ABCB1 is expressed in the liver, intestines, kidney, adrenal, capillary endothelial cells of the blood brain barrier, and is known to be over-expressed in cells exposed to a variety of chemotherapeutics. In previous studies, it was observed that treatment of porcine brain capillary endothelial cells with constitutive androstane receptor (CAR) ligand CITCO (6-(4-Chlorophenyl)imidazo[2,1-b][1,3]thiazole-5-carbaldehyde-O-(3,4-dichlorobenzyl)oxime) resulted in the activation of the nuclear receptor and subsequent up-regulation of ABCB1. Similarly, the antibiotic rifampicin

was observed to activate the steroid and xenobiotic nuclear receptor (SXR/PXR), also resulting ABCB1 up-regulation in porcine brain capillary endothelial cells. Our interest was to investigate the effects of these xenobiotics with respect to ABCB1 expression in H295R, a human adrenocortical cell line. Cells were treated with 10  $\mu$ M CITCO or 10  $\mu$ M rifampicin for 6, 12, 24, and 48 hour periods. Treatment was followed by RNA extraction and cDNA synthesis using an Applied Biosystems High Capacity cDNA Reverse Transcriptase Kit. Quantitative RT-PCR was performed using the Roche LightCycler 480 system, with a probe-primer combination specific for the ABCB1 gene. Fold changes in expression were calculated in comparison to a reference gene (PPIA or beta-2M) using the Pfaffl equation. Preliminary data suggests a modest change in expression of ABCB1 upon treatment with CITCO, but not rifampicin. This suggests involvement of CAR, but not SXR in the expression of ABCB1 in adrenocortical cells. Additional data and discussion will also be provided.

### **Saponification Value And GC Analysis Of Olive Oil**

Daniel Corella

Faculty Mentor: Marina Koether

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Chemistry and Biochemistry

This study involved measuring the saponification value of olive oils, oleic acid and decanoic acid. Saponification value is a measure of the amount of base needed to saponify 1 g of fat. It serves as a way of determining the average molecular weight and, by extension, the average chain length of fatty acids in a sample. Samples of olive oil, oleic acid, and decanoic acid were found to have saponification values of 198, 207, and 326, respectively. Using decanoic acid as the internal standard, samples, olive oil and oleic acid standards were methylated and quantified on a GC. Oleic acid is the primary ingredient in olive oils.

### **How Calculus Proves Liquid Courage Works, Finding The Average Number Of Drinks Needed To Receive The Maximum Phone Numbers From People We Would Like To Ask Out**

Cody Goss, Skyler Mize, Niloufar Mehrjerdian, Kyle Sekellick

Faculty Mentor: Flor Espinoza

College of Science and Mathematics

Chemistry and Biochemistry

Have you ever been to a bar and asked for someone's number just to be rejected? It is a sad experience that we may have lived at least once. Rejection is a very unpleasant feeling that humans should avoid if they can. Going to a bar for a couple of drinks with your friends is a

normal occasion in today's society. One of the first steps to asking someone out is getting their phone number. In this work, using what we have learned in Dr. Espinoza's Calculus class, we studied how an increase in blood alcohol content (BAC), alters someone's abilities to receive a phone number from someone they are interested in. We all know from experience that alcohol tends to boost confidence, which is a positive trait in most people's eyes. After doing some field research, we calculated the perfect BAC for both females and males to have in order to maximize the quantity of phone numbers received from people of interest. We call this The Calculus Bar Theory.

### **The Effects Of Protonated Pyrrole Isomers Tagged With Argon**

Christopher Harper  
Faculty Mentor: Martina Kaledin

College of Science and Mathematics  
Chemistry and Biochemistry

This work investigates the effects of the argon atom on the energetics and the infrared spectra (IR) for the following protonated pyrrole isomers:  $\alpha$ -pyrrole,  $\beta$ -pyrrole and N-pyrrole. Calculations of the structure, energy and vibrational frequencies of the three pyrrole isomers were performed using Density Functional Theory (DFT) and MP2 methods. The Gaussian 09 program was used to perform electronic structure calculations. Previous theoretical studies have found that the  $\alpha$ -pyrrole isomer is the most thermodynamically stable. The  $\beta$ -pyrrole experiences greater reactivity and the N-pyrrole is the least stable of the three isomers.

### **Alternative Reductants For The Catalytic Oxacyclization Of A 1,4-Dihydroxy-5-Alkyne To A 3-Hydroxytetrahydropyran**

Chelsea Harrod  
Faculty Mentor: Frank McDonald, John Haseltine

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The compatibility of various reducing agents with mercuric triflate has been explored for the oxacyclization of a 1,4-dihydroxy-5-alkyne. A compatible reducing agent will allow for single-step multi-ring formation, improving the total synthesis of the marine natural product, brevenal.

### **Towards The Synthesis Of Tris(N-Heterocyclic Carbenes)**

David Lee

Faculty Mentor: Daniela Tapu

College of Science and Mathematics  
Chemistry and Biochemistry

N-heterocyclic carbenes have emerged as a very useful type of ligands for homogeneous catalyst design, due to their high topological and electronic versatility, as well as a great coordination capability. We are interested in the preparation of multifunctional catalysts for their use in tandem catalytic processes. Within this context, we are interested in the synthesis of new NHC-based ligands capable of bridging multiple metals in different coordination environments. The preparation of a novel tris-NHC ligand and its coordination to transition metals will be presented.

### **Ac-Sar-Sar-Pro-Oet Tripeptide Multi-Step Synthesis**

Santiago Mestre Fos, Christina Taylor  
Faculty Mentor: John Haseltine

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Chemistry and Biochemistry

The goal of this project is to understand effects of long-range structure in enzyme mechanisms. The target for synthesis this semester by our two-person team is the tripeptide Ac-Sar-Sar-Pro-OEt. It will be made through a multi-step synthesis so we can study its kinetics in specific reactions, such as ester methanolysis. The results should be of important relevance when determining the role of long-range electronics in enzyme mechanisms, and trying to understand the essence of these mechanisms in detailed terms.

### **Investigation Of The Role Of The Vitamin D Receptor And The Farnesoid X Receptor In Expression Of ABCB1**

Kirt Ronig  
Faculty Mentor: Jennifer Powers

College of Science and Mathematics  
Chemistry and Biochemistry

The ABCB1 gene expresses the integral membrane phosphoglycoprotein (P-gp), which serves as a multi-drug resistance protein that is important for its physiological role in the excretion of a great variety of hydrophobic molecules such as steroids and xenobiotics (e.g. chemotherapeutic drugs). It is found to be highly expressed in the epithelial cells of hepatic, renal, intestinal, and adrenal tissues as well as in the endothelial cells of capillaries in the

blood-brain barrier (BBB). The ABCB1 gene has been reported to be under the control of the pregnane X receptor (PXR) and the constitutive androstane receptor (CAR) belonging to the NR1I subfamily of nuclear receptors. Another nuclear receptor belonging to this subfamily is the vitamin D receptor (VDR). VDR has recently been shown to control the expression of ABCB1 gene in different cell line. In previous results from our group, the farnesoid X receptor (FXR), a nuclear receptor from another subfamily, was found to be more highly expressed in the H295R adrenocortical cell line than PXR or CAR. Other groups have shown FXR to be involved in the regulation of the expression of ABCB2 and ABCB4 genes in human hepatocytes. Since VDR was found to be involved the ABCB1 gene expression in the intestinal, kidney, and BBB cell lines and FXR is found in significant levels in the H295R cell line, we were interested in whether or not the ABCB1 gene in these cells is regulated by these two nuclear receptors. Cells were treated with 250 nM  $1\alpha, 25$ -dihydroxy-vitamin D3 or chenodeoxycholic acid (an FXR agonist) for 6, 24, and 48 hours. RNA was extracted from these cells and converted cDNA using commercially available kits. Samples of the cDNA were analyzed using quantitative RT-PCR with the Roche Lightcycler 480 instrument. Data accumulated to date will be presented and discussed.

### **GC-MS Method Development for $\alpha$ -Pinene in Juniper Leaves**

Ivana Turner

Faculty Mentor: Marina Koether

College of Science and Mathematics

Chemistry and Biochemistry

Juniper leaves were harvested from the grounds of Kennesaw State University. These were analyzed for percent loss on drying and for analysis of  $\alpha$ -pinene by GC-MS. The percent loss on drying was  $59 \pm 4\%$ . Extraction methods and method development will be described. The internal standard used for the GC-MS analysis was o-xylene.

### **Improving Existing Tumor Growth Models**

Victoria Awokunle

Faculty Mentor: Philippe Laval

College of Science and Mathematics

Mathematics and Statistics

Many tumor growth models are based on either logistic growth or some form of the Lotka-Volterra equations. However, it has been known since the 1960's that Gompertz growth provides a better description for tumor growth than logistic growth does. We propose to improve these models by replacing logistic growth by Gompertz growth. More specifically,

we look at a competition Lotka-Volterra model which involves both healthy cells and cancer cells. For healthy cells, we keep the logistic growth. For cancer cells, we replace logistic growth by Gompertz growth. We then perform an analysis of this new model. We also compare numerical solutions of both models.

### **Applying Queuing Theory To Traffic Modeling**

Zachary Carter

Faculty Mentor: Anda Gadidov

College of Science and Mathematics

Mathematics and Statistics

We use methods of queueing theory to model the traffic on Chastain Road near the I-75N entrance intersection in Kennesaw GA. Queues are characterized by their arrival ( $\lambda$ ) and service ( $\mu$ ) rates and the number of servers in the system. Using Maple we simulate an M/G/1 queue (Poisson interarrival time distribution, General service times, and one server). The system is considered to be in “steady state” when  $\rho$ , defined as the ratio  $\lambda/\mu$ , is less than 1. We attempt to determine the relationship between  $\rho$  and the time to convergence of the system from the initial state to steady state.

### **Mathematical Analysis For An HIV/AIDS Model**

Ana Cienfuegos

Faculty Mentor: Liancheng Wang

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Mathematics and Statistics

A non-linear mathematical model of ordinary differential equations is presented in this paper. The model analyzes the spread and control of HIV (human immunodeficiency virus) AIDS (acquire immunodeficiency syndrome). The population is divided in 4 subclasses one of them is the susceptible population  $S$  and others are HIV infectives (that do not know they are infective)  $I_1$ , HIV positives that know they are infected  $I_2$ , and the AIDS patients  $A$ . The disease free equilibrium and the infected equilibrium are found and their stability is studied.

### **The Impact Of Learning Assistants In The Classroom**

Ana Cienfuegos

Faculty Mentor: Nancy Burney

College of Science and Mathematics

## Mathematics and Statistics

This research was conducted to study the students' completion of homework in classrooms with and without Learning Assistants (LAs). The goal was to show that classrooms with LAs tend to have a higher rate of homework completed by students than classrooms with no LAs. We also wanted to show that students in classrooms with LAs tend to get higher grades in the class.

### **Independent Bishop And Bouncing Bishop 'Armies' On Various Chessboards**

James Eubanks

Faculty Mentor: Ken Keating

College of Science and Mathematics

Mathematics and Statistics

The idea of independence of individual Bishops on a chessboard has been studied and modeled by several mathematicians in the past. In this presentation we discuss the idea of equally sized Bishop armies with each army independent of all other armies. We also introduce the idea of a Bouncing Bishop and prove some results about Bouncing Bishop armies.

### **Cyclic Dominating Sets In Cayley Graphs**

Matt Force, Jon Woltz

Faculty Mentor: Joe DeMaio

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Mathematics and Statistics

A set  $S \subseteq V$  is a dominating set of a graph  $G=(V,E)$  if each vertex in  $V$  is either in  $S$  or is adjacent to a vertex in  $S$ . The domination number of a graph  $G$ ,  $\gamma(G)$ , is the minimum cardinality of a dominating set of  $G$ . The Cayley digraph,  $\text{Cay}(G,C)$ , for any group  $G$  and  $C \subseteq G \setminus \{e\}$  has as its vertex set the group elements of  $G$  and the  $i \rightarrow j$  arc exists if and only if  $ji^{-1} \in C$ . If  $C$  is closed under inverses then  $\text{Cay}(G,C)$  is a graph rather than a digraph. Assume  $S$  is a dominating set in  $\text{Cay}(G,C)$ . We call  $S$  cyclic if there exists  $g,h \in G$  such that  $S = \{gh^k \mid k=1,2,\dots,|h|\}$ . The cyclic domination number of a graph  $G$ ,  $\gamma_{\text{cy}}(G)$ , is the minimum cardinality of a cyclic dominating set of  $G$ . In  $\text{Cay}(\mathbb{Z}_{10},\{\pm 1,\pm 2\})$ ,  $S=\{0,5\}=\{0+5k \mid k=0,1\}$  is a minimum dominating set and cyclic dominating set. In  $\text{Cay}(\mathbb{Z}_{10},\{\pm 1,\pm 4\})$ ,  $T=\{0,4,8\}$  is a dominating set of minimum size but is not cyclic. The set  $\{1,3,5,7,9\}=\{1+2k \mid k=0,1,2,3,4\}$  is a cyclic dominating set in  $\text{Cay}(\mathbb{Z}_{10},\{\pm 1,\pm 4\})$  but has cardinality that is greater than a minimum dominating set. In this talk we present properties of cyclic dominating sets.

## **Student Study Networks: Does Size Matter?**

Matt Force

Faculty Mentor: Nancy Burney

College of Science and Mathematics

Mathematics and Statistics

This experiment was constructed to observe how the size of the networks formed by students influences their performance in an introductory calculus course. Specifically, this project focuses on the networks that students form with the available resources that are external to the class. By doing so, this project will allow insight into how frequently students take advantage of the university made available resources, and how this frequency affects their course performance. It will allow transparency into the social study habits of students for we traditionally believe students form study groups and we wish to challenge whether this perception is still valid today. This experiment attempts to form a relation between a student's implemented study method or habits and the corresponding change in their performance in the course. Again, this experiment measures the students' social study networks.

## **Can Zombies Be Stopped?**

Luke Forkner, Evan Moore

Faculty Mentor: Meghan Burke, Flor Espinoza

College of Science and Mathematics

Mathematics and Statistics

Prior work on the epidemiology of the Zombie apocalypse (Munz, Hudea, Imad, and Smith) finds that it is nearly impossible to finish off the zombie population once the zombies attack. However, there is discussion that zombies could be at least temporarily stopped by separating the head from the body or destroying the brain. In this work, a mathematical model done with two undergraduate students, we consider the possibility of zombies moving permanently into a Removed category in these cases. This could be the difference between zombies taking over the world, and the zombies being defeated.

## **A Study On Terroristic Populations And Their Activity**

Henry B. Grimes

Faculty Mentor: Flor Espinoza

College of Science and Mathematics



## Mathematics and Statistics

The turn of the century brought on a new idea of modern warfare that provoked the United States to war - terrorism. With headlines reading like "SEAL Team 6: The Bad-Asses Who Killed Osama Bin Laden" and "Malaysian Plane Disappearance May Have Been Terrorist Hijacking," a complete paradigm shift needs to occur in studying warfare. Jeffrey Strickland's *Mathematical Modeling of Warfare and Combat Phenomenon* develops the dynamic model of terrorism to understand how populations, sectioned into terrorists and non-terrorists, change over time. The model is further enhanced by breaking down the non-terrorist population into susceptible and non-susceptible to become terrorists. Additionally, smaller rate-bearing factors such as suicide bombers, propaganda, and military intervention play a role in the change of populations. The differential equations are derived from the model, and then further developed to predict population change as factors like the aforementioned come into play. By studying the change in the terrorist populations, using the dynamical system described by Ordinary Differential Equations (ODEs), we will therefore be able to understand the effects of military/police and nonviolent intervention on the terrorist populations. From there we can draw conclusions on the effectiveness of the "War on Terror," also known as Global War on Terrorism (GWOT).

### **The Generalized Viète Formulas**

Benjamin Hoffman

Faculty Mentor: Josip Derado

College of Science and Mathematics

Mathematics and Statistics

In 1593 Francois Viète derived a famous formula for calculating Pi. This formula was based on presenting cardinal sine function as an infinite product of cosines. The classical proof of the formula is based on applying double angle formula for sine. We present the alternating proof, which uses integration and self-similarity of the underlying set. We then extend that formula for all self-similar sets in any dimension and hence derive the infinite product formula for generalized cardinal sine function We investigate the role self similarity plays in Wavelet Theory.

### **Control Of Carbon Dioxide Gas In The Atmosphere: Preliminary Results**

Joshua Howard

Faculty Mentor: Ana-Maria Croicu

College of Science and Mathematics

Mathematics and Statistics

A nonlinear mathematical model to control the effects of human population and forest biomass on the dynamics of atmospheric carbon dioxide gas has been analyzed. Deforestation increases the atmospheric concentrations of CO<sub>2</sub> and an increase in the anthropogenic CO<sub>2</sub> emissions into the atmosphere produces a decline in the human population. Therefore, a control problem is posed and investigated using Pontryagin Principle.

### **Frog On A Log: Do Visual Tools Help Students Learn?**

Michael Magruder

Faculty Mentor: Nancy Burney

College of Science and Mathematics

Mathematics and Statistics

There are multiple ways in which people learn, such as those who are auditory, kinesthetic, or visual learners. Most classes are geared heavily to the visual and auditory learners, with lectures, teaching notes, and reading textbooks. With this in mind, the thought of a visual to help the students learn was appealing to me.

Using the Frog on a Log, will help some students learn using a visual tool. It could also appeal to the spatial learners and the naturalist learner. The spatial learners might like the artistic element and the naturalists might like having a frog to help them learn.

The point of the study is to see if giving students visuals helps them understand concepts instead of the regular lecture that happens during a class. During this study it will be shown that visuals do help or do not help the students in understanding the subject with visuals.

### **The Cold Blue Flame: An Analysis Of The Relationships Between Temperature And The Price Of Natural Gas**

Galen Maret

Faculty Mentor: Lewis VanBrackle

College of Science and Mathematics

Mathematics and Statistics

Natural Gas is one of the premier sources of energy in the United States. It is used for Residential Heating, Industrial Manufacturing, Commercial uses, and Electrical Production. Since Space Heating constitutes 29% of residential usage, and 40% of commercial usage, it is logical to assume that temperature has something to do with the usage and by the law of supply and demand, the price of Natural Gas. Information from the analysis we performed here has many uses, from prediction of stock prices, to the analyses of the impact of natural disasters on the energy market. After the data set

was cleaned up, linear regression models were generated to look at the individual sector relationships, then ANOVA and multiple regression were used to look more closely at the affected sectors.

## **Tree Decompositions Of Cayley Digraphs On Word-Degenerate Connection Sets**

Evan Moore

Faculty Mentor: Erik Westlund, Mari Castle

College of Science and Mathematics

Mathematics and Statistics

In the mathematical field of graph theory, the subject of graph decompositions and related partitioning problems has generated a vast and rich literature with applications vast and varied. For a tree  $T$ , the graph  $G$  is  $T$ -decomposable if there exists a partition of the edge set of  $G$  into isomorphic copies of  $T$ . In 1963, Ringel conjectured that the complete graph on  $2m+1$  vertices can be decomposed by any tree with  $m$  edges. In the mid 1980s, Graham and Häggkvist conjectured more generally that every  $2m$ -regular graph can be decomposed by any tree with  $m$  edges. Fink showed in 1994 that for any directed tree  $T$ , the directed Cayley graph  $\text{Cay}(G;S)$  is  $T$ -decomposable if  $|S| = |E(T)|$  and  $S$  is a minimal generating set of  $G$ . Building upon that technique, this project presents an enlarged family of Cayley graphs and digraphs that are tree decomposable. In particular, we define a subset  $S$  of a finite group  $G$  to be  $(k,t)$ -word degenerate if there exist exactly  $t$  elements  $s$  of  $S$  that can be expressed as a product of fewer than  $k$  distinct elements of  $S \setminus \{s\}$  or their inverses. Using theoretical techniques buttressed with computational examples developed in the mathematics software system SAGE, we prove that if  $S$  is a  $(k,t)$ -word degenerate subset of any group  $G$ , and  $T$  is any directed tree with minimal spanning star forest  $F$ , then the directed Cayley graph  $\text{Cay}(G;S)$  is  $T$ -decomposable whenever  $|S|=|E(T)|$ ,  $k \geq \text{diam}(T) \geq 3$ , and  $t \leq |E(F)|$ . This produces Fink's main result among others as immediate corollaries.

## **Interpolation Of Quadratic Functions By Linear Splines**

Maice Muallem

Faculty Mentor: Yuliya Babenko

College of Science and Mathematics

Mathematics and Statistics

We consider quadratic functions  $Q$  of two variables defined on a polygonal subset  $D$ . The goal of this part of the project is to find a linear spline function  $L(Q)$  that interpolates function  $Q$  and minimizes the  $L_2$ -error of approximation of  $Q$  by  $L(Q)$ . Due to the natural connection between linear splines and triangulations of the domain, we construct triangulations of  $D$  in

order to construct linear splines. We first find optimal shape of a single local triangle. Using rotation and translation of the optimal triangle, we then build a triangulation of the whole domain that is proven to be optimal for the given quadratic function and given number of triangles. We conclude by giving a scheme on how we plan to use these estimates to obtain the optimal error estimate for arbitrary twice differentiable function  $f$  on  $D$ .

### **Modeling Traffic At An Intersection**

Dennys Rosales, Roger Hu  
Faculty Mentor: Anda Gadidov

College of Science and Mathematics  
Mathematics and Statistics

We use Maple to model the traffic at the intersection of Chastain Road and I 75N near Kennesaw GA. Cars arrive according to a Poisson process and “service” time (time it takes a car to go through the green light) is considered constant. With green light and red light returning at fixed intervals of time, the actual service time has a general distribution that we derive through simulations. We also study the effect that the duration of green light/red light have on the service time distribution and how they affect the behavior of the system.

### **The Card Collector Problem**

Michael Thomas  
Faculty Mentor: Anda Gadidov

College of Science and Mathematics  
Mathematics and Statistics

Using the statistics software R we simulate drawing cards from collections of different sizes under the assumption that the cards are equally likely. We derive empirical estimates for the expected number of cards needed to complete one, two or more collections and compare them with existing theoretical values. We also use linear regression to model the dependence of the expected value on the size of the collection.

### **Dominating Sets in $\text{Cay}(\mathbb{Z}_n, \{\pm 1, \pm 3, \dots, \pm 2k-1\})$**

Jon Woltz, Matt Force  
Faculty Mentor: Joe DeMaio

College of Science and Mathematics  
Mathematics and Statistics

The circulant graph  $\text{Cay}(\mathbb{Z}_n, C)$  has as its vertex set the group elements of  $\mathbb{Z}_n$  and the  $i \rightarrow j$  arc exists if and only if  $j-i \in C$ . If  $C$  is closed under inverses then  $\text{Cay}(\mathbb{Z}_n, C)$  is a graph rather than a digraph. Circulant graphs are a type of Cayley graph. The simplest possible circulant graph is the cycle graph with  $n$  vertices,  $C_n = \text{Cay}(\mathbb{Z}_n, \{\pm 1\})$ . It is well known that  $\gamma(C_n) = \lfloor (n/3) \rfloor$ . In 2009, Rad computed  $\gamma(\text{Cay}(\mathbb{Z}_n, \{\pm 1, \pm 3\})) = \lfloor (n/5) \rfloor$  for  $n \equiv 4 \pmod{5}$  and  $\lfloor (n/5) \rfloor + 1$  for  $n \not\equiv 4 \pmod{5}$ . In this talk we classify  $\gamma(\text{Cay}(\mathbb{Z}_n, \{\pm 1, \pm 3, \dots, \pm 2k-1\}))$  as either  $\lfloor (n/(2k+1)) \rfloor$  or  $\lfloor (n/(2k+1)) \rfloor + 1$ .

## **Exam Performance In A Calculus Class With Learning Assistants**

Jon Woltz

Faculty Mentor: Nancy Burney

College of Science and Mathematics

Mathematics and Statistics

The students' exam performance in a Calculus I class with Learning Assistants is compared with that of a Calculus I class without Learning Assistants. The two classes were both taught by Dr. Mari Castle. The class without Learning Assistants was held in Spring 2013. The classes with Learning Assistants was held in Fall 2013 and Spring 2014. The purpose of this study is to examine the relationship between having Learning Assistants in the class and the preparedness of students in taking a calculus exam.

## **Extracurricular Study Sessions And Student Achievement**

Casey Belli

Faculty Mentor: Belinda Edwards

College of Science and Mathematics

Mathematics Education

Extracurricular activities are found in all levels of our schools in many different forms—sports, band, drama club, and other social clubs. A student's future can be determined by the things that they do in the hours before or after school. While teaching in a suburban middle school, I noticed students focus more on extracurricular activities than do their school performance. My research shows the academic benefit of "extracurricular" study sessions on students' tests scores. The poster presentation will describe the role of "extracurricular" study sessions and the positive effects that "extracurricular" study sessions can have on students' academic achievement.

## **Student Proximity To Professor And Presence Of A Learning Assistant As Factors Of A Test Grade**

Erika Jaeger

Faculty Mentor: Nancy Burney

College of Science and Mathematics

Mathematics Education

During this research opportunity, I examined the mind set of the student, where the student sits in the classroom and how it affects their learning, and if the connection with the Learning Assistants has an effect on how well the student does in the class.

## **Pinpoint The Midpoint: A Focus On The Parabola**

Caroline Johnson

Faculty Mentor: Belinda Edwards

College of Science and Mathematics

Mathematics Education

Students often struggle in their understanding of parabola based on the focus and directrix. The "Pinpoint the Midpoint" Task is not an original task; however, the implementation of the task in a secondary mathematics classroom is unique. The task provided an opportunity for students to develop a deep understanding of parabolas based on the focus-directrix definition while discovering important properties of the parabola and its focus. Teamwork, problem-solving and reasoning, and questioning were stressed during task completion. The purpose of the "Pinpoint the Midpoint" Task was to develop the definition of a parabola as the set of all points equidistant from a given point (the focus) and a line (the directrix). Only those parabolas with horizontal directrices were considered in this task. Students explored the relationship between the focus and directrix and how the parabola changes as they are moved in relation to each other through a Geometer's Sketchpad file that accompanied the task. Data was collected to determine the impact this hands on activity had on their learning. Results from the analysis of data along with student work will be shared in the poster presentation.

## **Grieving Through Probability**

Erin Talley

Faculty Mentor: Belinda Edwards, Wendy Sanchez

College of Science and Mathematics

Mathematics Education

One of the largest obstacles in a mathematics class is that not many students want to be there. Their chief complaint against mathematics is that mathematics is not relevant to them and they will never have to use it again in the real world. Mathematics for social justice creates a classroom in which that question and feeling is not asked because students are using mathematics in a relevant way in their own world. The probability and statistics unit from the Analytic Geometry course was a way to break these walls with students while still exceeding the standards of the Common Core. Before the unit began, the high school where I am an intern lost a student in an automobile accident. Several of my students knew this individual and the grieving of losing a friend was very difficult. Instead of shying away from talking about such a difficult issue, we used our sadness to investigate teenage deaths in automobile accidents to find how Georgia could better protect their teenage drivers. Students investigated other states and laws across the country as well as teenage deaths in automobile accidents from other states. They used probability and explored conditional probability, independent events, dependent events, discovered the addition rule, and discovered and defined double counting among other concepts through this topic. The goal was not the test at the end of the unit nor was it the End of Course Test. The goal was to use mathematics to form an argument to write to their local representative about how they would like to see teenage drivers protected on the roads. The goal was to affect change in their community using mathematics. Data did show that students understood the concepts and were able to answer questions from a more traditional view of probability such as drawing marbles out of a bag or picking cards out of a deck. In fact their conceptual understanding was much stronger through this process because they used probability and discovered characteristics of probability and applied this knowledge to new situations in which a solution was not pre-determined. Mathematics for social justice is teaching mathematics, but it also gives students ownership of mathematics as well as ownership of their community. Ownership of mathematics allows for an environment in which all standards for mathematics practice are met.

### **Disassembling The Roman Mosaic: The Roles Of Indigenous Peoples In The Roman Mosaic From Ancient Uthina, Tunisia**

Lauren Bearden

Faculty Mentor: Kristen Seaman

College of the Arts

Art and Design

In the third-century C.E. Roman Empire, mosaics were crafted locally in Carthage, North Africa for wealthy Roman patrons. What has been recovered from these mosaics is detailed insight into ancient Roman culture. Previous scholarship has focused on cultural aspects that are related directly to Roman life and religion. Yet I believe an aspect that has been overlooked is the local imagery indigenous to North African life. For example, the Rural Life Mosaic from

the House of the Laberii in Ancient Uthina, Tunisia offers a unique insight into the lives of the Romans and the cultures with which they were in contact. It carries depictions of domestic activity involving both Roman and indigenous peoples. How might this mosaic help us to understand Roman and North African life? It expands our knowledge of the role that indigenous peoples played in the domestic life of the typical Roman household as well as the way in which Romans viewed and portrayed these local peoples. In this paper, I examine the mosaic's various scenes and diverse figures. I then unravel the mosaic's multiple layers of cultural symbolism in order to explore the artistic constructions of the roles of indigenous peoples in the Roman household.

## **Augmented Reality (AR) Design Research For Connecting Print And Interactive Media In Graphic Design**

Tyler Derek Behl, Anna Frances Clemens, Darren Lance Shonyo, Selina Walker  
Faculty Mentor: Kristine Hwang

College of the Arts  
Art and Design

Graphic design had been referring visual communication in print media, focusing on brand identity and publications, magazines, newspapers and books, signs, and product packaging until digital publications became popular media in advertising and education fields. Since mobile devices such as smart phones and mobile tablets became a center of our daily lives, numerous digital media have been published for these devices: e-Textbook, e-Book, interactive pdf, mobile app, mobile website, etc. Although both print and digital media are equally important for accomplishing the marketing campaign goals and strategies in the current market, there is a disconnection, due to the overwhelming differences. A bridge between print and digital media will bring more powerful and impressive results in advertising and education.

Augmented Reality apps put the print publication and digital media together. The print with Augmented Reality can deliver phenomenal and engaging interactive experiences to the targeted audiences, because it is directly linked to digital media such as motion graphics, animation, video, audio, 3D, game, and social media that provide dynamic interactivities. The interactive prints with Augmented Reality let the readers enjoy traditional reading experiences and explore interactive adventures. For producing dynamic and successful graphic design projects for the current market, graphic design students should understand and have knowledge of the current technology and targeted markets. There are the needs of AR professional practice in advertising, education, and entertainment. Therefore, AR design research in graphic design education lets students prepared for their professional practices in the industry of interactive prints with Augmented Reality.



## **Mosaics At The Baths Of Neptune**

Monisha Bernard

Faculty Mentor: Kristen Seaman

College of the Arts

Art and Design

Scholars of the ancient Roman world have long debated the purpose of black and white figural mosaics. Mosaics are commonly known as decorative elements of Roman homes. My paper, however, addresses the issue of ancient Roman mosaics as forms of power, paying special attention to black and white figural mosaics. Greek mosaics that used black and white tesserae to create figural patterns are dated as early as the fifth and fourth centuries BC. Yet I look at later mosaics in order to explain the sudden return to the use of black and white figural technique in the Roman world: the Neptune mosaic (AD 139) as well as the Nilotic scene mosaic (AD 139) located in the Baths of Neptune at Ostia in what is now modern Italy. I argue that black and white mosaics are a form of powerful communication and convey a commanding presence while still exhibiting a narrative.

## **Queer Identity In Alan Moore's Watchmen**

Shannon Broome

Faculty Mentor: Diana McClintock

College of the Arts

Art and Design

My presentation investigates a multitude of queer/non-heteronormative sexual orientation identities present through Alan Moore and Dave Gibbons' graphic novel, Watchmen. I talk about various levels of open and closeted homosexual identities metaphorically or overtly stated about the characters in terms of aesthetic design, canonical biography, and personal interpretation. While I discuss a number of characters in the main and supporting cast of the novel, my personal point of interest and thesis for my presentation is that the informal protagonist and narrator, Rorschach, can be interpreted as a metaphor for closeted homosexual identity.

## **An Approachable God: Hermes In The Temple Of Hera At Olympia, Greece**

Jane Custer

Faculty Mentor: Kristen Seaman

College of the Arts

## Art and Design

The Hermes of Olympia is a celebrated but controversial example of Classical Greek sculpture. Carved from Parian marble, the work shows Hermes holding the baby Dionysos, teasing him with a now-missing cluster of grapes— an action that is typically human. Since its discovery in 1877 at the Temple of Hera in Olympia, scholars have debated its authorship and dating: some think that the sculpture is a fourth century BCE work by Praxiteles, while others believe it was produced by a later artist who was working in the Praxitelean style. In this paper, I explore these controversies while questioning the sculpture's placement in the Temple of Hera. Attributing the sculpture to Praxiteles in the fourth century BCE supports my theory that it was commissioned to venerate Hermes at the Áltis, location of the ancient Olympic Games. I argue that the sculpture's presence inside the temple, the Áltis' most important structure, complements Hermes' altar near the Olympic stadium's gates. Honoring the god there was necessary because he protected athletes in competition. Placing the sculpture inside the temple encouraged worship there as well. This image of the god pleased temple visitors because fourth-century Greeks desired relatable gods, a response to popular philosophical thinking that doubted a relationship between gods and mortals. I suggest that the Hermes of Olympia aided in the construction of approachable Greek deities having human qualities. Placed in an important Pan-Hellenic site, the sculpture widely influenced the Greek people.

### **Ancient Egyptian Cosmetics: More Than Meets The Eye**

Ashley Hazel

Faculty Mentor: Jessica Stephenson

College of the Arts

Art and Design

Modern society has concocted an image of stereotypical ancient Egyptian body adornment-- ornate hair and headdress, white garments and, most definitive of all, thick, black winged liner to accentuate the eye. That elongated strip of eye makeup has become synonymous with an entire ancient culture that epitomizes for contemporary Western society the exotic, erotic and mystical. Though popularized as decoration in film, contemporary fashion, and Halloween costumes, eye makeup in dynastic Egypt was applied for more than aesthetic enhancement. Ancient Egyptian makeup encompassed more than eyeliner; the entire face was adorned with different cosmetics that were multipurpose and tied to religious belief and tradition. This paper considers the representation of cosmetics in ancient Egyptian sculptures, frescos and manuscripts. An examination of archaeological, art historical and literary evidence points to the multifaceted nature of ancient Egyptian cosmetics; they served as markers of beauty, status, health, protection and a connection to the divine.

## **Connections**

Mariah Heilpern

Faculty Mentor: Diana McClintock, Daniel Sachs

College of the Arts

Art and Design

Through her knowledge of social convictions of her time, Mary Cassatt leveraged her position as an upper class woman to connect with art dealers who would show and sell her work, and to connect with patrons who would buy her art. She wanted to be known as an artist, and was not concerned with gender issues, but because of the era in which she lived she had to work within the confines imposed by society. Her subjects were chosen based upon what a woman could portray in her art, but held underlying psychological meanings. Through her intelligent choice of subject matter she also communicated a message of love, and of helping others. Her pastel of *Young Mother Nursing Her Child*, 1898, reveals her message most effectively in its portrayal of the strong connection and bond between mother and child.

Because of Cassatt's intelligent choice of subject matter depicting the love and connection between a mother and child, she helped to introduce and message of hope, and the importance of helping others, into a society in need of that message. The role of women in late 19th century Parisian society forced Cassatt to prove herself as an artist. Although she never actually cared about gender roles, she leveraged her role, with a clear understanding of contemporary social ideologies, to become successful and connect with dealers who would show and sell her work, and patrons who would buy her art. She had a successful artistic career by smartly using the tools and connections at her disposal, not by worrying about what she could not do as a woman in Victorian society.

## **The Mughal Marvel That Is The Taj Mahal: Symbolic And Nostalgic Use Of Past Tomb Architecture**

Mariah Heilpern

Faculty Mentor: Kristen Seaman

College of the Arts

Art and Design

The Taj Mahal, an Islamic building dated to 1631-1647, in Agra, India has been examined by many people because of its beauty and wonder. It served as the Mausoleum for Shah Jahan's wife, Mumtaz Mahal. Many art and architectural historians talk about the structure as a whole, the placement of the building and its garden. They also are taken with the love story connected with the tomb. Yet discussing the structure in that manner does not take the building's allusions to previous tombs and its greater historical significance into consideration.

In my paper, I therefore propose that the Taj Mahal has an amalgamation of different architectural features that show a nostalgic look back to the older tombs of Islamic India. For example, the dome of Humayun's Tomb, 1562-1572, Delhi, India, possesses an interesting similarity to the dome of the Taj Mahal. I argue that the Taj Mahal's allusions to these older Islamic tombs and their significant symbolic religious meanings are what create the message and the portrayal of the Throne of God, an Islamic belief of the place Allah created to show His power and where His closest and most beloved servants would go to live in their afterlife.

### **Wonder Woman: Feminist Icon Of The 1940s**

Angelica Perez

Faculty Mentor: Diana McClintock

College of the Arts

Art and Design

The purpose of my research concerning the super heroine Wonder Woman is to identify the circumstances under which the comic was created, why its creator was set on using the medium of comics, the messages he was trying to communicate to American society regarding the roles of women, and why it has maintained its fan base from the 1940s to the present. My use of feminist and iconographic analysis provided me with a wealth of information concerning how this avant-garde comic series contested the widely accepted conventions concerning women with its sarcastic images and pejorative text . Creator William Moulton Marston, in collaboration with comic artist Harry Peter, set into motion a wave of feminist nuances within their comic run of Wonder Woman that aided the epoch of female empowerment during the 1940s. The text coupled with the artwork created a cohesive whole upon which the creative team could instill their views on contemporary society. Wonder Woman's personage gave both men and women an icon of what a woman was capable of should she possess an air of social, political, and sexual autonomy. I came to the conclusion that upon creation, Marston infused an image of a strong-willed woman among his contemporaries that he hoped would one day overtake its widely traditional submissive counterpart, and not only in the realm of comics.

### **Vincent Bach And The Modern Trumpet**

John Thomas Burson

Faculty Mentor: Edward Eanes

College of the Arts

Music

Musicologists have long traced the development of various instruments, but they often give little notice to those who designed and improved them. Dating to ancient Egypt, the trumpet has undergone many transformations by forward-thinking inventors that facilitated the brilliant sounds of virtuosos like Louis Armstrong and Harry James. The leader of the most significant advancement of the trumpet was Austrian-born Vincent Bach.

An artist and craftsman who advanced his diverse career with the profound drive of entrepreneurship, Bach first studied to become one of Europe's great cornet virtuosos before refining his technical craft as an engineer. In 1914 he moved to the United States after winning a position with the Boston Symphony. Assimilating and combining highly detailed musical intuition and technical expertise, Bach created an entirely new standard for the manufacturing and reliability of the trumpet, and in doing so synthesized a dependable sound concept and technique that would become the basis for the twentieth century American brass sound. Taking a financial risk, Bach opened his first instrument shop in New York. In many ways, the level of detail for which Vincent Bach strove echos the level of consistency and quality to which great performers aspire. A catalyst for change in the overall design of the trumpet, his legacy has allowed for constant improvement upon every instrument. The level of quality found in his instruments has allotted a new sense of freedom to the musician, thus eliminating many of the technical limitations found in previous generations. The heritage of Bach trumpets has continued through today by way of his company, which still produces a large percentage of the professional trumpets made in North America.

## **Richard Wagner's Influence On Adolf Hitler**

Lisa Mason

Faculty Mentor: Edward Eanes

College of the Arts

Music

Richard Wagner's influence on Adolf Hitler As Adolf Hitler once stated "I recognize in Wagner my only predecessor... I regard him as a supreme prophetic figure," there can be no doubt that the German Dictator was greatly influenced by Richard Wagner. Wagner himself, although a prolific composer, had a darker side to his legacy: that of anti-Semitism. Wagner's music and anti-Semitic works found an avid disciple in Adolf Hitler. It is uncontested that Richard Wagner harbored anti-Semitic sentiments since composer openly divulged his views on the matter in a number of publications, including his own work *Das Judentum in der Musik* (Judaism in Music.) In this publication Wagner described the "Jewification" of German music. He demanded that the Jews undergo *Untergang* and *Selbstvernichtung* or destruction and self-annihilation. What has remained a controversy, however, is the extent to which Wagner's anti-Semitism influenced his musical composition. It is understood that Wagner intended, however cunningly and concealed, for many of his villains and lesser characters to be cartoons of Jews. As a young man Hitler fancied himself as a composer and artist, modeling

himself after his idol, Richard Wagner. . He attended Wagner opera productions obsessively and boasted that he had read everything that the master wrote. Later in life Hitler recounted to Wagner's daughter-in-law about the first time he saw a performance of Wagner's Rienzi, "It was in that hour that it all began" showing how influential Wagner and his music was on Hitler's later life and political ideals. Hitler's vast knowledge of music was what helped him turn his political ranting in beer halls into a course of action. By giving a detailed analysis of Die Walkure to Carl von Schirach, the intendant of the National Theater in Weimar, he created a great connection that attributed to Hitler's quick ascent to national fame. The effect of Richard Wagner, his views and his compositions on the actions and views of the German Dictator Adolf Hitler cannot be overlooked. This paper will reveal in depth how Adolf Hitler was a supreme Wagnerite. Establishing countless times that Adolf Hitler's opinions on Aryanism and anti-Semitism were all sympathetic to Wagner's views. Adolf Hitler claimed affinity and prided himself as a kindred spirit of the great composer, Richard Wagner.

### **Teaching Beyond The Classroom: Supplemental Video Study**

Jacobi Mapp

Faculty Mentor: Nancy Burney

Wellstar College of Health and Human Services

Exercise Science and Sport Management

Students spend much of their time in class taking notes. Because of this, they may miss important points or fail to make important connections. Because students may miss connections or struggle to remember everything that was said, I wanted to find a way to fill this missing link. This project involved the study of incorporating a video tool as a supplement to the instruction students get in class. By creating and providing videos on D2L for the students to use at home, the students had help accessible to them at all times, resulting in better understanding of the material and improvement in grades.

### **Technology and Health: Sickle Cell Disease ... Is There an App for That?**

Gina Mills, Kaylynn Ewaskiew

Faculty Mentor: Jasmine Ward

Wellstar College of Health and Human Services

Health Promotion and Physical Education

The majority of American adults now own smartphones (61%) and a third (34%) have at least one tablet. Thus, public health professionals have turned their attention to the use of mobile and tablet applications (apps) for novel presentation of health related information and services. However, there remains a lack of information about many disease-specific apps. This

study seeks to provide a content analysis of all apps available on the Droid, iTunes, and Windows App Marketplace specific to Sickle Cell Disease. Eligible apps were identified in the Fall of 2013 using Sickle Cell-related key words. The apps were then independently coded by two individuals for health content related to physical activity, medication adherence, resource identification, nutrition, and education material. We included additional analysis of the cost, intended audience, possible developer bias, user rating, overall usability, and accessibility of the app. Preliminary results revealed that although Sickle Cell is the most common genetic disease in the U.S., few Sickle Cell apps are available. The vast majority (80%) were classified as educational, with the remaining functioning as either resource locaters or organizational apps. Pharmaceutical companies played a large part in the development of Sickle Cell apps (34%) across all markets. We discuss the potential use of apps in the Sickle Cell community – for the individuals across the life span – as well as those indirectly affected by Sickle Cell. Finally, we identify areas for improvement and components of a comprehensive app that may be useful in Sickle Cell maintenance, public health research, and practice.

# Poster Placement Assignment

**1:** *Student Proximity To Professor And Presence Of A Learning Assistant As Factors Of A Test Grade*

Erika Jaeger

Faculty Mentor: Nancy Burney

**2:** *Math Phobia And Metacognition In Calculus 1*

Erica Moody

Faculty Mentor: Nancy Burney

**3:** *Who Wants to Join the Fast? A Thematic Analysis of an Anonymous "Pro-Ana" Twitter Account*

Stephanie Hovis

Faculty Mentor: Erin Ryan

**4:** *Put Out The Flame: Moving Forward To A Tobacco-Free Generation*

Claire Bohrer

Faculty Mentor: Letizia Guglielmo

**5:** *The Afro-Cuban Voice in the Poetry of Nicolas Guillén*

Rebeca Amaya

Faculty Mentor: June Laval

**6:** *La Quête de soi – Les relations dans La nausée de Sartre*

Emily Kraus

Faculty Mentor: William Griffin, The Kennesaw Tower Undergraduate Foreign Language  
Research Journal Editorial Board

**7:** *Todos Se Van: A Reflection Of Cuban Reality*

Melissa Meistickle

Faculty Mentor: June Laval

**8:** *The "Special Period" In La Nada Cotidiana (The Daily Nothingness) By Zoe Valdes*

Amy Santana

Faculty Mentor: June Laval

**9:** *Why Use Complementary And Alternative Medicines?*

Amber Avery

Faculty Mentor: Brandon Lundy

**10:** *Could Be Decapitation: Comparing Hacking Trauma And Animal Scavenging*



Duncan Balinger  
Faculty Mentor: Susan Kirkpatrick Smith

**11:** *The Potential Effects Of Climate Change In The Ahar Banas Cultural Complex*  
Blake Bottomley  
Faculty Mentor: Teresa Raczek

**12:** *Differentiating Blunt Force Trauma: Vehicular Trauma Versus Vertical Fall*  
Selene Cannelli  
Faculty Mentor: Susan Kirkpatrick Smith

**13:** *Going...Going..Gone!: Toward A Spatial Analysis Of Baseball Hit Locations Using GIS*  
Jeremy Densmore  
Faculty Mentor: Nancy Hoalst-Pullen

**14:** *Skeletal Analysis: Broadhead Arrow Damage To Skulls*  
Ashley Estep  
Faculty Mentor: Susan Kirkpatrick Smith

**15:** *Analysis Of Native American Remains At Dabbs Site, Bartow County, GA*  
April Tolley, Anthony Chieffo, Ashley Estep, Eli Smith  
Faculty Mentor: Susan Kirkpatrick Smith, Terry Powis

**16:** *Interpreting Evidence Of Carnivore Predation Upon Hominins*  
April Tolley  
Faculty Mentor: Susan Kirkpatrick Smith

**17:** *Skeletal Analysis Of Two Individuals From A Roman Cemetery In Ierapetra, Crete, Greece*  
April Tolley  
Faculty Mentor: Susan Kirkpatrick Smith

**18:** *The Effect Of Yoga On The Beliefs And World View Of Practioners*  
Addison Hosley  
Faculty Mentor: Wayne Van Horne

**19:** *From The Field To The Lab: Artifact Analysis And Flotation From A Mississippian Site In Bartow County, GA*  
Emily Longacre, Duncan Balinger  
Faculty Mentor: Terry Powis

**20:** *What Are The Sustainability Trends Of Regional Craft Breweries In The United States?*

Rebecca Anna Mattord

Faculty Mentor: Nancy Hoalst-Pullen, Mark Patterson

**21:** *Gendered Market Spaces: Vendor Roles And Placement As Socio-Economic Indicators In Guinea-Bissau, West Africa*

Alex O'Neill

Faculty Mentor: Brandon Lundy

**22:** *Post-Fire Differences Between Complete And Fragmented Bone*

Chelsey Schrock

Faculty Mentor: Susan Kirkpatrick Smith

**23:** *Nontraditional Students In The Driver Seat*

Allison Smith

Faculty Mentor: Brandon Lundy

**24:** *Don't Judge a Book By Its Medium: The Social Situations That Affect How People Read*

Kaitlin Stotz

Faculty Mentor: Brandon Lundy

**25:** *Examining Correlation Between Shooting Skill [Ballistic] And Osteological Damage*

Danielle Tesina

Faculty Mentor: Susan Kirkpatrick Smith

**26:** *Tree Rings As Pictures Of The Past: Dendrochronology Of The Hemlock Legacy Project*

Damon Garges, Robert Bollinger, Bradon Pilcher

Faculty Mentor: Nancy Hoalst-Pullen

**27:** *Building Houses, Scrubbing Floors: A Look Into The Division Of Labor In The Mennonite Community*

Meagan Gibbs

Faculty Mentor: Brandon Lundy

**28:** *Estimating The Socioeconomic Condition Through Satellite Imagery Analysis: The Case Of Portland, OR*

Jennifer Heitert

Faculty Mentor: Mark Patterson

- 29:** *Estimating The Socioeconomic Condition Through Satellite Imagery Analysis: The Case Of New Orleans, LA*  
Manuel Velandia  
Faculty Mentor: Mark Patterson
- 30:** *Spatial And Temporal Dynamics Of A Mature Mixed Oak Forest Remnant In East-Central Indiana*  
David Zeh  
Faculty Mentor: Nancy Hoalst-Pullen
- 31:** *Involvement In Government And Education: A Cross-Cultural Comparison Of Students In Brazil And The U.S.*  
Elizabeth Sorby, Liza Stepat  
Faculty Mentor: Amy Buddie, Ken Hill, Phillip Poskus
- 32:** *Personality Factors And Whistle-Blowing In Undergraduate Cheating Situations*  
Adrienne Achille  
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- 33:** *Learning Assistants' Facilitation: Student Attitudes And Effects On Summative Assessments*  
Siggy Bohannattrawn  
Faculty Mentor: Nancy Burney
- 34:** *Stress, Personality, And Cognition*  
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Faculty Mentor: Adrienne Williamson
- 35:** *Perceptions Of Normative Sexual Behaviors For Self And Others By College Students"*  
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- 36:** *Visitor Behavior In The Reptile House At Zoo Atlanta*  
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- 37:** *The Effects Of An Expressive Writing Technique On Several Measures Of Stress*  
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**38:** *Relationship Between Gender, Age, Personality, And Religious Affiliation*

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Faculty Mentor: Gail Scott

**39:** *The Relationship Between Exposure To Outdoor Environments And Rates Of Depression, Anxiety, And Stress*

Oscar Mendez

Faculty Mentor: Gail Scott

**40:** *Introvert And Extrovert Personality Types And Test Anxiety*

Cristina Migles-Schmitt

Faculty Mentor: Gail Scott

**41:** *Recruiting Undergraduate Researchers: Best Practices in Psychology Departments*

Rachel Pack

Faculty Mentor: Dorothy Marsil

**42:** *Social Identity And Religion In Northern Ireland*

Sarah Paris

Faculty Mentor: Lauren Tagliatela

**43:** *Efficacy Of A Circus Arts Therapy Program To Improve Sociability, Teamwork, And Communication In Young Children*

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**44:** *Infants' Age-Specific Changes In Object-Oriented Social Referencing*

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**45:** *Differences In Mental Health Perception In KSU And USIL Students*

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**46:** *Food Preferences And Influencing Factors Across Cultures*

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Faculty Mentor: Sharon Pearcey, Ginny Zhan

**47:** *Efficacy Of Student-Led Study Groups*

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Faculty Mentor: Gail Scott

**48:** *What Would You Do? Factors Affecting Blame-Taking Behavior*

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Faculty Mentor: Jennifer Willard

**49:** *Different Methods In Calculus: Effect On Students*

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Faculty Mentor: Nancy Burney

**50:** *Doing Diversity: Three Years Of N/A\**

Gaius Augustus, DiAngele Augustus

Faculty Mentor: Nicole Martin

**51:** *Does The Aristaless/Arx Transcription Factor Control Kal-1/Anosmin Gene Expression?*

Joy Chibuzo

Faculty Mentor: Martin Hudson

**52:** *The A-Class Ephrin Efn-4 Is Required For Axon Outgrowth*

Cory Donelson, Alicia Schwieterman, Danielle Ereddia

Faculty Mentor: Martin Hudson

**53:** *Measuring Zinc Trafficking In Response To Hemorrhagic Venom*

Veronica Garbar

Faculty Mentor: Eric Albrecht

**54:** *Crushing Resistance Of Elimia Modesta And E. Carinocostata In Lower Etowah River Basin Tributaries*

Ashlee Grimm

Faculty Mentor: William Ensign

**55:** *Arbuscular Mycorrhizal Fungal Colonization In The Black Willow (Salix Nigra) And American Sycamore (Platanus Occidentalis)*

Joshua Hashemi, Barbie Hawkes

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- 56:** *Quantifying Potential Differences In Trophic Relationships Across Freshwater Streams Of Varying Urbanization*  
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- 57:** *Exploring The Impacts Of Urbanization On Stream Food Webs: Does Urbanization Affect Periphyton Abundance And Composition?*  
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- 58:** *Developing An RNA-Interference Assay To Knockdown Eph Receptor Gene Expression In Developing Neurons*  
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- 59:** *Univariate And Multivariate Assessment Of Habitat Preferences Of Stream Fishes*  
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- 60:** *Growth Rate Of Tipulidae On Ligustrum Sinense And Liriodendron Tulipifera*  
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- 61:** *Urbanization And Gut Length In Campostoma Oligolepis*  
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- 64:** *Comparison Of Protein Purification Systems For Supporting Fermentation Development In The Biologics Industry*  
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**65:** *The Role Of NeuroD In The Transcriptional Control Of Kal-1/Anosmin Gene Expression*

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Faculty Mentor: Martin Hudson

**66:** *Creativity In Mathematics: Stimulating Students' Creativity To Affect Long-Term Knowledge*

Aqsa Adnan

Faculty Mentor: Nancy Burney

**67:** *Using Calculus To Find The Average Value Of Kennesaw State University Available Monetary Funds From 2008 To 2013*

Michael Baker, Tony Guzman, Chelsea Harrod, Abdelsalam Sharkasi

Faculty Mentor: Flor Espinoza

**68:** *New MaloNHCs And Their Corresponding Anionic Thiones: Synthesis And Coordination*

Chance Boudreaux, Bradley Norvell

Faculty Mentor: Daniela Tapu

**69:** *Role Of The Steroid And Xenobiotic Receptor (SXR) And The Constitutive Androstane Receptor (CAR) In ABCB1 Expression*

Marina Chesnokova

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**70:** *Saponification Value And GC Analysis Of Olive Oil*

Daniel Corella

Faculty Mentor: Marina Koether

**71:** *How Calculus Proves Liquid Courage Works, Finding The Average Number Of Drinks Needed To Receive The Maximum Phone Numbers From People We Would Like To Ask Out*

Cody Goss, Skyler Mize, Niloufar Mehrjerdian, Kyle Sekellick

Faculty Mentor: Flor Espinoza

**72:** *The Effects Of Protonated Pyrrole Isomers Tagged With Argon*

Christopher Harper

Faculty Mentor: Martina Kaledin

**73:** *Alternative Reductants For The Catalytic Oxacyclization Of A 1,4-Dihydroxy-5-Alkyne To A 3-Hydroxytetrahydropyran*

Chelsea Harrod

Faculty Mentor: Frank McDonald, John Haseltine

**74:** *Towards The Synthesis Of Tris(N-Heterocyclic Carbenes)*

David Lee

Faculty Mentor: Daniela Tapu

**75:** *Ac-Sar-Sar-Pro-Oet Tripeptide Multi-Step Synthesis*

Santiago Mestre Fos, Christina Taylor

Faculty Mentor: John Haseltine

**76:** *Investigation Of The Role Of The Vitamin D Receptor And The Farnesoid X Receptor In Expression Of ABCB1*

Kirt Ronig

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**77:** *GC-MS Method Development for  $\alpha$ -Pinene in Juniper Leaves*

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**78:** *Improving Existing Tumor Growth Models*

Victoria Awokunle

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**79:** *Applying Queuing Theory To Traffic Modeling*

Zachary Carter

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**80:** *The Impact Of Learning Assistants In The Classroom*

Ana Cienfuegos

Faculty Mentor: Nancy Burney

**81:** *Independent Bishop And Bouncing Bishop 'Armies' On Various Chessboards*

James Eubanks

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**82:** *Student Study Networks: Does Size Matter?*

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**83:** *Can Zombies Be Stopped?*

Luke Forkner, Evan Moore

Faculty Mentor: Meghan Burke, Flor Espinoza



**84:** *A Study On Terroristic Populations And Their Activity*

Henry B. Grimes

Faculty Mentor: Flor Espinoza

**85:** *Control Of Carbon Dioxide Gas In The Atmosphere: Preliminary Results*

Joshua Howard

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**86:** *Frog On A Log: Do Visual Tools Help Students Learn?*

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**87:** *The Cold Blue Flame: An Analysis Of The Relationships Between Temperature And The Price Of Natural Gas*

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**88:** *Modeling Traffic At An Intersection*

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**90:** *Exam Performance In A Calculus Class With Learning Assistants*

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**91:** *Extracurricular Study Sessions And Student Achievement*

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**92:** *Pinpoint The Midpoint: A Focus On The Parabola*

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**93:** *Grieving Through Probability*

Erin Talley

Faculty Mentor: Belinda Edwards, Wendy Sanchez

**94:** *The Relationship Between Sensory Integration, Balance, And Reaction Time In Older Adults*  
Courtenay Hicks, Ashlyn Schwartz, Sara Morris, Jon Garrett, Elizabeth Thomas  
Faculty Mentor: Tiffany Esmat, David Mitchell

**95:** *Teaching Beyond The Classroom: Supplemental Video Study*  
Jacobi Mapp  
Faculty Mentor: Nancy Burney

**96:** *The Relationship Between Blood Pressure, Cardiovascular Function, And Executive Function In Older Adults*  
Ashlyn Schwartz, Courtenay Hicks, Sara Morris, Jon Garrett, Elizabeth Thomas  
Faculty Mentor: Tiffany Esmat, David Mitchell

# Oral Presentation Schedule

Convocation Center, Room 2015

## **6:00pm-6:15pm**

*Why Do I Have To Take This Class? - A Proposed Study Of How Mathematics Content Courses Affect Pre-Service Teachers' Beliefs*

Caitlin Walkey

Faculty Mentor: Susanna Molitoris Miller

## **6:15pm-6:30pm**

*Richard Wagner's Influence On Adolf Hitler*

Lisa Mason

Faculty Mentor: Edward Eanes

## **6:30pm-6:45pm**

*"Sideways With A Sunflower Ribbon": Developing A Ten-Minute Play*

Jennifer Butler, Andrew Harrison, Ashley Schomburg, Anna Lee, Natalie Corbin

Faculty Mentor: Margaret Baldwin, Aaron Levy

## **6:45pm-7:00pm**

*Survivors Of Intimate Partner Violence: Effective After-Care Implementation*

Sherri-Anne Forde

Faculty Mentor: Letizia Guglielmo

## **7:00pm-7:15pm**

*Casting Lines And Casting Spells: Southern Mysticism In Lake Horton*

Brittany Higginbotham

Faculty Mentor: Elizabeth Giddens

## **7:15pm-7:30pm**

*Global Library*

Tiffani Reardon

Faculty Mentor: Tamara Powell, Lucie Viakinnou-Brinson

## **7:30pm-7:45pm**

*Atlanta Parks - Online Mapping And Site Suitability Analysis*

Matthew Williams

Faculty Mentor: Nancy Hoalst-Pullen

**7:45pm-8:00pm**

*Realism And Mysticism In The Art Of Gian Lorenzo Bernini*

Mary Scannavino

Faculty Mentor: Federica Santini

**8:00pm-8:15pm**

*Marx, Rousseau, And The Political Economy Of Alienation*

Plamen Mavrov

Faculty Mentor: John Moran

**8:15pm-8:30pm**

*Augmented Reality (AR) Design Research For Connecting Print And Interactive Media In Graphic Design*

Tyler Derek Behl, Anna Frances Clemens, Darren Lance Shonyo, Selina Walker

Faculty Mentor: Kristine Hwang

**8:30pm-8:45pm**

*Vincent Bach And The Modern Trumpet*

John Thomas Burson

Faculty Mentor: Edward Eanes

**8:45pm-9:00pm**

*Ancient Egyptian Cosmetics: More Than Meets The Eye*

Ashley Hazel

Faculty Mentor: Jessica Stephenson

**9:00pm-9:15pm**

*Technology and Health: Sickle Cell Disease... Is There an App for That?*

Gina Mills, Kaylynn Ewaskiew

Faculty Mentor: Jasmine Ward

Convocation Center, Room 2016

**6:00pm-6:15pm**

*Interpolation Of Quadratic Functions By Linear Splines*

Maice Muallem

Faculty Mentor: Yuliya Babenko

**6:15pm-6:30pm**

*Cyclic Dominating Sets In Cayley Graphs*

Matt Force, Jon Woltz

Faculty Mentor: Joe DeMaio

**6:30pm-6:45pm**

*The Generalized Viète Formulas*

Benjamin Hoffman

Faculty Mentor: Josip Derado

**6:45pm-7:00pm**

*Tree Decompositions Of Cayley Digraphs On Word-Degenerate Connection Sets*

Evan Moore

Faculty Mentor: Erik Westlund, Mari Castle

**7:00pm-7:15pm**

*Mathematical Analysis For An HIV/AIDS Model*

Ana Cienfuegos

Faculty Mentor: Liancheng Wang

**7:15pm-7:30pm**

*Dominating Sets in  $\text{Cay}(\mathbb{Z}_n, \{\pm 1, \pm 3, \dots, \pm 2k-1\})$*

Jon Woltz, Matt Force

Faculty Mentor: Joe DeMaio

**7:30pm-7:45pm**

*Disassembling The Roman Mosaic: The Roles Of Indigenous Peoples In The Roman Mosaic From Ancient Uthina, Tunisia*

Lauren Bearden

Faculty Mentor: Kristen Seaman

**7:45pm-8:00pm**

*Mosaics At The Baths Of Neptune*

Monisha Bernard

Faculty Mentor: Kristen Seaman

**8:00pm-8:15pm**

*Queer Identity In Alan Moore's Watchmen*

Shannon Broome

Faculty Mentor: Diana McClintock

**8:15pm-8:30pm**

*The Mughal Marvel That Is The Taj Mahal: Symbolic And Nostalgic Use Of Past Tomb Architecture*

Mariah Heilpern

Faculty Mentor: Kristen Seaman

**8:30pm-8:45pm**

*Wonder Woman: Feminist Icon Of The 1940s*

Angelica Perez

Faculty Mentor: Diana McClintock

**8:45pm-9:00pm**

*An Approachable God: Hermes In The Temple Of Hera At Olympia, Greece*

Jane Custer

Faculty Mentor: Kristen Seaman

**9:00pm-9:15pm**

*Connections*

Mariah Heilpern

Faculty Mentor: Diana McClintock, Daniel Sachs

# Appendix

## Acknowledgements

Dr. Michele DiPietro, Executive Director, Center for Excellence in Teaching and Learning

Kaleem Clarkson, Operations Manager, Center for Excellence in Teaching and Learning

Alex Gambon, Operations Coordinator, Center for Excellence in Teaching and Learning

Grace Easton, Student Assistant, Center for Excellence in Teaching and Learning

Danielle Ereddia, Student Assistant, Center for Excellence in Teaching and Learning



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