


4-16-2015

## 2015 - The Twentieth Annual Symposium of Student Scholars

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

## Undergraduate Research/ Creative Activity Reception

April 16, 2015  
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 – 9:00pm

Oral Presentations and Performances

April 16, 2015

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 2014-2015. 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,

A handwritten signature in black ink that reads "Michele DiPietro". The script is fluid and cursive, with the first name "Michele" and last name "DiPietro" clearly distinguishable.

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

A handwritten signature in black ink that reads "Amy Buddie". The script is fluid and cursive, with the first name "Amy" and last name "Buddie" clearly distinguishable.

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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# Undergraduate Research/Creative Activity Reception Honorees

# Bagwell College of Education

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Megan Boyd, Nikki Devante, Mitchell Tanzi

Faculty Mentor: Yanghee Kim

*Katie And The Starry Night By James Mayhem: Vincent Van Gogh*

Sharon McCoy, Greta Samuels

Faculty Mentor: Yanghee Kim

*Science In My City: An Action Research Project*

Taylor Davis, Kassell Lebert, Alyssa Merendo

Faculty Mentor: Charlease Kelly-Jackson

*Teaching The Art Of Patricia Polacco: Artist, Writer, Storyteller*

Isra Ghanim, Jem Rogich, Danielle Walker

Faculty Mentor: Yanghee Kim

# Coles College of Business

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

*A Neuroeconomic Review: The Linear Evolution Of One's Financial Decision Making Process*

Cole Daniel

Faculty Mentor: Adriane Randolph, Tim Martin, Ann Gillette

# College of Humanities and Social Sciences

## **Communication**

*Message Design Logics Theory And Messaging In The Ebola Crisis*

Gregory Bieger

Faculty Mentor: Deanna Womack

## **Digital Writing and Media Studies**

*A Linguistic Phenomenon: Code-Switching In Media And Advertisement*

Rebecca Tuck



Faculty Mentor: Jeanne Bohannon

*Anonymous Discourse In Digital Spaces - A Microstudy*

Matthew Russell

Faculty Mentor: Jeanne Bohannon

*IDK, WTF: The Growth Of Acronyms from The Roman Empire To The iPhone 6*

Carson Long

Faculty Mentor: Jeanne Bohannon

*Just Text Me: Exploring Breakdowns In Human Communication And Technology*

Allyson Hight

Faculty Mentor: Jeanne Bohannon

*Math Education: A Failed Rhetorical Situation*

Elizabeth Melendez

Faculty Mentor: Jeanne Bohannon

*Mother Tongue Silenced: The Decay-ing Of The Gullah-Geechee Language And Culture*

Elizabeth Morris

Faculty Mentor: Jeanne Bohannon

*Talking White VS. Talking Black*

Sharon Roberts

Faculty Mentor: Jeanne Bohannon

## **English**

*A Stormy Summer*

Suzanne McWhirter

Faculty Mentor: Melanie Sumner

*Love, A Dream*

Brittany Cordaro

Faculty Mentor: Melissa Keith

*Ride Or Die: Gender & Survival In The Fast And Furious Franchise*

Andrew Kemp

Faculty Mentor: Letizia Guglielmo

*The Success Of Hashtags In Social Media Movements: A Linguistics Approach*

Hannah Smith

Faculty Mentor: Letizia Guglielmo, Chris Palmer

## **Foreign Languages**

*Deviant Art? From The European Avant-Garde To Pop Culture*

Kevin Latta

Faculty Mentor: Federica Santini

*El Bloqueo Cubano*

Lourdes Gendreau

Faculty Mentor: June Laval

*Le Monde Naturaliste Dans "Le Ventre De Paris" D'Emile Zola : Une Approche Évolutive*

Emily Kraus

Faculty Mentor: William Griffin, Federica Santini

*The Fox And The Curtain: On Translating The Poetry Of Alda Merini*

Emily Kraus

Faculty Mentor: Federica Santini

*Love And Death: A Creative Look At The European Romantic And Decadent Movements*

Levan Lamont

Faculty Mentor: Federica Santini

*Manuel Zelaya Y Una Crisis Política En Honduras En 2009*

Ariel Walley

Faculty Mentor: June Laval

## **Geography and Anthropology**

*"We Need To Talk": Methods, Timing, And Motivation For Coming Out LGBTQ*

Lindsay Montgomery

Faculty Mentor: Brandon Lundy

*A Family's Experience Caring For A Child Living With Spinal Muscular Atrophy*

Samantha Lawson

Faculty Mentor: Brandon Lundy

*An Anthropological Analysis Of The Chalcolithic Material Culture Found At Pachamta In The Mewar Plain, India*

Charles Brummeler

Faculty Mentor: Teresa Raczek

*And What Are You Going To Do With That?: The Usefulness And Applications Of An Anthropology Degree In The Modern Business World*

Cheyenne Dahlmann

Faculty Mentor: Brandon Lundy

*Bone Deterioration Due To Domesticated Rodent Scavenging*

Logan Howard

Faculty Mentor: Alice Fazlollah

*Craft Beers Make "Hoppy Locals"*

Cristal Inoh

Faculty Mentor: Brandon Lundy

*Cultural Critics: An Intimate Look At The Complexity Of Pursing Comedy In A Public Arena*

Kristofer Wachner

Faculty Mentor: Brandon Lundy

*Demonic Dogs: How Newspapers Portray Pit Bulls In The Atlanta Area And Help Shape Public Opinion*

Jessica Williams

Faculty Mentor: Brandon Lundy

*Diversity And Tolerance: Acceptance Of Minority Religious Faiths On A University Campus*

Michele Kumar

Faculty Mentor: Brandon Lundy

*Examination Of Blunt Force Skeletal Injuries As A Result Of Falls From Heights*

Michele Kumar

Faculty Mentor: Alice Fazlollah

*Effects Of Speed And Vehicle Weight On Pedestrian-Motor Vehicle Collisions*

Connor Plumley

Faculty Mentor: Alice Fazlollah

*Forensic Examination Of Sharp Force Trauma*

Anthony Rotoloni

Faculty Mentor: Alice Fazlollah

*Gardening In North Georgia: The Contemporary Struggle*

Stormy Jeans

Faculty Mentor: Brandon Lundy

*Going Greek: The Implications Of Collegiate Hellenic Culture At A Southeastern Comprehensive University*

Joshua Guilbaud

Faculty Mentor: Brandon Lundy

*How Does The Exploitation And Degradation Of Finite Natural Resources By Industrial Oil Producers Effect Our Future Planetary Environment*

Zachary King

Faculty Mentor: Jun Tu

*Investigation Of The Effects Of Canid Scavenging On Remains*

Lindsey Goff

Faculty Mentor: Alice Fazlollah

*Macroscopic Analysis Of Variations Of Machete Damage In Dismemberments Of Long Bone*

Kristofer Wachner

Faculty Mentor: Alice Fazlollah

*Make My Datum: Student Perceptions Of The Geographic Information Science Degree*

Kanne Ikwuezunma

Faculty Mentor: Nancy Hoalst-Pullen

*Mummification: A Critical Literature Analysis*

Jessica Williams

Faculty Mentor: Alice Fazlollah

*Positional Relationship Of The Fibula Relative To The Tibia In Collegiate Athletes*

Katherine Lane

Faculty Mentor: Alice Fazlollah

*Putting On A Show: Coping Strategies In The Restaurant Industry*

Madison Brennan

Faculty Mentor: Brandon Lundy

*Replicability Of Archaeological Quartz Lithic Analysis*

Staci Lusk

Faculty Mentor: Teresa Raczek

*Sex Estimation Techniques Of The Adult Pelvis*

Elizabeth Pomawski

Faculty Mentor: Alice Fazlollah

*Sharp Force Trauma Analysis: Hacking Wounds From Axe And Hatchet*

Lindsay Montgomery

Faculty Mentor: Alice Fazlollah

*Simulation Of A Civilian Blast Trauma Event In A Public Area*

Michael McClung

Faculty Mentor: Alice Fazlollah

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

David Zeh

Faculty Mentor: Nancy Hoalst-Pullen

*Stay-At-Home Fathers And Flexible Masculinities*

Brittany LaFace

Faculty Mentor: Brandon Lundy

*Structure And Composition Of The Kennesaw State University: Past And Present*

Stephanie Roper

Faculty Mentor: Nancy Hoalst-Pullen

*Sustainability Perceptions In The Brewing Industry: Regional/Regional Craft, Microbreweries And Brewpubs*

William Blake Pierson

Faculty Mentor: Nancy Hoalst-Pullen, Mark Patterson

*Symbolism In Indian Pottery Production*

Staci Lusk

Faculty Mentor: Teresa Raczek

*The Availability Of Public Transport And its Effect On Carbon Dioxide Pollution In Atlanta*

Nikki Lyons

Faculty Mentor: Jun Tu

*The Revolution Of Fitness: A Contemporary Analysis Of How Technological And Personal Training Influences Consumer Behavior In Two Atlanta, Georgia Fitness Centers*

Krista Cross

Faculty Mentor: Brandon Lundy

*The Social Construct Of Race In Forensic Anthropology: Complications In Ancestry Estimation*

Irina Paymer

Faculty Mentor: Alice Fazlollah

*Transitions In Material Culture And Transitions In Social And Economic Values: An Ethnoarchaeological Study Of A Basket-Weaver In Udaipur, India*

Duke Thomas

Faculty Mentor: Teresa Raczek

*Variability In Decomposition Dependent On Water Environment*

Raeanna Duck

Faculty Mentor: Alice Fazlollah

## **History and Philosophy**

*The Capture And Imprisonment Of Henry Laurens*

Aaron Clarke

Faculty Mentor: Jim Piecuch

*The Hessian Jager In The New York And Pennsylvania Campaigns, 1776-1777*

David Ross

Faculty Mentor: Jim Piecuch

*Thomas Jefferson, Scientist*

Travis Martin

Faculty Mentor: Jim Piecuch

## **Psychology**

*A Study Of Undergraduate Alcohol Consumption: Students Who Perceive One Or More Of Their Parents To Have A Drinking Problem Versus Students In Greek Life*

Jessica Dean

Faculty Mentor: Saul Alamilla

*An Analysis Of Male Versus Female Juror's Attitudes And Decision-making In A Rape Case: The Influence Of Legal Definitions And Rape Myth Beliefs*

Victoria Meier

Faculty Mentor: Dorothy Marsil

*An Assessment Of Undergraduate Research In The First Year*

Leslie Small

Faculty Mentor: Amy Buddie

*Can The Misattribution Of Blame Contribute To Falsely Taking The Blame*

Geena Washington, Olivia Alexander

Faculty Mentor: Jennifer Willard

*Effects Of Menstrual Cycle On Time Urgency And Anxiety*

Torrey Hill, Nicole Davis, Mariah Corey, Timothy Thurman, Courtney Skeete

Faculty Mentor: Ebony Glover

*Effects Of Menstrual Cycle Phase In Anxiety Responses*

Timothy Thurman, Nicole Davis, Mariah Corey, Torrey Hill, Courtney Skeete

Faculty Mentor: Ebony Glover

*Falsely Taking Blame: The Role Of Gender And Relationship Quality*

Jacob Allen, Alexis Lindsey

Faculty Mentor: Jennifer Willard

*Menstrual Cycle Effects On OCD Symptoms And Severity*

Nicole Davis, Torrey Hill, Mariah Corey, Timothy Thurman, Courtney Skeete

Faculty Mentor: Ebony Glover

*Reducing Automatic Stereotyping And Increasing Humanization Through Situational Attribution Training*

Sarah Hill, Jessica DeMarco, Essance Butts, Allyson Schmidt

Faculty Mentor: Tracie Stewart

*Sex And Menstrual Cycle Effects On Autonomic Nervous System Activity*

Mariah Corey, Nicole Davis, Timothy Thurman, Torrey Hill, Courtney Skeete

Faculty Mentor: Ebony Glover

*The Relationship Between Stress And Cognition*

Heather Cygan, Amy LeGrand, Carol Redman

Faculty Mentor: Adrienne Williamson

*Tobacco Use And Anxiety In Premenopausal Women*

Courtney Skeete, Nicole Davis, Timothy Thurman, Torrey Hill, Mariah Corey

Faculty Mentor: Ebony Glover

*Utilization And Impact Of Conservation Education Displays At The World Of Reptiles, Zoo Atlanta*

Allison Dawson, Sarah Dutton, Vanessa Pedroni, Hannah Dollinger

Faculty Mentor: Lauren Tagliatela, Suma Mallavarapu

*Visitor Behavior In The Living Treehouse At Zoo Atlanta*

Montana Holland, Rena Roberson, Cassandra Teal, Krystal Bailey

Faculty Mentor: Suma Mallavarapu, Lauren Tagliatela

# College of Science and Mathematics

## Chemistry and Biochemistry

*Comparing Faculty's And Student's Perceptions Of Chemical Representations*

Kayla Yoder, Elaina Genton

Faculty Mentor: Michelle Dean

*Determining Usability Of The SCI Hub Concept Inventory Database*

Zachary Farley

Faculty Mentor: Kimberly Linenberger

*Dissolution Analysis Of Potassium Gluconate Tablets: The First Step In An Analytical Method Transfer*

Cory Turner, Andrew Warren

Faculty Mentor: Marina Koether

*Dissolution And HPLC Analysis Of Glucosamine Tablets: An Analytical Method Transfer That Failed*

Andrew Warren, Cory Turner

Faculty Mentor: Marina Koether

*eNOS Regulation By MAP Kinases*

Myles Robinson, Virginie Stein

Faculty Mentor: Carol Chrestensen, John Salerno, Jonathan McMurry

*Gold Nanoparticles Immobilization On Fibrous Substrates: Heterogeneous Catalysis*

John Elliott, Theresa Kusumadjaja

Faculty Mentor: Bharat Baruah

*Mixed N-Heterocyclic Carbenes Based On Triazine Backbones: Synthesis And Catalytic Applications*

Aqsa Adnan, Chidi Amah

Faculty Mentor: Daniela Tapu

*Multisite Phosphorylation Of eNOS By Various Kinases And The Impact Of Calmodulin*

Alberto Romero, Mallory Welton

Faculty Mentor: Carol Chrestensen, John Salerno, Jonathan McMurry

*Notetaking: A Window Into Metacognition And Student Success In Chem 1211*

Katarina Dass, Elizabeth Johnson

Faculty Mentor: Michelle Dean



*REPSA-Directed Identification Of DNA-Binding Specificity For The E. Coli Transcription Factor LexA*

Kamir Hiam

Faculty Mentor: Michael Van Dyke

*Structural Optimization And Determination Of Dissociation Energies For Water Clusters Utilizing Computational Techniques*

Zobia Qureshi

Faculty Mentor: Martina Kaledin

*Surfactant Assisted Exfoliation Of Graphite Into Graphene: Water Purification Properties Of Graphene*

Garrison Kohler

Faculty Mentor: Bharat Baruah

*Synthesis Of 1,3-O,S-Esters*

James Law, David Kercher

Faculty Mentor: Christopher Alexander

*Synthesis Of Alpha-Hydroxy Phosphonates From Aldehydes And Ketones*

Jazmine McIntyre, Andrew Camp, Matthew Shipp, Derek Amponsah, James Law

Faculty Mentor: Christopher Alexander

*Teacher And Student Perceptions Of Biochemistry Representations*

Chloe House

Faculty Mentor: Kimberly Linenberger

*Time Dependent Phosphorylation In eNOS Linked Signal Transduction Pathways In Endothelial Cells Reveals Feedback Mechanisms*

Alden Lathrop, Joseph Blake, Nicholas Talley

Faculty Mentor: John Salerno

*Toward The Synthesis Of A Star-Shaped Tris(N-Heterocyclic Carbenes)*

Jordan Ossie Buckner, Chance Boudreaux, Bradley Norvell

Faculty Mentor: Daniela Tapu

*Toward The Synthesis Of New Polydentate N-heterocyclic Carbenes*

Chance Boudreaux, Jordan Ossie Buckner, Bradley Norvell

Faculty Mentor: Daniela Tapu

*Towards Water Soluble Porphyrins*

Brandon Easparro

Faculty Mentor: Janet Shaw

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

*Carbon Balance Of Green Roof Plants*

Keyaira Littles

Faculty Mentor: Matthew Weand

*Developing A Research Method To Evaluate The Effect Of Drought On Two Riparian Tree Species, With And Without Mycorrhizae*

Reuben Hilliard, Chelsea Harris, Joshua Hashemi

Faculty Mentor: Paula Jackson

*Do Eastern Mosquitofish (Gambusia Holbrooki) Take Advantage Of The "Cheerios Effect" To Consume Small Planktonic Prey*

Nicole Lynch

Faculty Mentor: Joseph Dirnberger

*Molecular Analysis Of Gut Content In The Striped Bark Scorpion Centruroides Vittatus*

Melissa Green, Paige Henley, Demtrius Geiger

Faculty Mentor: Thomas McElroy, Eric Albrecht

*The Impact Of Mycorrhizal Colonization On The Growth Of American Sycamore (Platanus Occidentalis) And Black Willow (Salix Nigra) Under Drought Conditions*

Joshua Hashemi, Reuben Hilliard, Chelsea Harris

Faculty Mentor: Paula Jackson

## **Mathematics**

*A Differential Equation Model Examining The Impact Of Post-Mortem Practices On The Spread Of Ebola*

Saniita FaSenntao, Denise Hernandez

Faculty Mentor: Meghan Burke

*A Search For Optimal Living Arrangements For Kennesaw State University Students Completing A Four-Year Degree*

Cody Baum, Justin Farmer, Katelyn Marsala, Wesley Queen, Allison Sommers

Faculty Mentor: Flor Espinoza

*Applying The Gauss-Jordan Method For Group Inverse To An Irreducible Singular M-Matrix*

Jillian Kuether

Faculty Mentor: Jun Ji

*Hall Pre-Colorings Of Graphs*

Hunter Rogers

Faculty Mentor: Jennifer Vandenbussche

*Modeling Traffic At An Intersection*

Saniita FaSenntao, Kaleigh Mulkey

Faculty Mentor: Anda Gadidov

*Models Of Progressive Addiction Of: Alcohol, Alprazolam, Cannabis, And Cocaine*

Everette Crump, Gayland Dodd, Sophia Kirchhoff, Dalton Mullinax, Akinwande Olufisayo

Faculty Mentor: Flor Espinoza

*Optimal Recovery Of Solutions To Dirichlet Problem For Laplace And Poisson Equations Based On Incomplete Information*

Najia Bacha

Faculty Mentor: Yuliya Babenko

*Students' Thinking About Proportional Relationships Between Quantities Of A Circle*

Mariah Simmons

Faculty Mentor: David Glassmeyer

*Study Of Multiply And Completely Monotone Sequences And Functions*

Ryan Cottrill

Faculty Mentor: Yuliya Babenko

## **Molecular and Cellular Biology**

*Helicobacter Pylori Type III Secretion Genes fliI And fliJ Are Required For Efficient Flagellar Assembly And Motility*

Rachel Martini

Faculty Mentor: Jonathan McMurry

*Identification Of Novel Kallmann Syndrome Genes By Fluorescence-Activated Cell Sorting And Expression Profiling*

Samuel Keenan

Faculty Mentor: Martin Hudson

*Molecular Characterization Aspergillus Flavus In Peanuts*

Fatoumata Sylla

Faculty Mentor: Premila Achar

*Ontogenetic Variability In Centruroides Vittatus (Bark Scorpion) Venom Toxicity*

Kelci Knight, Whitney Smith

Faculty Mentor: Eric Albrecht, Thomas McElroy

*Purification Of Recombinant Lingulodinium Polyedrum Luciferase Protein*

Meredith Sapp

Faculty Mentor: Susan Smith

*Putative Voltage Sensitive Enzymes In Prokaryotes*

Joshua Clark

Faculty Mentor: Susan Smith

*Syndecan And Wnt Signaling Are Required To Orient Early Embryonic Cell Migration In C. Elegans*

Aaron Pital

Faculty Mentor: Martin Hudson

*Understanding Voltage-Gated Ion Channels Via Bioinformatic Analyses*

Nadav Topaz, Jonathan Winkjer, Cori Moore, Rosalyn Price

Faculty Mentor: Tsai-Tien Tseng

*Understanding Zinc Trafficking During Snake Envenomation*

Evan Williams

Faculty Mentor: Eric Albrecht

## **Physics**

*Black Hole Jets In Active Galaxies*

Aaron Lowery

Faculty Mentor: David Garofalo

*Crystal Nucleation Of Palladium Doped Lithiumdisilicate Glass*

Gregory Humble

Faculty Mentor: Kisa Ranasinghe

*Investigating Bioactive Borate Glass For Biological Applications*

Samuel Parker, Gregory Humble

Faculty Mentor: Kisa Ranasinghe

*Spinning Black Holes In The Universe*

Emily Hollingworth

Faculty Mentor: David Garofalo

*Studying The Aerodynamics Of Wind Turbines using LabVIEW*

Chris Rose

Faculty Mentor: Ratnappuli Kulasiri

*Supermassive Black Holes Near The Birth Of The Universe*

Derrick Pruitt

Faculty Mentor: David Garofalo

## College of the Arts

### **School of Art and Design**

*Angu Walters And Contemporary Cameroonian Art*

Stephanie King

Faculty Mentor: Jessica Stephenson

*Mami Wata: The Story Of A Femme Fatale*

Kelsey Moran

Faculty Mentor: Jessica Stephenson

*Mohamed Banawy's "The Valley" And The "Treasures Of Knowledge"*

Emily Knight

Faculty Mentor: Jessica Stephenson

*Rethinking The Representation Of Prostitution In Ancient Greek Vase-Painting*

Madeline Beck

Faculty Mentor: Kristen Seaman

### **School of Music**

*Benefits And Methods Of The Scale Practice For The Beginner Piano Students*

Ai Nguyen

Faculty Mentor: Soohyun Yun

*Improvisation - An Important Pillar Of Music Education*

Beth Anne Ake

Faculty Mentor: Soohyun Yun

*Incorporating The Art Of Dance In The Piano Lesson*

Haley Myers

Faculty Mentor: Soohyun Yun

*Motivating Young Beginning Piano Students By Rhythm Counting Activities*

Soyoun Sheehan

Faculty Mentor: Soohyun Yun

*Popular Music Arranging As A Tool To Teach Functional Theory*

Beth Anne Ake, Haley Myers, Soyoun Sheehan, Ai Nguyen

Faculty Mentor: Soohyun Yun

*The Effects Of Music Training In Primary School Children: Memory Improvement*

Kim Royer

Faculty Mentor: Edward Eanes

*The Evolution Of Music Education From Ancient Greece To The 21st Century*

Sara Knapp, Madison Hall

Faculty Mentor: Edward Eanes

## Honors College

### Honors College

*Contrasting Technological Views Between Brazil And United States*

Samantha Slicker, William Tyler, Sean Whealton

Faculty Mentor: Amy Buddie, Ken Hill

## Southern Polytechnic College of Engineering & Engineering Technology

### Mechanical Engineering

*Automatic Integrated Vehicle Jack*

Eliana Pippen, Christopher Beals, Duy Tran, Adam Shirley

Faculty Mentor: Mir Atiqullah

*Dynamic Elastography*

John Cronin, Anderson Drew, Thomas Ryles

Faculty Mentor: Muhammad Salman

*Heavy Lifting Clutch*

Jose Orozco, Waheed Choudhry, Syed Humail

Faculty Mentor: Mir Atiqullah

*Long Hair In Football: Visible Impact, Invisible Penalty*

Emerald Alexis

Faculty Mentor: Laura Ruhala, Richard Ruhala

*Rescuer*

Brett Hardy, Brian Maki, Parin Patel, Erick Steele

Faculty Mentor: Mir Atiqullah

*Sound Levels Of Chiller Units On KSU Marietta Campus And Consequences*

Jacob Davis

Faculty Mentor: Richard Ruhala

*Two-Way Powered Rickshaw*

Karen Boze, Ubaidullah Muhammad, Matthew Hamilton

Faculty Mentor: Mir Atiqullah

*Wheelchair Carrier For Use In Airports*

Chase Davani, Luke Mullins, Greg Paris, Donald Lockwood

Faculty Mentor: Mir Atiqullah

## University College

### University Studies

*Depictions Of Leadership In Television, Film, And Advertising.*

E. Monique Jones, J. Kevin Brown, Leroy John, Timothy Saint-Fort, Wassim Khalek, J. TJ Duhart, Akash Patel, Tenae Henderson, Erica Malcom, Ayanna Ward, DeVontre Echols, William Lowman, Corinthian Grace, Caitlin Callaway, Sarah Coicou, Bethany Barrera, Austin Molkie

Faculty Mentor: Nyasha GuramatunhuCooper

*Leadership Development And Practice: A Narrative Of Peer Mentorship And Leadership*

Alicia Whittle

Faculty Mentor: Nyasha GuramatunhuCooper

# WellStar College of Health and Human Services

## **Exercise Science and Sport Management**

*Association Of Physical Inactivity With Visceral Fat Accumulation In Pregnant Women*

Ashlyn Showalter, Danielle Brown

Faculty Mentor: Katherine Ingram

*Is Prenatal Exercise Participation Associated With Reduced Discomforts Of Pregnancy*

Danielle Brown, Melanie White, Alexandra Grant, Taylor Swanson

Faculty Mentor: Katherine Ingram

*Is There A Relationship Between Visceral Fat Accumulation And Insulin Resistance In Pregnant Women*

JaBreia James, Michelle Scroggins, Alexandra Grant

Faculty Mentor: Katherine Ingram

*Is There an Association Between Sex Hormone Levels And Visceral Fat Accumulation In Postpartum Women*

Kayleigh Noble, Ayles Herrington

Faculty Mentor: Katherine Ingram

*Maternal Abdominal Fat And Birth Weight*

Mary Kate Higgins, Ayles Herrington

Faculty Mentor: Katherine Ingram

## **Health Promotion and Physical Education**

*Utilization Of Workplace Health Promotion (WHP) Programming To Improve Health Literacy*

Lyric Hayden-Lanier

Faculty Mentor: Mari-Amanda Dyal

## **Social Work and Human Services**

*Georgia Latino & Immigrant-Serving Nonprofit Organizations: Identifying And Mapping Human Services*

Karen Costa, Gabriela Mosso

Faculty Mentor: Darlene Rodriguez



# Presentation Abstracts

## **Message Design Logics Theory And Messaging In The Ebola Crisis**

Gregory Bieger

Faculty Mentor: Deanna Womack

O'Keefe's (1988) theory of message design logics explains why some messages are more persuasive than others. The first, expressive design logic, is the most basic and focuses on expressing individual thoughts and opinions (O'Keefe, 1988). This type of message design merely states what the persuader wants. The second, conventional design logic, appeals to typical reasons or emotional appeals that would be suitable for any audience. The third, rhetorical message design logic, is the most complex and sophisticated message design focusing on achieving an agreement between the sender and receiver in which the message provides context. Unlike conventional design logic, rhetorical message design logic is adapted to the particular audience being addressed.

When Message Design Logics Theory is used to examine a public service announcement about Ebola from the WHO, one notices examples of all three types of message designs: expressive, conventional, and rhetorical. The images used are basic and reach the largest demographic. Literacy is not necessary; the images communicate basic ideas such as "traveling" and "sick." The flow chart structure also lends itself to basic understanding of the message. The text used is also very simple; however it can be classified as conventional messaging. Messages like, "Seek prompt medical attention" are very direct and show expressive construction. Other messages, like the picture of a man wearing the tie and carrying luggage, do show awareness of social convention, in this case the fact that many travelers travel for business. The message says that Ebola can still infect business travelers. It recognizes the belief that Ebola is a "poor peoples' disease," but challenges that belief with the image of a man in a suit. The message shows little evidence of rhetorical design. There is very little back and forth communication between the sender, the WHO, and the receiver, the traveler. This lack of the most sophisticated design logic brings into question the effectiveness of the message as a whole. The rhetorical message design is the most effective form of the three at persuading audiences. Perhaps adding a blurb such as, "Protect you and your loved ones. Help stop Ebola" might convince some receivers to agree that the actions taken in stopping Ebola could help themselves and their families rather than just an unknown public. This is just one example of how message design logics theory is extraordinarily useful in everyday life. It describes, explains, and predicts behavior extremely well.

## **A Linguistic Phenomenon: Code-Switching In Media And Advertisement**

Rebecca Tuck

Faculty Mentor: Jeanne Bohannon

The purpose of this paper is to examine the linguistic phenomenon of code-switching in two different forms of communication: social media and traditional advertising. Code-switching,

most common among bilinguals, is the practice of expressing ourselves in conversation, the act of altering the languages we speak, or the ability to switch back and forth between two different languages simultaneously. We all do it, albeit, inadvertently at times, whether it is to fit in, stand out, be understood, emphasize a point, or deliver a message. Throughout this paper, I will analyze code-switching found in a popular actress' social media account as well as its presence in global marketing advertisements, and thus, determine why code-switching has become the intensively researched linguistic phenomenon that it is today.

## **Anonymous Discourse In Digital Spaces - A Microstudy**

Matthew Russell

Faculty Mentor: Jeanne Bohannon

Today, it is easy to contact someone you know through the internet. There are Facebook, Twitter, Skype, Instagram, and a host of other social media services to choose from. In these spaces, you know the names - and possibly the faces - of the people you are communicating with. Even if you do not know them personally, you at least know who they are. Likewise, they know who you are.

But what about digital spaces where the identities of the communicators are hidden? What happens when people know their words cannot be directly attributed to them? Do they behave differently? If so, how? How does anonymity affect conversations where not even the voices of the speakers are known? What kind of effects might anonymity have on the language of the community? These are the questions this microstudy sets out to answer.

In this microstudy, I examine the culture and patterns of online communication of discourse communities in which the users are anonymous. I will present data gleaned by watching and recording the interactions between anonymous communicators on 4chan, a website where all users are anonymous by default. I will illustrate and explain the patterns of anonymous discourse in order to make them more understandable for those who are not immersed in the community.

It is difficult, if not impossible, to gauge the demographics of the 4chan user base because of the nature of this digital space. That has no impact on the study itself, however. The study focuses on the particular lack of identity in this digital communication space.

Disclaimer: The users of 4chan use profanity and terminology that some readers may find offensive. This paper contains such language to explain how this discourse community uses it.

## **IDK, WTF: The Growth Of Acronyms from The Roman Empire To The iPhone 6**

Carson Long

Faculty Mentor: Jeanne Bohannon

This paper describes research of the history of acronyms and abbreviations leading up to the usage of IDK and WTF in everyday, digital native language. The purpose of my research is to

demonstrate how language adapts with the culture(s) around it to make communicating as efficient as possible. I looked into the history of acronyms and abbreviations by finding the earliest examples available to me as well as looking into the reasons behind them. This paper spans from the Roman Empire to 2014.

### **Just Text Me: Exploring Breakdowns In Human Communication And Technology**

Allyson Hight

Faculty Mentor: Jeanne Bohannon

The changes that language, discourse, and media undergo on a daily basis directly affect how people communicate. In my project, I researched how communication is changing and the ways that those changes affect the ability and willingness to connect with one another on a meaningful level. With recent re/mixes in technology and discourse, people have smaller attention spans and less willingness to really get to know people. As we rely more on technology for information, we rely less on connecting with others and participating in "real" communication. People have smaller attention spans in most areas, conversations and relationships included. I have explored the data supporting these ideas as well as connected them to why people no longer seem to be able to communicate in both Platonic and romantic relationships. I ask and answer: if people are losing the ability and willingness to connect verbally and emotionally now, what changes might the future hold for human communication?

### **Math Education: A Failed Rhetorical Situation**

Elizabeth Melendez

Faculty Mentor: Jeanne Bohannon

After no less than five attempts and two completions, I was unable to earn a grade in college algebra sufficient to satisfy my program requirement. Despite nearly straight A's in all other subjects, I suffered from what felt like paralysis that completely prevented me from performing well in math. Many of my peers also suffered from this math paralysis. Others, even some that were considered high performers, had simply learned to survive math by sheer rote memory, recitation and performance, but were actually no closer to understanding the subject than I was.

However, a unique convergence of fortuitous circumstances illuminated a solution. With this enlightened perspective, and using the model of the rhetorical situation, I was able to analyze my experience from a rhetorical perspective which allowed me to see not just my problem with math, but the overall problem of inefficacy in math education more clearly. Most importantly, it cleared the way for me to apply a blend of my diverse and unique skill sets toward developing a solution. This would have all been mere theory. However, I put my approach into real practice and within six weeks had pulled my college algebra grade from

failing at midterm to an A on the final exam. On my sixth and final attempt, using this new perspective and approach, I had solved the "math" problem, passing college algebra with a B. The experience and the result is now the subject of my honors thesis and I have been asked to present my story and my research at a conference for Georgia Math Educators in Fall 2015. I look forward to the opportunity to also present this research at the KSU Symposium of Student Scholars.

### **Mother Tongue Silenced: The Decay-ing Of The Gullah-Geechee Language And Culture**

Elizabeth Morris

Faculty Mentor: Jeanne Bohannon

This research presentation examines the influence of the Gullah-Geechee language and culture on American English, as well as addresses the current crisis that is the loss of Gullah-Geechee culture and language entirely with specific emphasis on Sapelo island, Georgia. Due to outside influence, societal standards, and economic crisis, the Sea Islands and their native residents are losing their culture at an exponential rate. This paper specifically examines the historical causes such as Jim Crow laws and social viewpoints of this minority language and culture to define root causes of the degradation which the academic community can solve through utilizing multiple sources such as academic historical newspapers and accounts from the University of Georgia, interviews done with important locals such as Cornelia Burke, and scholastic publishing's on Standard American English. The Sapelo people and all Sea Islanders' culture is something unique, and beautiful created from the ugliness of American slavery. The preservation of this culture is key to chronicling the events of that time period as a living example of cultural evolution in the Southern region of the United States. The Geechee -Gullah language also serves as a major connector between African American urban language and culture and it root home in Western Africa.

### **Talking White VS. Talking Black**

Sharon Roberts

Faculty Mentor: Jeanne Bohannon

The words, sounds, and grammatical constructions of current day African American language can be attributed to post-slavery social, political and economic conditions. The impetus for this paper arose out of a personal discussion among a group of students overcome with division in regards to a response from one student to another. The question asked, "Hey, why are you always Talking White?"

This paper examines the sociolinguistics of urban culture and the position African American Vernacular English (AAVE) holds in American English (AE). Understanding AAVE development, evolution and purpose offers insight into and the importance of collaborating education and social environments of impoverished communities preserving a concept of AE.

Social communities influence speech-creating bilingualism as though the English language is foreign. There is an increase in literacy issues in American born English Language Learners (ELL), children who are unable to pass basic English exams because there is a disconnect between the English spoken and the English learned in their environment. The influx of urban slang users in modern modes of communication allows for an examination into the corruption of the English language that is not always a derivative of AAVE.

### **A Stormy Summer**

Suzanne McWhirter

Faculty Mentor: Melanie Sumner

Suzanne McWhirter, a student in my WRIT 3120 , Beginning Fiction Writing class, has written a remarkable short story titled, "A Stormy Summer." Harley Hill, the young narrator, tells a moving story set in Cold Iron Holler in Eastern Kentucky circa 1974. McWhirter's use of selective detail depicts this unique world in vivid color. Using the physical storm as a metaphor for a violent attack from "the coal company men," the story portrays the strength of a family in the face of fear. The characters are drawn with careful attention, exquisite dialogue, and deep feeling. McWhirter writes:

"That summer I was forced to grow up. All I ever really wanted was a safe place to be loved but my expectations had been those of a child, longing for a place where nothing bad ever happens, no one ever dies, and as long as you're not getting beat you're not getting hurt. But the truth is, bad things happen everywhere and to love is to risk being hurt."

### **Love, A Dream**

Brittany Cordaro

Faculty Mentor: Melissa Keith

This is a work of poetry.

### **Ride Or Die: Gender & Survival In The Fast And Furious Franchise**

Andrew Kemp

Faculty Mentor: Letizia Guglielmo

Universal's Fast and Furious films are among the most popular and significant studio blockbusters of the past 15 years. After an inauspicious launch with 2001's The Fast and the Furious and its two poorly-received sequels, the franchise - primarily concerned with illegal street racing - thrived by becoming a heist franchise and broadening its audience appeal. Originally powered by its male stars, the franchise's core cast evolved into a gender- and racially-diverse "family," and female audiences responded enthusiastically, transforming the

movies into billion-dollar earners by embracing the postfeminist utopia they appear to represent.

In this presentation, I will chronicle the franchise's evolution and argue that its popularity with women and presentation of female heroism establish it as a relevant and vital postfeminist text. I will then analyze the franchise's key female characters to reveal how that postfeminist narrative does not, in fact, hold together. Through a discussion of female action archetypes like the "Amazon" and the "Mother," I will identify how these supposedly new-era women are still entangled in patriarchal, misogynistic roles that place men at the center of the "family," reformatting or eliminating women when their stories transgress that ideal. "Toughness and masculinity in women continue to be taboo," and the films repeatedly reinforce this male anxiety by killing threatening female characters or sanctifying them into matriarchal roles. I will further argue that the franchise's disappointing gender politics are especially troubling in light of its continuing popularity with young women, exemplifying ongoing tension between contemporary schools of postfeminist thought.

### **The Success Of Hashtags In Social Media Movements: A Linguistics Approach**

Hannah Smith

Faculty Mentor: Letizia Guglielmo, Chris Palmer

In 140 characters, any message can be shared in a matter of seconds with the entire world. Language has been impacted in the way we communicate through advancements in technology. Individual men and women, organizations, small businesses, news stations, etc. are able to broadcast their ideas and opinions through social media outlets like Twitter, Instagram, and Facebook to increase the number of people receiving their messages. Minority groups that still face discrimination and oppression have been given an opportunity to be heard through new social movements occurring in the media. Focusing on the black community facing continual exploitation, this research will follow the hashtags #ICantBreathe and #BlackLivesMatter, but observe them from a linguistic standpoint. By considering the syntactic and discursive properties of these two hashtags on Twitter, my research explores how language impacts the success of particular political movements through the rhetorical use of hashtags.

### **Deviant Art? From The European Avant-Garde To Pop Culture**

Kevin Latta

Faculty Mentor: Federica Santini

The project is an analysis of the long-lasting impact of the theories and practices implemented by European Avant-Garde on pop culture. Mr. Latta has investigated and illustrated a number of direct and indirect references, which he uses to showcase the positive impact of art that aims to go against societal norms.

## **El Bloqueo Cubano**

Lourdes Gendreau

Faculty Mentor: June Laval

Hace 55 años, el gobierno de los Estados Unidos implanto un bloqueo financiero, económico y comercial a Cuba. El 2 de marzo de 1961, antes de la invasión de Playa Gijón, se anunció la posible aplicación a Cuba de la Sección 5, inciso B, de la Ley de Comercio con el enemigo, que prohibía todo comercio de exportación e importación. El 7 de febrero de 1962, el entonces presidente de los Estados Unidos, John F. Kennedy, declaró el bloqueo total contra Cuba. Como sabemos, los Estados Unidos y Cuba han iniciado negociaciones para normalizar sus relaciones bilaterales, congeladas desde 1961. Vamos a examinar el estado actual del progreso de los Estados Unidos y Cuba para cesar este bloqueo total y al mismo tiempo los efectos del bloqueo sobre el pueblo cubano durante 53 años.

## **Le Monde Naturaliste Dans "Le Ventre De Paris" D'Emile Zola : Une Approche Évolutive**

Emily Kraus

Faculty Mentor: William Griffin, Federica Santini

In Émile Zola's naturalist novel *Le Ventre de Paris* (*The Belly of Paris*), the protagonist, a young man named Florent, tries to find his way back into Paris after having been deported to French Guiana. Les Halles, the central marketplace of Paris at the time, are a focal point of the story since it is within their confines that the majority of the action takes place. The goal of this paper, which will be visualized on the poster, is to study the circular pattern of Florent's life and to show the similarities that exist between his life and human condition in general.

## **The Fox And The Curtain: On Translating The Poetry Of Alda Merini**

Emily Kraus

Faculty Mentor: Federica Santini

This project is the result of a yearlong literary translation workshop that Ms. Kraus and Dr. Santini have been engaged in since Fall 2015. Ms. Kraus will present selected translations from the works of Italian poet Alda Merini and discuss translation theory and practices. The project's ultimate goal is the production of a fully annotated translation of Merini's collection "*La Volpe e il sipario*" ("*The Fox and the Curtain*").



## **Love And Death: A Creative Look At The European Romantic And Decadent Movements**

Levan Lamont

Faculty Mentor: Federica Santini

Ms. Lamont draws specific connections between her own creative work and the European Romantic and Decadent Movements She will present two of her own sculptures and illustrate their relation to the literary and artistic movements she has studied, providing specific references to relevant works from the periods she is focusing on.

## **"We Need To Talk": Methods, Timing, And Motivation For Coming Out LGBTQ**

Lindsay Montgomery

Faculty Mentor: Brandon Lundy

The LGBTQ coming out process is a deeply personal, and often misunderstood stage of life for anyone that falls under the category of a sexual minority. Many studies have been conducted focusing on very specific sexual orientations or age ranges, but this study examines the commonalities in the coming out process between sexual orientations, age ranges, and genders. This study uses a combination of online surveys completed by self-reported sexual minorities and semi-structured interviews with the same sample. Participants for interviews were purposefully selected and recorded. Interviewees answered questions pertaining to their own coming out process and were allowed the opportunity to tell their story in their own words. Through thematic coding and analysis, early findings seem to show that the study participants have a common denominator of fear of social rejection, which in most cases could explain the long gap between self-recognition and discussing their sexual orientation with others. The findings of this study suggest that while social change is rapidly occurring, there is still room for improvement in better understanding this process. Finding common issues in the coming out process is beneficial toward reducing ignorance and discrimination of a minority group.

## **A Family's Experience Caring For A Child Living With Spinal Muscular Atrophy**

Samantha Lawson

Faculty Mentor: Brandon Lundy

Spinal Muscular Atrophy (SMA) is a non-discriminatory neuromuscular disease that leads to progressive muscle degeneration and mobility impairment in its victims. Caring for a family member with this disease can be particularly challenging due to the level of personal attention and treatment that is required in order to sustain a healthy and stable life. This study captures an experiential snapshot of how one family copes with the unique challenges of this debilitating disease. The research methodology employed for this study includes participant

observation of educational seminars and clinical appointments, and semi-structured interviews with primary caregivers of a two-year old girl recently diagnosed with SMA. The findings show the obstacles faced in diagnosing SMA, clinical experiences and outcomes, healthcare limitations, misguided information, and personal experiences from a family faced with these challenges. The analysis of the collected data shows overall impacts of SMA on an entire circle of care such as lifestyle adaptations and personal experiences. Understanding the social implications of SMA is important because it depicts the intricate restrictions and boundaries that a family can face when providing care to someone with any debilitating disease.

### **An Anthropological Analysis Of The Chalcolithic Material Culture Found At Pachamta In The Mewar Plain, India**

Charles Brummeler

Faculty Mentor: Teresa Raczek

The study of material culture provides anthropological insight into archaeological research. This insight allows modern day people to understand how people lived in and viewed the world in the distant past. This paper will analyze the material culture found during excavations in the village of Pachamta, in northwest India, which dates back to the third millenium B.C.E. This site consists of a Chalcolithic period deposit associated with the Ahar-Banas culture, a regional society that was a contemporary of the Harappan culture of the Indus Valley. In addition to analyzing the artifacts found at Pachamta, this paper will also discuss anthropological theories in order to analyze this material culture in an anthropological context. This context will help us to understand and visualize everyday life within this culture.

### **And What Are You Going To Do With That?: The Usefulness And Applications Of An Anthropology Degree In The Modern Business World**

Cheyenne Dahlmann

Faculty Mentor: Brandon Lundy

In today's fast-paced, technology-driven world, degrees in the humanities or social sciences often take a backseat to those in the hard sciences or business. As a senior about to get my degree in Anthropology, this issue is at the forefront of my mind. My peers and I are questioned constantly: what kind of job do we think we're going to get; how much money do we expect to make; why did we even choose this as our major, anyway? This study asks, is there really no room in the business world for an Anthropologist's perspective? This paper examines the data collected through semi-structured interviews and pile sorting exercises with a small number of professionals in various business-related fields. Analysis revealed that individuals with anthropological training were considered well-suited for certain careers including research and marketing. Findings also indicated that within these fields, the most

important qualifications an Anthropology degree carries include the ability to think from an "others" perspective (i.e., empathy), having practical experience applying the knowledge and skills learned, and most importantly, writing and communicating well. This study began the arduous task of translating the academic values and skills of a liberal arts education into language that is understandable and employable in a business environment. These findings should prove useful to both anthropology majors specifically and those with liberal arts degrees more generally in making themselves marketable in a competitive professional environment.

### **Bone Deterioration Due To Domesticated Rodent Scavenging**

Logan Howard

Faculty Mentor: Alice Fazlollah

This project examines the deterioration of bone caused by rat scavenging. Additionally, it will focus on what types of bones rats prefer when scavenging remains. The expected outcome is that the rodents will prefer the antler, with concentrated scavenging on the diaphysis due to the marrow within the core.

The purpose for this project is to compare the markings left upon bones from rat gnawing. Knowing the effects of rat markings on remains are important when differentiating between traumatic damages and postmortem scavenging. Rat gnawing on human bones sometimes causes breakage associated with skeletal trauma, so distinguishing between the two is vital during investigations. Because rats prefer drier bone, their interest in remains occurs later than that of other scavengers, and is less frequent as a result. Further, rat scavenging, while just as important as avian and canid scavenging, is a less studied area.

The experiment used four adult domesticated brown female rats (*Rattus norvegicus*). The bones were placed in the rats' caged environment, measuring 101cm high, 78.5cm wide, and 53cm deep. A hollowed cow bone and a deer antler were chosen as the variables, and the rats' gnawing wheels were left within the environment as a control. The bones were photographed every five days over a 20-day period in order to track the rats' effects on both objects. Data collection included which type of bone the rats preferred, the amount of damage to each bone, and the overall deterioration of each bone at the end of the study. Measurements were compared by the amount of striae per square centimeter.

### **Craft Beers Make "Hoppy Locals"**

Cristal Inoh

Faculty Mentor: Brandon Lundy

"Supporting local" is a concept that improves the locale of any city by providing a unique sense of identity and bolstering the local economy. In the greater Atlanta area, there has been a growth of strongly supported local breweries such as Red Hare, Burnt Hickory, and

Schoolhouse Beer and Brewing alongside local home brewers. This study examines how local breweries, local brew shops, and local home brewers have adopted and adapted to the sustainability movement. The study's methodology employed semi-structured interviews with employees of breweries and home brewers alongside participant observations on brew tours at Monday Night Brewery, Sweetwater, and Orpheus to better understand how their ingredients are supplied and used, what they do with leftover grain, and how their beer ultimately impacts the local audience. For example, Creature Comforts and Terrapin brewing company donated their spent grain to local pig and chicken farms. This great source of sustainability seems to be encouraging a more localized identity among the community of Atlanta brewers with wide and growing popular support.

### **Cultural Critics: An Intimate Look At The Complexity Of Pursing Comedy In A Public Arena**

Kristofer Wachner

Faculty Mentor: Brandon Lundy

This research examines the factors surrounding Atlanta area-based comedians in their attempt to pursue comedy in public. The topic addressed by this study is an intimate look at methods, limitations, and motivations presented by performers who actively participate in stand-up comedy and Improv. Through participant observation, semi-structured interviews, and surveys, this project captures the choices, methods, motivations, and views about successes and failures in public comedy. Findings trace choices about style and content of acts and the implementation of performativity with an unfamiliar audience. These cultural critics are constantly gauging audience reactions and making real-time changes in an attempt to gain the most precious of currency to a comedian...laughter. These results are important because they shed light on the community aspect involved in pursuing comedy and how individual performance is often tied to ongoing community interactions. This study represents larger motivations to performing as cultural critics in spite of a reasonable risk of failure and a continuous need to update and improve material.

### **Demonic Dogs: How Newspapers Portray Pit Bulls In The Atlanta Area And Help Shape Public Opinion**

Jessica Williams

Faculty Mentor: Brandon Lundy

A recent headline in the Atlanta Journal Constitution (AJC) read, "California Man Mauled by Pit Bulls Dies." The pit bull dog breed is under attack in the media as a vicious killer or victim of abuse and dogfighting. This study engages with the popular conceptions of the pit bull in order to better understand people's opinions about the breed. The research project looked specifically at how newspapers represent pit bulls and how dog owners view the breed,

partially based on what they read, hear, and see in the mass media. Using the AJC as a representative sample of national papers, 160 articles mentioning pit bulls were thematically analyzed based on content. Additional data was collected through direct observations and semi-structured interviews with pet owners who frequented a national pet store chain to better understand their sentiments of and behaviors around pit bulls. Initial findings suggest an overwhelmingly negative image of pit bulls being portrayed in the mass media such as pit bulls being "demon dogs" and "killers," although positive stories are also occasionally printed. Further, the observations and interviews yielded similar results with dog owners' behaviors around pit bulls tending toward fear of the breed. Major preliminary themes from the interviews and news stories include pit bulls being the breed that is most "newsworthy." This study is important because empirical research on pit bulls shows no real difference between the dispositions and behaviors of pit bulls in comparison to other breeds, but people continue to judge the breed and its owners more negatively than compared to other types of dogs.

### **Diversity And Tolerance: Acceptance Of Minority Religious Faiths On A University Campus**

Michele Kumar

Faculty Mentor: Brandon Lundy

The purpose of this research is to explore diversity of non-Christian religions on a university campus to better understand the acceptance and tolerance of these religious affiliations and belief systems. In doing humanistic, exploratory research using both deductive and inductive methods of participant observation and semi-structured interviewing, this study asks, how do the students of non-Christian faiths or belief systems at a southeastern comprehensive university feel about the level of acceptance and tolerance toward their beliefs on campus? Organizations such as the International Student Association and other non-Christian religious and spiritual organizations were purposefully selected. Preliminary findings suggest that even with programs designed to enrich the lives of students in regards to their being able to "experience" another culture, many students may not wish to participate when the "difference" being experienced is religious in nature. A relationship between feeling safe and accepted to practice a non-Christian faith on campus may provide important support structures for student success. Finally, feelings of marginalization and exclusion seem to occur more frequently among students of non-Christian faiths. These findings suggest important benefits to marginalized students when a progressive and tolerant stance on campus regarding religion is maintained and encouraged.

### **Examination Of Blunt Force Skeletal Injuries As A Result Of Falls From Heights**

Michele Kumar

Faculty Mentor: Alice Fazlollah

Damage to the skeleton can be extensive with falls from heights. Using measurements such as the height of the fall, the weight of the individual to calculate acceleration due to gravity, velocity of the launch speed, and the take-off distance in cases of homicide or suicide, certain occurrences can be predicted (Cross 2006:93). The position of the body, in conjunction with the surface and angle of impact can identify skeletal trauma in cases where the manner of death is unknown. Although forensic anthropologists do not determine cause of death, this type of information is useful in understanding fractures to bone in order to distinguish between antemortem, perimortem, and postmortem trauma. Determining whether cranial trauma is due to the fall or to a fatal blow to the head can be assessed using a definition proposed by Kremer et al. (2008:718), which states that identifying the area known as the "hat brim line," (HBL) to be only the area between the G line and the EAM line using the Frankfort horizontal plane which proves beneficial to forensic anthropologists. The two lines are horizontal and parallel, where the G line is the area passing through the superior margin of the glabella, and the inferior EAM line passes through the external auditory meatus and through the upper margin of the ear canal at the orbitomeatal plane. This is helpful in cases where only a dry skeleton is available. In cases with dry skeletal remains, the trauma to bones can be seen more easily, but the HBL is more difficult to discern. Fractures on other bones are seen with greater frequency depending on whether the death was a homicide, an accident, or a suicide.

## **Effects Of Speed And Vehicle Weight On Pedestrian-Motor Vehicle Collisions**

Connor Plumley

Faculty Mentor: Alice Fazlollah

This research project examines pedestrian-motor vehicle collisions resulting in either trauma or alteration to the bone. This topic is relevant to the field of forensic anthropology because it could help to determine first whether a person was run over by a car, and second, how fast the car was going or how large the car was, which could help police to determine whether the impact was intentional or incidental.

This research tests how the speed and weight of a car involved in running over a pedestrian affect the trauma caused by the incident, specifically if either variable affects whether a collision results in elastic deformation or plastic deformation. It is hypothesized that speed will have less of an effect on the amount and intensity of damage than will the weight of the car and that the trauma caused will result in either transverse or comminuted fractures to the bone. To test this hypothesis pig legs were run over with two different size cars, one a small SUV, and the other a large SUV with a weight difference of 973 pounds. Each car was used to run over one leg at 25 miles per hour and one leg at 50 or 60 miles per hour. To determine the speed at impact the researcher noted the speedometer as the vehicle passed over the leg. The flesh was then removed from each leg in order to examine the breaks and fractures in the leg. Both the type of fracture and the degree to which the bone is fractured, i.e. whether the fractures are hairline fractures or large fractures that go all of the way through the bone were recorded and compared.

## **Forensic Examination Of Sharp Force Trauma**

Anthony Rotoloni

Faculty Mentor: Alice Fazlollah

The purpose of this experiment is to observe the fracturing pattern, wound size and incision depth associated with sharp force trauma, specifically chop wounds. By using the data gathered from the fracturing pattern, wound size, and incision depth it is possible to identify the type of weapon that was used to create the trauma. There are three categories of incised trauma, each with its own distinct forensic evidence. Stab wounds tend to be deeper internally than they are wide on the surface. While slash wounds are the opposite and are typically longer laterally than they are deep. The final category is chop wounds which display forensic characteristics of both incised and blunt trauma. It is also important to understand the distinction between lacerations which have features like tissue bridging, and incised wounds. By examining in a forensic context the fracturing pattern, wound size, and depth of incisions on pig bones the data can be used to determine if the damage pattern is consistent with sharp force trauma. It is expected that the sharp force trauma that is inflicted on pig arm bones will mirror the fracturing pattern wound size, and depth of incision that is consistent with scholarly research on sharp force trauma damage.

Two pig arms were laid horizontally on two wood blocks parallel to the ground on a table three feet tall. One pig arm was struck with an axe, the other was struck with a large sword. Each bone was struck twice with the respective weapon. Each strike was preformed as close to a consistent speed as is possible without a machine. To achieve this consistency, the strike was preformed with a Japanese martial arts style strike (ichi no suburi). This is a two-handed strike that is raised above the head and brought downward in a straight path stopping at the waist. After the trauma was inflicted, wound size and incision depth were examined prior to removing the flesh. Each bone was de-fleshed and boiled so the fracture patterns, and true depth of the incisions could be measured and compared. The data gathered from the experiment was then compared to scholarly research done on sharp force trauma.

## **Gardening In North Georgia: The Contemporary Struggle**

Stormy Jeans

Faculty Mentor: Brandon Lundy

Where does your food come from? Imagine one day waking up and there is no food at the grocery store. Gardening is something that might be therapeutic to some or related to subsistence and livelihood for others. In North Georgia, as gardening declines in popularity, what might be the implications? Is there a resurgence of gardening and the associated skills taking place in urban and educational settings that may reinvigorate the art of gardening on a national level? The methodology used for this study about gardening practices includes semi-structured interviews and direct observation at a local public garden with 220 acres dedicated

to enthusiasts. Preliminary findings suggest that older people are most interested in gardening for the following reasons: therapeutic stress relief, self-reliance, availability of fresh produce, and physical activity. The drive behind gardening can vary from person to person. Gardening is important because in contemporary society most are deeply embedded in a food web that is largely beyond their control making food security tenuous and poorly recognized. With the looming problems associated with food deserts and urban isolation, fostering the skills associated with gardening and subsistence food production are returning in importance.

### **Going Greek: The Implications Of Collegiate Hellenic Culture At A Southeastern Comprehensive University**

Joshua Guilbaud

Faculty Mentor: Brandon Lundy

Greek life in the university system has long been considered to be a traditional part of the college experience; but recently, public events such as the University of Oklahoma SAE Fraternity's videotaped racism or the pending \$3 million dollar lawsuit against Alpha Phi Alpha have led to outrage and public scrutiny over the value of Hellenic culture. This study examined the potential social, professional, and academic effects of the Greek system on affiliated students at a southeastern comprehensive university. More specifically, this research project asked, how are students, affiliated with the Greek system, impacted by its culture and what are the benefits and risks associated with this affiliation? Data was collected from active university fraternity and sorority members through direct and participant observations and semi-structured interviews. Preliminary findings suggest that involvement with Greek Life organizations has a positive effect on these students by providing a sense of belonging and community, a vast global network of mentors and employment opportunities, and an improved level of self-confidence that stems from the successful socialization into Hellenic culture. Even with a reported 90% graduation rate compared to a 70% graduation rate among non-Greeks, as the recent news stories attest, there is an element of racism, violence, and misogyny that seems to be a direct by-product of this system. Understanding this dichotomy better is an important next step in Hellenic culture research. Finding a way to distill the strengths of Greek Life such as those found in this research, while eliminating the negative by-products of in/out group sentimentalities should enhance the college experience for a high number of students and should lead to long lasting positive outcomes for these students professional development.

### **How Does The Exploitation And Degradation Of Finite Natural Resources By Industrial Oil Producers Effect Our Future Planetary Environment**

Zachary King

Faculty Mentor: Jun Tu



The purpose of this presentation is to communicate content of the reports given by credible institution on the degradation and exploitation of finite natural resources by corporate institutions, for short term financial gain, and how it will effect the future planetary environment. Methods used in obtaining this research range from point source observation directly from oil spills in the Gulf or pipe leaks in the Mid-West, to analytical and numerical data quantifications gathered over a period of two decades. This presentation encompasses a wide scope of information concerning the way we disseminate and education to the populous on oil companies pollution as well as the inherent dangers connected with this volatile form of energy acquisition. Results show that finite natural resource such as fossil fuels have severely impact the troposphere and hydrosphere of our ecological planetary environment. Continuation of the method of energy consumption will lead to degradation of wetlands, waterways, and agricultural hearths. Recommendations suggested by my presentation push towards more sustainable form of energy production that will persevere and protect our planet for the succession of our species.

### **Investigation Of The Effects Of Canid Scavenging On Remains**

Lindsey Goff

Faculty Mentor: Alice Fazlollah

Canid scavenging often occurs when a body decays outdoors. Dogs will eat the meat of a body and chew on the epiphyses of the long bones that may be left outdoors. Often they will search for food, scavenge what is there, and move the bones to a different site to where the body was originally. They favor the long bones that have cartilage and trabecular bone, and will often avoid the skull. An experiment was conducted to examine how long it will take a canid to scavenge a bone with different durations of time in which they will have to complete the task. This experiment demonstrates the time since death at which it will take a canid to locate a bone, how long they have been scavenging the bone, and the extent of damage they create within that time period.

It is hypothesized that depending on the age and duration of time a canid is able to scavenge a bone will depend on what type of marks will be made and how much of the bone will be scavenged. This hypothesis was tested on three different breeds of canids. One is a nine month old female German shepherd and Blue Heeler mix, a nine year old male Rhodesian ridgeback and Boxer mix, and a third is an eight year old female Labrador retriever and Terrier mix. These canids were individually observed on how long it took each to locate a bone, hidden in an enclosed area. These bones were observed for scavenging damage left behind after different time durations. These durations were be fifteen minutes, thirty minutes, and sixty minutes. This will be documented by photographs. Measurements of the bones were collected before and after each trial, and the number of teeth markings were noted and compared the bone. Preliminary results suggest that the younger canid chewed the majority of the femur in a short duration of time, while the older canids chewed most of the femurs in the longer duration of

time. When the older canids scavenged the bones in the short durations, a large majority of marks were made but the epiphyses were not fully scavenged compared to the younger canid.

### **Macroscopic Analysis Of Variations Of Machete Damage In Dismemberments Of Long Bone**

Kristofer Wachner

Faculty Mentor: Alice Fazlollah

The topic that will be researched is comparative damage between three different types of sharp force trauma due to dismemberment, on perimortem bone using a machete. The research is important because in Forensic cases, it is a common practice to work backwards from damage to bone, to determine types of weapons used in cases of violence. In a case of dismemberment, even though it is the same weapon, different methods of dismemberment can yield different results due to sharp force trauma. With enough velocity and the right weapon a transverse cut would be expected and apparent. In cases where the methods of dismemberment may be ill prepared, it would yield significantly different results from a high velocity chop. This is why examining multiple types of dismemberment with the same weapon, can give great insight on damage variation capabilities of one weapon. Three pig long bones with hooves intact, will be required for this experiment. Each bone will be cut using different forms of sharp force trauma found in dismemberment cases. One method will be single blow by a machete to create a complete transverse fracture of the bone. Then the second bone will be damaged by a continual hacking method until complete fracture. This should yield various cut marks distinguishable from the other two methods. Third will be a hack-break method, which involves hacking once breaking and hacking again until the bone is completely fractured. This method should yield the most variation in damage, due to a combination of fractures including but not limited to greenstick, Comminuted fracture, and or compression. The hypothesis is that each bone; though damaged by the same weapon, will yield Marco-level variation of apparent damage to the bone. The bones will then decompose naturally to simulate the same conditions of dismembered appendages being left in the wild. The bones will then be cleaned for inspection of both ends of the fractures. The expected results are to witness clear and unique indicators of damage through use of different methods of dismemberment with the same bladed weapon.

### **Make My Datum: Student Perceptions Of The Geographic Information Science Degree**

Kanne Ikwuezunma

Faculty Mentor: Nancy Hoalst-Pullen

The purpose of the study is the assess the perceptions of students on the state of the Geographic Information Science (GIS) program at Kennesaw State University (KSU). We implemented an online survey to ask questions regarding what skills and expertise students

have learned, the quality of their learning, and the overall quality of teaching and available resources provided during their degree-seeking years at KSU. Overall, the findings suggest that the program is providing the appropriate skills and expertise necessary for the degree, but that there is a need for additional courses and instructors within the program.

### **Mummification: A Critical Literature Analysis**

Jessica Williams

Faculty Mentor: Alice Fazlollah

The topic for this paper is mummification. This research examines the different environments that are conducive to mummification, such as peat bogs and places with climates. This paper also examines new research that is being done on mummification and how it relates to forensic anthropology. Some examples would include looking at new research of how heat could destroy the process of mummification. In places the temperature is rising, so the bodies that have been mummified are melting and being destroyed. This would harm forensic anthropology. If the body is melted or not present then forensic anthropologist cannot identify the individual.

Mummification can be part of the decomposition process. It is the process of the remains of an individual drying out to a state of preservation. The skin and flesh dry up and turn into a state that will cease to decompose. It does tend to happen with individuals with low body fat. This process takes time and can only happen in certain environments, such as an arid climate that can be hot or cold with little humidity. Mummification can also occur in peat bogs due to tannic acid, low oxygen, and low temperature. Mummification can happen naturally in the right environment.

Reviewing research in this area is key because it is important to know how long the process takes and under what conditions it takes place. The information from the research done will help when there is a forensic case. It is great indicator for time since death information. This is due to the fact that the process does take time. An individual cannot be mummified in a day. Depending on the environment it could take months or years. Forensic anthropologists can then know that this individual could not have died recently.

### **Positional Relationship Of The Fibula Relative To The Tibia In Collegiate Athletes**

Katherine Lane

Faculty Mentor: Alice Fazlollah

The research examines the cross-sectional geometric properties of the tibia and fibula. Wolff's Law states that form follows function, or that when stresses are placed on bone, the bone will remodel through absorption and deposition in order to maintain optimal strain levels.

Previous research in cross-sectional bone geometry has been on the femur, and that which has examined the lower leg usually focused on only the tibia. The fibula has often be ignored due

to the assumption of its lack of importance due to its lesser weight bearing capabilities. The sample consists of 83 males between the ages of 18 and 30 years who participate in collegiate level sports: field hockey (n=15), distance runners (15), swimmers (15), cricketers (16), and non-athletes (20). Numerous studies have been conducted using this data set, but has yet to address the position of the fibula. Data was collected using the pQCT scans of the lower leg of these individuals; the scans were imported into ImageJ and analyzed using BoneJ. Data was then stored in an Excel sheet.

The study examines the correlation between the distance and angle between the tibia and fibula and tibial rigidity. The study hypothesized that the greater the distance between the tibia and fibula would result in a less robust tibia, and vice versa the lesser the distance between the tibia and fibula would result in a more robust tibia. With the angle, it was hypothesized that the closer the fibula was positioned to mediolateral results in a less robust tibia in the mediolateral aspect.

Preliminary findings show that the hypothesis was not supported. There was a positive correlation between distance and all cross-sectional geometric properties for both bones. For the tibia there was a positive correlation between angle and  $I_y$ , and for the fibula there was a positive correlation between angle and  $I_y$  and  $J$ . When examined by sporting groups, field hockey players and cricketers stood out. These two groups had no correlation between distance and  $I_y$  (while runners, swimmers, and controls had a positive correlation), and had a positive correlation between angle and  $I_y$  (while the other groups had no correlation). While further analysis is still needed, this could be indicative of the different loading patterns of field hockey players and cricketers. These two groups have a more multidirectional, especially mediolateral, loading patterns versus the more anterior-posterior loading patterns of runners, swimmers, and control.

## **Putting On A Show: Coping Strategies In The Restaurant Industry**

Madison Brennan

Faculty Mentor: Brandon Lundy

This study presents a fresh look at coping strategies used by workers (i.e., servers, bartenders, and managers) in the restaurant industry. How do they maintain a calm and professional genuineness when the work environment might be hectic and stress inducing? Based on previous research, the study focused on detachment and investment coping strategies used in the service industry such as surface acting or deep acting. Findings from participant observation, semi-structured interviews, focus groups, and surveys, suggest that both strategies (detachment and investment) can be performed by a single worker. However, the findings also suggest that in instances of increased stress such as busyness and problems with guests, the detachment strategy was utilized more frequently. With the service industry driving the U. S. economy, recognizing how workers navigate, act, and manipulate social encounters that affect their livelihoods is critical to establishing a functional, happy, and healthy workplace.

## **Replicability Of Archaeological Quartz Lithic Analysis**

Staci Lusk

Faculty Mentor: Teresa Raczek

Being one of the most abundant materials on Earth, quartz is commonly found in the archaeological record. It has been used for millennia by societies from all parts of the world for the production of lithics (stone tools). Quartz is a challenging material to use for knapping (stone tool production) because it is large grained and tends to shatter when struck, making it harder to predictably manipulate. The nature of the raw material is also problematic for modern analysts, as it contains many natural fractures. Because of this, inter-observer variability can occur. This project assesses the replicability of quartz lithic analysis when compared to that of obsidian and chert. Using experimentally knapped lithics, voluntary participants of various skill levels are asked to analyze chert, obsidian, and quartz lithics to determine their rate of analytical success. This paper conjectures that the rate of analytical error is much higher with quartz than with the other raw materials.

## **Symbolism In Indian Pottery Production**

Staci Lusk

Faculty Mentor: Teresa Raczek

Potters in India have produced vessels for thousands of years. Today, it is a trade that is passed down by family members through the generations and can provide a consistent income as well as a connection to the past. Though the craft is still relevant, it is threatened by globalization, and the younger generations are beginning to lose interest in the traditional trades of their fathers. However, clay vessels continue to play an important role in religious festivals like Diwali and are still sought after, despite the availability of metal and plastic pots. The production of pottery from an economic perspective has been well documented by various anthropologists, so this research focuses on the ritual uses and importance of the pottery, instead.

## **Sex Estimation Techniques Of The Adult Pelvis**

Elizabeth Pomawski

Faculty Mentor: Alice Fazlollah

This paper will examine sex estimation techniques of the adult pelvis developed by forensic anthropologists; it will incorporate material from the 1960s until now to provide a historical overview of the topic. The goal of this critical literature review is to understand how technological advancement has changed sex estimation methodology as well as create a comprehensive report of the different sex estimation practices that use the adult pelvis.

There are two categories of sex estimation methods; non-metric analysis involves observing morphological differences between sexes while the metric tests take measurements of a particular trait or landmark. Forensic anthropologists emphasize the three traits discovered by T. W. Phenice when conducting a non-metric assessment of the pelvis - the ventral arc, ischiopubic ramus' medial side, and the subpubic concavity - because this method has a high accuracy rate. Phenice's own study revealed a 95% accuracy in establishing an individual's sex while Nancy Lovell's test showed an 83% accuracy (1989:117). However, the pelvis is also the most sexually dimorphic compared to the rest of the skeleton. This means the measurements taken from the pelvis' traits can be entered into a discriminant function analysis and other statistical equations to determine sex (Decker et al. 2011).

It is important to review this research because forensic anthropologists help law enforcement identify missing and unknown persons. These scientists must know the components that create a biological profile and practice the methods to maintain a certain skill proficiency level. Sex estimation contributes to the biological profile; however, it also affects the age estimation, stature estimation, and ancestry estimation since these assessments are based upon sex determination.

### **Sharp Force Trauma Analysis: Hacking Wounds From Axe And Hatchet**

Lindsay Montgomery

Faculty Mentor: Alice Fazlollah

The purpose of this research is to examine trauma to bone caused by hacking, a type of sharp force trauma. Axes and hatchets have very similarly shaped blades, making marks on bones difficult to distinguish. Differentiating between axe and hatchet trauma is forensically significant in determining weapons used in criminal cases. A popular brand of axe and hatchet are used to inflict trauma to partially defleshed deer tibia to determine metric and non-metric differences between axe wounds and hatchet wounds. The majority of sharp force trauma analysis is conducted using knives and saws (Lynn and Fairgrieve 2009), however, little research is conducted using chopping tools such as axes and hatchets. Because of a need for more research on hacking trauma, this study analyzes the differences in cut style, fracturing, and splintering between chopping tools to distinguish between weapons used in criminal cases involving axes and hatchets.

Because of difference in weight and in blade size, it is expected that axe wounds will be deeper and larger in width than hatchet wounds. Hatchet wounds will produce more fracturing around the point of impact due to lighter weight and speed of swing as compared to an axe. Axe wounds will more than likely completely cut through the bone, whereas hatchet wounds will not completely sever the bone.

This experiment utilizes one partially defleshed deer tibia to analyze hatchet trauma, and another partially defleshed deer tibia to analyze axe trauma. Each deer tibia was struck twice, once from a position laying on the ground and once while strapped in an upright position to a small tree. This positioning allows for differences in swing and gravity to be examined. Each

step was drawn, numbered, and photographed. The cut remains were then placed in a wire cage staked to the ground and left outside for two weeks to allow for decomposition. Once the remains had decomposed naturally, the remains were boiled and cleaned to allow for bone analysis. Metric analysis, including measuring cut depth and width, were performed as well as non-metric analysis, including examination of any distinct marks left on the bone by the different blades. The results were compared to similar research published in Forensic Science International and the Journal of Forensic Sciences. Preliminary results suggest that hatchet wounds cause significantly more fracturing and splintering of bone than axe wounds. Axe wounds make a clean, straight cut with nearly no fracturing.

## **Simulation Of A Civilian Blast Trauma Event In A Public Area**

Michael McClung

Faculty Mentor: Alice Fazlollah

This paper will focus on an experiment to be conducted with the assistance of Law Enforcement, which will simulate a terrorist attack using an explosive in a public area. Although a small amount of research exists regarding blast force trauma, there is a great deal to be learned. Previous research has not addressed scenarios where a remote explosive device has been placed on the ground, or the effects of the ground and other structures on the blast wave and the dis-persment of remains. This experiment will test the spacial relationship of an explosive to partic-ular patterns of bodily trauma and evidence dispersal by simulating a homemade explosive placed on the ground in an outdoor public area

This paper will serve as the literature review for the experiment. There is little published work on the subject of civilian blast force trauma. However, there is an adequate amount of material which will provide a sufficient understanding of key topics related to the experiment. These topics of research will include: the chemistry and physics of explosives, the biomechanics of injury from a blast event, patterns of bodily injuries, and mapping and recovery of a post-blast scene. The Journal of Forensic Sciences will be the top resource for published works on these subjects. Medical, military and historical journals will also be cited. "Practical Bomb Scene Investigation" (Thurmond 2011) is a book that will provide background on the subjects of explosive chemistry and physics as well as bomb scene investigation techniques.

The information gathered for this paper will be valuable for the development of the experiment. The first objective of the experiment is to determine the influence of spatial position of explosive to known patterns of cranial and postcranial skeletal blast trauma. The second is to determine the influence of spatial position of explosive to dispersal of remains. These objectives will be observed and recorded through a simulation of an explosive event. The explosive device will be placed on the ground in various positions in relation to a wall. Pigs will be used as "victims" stationed around the device in upright positions.

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

David Zeh

Faculty Mentor: Nancy Hoalst-Pullen

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).

## **Stay-At-Home Fathers And Flexible Masculinities**

Brittany LaFace

Faculty Mentor: Brandon Lundy

The changing nature of work in the globalized economy has contributed to alternative understandings of male roles within the family and private sphere. The Bureau of Labor Statistics (BLS) reports that in 1972 43.9% of women in the United States were employed and by 2012, 57.7% of women were employed. The same report shows that the percentage of men employed has fallen from 78.9% in 1972 to 70.2% in 2012. Research shows that relationships in which the father is the primary caregiver are becoming more about choice rather than a result of circumstances (Kramer et al. 2013). It is hypothesized that male caregivers who are forced into the role of stay-at-home father by economic circumstances tend to develop changing notions of masculinity and fatherhood, similar to those who do it by choice, becoming more liberal about gender roles and expectations (Broughton 2006). Drawing on ethnographic fieldwork among stay-at-home fathers, this study explores contemporary fatherhood in the context of relationships where fathers are the primary childcare providers. Men who choose to be stay-at-home are compared with fathers who take on this role as a result of circumstances using participant observation and semi-structured interviews. The sample for this study was derived from a stay-at-home father meet up group. Based on thematic analysis, preliminary findings suggest that males who become stay-at-home fathers adapt to their new roles and take more interest in performing activities previously labeled female or women's work. This may suggest that the nature of fatherhood is changing and becoming more heterogeneous. The family unit is the primary building block of social organization. As the roles within a society change due to shifting economic opportunities and choice, how does that shift affect society and gender inequality as a whole?



## **Structure And Composition Of The Kennesaw State University: Past And Present**

Stephanie Roper

Faculty Mentor: Nancy Hoalst-Pullen

The purpose of this study is to determine the trends in composition and structure of the Kennesaw State University Arboretum, located on the Kennesaw Campus. To assess the trends, we identified the tree species, and measured the diameter (dbh) and locations of all stems including new growths (i.e. greater than 1cm dbh) in the permanent plot during the summer of 2014. Density, dominance, and frequency values were calculated and all trees were plotted from data collected in 2008, 2010, and 2014. Findings show that there have been an increase in *Fagus grandifolia* (beech), a significant decline in *Cornus florida* (flowering dogwood) and marked differences in the understory species compared to those dominating the canopy layer. As a small urban forest remnant, the trees located in the plot show a community transition from a pine/oak stand to one dominated by shade-tolerant mesophytic species.

## **Sustainability Perceptions In The Brewing Industry: Regional/Regional Craft, Microbreweries And Brewpubs**

William Blake Pierson

Faculty Mentor: Nancy Hoalst-Pullen, Mark Patterson

The purpose of this study is to identify sustainability perceptions within the US brewing industry. In 2014, we disseminated an online survey to all regional/regional craft breweries, microbreweries and brewpubs as identified by the Brewer's Association, 2012 (<http://www.brewersassociation.org/>). We employed statistical analysis to determine if there was a significant difference among the three categories of breweries found in urban and urban clusters regarding their self-assessment of sustainability. Findings indicate that regional/regional craft breweries and microbreweries tend to score higher in their self-assessment when compared to brewpubs.

## **The Availability Of Public Transport And its Effect On Carbon Dioxide Pollution In Atlanta**

Nikki Lyons

Faculty Mentor: Jun Tu

The focus of this research is to be able to relate public transportation availability to levels of carbon dioxide emissions produced by transportation. Certain variables related to public transportation may be used as predictors in levels of carbon dioxide emissions. Using multiple regression and ANOVA procedures, the data set was analyzed to find any relationships among

the variables. It was found that the percent of urban area covered by public transport service and the ratio of fares earned to total operating costs were significant predictors in determining carbon dioxide emissions, while percent of the population living within the service area was found not to be significant. The ANOVA that was performed analyzing mean amounts of emissions by mode of transport found that while the means for each group were significantly different, the variation among modes only accounts for 0.9% of variation in emissions.

### **The Revolution Of Fitness: A Contemporary Analysis Of How Technological And Personal Training Influences Consumer Behavior In Two Atlanta, Georgia Fitness Centers**

Krista Cross

Faculty Mentor: Brandon Lundy

Today, fitness gyms and private health clubs are globally recognized as multi-billion-dollar establishments. This study explores the development of the modern gym and fitness culture, particularly the emergence of fitness trends such as personal training and technology. This paper aims to understand how and why training in the gym has become so important for people. A comparative case study approach was used to consider personal training and technological influences, which are both contributing to the prevailing phenomena of the fitness industry. While both facilities under investigation entered the market in 2013 and both utilize group-based personal training instructed classes, they each incorporate different workout regimes. How are gym members' behaviors affected by the fitness centers' culture? Why do consumers seek to use technology while working out? Why do they rely more on personal training in studio-based gyms versus the "big box" gyms. In this study, "fitness culture" is the embodied culture found inside health studios and clubs amongst members. I purposefully observed two gym locations during class times through continuous monitoring and conducted semi-structured interviews with the management experts. I also used participant observation to gain experiential data through immersion. I found that technology and personal training both have tremendous benefits and purposes for the members taking the classes. The analysis also suggests that the practices, apparatuses, and physical exercises used today in these two Atlanta area gyms are the result of a physical fitness culture established and currently refined throughout the twentieth century. The physique ideals, exercises, and incorporation of technology have turned fitness into a highly customizable popular movement based on fitness culture and modern trends. Further results should reveal the complex motives underlying the members' participation in these two modern fitness fashions alongside their individualized optimal fitness goals.

### **The Social Construct Of Race In Forensic Anthropology: Complications In Ancestry Estimation**

Irina Paymer

Faculty Mentor: Alice Fazlollah

Cultural Anthropology teaches students to view race as a social construct. Biologically speaking, all humans are of the same species, and separating people into categories based upon appearance is a concept that has almost no place in anthropology. However, since anthropology is the study of culture, race must be acknowledged, where applicable, to fully understand the dynamics involved. When examining skeletal remains for the purposes of ancestry estimation, forensic anthropologists must acknowledge race if they are to consider the social aspects of ancestry, and find all possible clues as to whom the skeletal remains may have belonged. The purpose of this paper is to examine the problems and solutions that are used to circumvent the issue of race, and to find phenotypic features reflected in the skeleton that could help a forensic anthropologist determine the ancestral background of the deceased.

It is important to review published research on how forensic anthropologists have handled the race/ancestry issue with a critical eye. A forensic anthropologist faces the challenging act of balancing the knowledge that there is no biological explanation for race and the social perspective of race, to find what categorization an individual may have had during life. Another factor in the contention between race and ancestry is the current climate, especially in the United States, surrounding race in association with law enforcement. Events, such as those in Ferguson, Missouri, prove that, in law enforcement's view, race is still relevant to identification. The value in reviewing previous research to look for new methods of ancestry estimation with minimal complications due to the social construct of race is of continuing importance, and anthropologists of all fields must continue to navigate the complex issues of race as well as ancestry as long as the social construct exists.

### **Transitions In Material Culture And Transitions In Social And Economic Values: An Ethnoarchaeological Study Of A Basket-Weaver In Udaipur, India**

Duke Thomas

Faculty Mentor: Teresa Raczek

In Udaipur, India, ethnoarchaeological studies were conducted in a bamboo-weaver's workshop in summer 2014. Through interviews and observation it is concluded that bamboo products were heavily integrated into social, religious, and economic practices. In recent years, bamboo-workers have diversified from solely weaving baskets to weaving a multitude of items in order to meet the needs of society. A framework for understanding social and economic values of the present and past can be examined through the modern dynamics of basket-weaving as it is an ancient craft accompanied by rich folklore and history. However, the skill to weave bamboo as well as the desire for bamboo goods are decreasing due to radical economic, social, and political change. The demand of goods- or lack of it- reflects changes in social values.

## **Variability In Decomposition Dependent On Water Environment**

Raeanna Duck

Faculty Mentor: Alice Fazlollah

Moisture has observable effects on decomposition of human remains. This factor is relevant to forensic anthropology due to the frequency of body disposal in aquatic environments and the need for validation of time since death estimation methods. Knowledge of taphonomic processes allows forensic anthropologists to recreate crime scenes, rule out skeletal disease, estimate the post mortem interval, and determine whether a body has been relocated. This research focuses on patterns of decomposition in varying aquatic environments. It is hypothesized that salinized and controls samples will decompose more slowly due to the preservation qualities of the salt and the control sample due to its initial exposure to cold dry air. Two samples will decompose more quickly- the pond sample due to the likely presence of microbes and the creek sample due to the constant water movement and feeding animal life. Lastly, the municipal sample will decompose at a median rate due to the microbe removal and chlorine added during the water treatment process. Bones and soft tissue of the white-tailed deer (*Odocoileus virginianus*) were utilized as a proxy for human remains.

Each water sample was chosen to simulate different aquatic environments in which human remains could be disposed. The water samples consist of salinized water, municipal water, pond water and creek water. Four gallons of each sample were placed inside of basins to which the bone was submerged. The bones in the creek water sample were placed inside of a cage, then be submerged into the creek. As a control, five ounce water sample was collected prior to the addition of the bones from each of the water environments.

Over an 8-week observation period the ambient high and low temperatures, photographs, and water pH levels were recorded on a weekly basis. Observational changes including insect counts, visual changes, and changes in smell will be documented bi-weekly. At termination of the experiment a second set of five-ounce water samples were analyzed to identify changes in water composition. Remains were also analyzed for observable differences. Preliminary results suggests slowed decomposition and little odor from sample A due to salt levels, greater preservation in sample B, thick film formation on the surface of sample C which obstructs observation, sample D shows the greatest amount of insect activity, odor and observable larvae beneath the water's surface. The pH levels of the samples have remained fairly steady throughout the weeks with decreases correlating to rainfall.

## **The Capture And Imprisonment Of Henry Laurens**

Aaron Clarke

Faculty Mentor: Jim Piecuch

In 1780 a British warship captured Henry Laurens, a prominent American Revolutionary leader, while on a diplomatic mission to Europe. As the most important American captured by

the British during the Revolution, Laurens was confined in the Tower of London and his captivity became a major diplomatic issue.

### **The Hessian Jager In The New York And Pennsylvania Campaigns, 1776-1777**

David Ross

Faculty Mentor: Jim Piecuch

This paper examines the contributions of the Hessian jager, an elite corps of German soldiers in British service, to the British campaigns in New York and Pennsylvania during the early years of the American Revolution, 1776-1777.

### **Thomas Jefferson, Scientist**

Travis Martin

Faculty Mentor: Jim Piecuch

This paper examines Thomas Jefferson's contributions to the development of science in the United States, and Jefferson's achievements in a variety of scientific fields.

### **A Study Of Undergraduate Alcohol Consumption: Students Who Perceive One Or More Of Their Parents To Have A Drinking Problem Versus Students In Greek Life**

Jessica Dean

Faculty Mentor: Saul Alamilla

The purpose of this study is to examine two important influences of alcohol consumption among undergraduate students. These two possible factors are students who perceive one or more of their parents to have a drinking problem and students who are in Greek life. Studying these influences on alcohol patterns is important because it can help identify what leads students to consume high amounts of alcohol. Few studies have tested these two specific factors and which of these can cause students to be more at risk for drinking higher amounts. Specifically, no studies have compared alcohol consumption exclusively among students involved in the campus' Greek life to those who perceive one or more of their parents as having a drinking problem. Previous researchers have found that these are the two most at-risk groups among college students to engage in high amounts of alcohol consumption. Examining these factors may help us locate the source of potential alcohol-related problems and eliminate these risks before they become a problem.

## **An Analysis Of Male Versus Female Juror's Attitudes And Decision-making In A Rape Case: The Influence Of Legal Definitions And Rape Myth Beliefs**

Victoria Meier

Faculty Mentor: Dorothy Marsil

The primary purpose of this research was to assess female and male mock jurors' attitudes about a rape case and their understanding of judicial instructions regarding the historical definition of rape versus the current federal legal definition of rape on decision-making. Additionally, we sought to determine the relationship between mock jurors' rape myth endorsement and their legal decision-making. This was a 2 (Rape Definition) x 2 (Gender of Juror) between subjects design. Students from the subject pool in the psychology department were randomly assigned to a rape definition condition. They read a trial summary and completed a questionnaire online. They also completed a Rape Myth Scale (either before or after the trial summary and questionnaire) that was counterbalanced to prevent possible order effects that could have resulted from priming. We found that there was a significant difference between groups. That is, males were more likely to have pro-defendant attitudes and females were more likely to have pro-prosecution attitudes. Additionally, there was a significant difference in conviction rates between the new federal definition of rape and the historical definition. Finally, rape myth endorsement was related to juror attitudes and their decision-making in the case. The results of this study highlights gender differences in juror decision-making, the importance of educating the public on the new, more inclusive federal definition of rape, and the need to continue to challenge rape myths.

## **An Assessment Of Undergraduate Research In The First Year**

Leslie Small

Faculty Mentor: Amy Buddie

Research has shown that undergraduate research is a high-impact educational practice that leads to deep learning gains for students (Kuh, 2008). There is little research, however, on the extent to which those learning gains occur for students who engage in undergraduate research early in their academic careers. Therefore, the purpose of the present study was to address this research gap. Participants in this study included students in the President's Emerging Global Scholars (PEGS) program at Kennesaw State University. These students completed a cross-cultural undergraduate research project in their first year in which they collaborated with peers at a university in Brazil and then traveled to Brazil at the end of their first year. Thirteen of these students completed an online survey about their experiences, and 20 students completed a research poster for their project. The online survey consisted of 57 questions about undergraduate research, the PEGS program, teamwork both within their teams at KSU as well as their cross-cultural teams in Brazil, and background information. Students took an average of 10 minutes to complete the online survey. There was an informed consent page that needed

to be filled out before participants could answer any questions. We created an empirical research rubric to evaluate the posters. The rubric consisted of 21 categories, such as Introduction, Method, Results, Discussion, etc. The rubric had a 3-point scale (Above Average, Average, and Below Average) for grading.

We used a repeated-measures *t* test to analyze the teamwork data, with an alpha level of .05 as the criterion for significance. The teamwork with Kennesaw State University students ( $M = 3.65$ ,  $SD = 0.87$ ) was rated better than the teamwork with Brazilian students ( $M = 2.97$ ,  $SD = 0.80$ ). The repeated-measures *t* test revealed that the difference between the conditions was significant,  $t(8) = 2.39$ ,  $p = .044$ . Students from the KSU PEGS Program on average felt moderately confident ( $M = 3.14$ ,  $SD = 0.35$ ) with doing empirical research and on average agreed moderately ( $M = 3.54$ ,  $SD = 0.61$ ) that the program furthered their learning and developed skills necessary for the future.

These results suggest that undergraduate research can be beneficial in the first year, but especially with cross-cultural collaborative research, extra attention should be paid to the ways in which the teams work together. Limitations and implications of these results will be discussed.

### **Can The Misattribution Of Blame Contribute To Falsely Taking The Blame**

Geena Washington, Olivia Alexander  
Faculty Mentor: Jennifer Willard

In the legal system, sometimes people confess, plead guilty, or admit to crimes they did not commit in order to protect the true offender (Mallory et al., 2013). Our study investigated under what conditions people falsely take the blame. Participants ( $N=156$ ) were randomly assigned a 2 (relationship closeness: casual vs. close friend)  $\times$  2 (blame attribution: self vs. perpetrator)  $\times$  2 (perpetrator offense: driver vs. shopper negligence) factorial design. Participants thought about a close or casual friend before they read a scenario in which their friend committed an offense that was either misattributed to the participant or rightly attributed to the perpetrator. Participants' willingness to take the blame for the offense, along with their belief in a just world and beliefs about snitching, were assessed. Results supported the hypothesis that people were more likely to take the blame for a close versus casual friend,  $F(1,148) = 6$ ,  $p < .016$ . However, there were no significant difference in people's willingness to take the blame based on blame attribution. Willingness to take the blame was positively related to belief in a just world, but unrelated to snitching beliefs. These results suggest that both situational factors and individual differences contribute to blame-taking behavior.

### **Effects Of Menstrual Cycle On Time Urgency And Anxiety**

Torrey Hill, Nicole Davis, Mariah Corey, Timothy Thurman, Courtney Skeete  
Faculty Mentor: Ebony Glover

The present research aims to serve as an exploratory analysis of the effects of the menstrual cycle on time urgency, perceived stress, and anxiety sensitivity. In order to facilitate further understanding of these factors at an individual participant level, a correlational analysis will be conducted based on a community sample of local college students. Preexisting meta-analysis research suggests that high time urgency is correlated with a Type A behavior pattern and that individuals with a Type A behavior pattern may also report higher symptomology of related stress and anxiety sensitivity (Kuiper & Martin, 1989). Because estradiol, a major estrogen hormone, is correlated with anxiety inhibition, it is hypothesized that women who report being in the luteal phase of their menstrual cycles will also have lower levels of time urgency, higher levels of perceived stress, and higher levels of anxiety sensitivity. Accordingly, it is also hypothesized that women in the follicular stage of the menstrual cycle, women who take contraceptives, and men will report lower levels of time urgency, lower levels of perceived stress, and lower levels of anxiety sensitivity.

### **Effects Of Menstrual Cycle Phase In Anxiety Responses**

Timothy Thurman, Nicole Davis, Mariah Corey, Torrey Hill, Courtney Skeete  
Faculty Mentor: Ebony Glover

Men are less likely to develop anxiety disorders in their lifetime compared to women. Low estrogen has been associated with increased anxiety symptoms in women. The purpose of this study is to investigate anxiety in men compared to women who are at different phases of their menstrual cycle. Female participants were divided into groups that are naturally cycling versus those using hormonal contraceptives. Anxiety was assessed via self-reported scores from the Anxiety Sensitivity Inventory (ASI) and the Perceived Stress Scale (PSS). In addition, physiological levels of arousal were measured using the galvanic skin response (GSR) to a series of images, either positively or negatively valenced. It is hypothesized that women in the follicular phase (low estrogen) of their menstrual cycle will report higher anxiety and increased GSR activity relative to women in the luteal phase (high estrogen), women on contraceptives, and men. This would show that women are at a higher risk for expressing anxiety-related behaviors during the follicular phase of their menstrual cycle. This could have wide implications for the clinical treatment of anxiety disorders.

### **Menstrual Cycle Effects On OCD Symptoms And Severity**

Nicole Davis, Torrey Hill, Mariah Corey, Timothy Thurman, Courtney Skeete  
Faculty Mentor: Ebony Glover

Previous research have shown that premenopausal women with a diagnosis of Obsessive-Compulsive Disorder (OCD) have increased OCD symptoms. These symptoms are characterized by increased anxiety, stress, depression, and arousal. The goal of the present study is determine a relationship between the severity and presence of OCD symptoms at



different stages of the women's menstrual cycle. The galvanic skin response (GSR) will be used to measure the arousal level. The self-report of the Florida Obsessive Compulsive Inventory (FOCI) will be used to assess the presence and severity of OCD symptoms followed by a self-report of the participant's stage of their menstrual cycle. To measure the severity of the anxiety symptoms, the participants will be administered the Anxiety Sensitivity Index and the Perceived Stress Scale. Our hypothesis is that women will have a variation in both OCD severity and symptom presentation during different stages of their menstrual cycle, with the most severe symptomology expressing immediately prior and during menses. The potential benefits of this study include advisement to women, via their physician, with OCD to expect an increase of both the number and severity of OCD behaviors during a specific time during their menstrual cycle, increasing the potential for more targeted pharmaceutical intervention.

### **Reducing Automatic Stereotyping And Increasing Humanization Through Situational Attribution Training**

Sarah Hill, Jessica DeMarco, Essance Butts, Allyson Schmidt  
Faculty Mentor: Tracie Stewart

Dehumanization (ascribing fewer uniquely human traits) of members of minority groups has been a persistent issue in our society and is an influential factor in perpetuating prejudice (Costello & Hodson, 2010). Situational Attribution Training (SAT) is a paradigm that has been shown to reduce automatic stereotyping of outgroup members (Stewart et al., 2010). We expanded on previous research by looking at other bias-related variables that might also be positively impacted by SAT. By utilizing SAT, we hypothesized that both automatic stereotyping and dehumanization of outgroup members would be reduced. We created a new measure to determine participants' level of dehumanization. We found that SAT was successful at reducing both participants' level of dehumanization and their automatic stereotyping of outgroup members. Our presentation provides insight into a future direction of the fascinating SAT research that could utilize an implicit association test of dehumanization.

### **Sex And Menstrual Cycle Effects On Autonomic Nervous System Activity**

Mariah Corey, Nicole Davis, Timothy Thurman, Torrey Hill, Courtney Skeete  
Faculty Mentor: Ebony Glover

Women are two times more likely than men to develop an anxiety disorder in their lifetime. Previous studies have found statistical relationships between circulating estrogen levels and anxiety regulation. The goal of the current study is to determine whether self-reported measures of menstrual cycle activity can be used to approximate estrogen levels in a sample of women who are naturally cycling or are taking hormonal contraceptives. In addition, we will measure autonomic nervous system activity (via the galvanic skin response, GSR) across

different phases of the menstrual cycle in women and in men in relation to scores from the Anxiety Sensitivity Index and the Perceived Stress Scale. We predict that women in the follicular phase (low estrogen) of their cycle will show increased ANS activity and score higher in self-reported anxiety indexes compared to men and women in the luteal phase (high estrogen) of their cycle, and women taking hormonal contraceptives. If our hypotheses are supported, they would suggest that low estrogen may be a risk factor for anxiety-related disorders.

### **Tobacco Use And Anxiety In Premenopausal Women**

Courtney Skeete, Nicole Davis, Timothy Thurman, Torrey Hill, Mariah Corey  
Faculty Mentor: Ebony Glover

Women report having different intensities of anxiety symptoms at different stages during their menstrual cycle. Fluctuating estrogen levels across the reproductive cycle may contribute to these anxiety symptoms. Previous studies have found that tobacco use is linked to reduced estrogen in women. The goal of our study is to determine whether premenopausal women who smoke tobacco have higher levels of anxiety than non-smoker premenopausal women and if the intensities of symptoms vary at different stages of their menstrual cycle. Using the galvanic skin response to determine physiological indices of anxiety, we will measure the responses to pictorial stimuli during the luteal and follicular menstrual cycle phases of both smokers and nonsmokers. It is hypothesized that women who use tobacco will have higher anxiety intensities at the various stages of their cycles than nonsmoker women. The benefits of this study will advise women of the effect that tobacco may have in premenopausal women on stress and anxiety-related disorders.

### **Utilization And Impact Of Conservation Education Displays At The World Of Reptiles, Zoo Atlanta**

Allison Dawson, Sarah Dutton, Vanessa Pedroni, Hannah Dollinger  
Faculty Mentor: Lauren Taglialatela, Suma Mallavarapu

Visitor studies at zoos indicate that engagement with informative signage can improve conservation attitudes, behaviors, and knowledge about animals (Hosey, 2005). Visitors to the World of Reptiles at Zoo Atlanta completed pre- and post-surveys related to conservation knowledge, attitudes, and behaviors. To measure engagement with exhibits, unobtrusive behavioral observations of surveyed individuals were conducted as visitors moved through the building. Knowledge scores at posttest ( $M=2.29$ ,  $SD=1.24$ ) were not significantly different from knowledge scores at pretest ( $M=2.36$ ,  $SD=1.17$ ),  $F(1, 44) = .286$ ,  $p = .596$ . Attitude scores at posttest ( $M=29.52$ ,  $SD=7.52$ ) were not significantly different from attitude scores at pretest ( $M=29.24$ ,  $SD=6.18$ ),  $F(1, 32) = .344$ ,  $p = .562$ . Data indicate that very few visitors engaged with informative signage (knowledge signs: 12%, attitude signs: 26%), which may explain the lack

of change in attitude and knowledge. Intended conservation behavior scores at posttest ( $M=22.56$ ,  $SD=0.60$ ) were significantly higher than reported conservation behavior scores at pretest ( $M=9.77$ ,  $SD=6.23$ ),  $F(1, 42) = 63.99$ ,  $p < .001$ ,  $\eta^2 = .604$ , which may be influenced by socially desirable responding tendencies.

### **Visitor Behavior In The Living Treehouse At Zoo Atlanta**

Montana Holland, Rena Roberson, Cassandra Teal, Krystal Bailey

Faculty Mentor: Suma Mallavarapu, Lauren Tagliatela

Given that wildlife conservation is a main goal for zoos, it is important to conduct research on whether visitors utilize conservation displays at zoos (Dierking et al., 2002). The aim of this project was to study visitor interaction with conservation displays in the Living Treehouse at Zoo Atlanta. We collected data on 131 visitors over 16 weeks (July to November, 2014).

Average visit duration in the building was 98.13 seconds and the average duration spent reading displays was 15.13 seconds. There were no significant differences in the duration of time spent reading displays when comparing men and women [ $F(1, 47) = 0.36$ ,  $p = 0.55$ ], solitary adults, adults without children, and adults with children [ $F(2, 46) = 2.67$ ,  $p = 0.08$ ], and young, middle-aged, and older adults [ $F(2, 46) = 1.27$ ,  $p = 0.29$ ]. Approximately 34% of visitors read displays and watched animals on exhibit. This subset of visitors spent significantly more time watching animals than reading displays [ $F(1, 44) = 15.62$ ,  $p < 0.001$ ,  $\eta^2 = 0.26$ ]. Limited interaction with relatively static displays may not lead to the intended change in conservation attitudes among visitors. Interactive displays may be more effective in attracting visitor interest and delivering conservation messages.

### **Comparing Faculty's And Student's Perceptions Of Chemical Representations**

Kayla Yoder, Elaina Genton

Faculty Mentor: Michelle Dean

Chemical representations are paramount to conveying chemical concepts and often serve as a focal point for discussions in the classroom. Johnstone first presented the chemical knowledge triplet in the early 1990s, and it has since served as model for how chemical information is processed. Since this time, there is a plethora of literature that discusses how experts and novices process chemical information by their ability, or inability, to freely move between the three domains of chemical representations. However it is unclear exactly how people at various levels of chemistry experience (i.e students versus faculty) perceive these representations. This poster will present a simple, yet effective way, to gain insight into understanding what representational domains are present in an image. This method will be used to determine how one's level of experience affects the perception of the domains present in a representation. Further research in this area will seek to better understand how one's perception of a chemical representation drives the type of discourse that ensues.

## **Determining Usability Of The SCI Hub Concept Inventory Database**

Zachary Farley

Faculty Mentor: Kimberly Linenberger

Concept inventories have been created by discipline-based education researchers for instructors to be able to quickly determine student misconceptions. The issue arises that most instructors are not aware of what concept inventories are available for use in their classroom. To correct the issue the SCI Hub Concept Inventory Database was created for instructors to be able to easily find and use inventories in their classroom. This study focuses on the usability of SCI Hub by science faculty. Using the Morae software suite, faculty were recorded completing 8 tasks related to the database and rated their ease of use for each task. Discussion will include the results of the tasks' ease and improvements made to the database.

## **Dissolution Analysis Of Potassium Gluconate Tablets: The First Step In An Analytical Method Transfer**

Cory Turner, Andrew Warren

Faculty Mentor: Marina Koether

Analytical method transfer is the process of transferring a validated analytical procedure from an originating laboratory to another laboratory. Analytical method transfers are particularly useful in pharmaceutical analysis and often performed for dissolution testing. Dissolution tests provide an in vitro study of the rate of release of the active pharmaceutical ingredient in drug tablets. The objective for this investigation is to provide dissolution analysis of potassium gluconate tablets for determining the concentration in ppm and average percent recovery of the drug upon dissolution. The 595.7 mg potassium gluconate tablets were assayed for dissolution rate using apparatus 2, as described by the USP. The dissolution samples were analyzed after 45 and 75 min by the Varian SpectrAA 220. Each sample solution was micro filtered prior to instrumentation. The average concentration and percent recovery of the tablets after 45 and 75 minutes of dissolution were  $0.56 \pm 0.03$  ppm with a  $101 \pm 5$  % recovery and  $0.57 \pm 0.03$  ppm with a  $104 \pm 5$  % recovery, respectively. Filter validation was then performed for comparison of detected concentrations in unfiltered versus micro filtered samples. The average concentration of the unfiltered and filtered solutions were 0.530 ppm and  $0.54 \pm 0.02$  ppm, respectively. The average percent recovery for the filtered samples was  $101 \pm 6$  %.

## **Dissolution And HPLC Analysis Of Glucosamine Tables: An Analytical Method Transfer That Failed**

Andrew Warren, Cory Turner

Faculty Mentor: Marina Koether

This study involved the dissolution of glucosamine hydrochloride tablets and the subsequent measurements for amounts of glucosamine in samples using High Performance Liq. Chromatog. (HPLC). Using deaerated water as the dissolution media, 6 tablets, one in each vessel, were run for 45 min at 100 rpm. After 45 min samples were taken, filtered and run on an HPLC instrument. The samples were found to contain 83%-108% of the expected value. Filter validation produced a similarly large range indicating poor precision. Results from a method transfer were not replicable.

### **eNOS Regulation By MAP Kinases**

Myles Robinson, Virginie Stein

Faculty Mentor: Carol Chrestensen, John Salerno, Jonathan McMurry

Endothelial nitric oxide synthase (eNOS) is an enzyme responsible for the production of nitric oxide (NO) in endothelial cells. NO plays many critical signaling roles in the endothelium including modulation of vascular tone and platelet aggregation, making regulation of NO production vital to vascular health. NO is produced by neuronal and inducible NOS as well, but there is considerable evidence that it is regulation of eNOS activity that particularly impacts vascular health. There are many ways eNOS is modulated posttranslationally; phosphorylation is one of the major ways. Our recent discovery of a previously unknown inhibitory phosphorylation site in eNOS, S602, has led to new questions about the physiological role of pS602 in eNOS, and excitingly about the potential implications in diabetic cells and overall vascular health. We have developed a novel phospho-specific antibody for pS602 and have used this antibody to characterize the phosphorylation of this site in vitro and to visualize cellular phosphorylation of this site. Our in vitro results show that protein kinases ERK and p38 but not JNK phosphorylate S602. Our results also show that eNOS is basally phosphorylated at S602 in endothelial cells.

### **Gold Nanoparticles Immobilization On Fibrous Substrates: Heterogeneous Catalysis**

John Elliott, Theresa Kusumadjaja

Faculty Mentor: Bharat Baruah

The current study demonstrates deposition of gold nanoparticles (AuNPs) on cellulose based fiber. Gold nanoparticles (AuNPs) are synthesized by both ex-situ method with citrate and in situ method in absence of capping agent. AuNPs synthesized ex-situ are modified with cetyltrimethylammonium bromide (CTAB) and n-nonylamine (NA) in order to effectively immobilize on fibrous substrate. The cellulose based fibers are pretreated with ethanol, HCl and NaOH with subsequent rinsing in water and drying. The morphology of these deposited AuNPs was verified by scanning electron microscopy (SEM), energy dispersive X-ray analysis

(EDX), Fourier transformed infrared spectroscopy (FTIR), and tested for catalytic activity with different reactants.

## **Mixed N-Heterocyclic Carbenes Based On Triazine Backbones: Synthesis And Catalytic Applications**

Aqsa Adnan, Chidi Amah

Faculty Mentor: Daniela Tapu

The chemical industry relies heavily on the use of metal catalysts for the economical production of a wide variety of petrochemicals in use today. Estimates are that 90% of all commercially produced chemical products involve catalysts at some stage of manufacturing. Development of improved catalysts was identified as a key challenge in the Department of Energy's Vision 2020 report. Metal-catalyzed reactions can be both economically and environmentally advantageous because catalysts allow transformations to be carried out under mild conditions with high selectivity and yield. As a result, it is extremely important to develop new catalyst systems that offer increased activity with inexpensive materials under mild conditions. Due to their functional and synthetic diversity, air and moisture stability, nontoxicity, as well as a high affinity toward a wide range of main group and transition metals, nucleophilic carbenes, namely N-heterocyclic carbenes (NHCs), have shown remarkable utility as ligands for organometallic catalysts and as organocatalysts. Vital to the advancement of NHC-based catalysts has been the design and synthesis of new mono- and multitopic NHCs that display an array of electronic and steric properties. This project investigates the synthesis and properties of a new class of mono- and ditopic mixed-NHCs derived from a triazine backbone. These systems have not been described yet in literature. They have the potential to find tremendous utility as building blocks for homo- and heterometallic transition metal complexes. Complexes of catalytically relevant metal centers (e.g. silver, gold, palladium, copper, rhodium and iridium) are targeted. Understanding the chemistry of these compounds has the potential of providing relevant information for the development of new and more efficient ways of making chemical products.

## **Multisite Phosphorylation Of eNOS By Various Kinases And The Impact Of Calmodulin**

Alberto Romero, Mallory Welton

Faculty Mentor: Carol Chrestensen, John Salerno, Jonathan McMurry

Nitric oxide synthases (NOS) are the enzymes responsible for production of NO. The nitric oxide (NO) these enzymes produce is ubiquitous and essential to many physiological processes. Mitochondrial biosynthesis, neurotransmission, blood pressure regulation, smooth muscle relaxation and immune function, are processes affected by NO. Calcium bound calmodulin (CaM) is the chief regulator of enzymatic activity for endothelial NOS (eNOS) and neuronal NOS. However, little is known about how CaM might modulate phosphorylation.

Kinases, particularly PKA and AKT, are known to activate eNOS through phosphorylation. RSK has overlapping substrate specificity with PKA and AKT and has been shown to phosphorylate eNOS. We tested kinase phosphorylation in the presence and absence of CaM, we hypothesized that CaM binding would hinder phosphorylation at the sites in the autoinhibitory insertion (S615 and S632), but not the c-terminal site (S1177). Investigating the effects of CaM on phosphorylation of eNOS led to the exploration of kinase site specificity and rate between Akt, PKA and RSK. We postulated that like PKA and AKT, RSK might have the ability to phosphorylate and activate eNOS. Our findings indicate that calmodulin may inhibit phosphorylation at the S615 and S632 sites. RSK has the ability to phosphorylate eNOS in vitro at all three sites. Analysis indicates that the S615 site may be the last to be phosphorylated by PKA, RSK, and AKT.

### **Notetaking: A Window Into Metacognition And Student Success In Chem 1211**

Katarina Dass, Elizabeth Johnson  
Faculty Mentor: Michelle Dean

As students transition from high school to college they face new demands in the classroom that require them to adjust their learning strategies. It is expected in college the students become more independent learners. Student are presented with new teaching methods that are not consistent with what they have experienced in high school when they enroll in General Chemistry I (CHEM 1211), a high DFW course. Research has shown that students who are more metacognitively aware and better able to self-regulate their learning perform better in chemistry. To this end, this research focuses on investigating how student's metacognition and ability to self-regulate their learning in CHEM 1211 changes over their first semester in college. Note-taking was introduced in this class to aid in increasing the students ability to be more aware of their learning. Performance on the note-taking assignments was measured to determine the correlation between the note-taking score relative to their metacognitive abilities. Results from this study will begin to inform educators on what teaching methods are to effectively increase student metacognition, and as a result success in this course.

### **REPSA-Directed Identification Of DNA-Binding Specificity For The E. Coli Transcription Factor LexA**

Kamir Hiam  
Faculty Mentor: Michael Van Dyke

The function of many genes and the biological roles of their encoded products are still not well characterized. Given the sequence-specific DNA-binding properties of transcription factor proteins, it is possible to purify them, identify the responsible polypeptide(s), determine their consensus binding sequences, and identify their genomic binding sites. Thus, one can go from cellular extract to proposed biological regulatory roles in relatively short order. Our goal is to

identify and characterize orphan DNA-binding proteins in the model organism *E. coli* K12 using the novel combinatorial technique, REPSA (Restriction Endonuclease Protection Selection Amplification), as well as further develop the REPSA to be able to analyze whole cell extracts. REPSA does not require any prior knowledge of a ligand in order to determine its preferred binding site on duplex DNA and has been previously utilized successfully to identify binding specificity. We are currently studying LexA, a repressor protein with a defined consensus binding sequence, although a technique such as REPSA has never been used to study its specificity. Thus, LexA provides an appropriate starting point to optimize REPSA and compare its data with previously accepted findings. Even if novel sequences are not found, our studies will provide a proof-of-concept and methodology applicable to more uncharacterized transcription factors in *E. coli* and other organisms. This research is expected to lead to a greater understanding of bacterial biology at a molecular level and ultimately advance public health by characterizing orphan regulatory proteins that can be critical players in many different microbial diseases and the inner workings of the human microbiome.

### **Structural Optimization And Determination Of Dissociation Energies For Water Clusters Utilizing Computational Techniques**

Zobia Qureshi

Faculty Mentor: Martina Kaledin

The water clusters  $H+(H_2O)_n$  ( $n=1,2,...6$ ) and their components were analyzed computationally at varying levels of theory to determine structural parameters, optimization energies, and zero-point energies. Dissociation energy  $D_e$  and zero-point corrected dissociation energy  $D_0$  were calculated and showed agreement with past research at the B3LYP/6-31+G\*\*, B3LYP/6-311+G\*\*, and MP2/aug-cc-pvtz levels of theory. Comparison to experimental solvation enthalpies found that MP2/aug-cc-pvdz and MP2/aug-cc-pvtz were consistently among the most accurate levels of theory for the tested water cluster sizes. The IR spectra of  $H_5O_2^+$  and its deuterated counterpart were also compared.

### **Surfactant Assisted Exfoliation Of Graphite Into Graphene: Water Purification Properties Of Graphene**

Garrison Kohler

Faculty Mentor: Bharat Baruah

In this study, we separate the  $sp^2$  hybridized carbon layers of graphite in order to obtain pure graphene under sonic waves in surfactant solutions. Sodium dodecyl sulfate (SDS) is our surfactant of choice. We have developed sand and silica based composite materials of graphene and they adsorb organic contaminant from water much more effectively than the pure sand or silica. Various dyes, toxins, pollutants, and contaminants are tested to confirm viability of graphene@sand and graphene@silica composites' adsorbability with the help of



UV-visible spectroscopy. We characterize graphene and its composites thereof by Raman spectroscopy and scanning electron microscopy.

### **Synthesis Of 1,3-O,S-Esters**

James Law, David Kercher

Faculty Mentor: Christopher Alexander

1,3-O,S-Esters (beta-thiol esters) are molecular building blocks used in the synthesis of heterocycles, natural products, and other ester derivatives. 1,3-O,S-esters via an acid-promoted hydrolysis of alpha, alpha-dioxoketene dithioacetals. The methods to synthesize 1,3-O,S-esters typically involve expensive or sensitive reagents. In this project, Amberlyst A15, an insoluble, recyclable sulfonic acid resin is used to catalyze the reaction. This catalyst is relatively inexpensive and can be easily filtered out of reactions thus avoiding the need for tedious workup. Herein, we present our initial results in developing a convenient method to synthesize functionalized 1,3-O,S-esters.

### **Synthesis Of Alpha-Hydroxy Phosphonates From Aldehydes And Ketones**

Jazmine McIntyre, Andrew Camp, Matthew Shipp, Derek Amponsah, James Law

Faculty Mentor: Christopher Alexander

The focus of our research is the development of new methodologies for the syntheses of alpha-hydroxy phosphonates and alpha-acyl phosphonates. Derivatives of these organophosphorus compounds are attractive targets because of their demonstrated pharmaceutical and commercial applications: anti-viral, antibiotic, and anti-osteoporosis drugs; and a herbicide. Our goal is to develop improved and more environmentally friendly syntheses of alpha-hydroxy phosphonates. Herein we present a snapshot of our recent progress in developing an improved method for the synthesis of alpha-hydroxy phosphonates.

### **Teacher And Student Perceptions Of Biochemistry Representations**

Chloe House

Faculty Mentor: Kimberly Linenberger

Biochemistry is a field where communicating through pictures is vitally important. Research has looked at the types of representations used in biochemistry and have come up with a categorization scheme known as the biochemistry tetrahedron which includes representations at the macroscopic, microscopic, particulate, and symbolic levels of representation. This study will observe how biochemistry teachers and students categorize selected biochemistry external representations naturally, how they interpret the levels of representation, and how they categorize representations into the levels of representation. It is important to find out whether

the biochemistry tetrahedron is effective or not in practice, so its effectiveness in understanding concepts discussed in biochemistry courses can be deemed helpful. Placing an image within a category of the biochemistry tetrahedron can aid a student and faculty member in how to approach understanding the image for its intended purpose. Each image selected will have a purpose to help understand a biochemistry concept and lead to a new strategy for students and instructors to approach the image in a different way.

### **Time Dependent Phosphorylation In eNOS Linked Signal Transduction Pathways In Endothelial Cells Reveals Feedback Mechanisms**

Alden Lathrop, Joseph Blake, Nicholas Talley  
Faculty Mentor: John Salerno

Within mammalian cells, developmental and metabolic states are controlled by a complex signal transduction network. By examining behavior of multiple phosphorylation sites of cultured endothelial cells in response to stimuli, patterns of time dependent phosphorylation appear. At these sites oscillatory behavior is seen, indicating the presence of negative feedback loops that include time delays from various sources. Original models allowed for the simulation of results using an explicit time delay with implicit intermediates. By applying fourth order runge kutta to sets of differential equations, we were able to create a program that added explicit intermediates with an implicit time delay to model the data, and to provide information for future experimental design. By expanding upon the initial model to include up to six intermediates, a much closer fit to the data was obtained, strengthening the hypothesis that phosphorylation at the Ser1179 site in eNOS is controlled by a complex series of intermediates (with AKT being the principal regulator). The model suggests rate constants for the various intermediates involved, confirms the oscillatory behavior proposed in our initial hypothesis, shows the limited set of conditions under which the system is stable, and suggests that the system may be subject to bifurcation.

### **Toward The Synthesis Of A Star-Shaped Tris(N-Heterocyclic Carbenes)**

Jordan Ossie Buckner, Chance Boudreaux, Bradley Norvell  
Faculty Mentor: Daniela Tapu

Since the isolation of the first stable carbene by Arduengo in 1991, N-heterocyclic carbenes (NHCs) have emerged as a very useful type of ligands for homogeneous catalyst design, due to their high topological and electronic versatility, as well as a great coordination capability. The majority of known NHCs are either monofunctional or difunctional with tethered carbenes poised for chelation to a single metal center. Essential to the advancement of NHC-based materials has been the design and synthesis of new molecules featuring multiple NHC moieties capable of functioning independently of each other. These multitopic NHCs are not only structurally fascinating, but could also function as building block for accessing new

classes of polymers, as self-assembled materials and as recyclable catalysts. Within this context, this project targets a star-shaped tris(NHC) in which the three carbenes are connected by a delocalized polyaromatic system. Given the high affinity of NHCs for a broad range of metal fragments, this new D<sub>3h</sub>-symmetry system has the potential to function as a versatile building block for the preparation of a wide variety of trimetallic complexes. Our efforts directed toward the synthesis and spectral and structural characterization of this carbene and its corresponding polymetallic complexes will be presented.

### **Toward The Synthesis Of New Polydentate N-heterocyclic Carbenes**

Chance Boudreaux, Jordan Ossie Buckner, Bradley Norvell  
Faculty Mentor: Daniela Tapu

Catalytically active metal complexes derived from N-heterocyclic carbenes (NHCs) have found increasing interest in the last years, in part due to the unique electronic and steric properties of the ligands. This project targets the synthesis and spectroscopic characterization of a new class of multidentate NHCs. These ligands have rigid architectures that allow them to function as supports for homo- and heterometallic complexes. Our investigations into the synthesis and characterization of these new species will be presented.

### **Towards Water Soluble Porphyrins**

Brandon Easparro  
Faculty Mentor: Janet Shaw

N-confused tetraphenylporphyrin is an isomer of tetraphenylporphyrin (H<sub>2</sub>TPP) that first was isolated in the mid 1990's. NCTPP is unique in that there is one carbon and three nitrogens in the cyclic core whereas H<sub>2</sub>TPP has 4 nitrogens. This is due to an inverted pyrrole ring and has great potential for metal ligation. NCTPP has been the focus of much research due to interesting characteristics including coordination chemistry and light absorbing properties. Recent research has shown promise of NCTPPs in photodynamic therapy (PDT), which is a noninvasive treatment for various types of cancer. In this experiment, NCTPP and H<sub>2</sub>TPP were synthesized, purified and identified. The NMR and UV Visible spectroscopy confirm that the products were synthesized based on previous literature. Attempts are underway to introduce sulfonato groups to the benzyl rings on the exterior of the cyclic core which will allow the NCTPP to be water soluble.

### **Carbon Balance Of Green Roof Plants**

Keyaira Littles  
Faculty Mentor: Matthew Weand

A green roof, the use of plants on building roofs, offers many environmental benefits in urban areas, including absorption of solar radiation and carbon dioxide (CO<sub>2</sub>) that would otherwise warm the local air and lower air quality respectively. Alteration of local carbon cycle fluxes may be expected as the use of green roofs expands in urban and suburban areas. These changes may be important since green roof plants vary in photosynthetic efficiency (carbon uptake) and respiration rate (carbon loss). The objective of this experiment is to compare seasonal changes in the whole-plant carbon balance between two *Sedum* species, *Sedum reflexum* 'Angelina', and *S. reflexum* 'Blue Spruce', commonly employed in green roof installations in the southeastern US. Carbon balance was measured three times a day during summer and winter days with "near average" weather and similar levels of cloud cover. Our results suggest that there are seasonal as well as species differences in carbon balance. We found approximately 80% lower carbon uptake during winter compared to summer. During summer plant carbon balance was similar between species, but during winter *S. reflexum* 'Angelina' had greater carbon uptake. These species differences suggest that not all green roof plants have equal potential for "greening" urban areas. Additionally differences in plant performance may impact the degree of thermal insulation a green roof provides.

### **Developing A Research Method To Evaluate The Effect Of Drought On Two Riparian Tree Species, With And Without Mycorrhizae**

Reuben Hilliard, Chelsea Harris, Joshua Hashemi

Faculty Mentor: Paula Jackson

Riparian zones function as a natural buffer against erosion in river and stream banks, filter downstream pollution, and provide increased habitat complexity. Due to development, logging, and expanding agriculture, many riparian zones have been destroyed or depleted. This research is part of a larger study looking at the ecology and physiology of *Salix nigra* Marshall (Black Willow) and *Platanus occidentalis* L. (American Sycamore) and their use in riparian restoration. For this part of the research we focused on developing a greenhouse research method to evaluate the effect of drought on both riparian tree species with and without mycorrhizae. For this, we looked at: 1) running a bioassay to determine mycorrhizal spore viability; 2) finding an appropriate statistical design for our greenhouse setup; 3) determining anatomical and physiological measurements; 4) establishing the statistical methods to analyze results; 5) finding a method to stain and quantify mycorrhizal colonization.

For our experimental design we found that 1) spores tested were not viable after >1 year storage; 2) a randomized complete block design be used for our greenhouse setup; 3) Anatomical and physiological measurements to include: total length of the plant, stem diameter, biomass, leaf area, mycorrhizal colonization, and gas exchange using a LI-COR LI-6400; 4) light curves will be compared using a factorial design (23), in a three-way analysis of variance with repeated measures (ANOVAR); 5) after staining, mycorrhizal colonization will

be quantified using the root piece method, results will be analyzed using non-parametric methods such as the Mann-Whitney U test.

### **Do Eastern Mosquitofish (*Gambusia Holbrooki*) Take Advantage Of The "Cheerios Effect" To Consume Small Planktonic Prey**

Nicole Lynch

Faculty Mentor: Joseph Dirnberger

While the Eastern Mosquitofish (*Gambusia holbrooki*) is clearly adapted for surface feeding, numerous studies indicate that it is quite capable of consuming zooplankton. Based on previous field surveys, mosquitofish consumed a wide range of different size prey, from large insect larvae (>6 mm) to small microcrustaceans, particularly the small planktonic cladoceran *Bosmina* (<0.4 mm). Catching a high number of individual small prey is presumably energetically expensive (Brooks and Dodson 1965). Prey items that are known to aggregate at the air-water interface (e.g. terrestrial insects and ephippial eggs) were also found in guts but not in the water column or on plant surfaces, suggesting that small planktonic prey might be consumed not from the water column but when caught in the surface tension. The Cheerios Effect (the tendency for objects sitting on liquid surfaces to clump together) is documented in this study for plankton on the air-water interface, and can explain extreme variability among individual mosquitofish in number of prey consumed. Because mosquitofish are abundant and widely distributed, the physics of plankton entrapment in the surface tension is potentially important in understanding their impact on zooplankton assemblages, and in assessing energy transfer between pelagic and littoral zones.

### **Molecular Analysis Of Gut Content In The Striped Bark Scorpion *Centruroides Vittatus***

Melissa Green, Paige Henley, Demtrius Geiger

Faculty Mentor: Thomas McElroy, Eric Albrecht

The Striped Bark Scorpion, *Centruroides vittatus*, is distributed through the southwestern United States, and they are abundant in south Texas. *C. vittatus* is primarily nocturnal and can be found in vegetation, logs, and other cool and damp areas. They forage mostly for insects, such as crickets, centipedes, spiders, many other smaller insects. Cannibalism also occurs, typically larger scorpions will eat smaller scorpions. Once prey is captured, the scorpion uses its pinchers to clasp and compress the prey. The telson may be used to sting the prey and inject venom. The prey is drawn towards the scorpion's mouth and ingested. Venom composition can vary among individuals. Previous results from venom toxicity testing suggest that adult venom may be 1.8 fold more potent than juvenile venom. Thus some variation in venom composition may be explained by ontogenetic differences; however, understanding the effects of diet on venom composition for scorpions in the wild will require the ability to reliably detect what the scorpion has eaten. The objectives of this experiment were to determine if

cricket DNA could be reliably recovered from the gut contents of scorpions, and to estimate gut retention time. Preliminary results indicate that we were able to recover cricket DNA from the gut content of scorpions for up 4 days after feeding. We will report our latest findings on DNA recovery and gut retention times. These data will help us refine our procedures so that our research can investigate the diet of scorpions in their natural environment.

### **The Impact Of Mycorrhizal Colonization On The Growth Of American Sycamore (*Platanus Occidentalis*) And Black Willow (*Salix Nigra*) Under Drought Conditions**

Joshua Hashemi, Reuben Hilliard, Chelsea Harris

Faculty Mentor: Paula Jackson

This experiment is part of a larger investigation to examine the suitability of using American Sycamore (*Platanus occidentalis* L.) in addition to, or as an alternative to Black Willow (*Salix nigra* Marshall) in riparian restoration. Climate change is significantly affecting environmental systems and is expected to cause a greater frequency in severe droughts and flooding. Black Willow has been used extensively in the southeastern United States in riparian restoration sites because of its putative tolerance to flood and drought conditions and ease of vegetative reproduction. Little information has been collected on American Sycamore and therefore little is known regarding its potential use in riparian restoration. This research compared species under field and greenhouse conditions. For the field component, roots were collected from ten trees of each species (*Salix nigra* and *Platanus occidentalis*) growing alongside a small (< 1 m width) perennial stream on the campus of Kennesaw State University. Roots were stained (acid fuchsin or trypan blue) and the presence of mycorrhizal structures was quantified using the root piece method. Greenhouse experiments were conducted subjecting 10 individuals of each species to well watered conditions or drought, with and without mycorrhizal colonization. (Detailed methods presented separately).

Preliminary results for field data indicate that *Platanus* samples exhibited higher levels of mycorrhizal colonization, and therefore are expected to be more strongly influenced by mycorrhizal presence in the greenhouse experiments. Results and implications will be discussed.

### **A Differential Equation Model Examining The Impact Of Post-Mortem Practices On The Spread Of Ebola**

Saniita FaSenntao, Denise Hernandez

Faculty Mentor: Meghan Burke

The purpose of this work is to develop a mathematical model using differential equations for the spread of Ebola. We extended the model of Astacio, Briere, Guillen, Martinez, Rodriquez, and Valenzuela-Campos to include the possibility of transmission from recently deceased infected individuals to their loved ones and others involved in post-mortem care. This model

extends the SIR model into an SIRD compartment model. We use data to compare different outbreaks and burial practices to observe the effect of safer practices on the basic reproductive number, and hence, on the severity of the epidemic.

### **A Search For Optimal Living Arrangements For Kennesaw State University Students Completing A Four-Year Degree**

Cody Baum, Justin Farmer, Katelyn Marsala, Wesley Queen, Allison Sommers  
Faculty Mentor: Flor Espinoza

Graduating college seniors face many challenges in today's economy. Continued increases in the cost of higher education paired with a bleak job market lead to a difficult financial situation upon graduation, where many students face large debt amounts without the financial means to support themselves and payoff loans. The national average student loan debt for a graduating student in 2014 has increased to \$33,000 from an average in 1993 of \$15,000. In this work, searching for applications of what we learned in our Calculus class, we had the goal of providing KSU students with the total cost of different living arrangements to help them make informed decisions. To achieve this goal, we compared the total expense associated with the different possible living arrangements, living on campus or off campus (with or without roommates). Since for some students living off-campus seems cheaper, we also analyzed the cost of commuting to school.

One of our results demonstrated that a student could save an average amount of \$22,778.36 by choosing to live in a three bedroom apartment with roommates instead of a one bedroom apartment without roommates, an amount that is greater than the average amount of student loan debt held by a graduating student at KSU.

Next, we used the relationship between rent cost per month and total square foot of living space to predict potential savings for a micro-style apartment as seen elsewhere in the world. We were able to show that the new conceptual micro-style apartment unit could bring significant cost savings to students. Our main results estimated a rent cost for the 'micro-units' to potentially total \$8,896.20 over the course of a four-year. Impressively, this amount would afford a student \$33,185.71 of savings over the course of a four-year degree when compared to the average cost of a standard commercial one bedroom apartment unit.

Our analysis have proved that through careful planning and wise decisions, students can save many thousands of dollars by choosing the most cost effective living arrangement while completing their degree.

### **Applying The Gauss-Jordan Method For Group Inverse To An Irreducible Singular M-Matrix**

Jillian Kuether  
Faculty Mentor: Jun Ji

There are many situations in which group inverses of singular and irreducible M-matrices facilitate the analysis of various phenomena. In a recently published article in the literature, a new Gauss-Jordan-like method was proposed for the computation of the group inverse of a generic matrix of index one. In this talk we will apply the new method to the singular and irreducible M-matrices, the special class of matrices of index one and analyze its computational complexity.

### **Hall Pre-Colorings Of Graphs**

Hunter Rogers

Faculty Mentor: Jennifer Vandenbussche

Graph colorings have applications in scheduling, conflict resolution, and many other areas. This project studies conditions under which a precoloring of a graph may extend to a full coloring. In particular, we study a condition related to Hall's Theorem, a classic theorem in combinatorics.

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

Saniita FaSenntao, Kaleigh Mulkey

Faculty Mentor: Anda Gadidov

The main purpose of this project is to build a mathematical model for traffic at a busy intersection. We use elements of Queueing Theory to build our model: the vehicles driving into the intersection are the "arrival process" and the stop light in the intersection is the "server."

We collected traffic data on the number of vehicles arriving to the intersection, the duration of green and red lights, and the number of vehicles going through the intersection during a green light. We built a SAS macro code to simulate traffic based on parameters derived from the data.

In our program we compute the number of vehicles in the queue every time a vehicle arrives and leaves the intersection, the service time, and the total time the vehicle spends in the queue, or the sojourn time. We describe the probability distribution of the queue length in the long run and analyze its dependence on and the durations of the green and red light. Using regression we build a model for the dependence of the average queue length and the average service time on and the durations of the green and red light.

Based on the regression results we propose traffic models that achieve optimal queue lengths and sojourn times.



## **Models Of Progressive Addiction Of: Alcohol, Alprazolam, Cannabis, And Cocaine**

Everette Crump, Gayland Dodd, Sophia Kirchhoff, Dalton Mullinax, Akinwande Olufisayo  
Faculty Mentor: Flor Espinoza

In this work, we studied the progressive effect of alcohol, alprazolam, cannabis and cocaine on the body and the resulting cost of each drug if used over a certain period of time. Our focus was mainly college students, ages eighteen to twenty-four, who use drugs more frequently due to different reasons: an increase in freedom, a recreational activity, and stress and depression relief. Many people end up getting trapped within a bad habit that can eventually ruin their lives. Even though drug use may start out as a recreational activity, it can eventually turn into a habit that leads to costly side effects. Although people have been educated about drug use, the severity of the effects on the human body have not been fully understood. Our work, an illustration of a Calculus application, provides students with a better way to understand the consequences behind drug use and proves why drugs should be avoided. We showed how the progression of drug use over time eventually leads to a lethal overdose. This overdose is based on the LD50 measurement for each drug, which is the amount at which fifty percent of a test population dies. Then, we used definite integrals to find the total amount spent on the drugs over a certain period of time. Our results showed that the continuous use of each drug leads to extremely high costs. The cost of a progressive addiction leading to a deadly dosage are as follows: alcohol was \$16,801.72 if used over 60 months (5 years), alprazolam was \$515,046,634,920.00 if used over 496 months (41.3 years), cannabis was \$1,795,100.32 spent over 50 months (4.2 years) and \$39,266.40 spent on cocaine over 450 days (1.2 year). Therefore, even if various health and lifestyle choices affect how an individual takes these drugs, it is more advisable to stay away from drugs for health and financial reasons.

## **Optimal Recovery Of Solutions To Dirichlet Problem For Laplace And Poisson Equations Based On Incomplete Information**

Najia Bacha  
Faculty Mentor: Yuliya Babenko

Laplace equation is a partial differential equation of the second order, which has a different use in mathematical physics (electrostatics, mechanics, thermodynamics, etc.). Frequently, boundary condition is also added (Dirichlet's problem). The solution to this problem is well known in the case when boundary function is fully known. Our goal in this study is to develop an optimal method of recovery of the solution based on information we have on hand about the function  $f$  (when this information is not complete; for example,  $f$  is known at  $N$  equally spaced points) and to compute the optimal error between the actual solution and the recovered one. We also consider similar question for Poisson's equation.

## **Students' Thinking About Proportional Relationships Between Quantities Of A Circle**

Mariah Simmons

Faculty Mentor: David Glassmeyer

In this action research project we investigated the ways in which high school students' conceptions of mathematics evolved as they engaged in a series of lessons we developed. The learner-centered lessons asked groups of students to investigate and analyze the relationships between the angles of a circle and their intercepted arcs, the area of a sector, and arclength. They were challenged to make generalizations and conjectures about the proportional relationships between the different quantities of a circle by using tools such as rulers and protractors. We audio-recorded group discussions, analyzed the high school students' work during these lessons, and conducted interviews with students to investigate our research question, how do students think about proportional relationships between (a) a circle's arclength and radius and (b) a circle's radius, angle measure, and area of the sector? Our findings indicated that many students did not initially recognize that the relationships were proportional relationships. We found that students could recognize what a proportion looks like and how to solve proportions within our lessons. Although students had few problems with solving equations with a missing quantity, most of the students looked for a formula that would fit the situation without using reasoning to solve the problems presented. Despite trying to support generalization and conjecturing in our lessons, we found students still struggled to make generalizations and form conjectures about proportional relationships. This suggests that more exploration activities can begin to change the ways students think about proportions within a circle, but that these kinds of lessons need to be a continual part of the curriculum to support students' conceptual thinking about mathematical relationships.

## **Study Of Multiply And Completely Monotone Sequences And Functions**

Ryan Cottrill

Faculty Mentor: Yuliya Babenko

In this presentation we discuss our studies of Kolmogorov type inequalities for multiply and completely monotone functions and sequences, and connections between them.

## **Helicobacter Pylori Type III Secretion Genes *flhI* And *flhJ* Are Required For Efficient Flagellar Assembly And Motility**

Rachel Martini

Faculty Mentor: Jonathan McMurry

*Helicobacter pylori* is a Gram-type negative bacterium that is native to the human stomach mucosa. *H. pylori*'s 2-6 unipolar flagella are critical to its success to host colonization. Over 40

structural and regulatory genes, including a set of genes encoding a specialized Type III secretion system (T3SS) used to export flagellar components across the membrane, are required for flagellar biogenesis. Focus was placed on two potential T3SS genes, *fliI* and a *fliJ* homolog (HP0256), and two ideas were investigated: how flagellar biogenesis and thus motility is affected by deletions of these genes, as well as looking into FliI and FliJ protein interactions using bio-layer interferometry. Based on studies in *Salmonella*, FliI is an ATPase and FliJ is a chaperone that works together to keep protein substrates in an unfolded state and bring them to the export port of the T3SS. Previous studies showed that FliJ is required for full motility in *H. pylori* but not flagellar synthesis, but potential polar effects on downstream genes complicate interpretation of these results. To address this issue, an unmarked deletion of *fliJ* was constructed, and analysis of the resulting mutant showed very limited motility. In regards to the protein interactions of FliI and FliJ, bio-layer interferometry showed high affinity binding between FliI and FliJ in the presence of ATP.

### **Identification Of Novel Kallmann Syndrome Genes By Fluorescence-Activated Cell Sorting And Expression Profiling**

Samuel Keenan

Faculty Mentor: Martin Hudson

The *kal-1*/anosmin gene encodes the secreted extracellular matrix protein anosmin-1. This protein is involved in axon branching, axon migration, and cell differentiation during early development. In humans, mutations in the *kal-1*/anosmin gene lead to X-linked Kallmann syndrome (KS), which is characterized by loss of the ability to smell and impaired sexual development. KS is a polygenic trait, and 20 genes have been associated with this disease to date. Despite this, only 35% of affected individuals exhibit abnormalities in genes that have been shown to cause Kallmann syndrome, suggesting that other genes may be involved in this disease. We hypothesize that genes required for the transcriptional control of known KS genes may be KS candidates in their own right. Based on this hypothesis, loss-of-function mutations in genes regulating transcription of *kal-1* will present similar phenotypes to *kal-1* loss-of-function mutations. Likewise, loss-of-function mutations in genes regulating transcription of *kal-1* should prevent expression of a GFP transgene driven by a *kal-1* transcriptional promoter. Utilizing expression of a *kal-1*-GFP transgene has allowed us to determine whether candidate transcription factor genes are up-regulated in GFP-positive cells relative to GFP-negative populations. To accomplish this, we used a fluorescence activated cell sorter to isolate GFP-positive and negative cells from a *kal-1*-GFP *C. elegans* strain. Validated quantitative-PCR primer sets were used to confirm that we were enriching for *kal-1*-positive cells in our GFP positive cell population. Our ultimate goal is to perform a transcriptome analysis on the mRNA extracted from the GFP-positive and negative populations to assist in identifying the transcription factors that are present in these cell populations, then validate these candidates using *C. elegans* models of embryonic development and axon branching.

## **Molecular Characterization *Aspergillus Flavus* In Peanuts**

Fatoumata Sylla

Faculty Mentor: Premila Achar

Georgia, Florida and Alabama are known for growing peanut. Georgia alone produces roughly 45% of peanuts in the United States with a few hundred million dollars in income. Regardless of strict control measures, the peanut industry continues to suffer economic loss due to aflatoxin contamination from *Aspergillus flavus* and *Aspergillus parasiticus*. Understanding hereditary differing qualities among *A. flavus* isolates may be of significance in management strategies of this disease for the peanut industry. Polymerase Chain Reaction (PCR) strategies are quick, delicate and dependable for deciding hereditary connections among organisms. In addition, the Internal Transcribed Spacer (ITS) sites, are great focus for phylogenetic examination. In this study, the hereditary variability among isolates of *A. flavus* from shelled nuts in three separate states (Georgia, Florida & Alabama) were examined. We hypothesize that these isolates will show some degree of molecular characterization. We explored the morphology of *A. flavus* utilizing customary microscopy and DNA was isolated utilizing a MO BIO Microbial Isolation Kit. To study the DNA profile of these segregates, fundamental PCR systems were utilized using an Epicenter FailSafe PCR Premix Selection Kit and ITS first stages 1 & 4. The PCR items for *A. flavus* secludes from the three distinctive geographic territories demonstrated a typical banding pattern at 550-600bp with a 3% agarose gel, demonstrating relatedness. Henceforth, future study will focus on sequencing of amplified PCR products and the aflatoxin producing genes

## **Ontogenetic Variability In *Centruroides Vittatus* (Bark Scorpion) Venom Toxicity**

Kelci Knight, Whitney Smith

Faculty Mentor: Eric Albrecht, Thomas McElroy

Foraging behavior is a critical component to an organism's success and changes in several species during ontogenetic development. Initial *Centruroides vittatus* (bark scorpion) prey capture studies indicated a significantly higher volume of caterpillar prey ( $p < 0.001$ ) in size class III scorpions, compared to I-II and IV classes. SDS-PAGE analysis of pooled crude venom collected from captive fed adult (IV) and juvenile (I-III) scorpions displayed different protein signatures. Suggesting ontogenetic differences in protein expression exist in this species. Toxicity (mean effective dose 50, ED50) for crickets was associated with ontogenetic group (size class IV vs. size class I-III) and probit analysis returned ED50 values of 113.6  $\mu\text{g/g}$  for adults compared to 206.4  $\mu\text{g/g}$  juveniles, 24 hours post injection. The temporal responses to 200  $\mu\text{g/g}$  of adult and juvenile venom in crickets were monitored every hour, for 4 hours, with a final assessment 24 hour post injection. Forty percent of the crickets injected with juvenile venom were unable to right self 4 hours post injection, while the remaining 60 % were unaffected. In contrast, 50 % of the crickets injected with adult venom were deceased after 4

hours. Our data suggest ontogenetic differences such as foraging behavior, proteomic expression, and venom potency exist between juvenile (I-III) and adult (IV) size classes.

### **Purification Of Recombinant Lingulodinium Polyedrum Luciferase Protein**

Maredith Sapp

Faculty Mentor: Susan Smith

Lingulodinium polyedrum is a bioluminescent dinoflagellate, a single celled marine organism that flashes light in response to mechanical forces. The light originates from a small organelle, the scintillon, a cytosolic sac formed by the evagination of the central acidic vacuole. The scintillons contain the biochemical machinery necessary for luminescence: luciferase binding protein (LBP), luciferase (LCF), and luciferin (a small molecule). A drop in pH causes luciferin to detach from LBP and bind to LCF which catalyzes the bioluminescence reaction. Voltage gated proton channels (Hv1), characteristically proton specific and activated by depolarization, in the scintillon membrane are proposed to control scintillon pH, conducting protons from the acidic vacuole to the scintillon interior, thus triggering the light flash. Our lab is working to create a synthetic scintillon, which will confirm the proposed function of Hv1 and also provide a biochemical method to assay its activity based on bioluminescence. The construction of synthetic scintillons will require purified LCF (as well as purified LBP, luciferin, and Hv1). The L. polyedrum LCF is comprised of three homologous domains, each of which can be expressed independently and catalyze the bioluminescent flash. Here we used synthetic LCF-FL constructs optimized for bacterial codon usage to express and purify LCF.

### **Putative Voltage Sensitive Enzymes In Prokaryotes**

Joshua Clark

Faculty Mentor: Susan Smith

A voltage sensor domain (VSD) is a protein module that rearranges its conformation based on the electric potential of the cell membrane. VSDs have classically been described as N-terminal modules that confer voltage sensitivity to C-terminal pore domains in ion channels. More recently, N-terminal VSDs have been shown to confer voltage response to C-terminal enzyme modules in voltage sensitive enzymes (VSE), while the isolated VSDs of voltage gated proton channels (Hv1) perform both voltage sensing and proton channel functions. So far, VSEs and Hv1s have been found only in eukaryotes. We have identified a set of prokaryotic sequences that contain a VSD homolog; however, the C-terminal domains of these sequences, which we refer to as putative prokaryotic voltage sensitive enzymes (ppVSE), are dramatically different from ion pores. As expected, predicted secondary structures of the N-terminal domain are similar to those for bona fide VSDs; however, unlike the pore domains of ion channels, which contain two transmembrane helices, predicted structures of the C-terminal domains of the ppVSEs do not contain transmembrane helices. Alignment of individual domains to the HMM

of the ion channel pfam pf00520 indicates significant similarity of ppVSE N-terminal domains but no detectable similarity of ppVSE C-terminal domains to the pf00520 HMM. A phylogenetic analysis of VSDs from prokaryotic sequences indicates a distinct lineage of the ppVSE VSD. This is the first documented evidence of a prokaryotic VSD-containing protein that does not have a pore domain.

## **Syndecan And Wnt Signaling Are Required To Orient Early Embryonic Cell Migration In *C. Elegans***

Aaron Pital

Faculty Mentor: Martin Hudson

Genetic analyses in model organisms offer a powerful mechanism to investigate the role of signaling pathways during development. In addition, genetic approaches can be used to model diseases and deficiencies seen in humans in pursuit of therapeutic interventions. The Wnt signaling pathway is crucial for normal human development, and defects in this pathway underpin essentially all colon cancers. We have used a *C. elegans* model to investigate the Wnt pathway interactions with the heparan sulfate proteoglycan syndecan. Using a nuclei tracking assay, we have identified roles for both Wnts and syndecan in orienting cell division axes during early embryonic development. We hypothesized that differences in cell division angles will translate into distinct phenotypes and failure of development. In addition, we have begun to use a fluorescent histone reporter gene to semi-automate tracking of developmental events. Complex interrelations between Wnt and syndecan can be teased out by merging these data, yielding highly resolved temporal and spatial relationships within the developing organism.

## **Understanding Voltage-Gated Ion Channels Via Bioinformatic Analyses**

Nadav Topaz, Jonathan Winkjer, Cori Moore, Rosalyn Price

Faculty Mentor: Tsai-Tien Tseng

The voltage-gated ion channels (VIC) is a superfamily of energy-independent transmembrane transporters with selectivity towards potassium, calcium and sodium ions. In excitable tissues, they are responsible for transmission and propagation of signals. Most recently, VICs are also implicated in the proliferation of cancer cells. While individual members of this superfamily are selective towards one of the above three ions, they have a wide variety of topologies, as a result of multiple duplication and fusion events. Fine-tuning of the kinetics and biogenesis is carried out by auxiliary subunits, which form a complex with the pore-forming principal unit in the membrane. Our study focuses on the molecular evolution of pore-forming subunits and their auxiliary subunits. We reconstructed the path of evolution, including fusion and duplication events, to find that fusion between voltage-sensing domain and pore helices occurred prior to the divergence between the three kingdoms of life. We further expanded previous findings by mining newly sequenced homologues in databases to aid in future

annotation efforts. The degree of sequence similarity and path of evolution are demonstrated by structural analyses, multiple sequence alignments and phylogenetic trees. We also incorporated many sequences of potassium channels from metagenomic data to more accurately depict the history of evolution of this superfamily. For auxiliary subunits, the inclusion of certain homologues, such as ones from pea aphid and silkworm, has allowed us to conclude that many of these auxiliary subunits arose prior to the presence of higher eukaryotes.

## **Understanding Zinc Trafficking During Snake Envenomation**

Evan Williams

Faculty Mentor: Eric Albrecht

Snake venoms disrupt cell anchorage by inhibiting integrin attachment to the extracellular matrix. Loss of contact with the extracellular matrix, during venom exposure promotes apoptosis in adherent cell types and is regulated by a variety of signaling pathways depending on cell type and integrin expression. Alpha 5 Beta 1 ( $\alpha 5 \beta 1$ ) integrins are critically linked to this process by providing "outside in" survival signaling, which utilizes FAK and PI3K/AKT cellular signaling cascades to modulate adherence or apoptotic cascades.  $\alpha 5 \beta 1$  integrins are highly expressed adherence receptors in mammalian cells and have been shown to play a central role in signaling events related to anchorage.  $\alpha 5 \beta 1$  integrins have been shown to control mitochondrial reactive oxygen species (ROS) production via interactions with small G proteins. For example, the activation of  $\alpha 5 \beta 1$ , leads to signal transduction events that transiently activate Rac1 and mitochondrial ROS production. This poses an interesting question regarding cell survival signaling: Does integrin disengagement trigger the mitochondria or other reactive oxygen sources to alter the reducing environment as a way of regulating downstream signaling events? Emerging lines of investigation have suggested that oxidative regulation is important for modulating proteins such as metallothioneins. Therefore, the goal of this project is to examine a novel cell survival mechanism involving  $\alpha 5 \beta 1$  integrins and metallothioneins (MT) during venom induced loss of cellular adherence.

## **Black Hole Jets In Active Galaxies**

Aaron Lowery

Faculty Mentor: David Garofalo

Ten percent of galaxies observed in the universe display intense energetic beams of matter and radiation that in some cases affect the intergalactic medium. I will discuss data showing how the different kinds of jets produced depend on the properties of matter falling into black holes at the centers of active galaxies.

## **Crystal Nucleation Of Palladium Doped Lithiumdisilicate Glass**

Gregory Humble

Faculty Mentor: Kisa Ranasinghe

The effect of concentration of palladium particles on crystal nucleation was investigated for lithiumdisilicate glass. The heterogeneous nucleation rate for 4400C and 4500C was calculated for different concentrations of palladium. The DTA method of measuring nucleation and crystallization was used in this calculation.

## **Investigating Bioactive Borate Glass For Biological Applications**

Samuel Parker, Gregory Humble

Faculty Mentor: Kisa Ranasinghe

A glass composition with biomedical applications is under investigation. New glass compositions are melted and currently their properties are investigated. In order to determine specific thermal properties of the glass compositions, the advanced method of Thermal Differential Analysis is used. Once a promising composition is obtained, using ICP spectroscopy the reaction to variety of synthetic body fluids will be analyzed. Finally, if the composition is found to be sufficiently bioactive, its behavior on a scaffold similar to that of bone will be examined.

## **Spinning Black Holes In The Universe**

Emily Hollingworth

Faculty Mentor: David Garofalo

Spinning black holes are thought to describe some of the most energetic phenomena in the observable universe. I will present analysis of data on black hole spin and energy emitted by black holes in an attempt to constrain theories of how black holes power so-called active galaxies.

## **Studying The Aerodynamics Of Wind Turbines using LabVIEW**

Chris Rose

Faculty Mentor: Ratnappuli Kulasiri

The maximum power coefficients ( $C_p$ , max) and the corresponding optimum axial induction factors ( $a_2$ ) for different tip speed ratios were obtained using the Monte Carlo simulation technique. The obtained results agree well with the results obtained using other techniques. In addition to that optimum blade parameters were obtained for a three blade rotor.



## **Supermassive Black Holes Near The Birth Of The Universe**

Derrick Pruitt

Faculty Mentor: David Garofalo

Supermassive black holes have been observed at the centers of almost all large galaxies. However, given our understanding of how black holes form, it is difficult to explain the existence of black holes as massive as a billion suns very early in the life of our universe, as we in fact observe. I will describe calculations showing how the universe may have produced such massive black holes only 800 million years after the big bang, less than one tenth of the present age of the universe.

## **Angu Walters And Contemporary Cameroonian Art**

Stephanie King

Faculty Mentor: Jessica Stephenson

For centuries, the Western art market has associated art in Africa with objects of a functional or ceremonial nature, such as masks, jewelry and textiles. However, by the 21st century, one sees a wide range of other African art idioms being created for non-functional purposes, including painting, sculpture, photography and printmaking. Despite over one hundred years of modern art production in Africa, these newer genres remain underrepresented in international art circles. And, while contemporary art from South Africa, Nigeria, Senegal, and Ethiopia has made inroads on the international stage, modern artists from countries such as Cameroon are largely unknown, as is the case with Angu Walters, a painter from the town of Bamenda. Through a discussion of Walters' biography and art work, as well as international exhibitions of art from Cameroon, this paper seeks to better understand the factors informing the marginal position of contemporary Cameroonian artists at home and abroad. The paper also argues that the categories of contemporary African art as defined by Peter Ndidi Osegi are limiting when applied to work by artists such as Walters.

## **Mami Wata: The Story Of A Femme Fatale**

Kelsey Moran

Faculty Mentor: Jessica Stephenson

Mami Wata is known throughout Africa and the Diaspora as a water deity. She is represented most often as a mermaid with beautiful skin and long silky hair. In my research I found that in appearance and character Mami Wata can play a dual role in the lives of an individual or community, bringing either riches or destruction to those who enter into a relationship with her. In 2008 Henry Drewal edited the book 'Sacred Waters: Arts for Mami Wata and Other Divinities in Africa and the Diaspora' and this is where my search to define the essence of

Mami Wata began. With forty-six chapters of documented research, and endless accounts of who Mami Wata was and is, my research quickly became convoluted. Anyone could write of Mami Wata and they would be correct; anything could be said of her and it would be true. However, there seems to be an overall consensus that she can either be a blessing of riches or a curse. The combination of the two defines the ultimate femme fatale, a concept that I apply to better understand the essence of Mami Wata. A femme fatale describes a woman who, through her attractiveness and charm, can lead mankind into dangerous situations. I also apply Roland Barthes' theory of the death of the author to readings of Mami Wata so that we can come a little bit closer to understanding this mysterious and seductive water deity.

### **Mohamed Banawy's "The Valley" And The "Treasures Of Knowledge"**

Emily Knight

Faculty Mentor: Jessica Stephenson

Within the context of the production of contemporary art, international interest has become increasingly focused on the non-western world. In the past fifty years, new cultural and artistic exchanges have influenced and enabled artists of diverse backgrounds to gain global recognition, and international art exhibitions have become the forum through which to encounter and interpret these new artistic representations. The 55th Venice Biennale held in 2013 hosted over 88 national pavilions, exhibiting works by over 150 artists. It was here that I encountered the work of Egyptian artist Mohamed Banawy, including his large-scale multimedia mosaic, 'The Valley'. Through visual analysis and dialog with the artist, I examine Banawy's exploration of the mosaic technique and medium of clay with respect to his Egyptian heritage. I consider how his materials carry symbolism in reference to the history and landscape of the Nile Valley and using landscape theory I formulate a context for Banawy's work within the contemporary Egyptian art world's prevailing concerns with nationhood, authenticity, and the application of heritage.

### **Rethinking The Representation Of Prostitution In Ancient Greek Vase-Painting**

Madeline Beck

Faculty Mentor: Kristen Seaman

Ancient Greeks in the Classical Period (ca. 480-323 BCE) surely did not shy away from eroticism in their production of artwork. Yet elite Greek women were never shown in sexual situations in art, for blatant sexual expression was reserved only for men and the objects of their lust such as prostitutes. Many surviving examples of Classical vase-painting from Athens clearly and subtly represent prostitution. In the past, scholars have used this art predominantly to theorize about male societal values and politics. Prostitution is often examined in the context of male relations, not as a study of women. This perpetuates the societal failure to humanize prostitutes; they function to serve a specific role for male

exploitation. Focusing on a kylix by the Pedieus Painter (ca. 510 BCE) and an Athenian red-figure cup by the Euaion Painter (ca. 470 BCE), I compare and contrast prostitutes in Greek art to those in real Greek life; employ gender theory; and explore engrained patriarchal systems that are still relevant to modern feminism. I aim not only to investigate what the imagery of prostitution tells us about ancient Greek society, but also to give a perspective on the harsh realities that were trivialized in erotic art created for male enjoyment during the festivities of the symposion. I argue that Ancient Greek prostitution and the art associated with it are about men for men. Women are forced into these positions to satisfy the male citizen's "democratic right" to access brothels but they are then overlooked by society.

## **Benefits And Methods Of The Scale Practice For The Beginner Piano Students**

Ai Nguyen

Faculty Mentor: Soohyun Yun

This poster presentation will provide for teachers and students a brief overview of the benefits and methods of the scale practice. Scale practice in piano learning would improve beginner student's sight-reading. It helps students in memorizing the notes, reading faster and locating the notes on the piano. Scale takes the same step-by-step practice as we practice for reading, which begins from reading letter notes.

First, scale practice is a foundation to learn and memorize the names of the notes. Students need to understand the pattern of the alphabet letter name starting from A to G. Reading notes out loud will help a student memorize notes faster. When a student plays scale, playing by separate hand is helpful before playing both hands.

Second, saying the notes' names out loud will help with sight-reading skill and memorizing notes. Richard Chronister, the founder of Keyboard Companion said, "Playing a simple scale demonstrate that the student knows the notes."

Last but not least, a student will be able to locate the notes on the piano on the larger range of keys. Understanding the twenty-four major and minor keys' structure will help student to understand the repertoire.

Dr. Scott McBride Smith, a renowned piano pedagogue, provided numerous practical initiatives to improve today's piano lesson experience. "Zig-Zag Pentascales, Doubled-Pair Pentascale and Complementary Patterns" are a couple of examples from the series American Popular Piano by Dr. Smith. These sample pieces help students apply the scale to play the small piece using various intervals, rhythm and reading both clefs. Scales are the fundamental technique to learn solo repertoire.

Teaching piano for young age beginner is about to make it as easy as we can to make them having interested and fun with piano, also we help them to build a good foundation for later. When students accomplish all the scales, they will find it is easier to play repertoire.

Apparently, scale practice is one of the indispensable benefits for beginning students.

## **Incorporating The Art Of Dance In The Piano Lesson**

Haley Myers

Faculty Mentor: Soohyun Yun

Although pianists taste a variety of arts in daily life, students often neglect recognizing connections between the arts, such as dance and music. Since the arts have been entwined throughout history, piano students benefit by participating in linked dance and music activities. Relating dance to the piano lesson gives students kinesthetic and visual aspects to connect to the music. This association gives students an outlet to grasp musical concepts, such as rhythm, intervals, and history. This poster presentation explores three activities to incorporate the art of dance in the piano lesson through videos and physical movement. Watching a performing arts video of music and dance helps students discover connections between these two arts. Dance embodies musical concepts, which pianists observe in the videos. For example, dancers may embody the legato sound pianists desire to produce with their fingers, or they may perform a traditional ballet, such as Swan Lake, with historical aspects. Students learn historical styles, composers, and various musical concepts by observing the connection between the dance and the music. Pianists may utilize this visual tool to transfer the sound to their piano playing. Physical movement activities assist the student in discovering music concepts in larger parts of the body, which can kinesthetically transfer to the fingers for piano playing. Steady Now is a rhythm activity, which benefits the students by establishing consistent rhythms. While the instructor plays a piano piece, students dance with the tune by listening to the rhythm and melodic line. The kinesthetic movement instills a foundation for recognizing constant beats, tempos, and listening skills. Interval Hopscotch is an activity to learn intervals off the keyboard. Students utilize an enlarged scale on the floor to learn blocked and broken intervals by placing their hands and feet in front of notes, which produce the interval.

These activities give piano instructors ideas to expand this concept and create their own exercises relating to any art to improve piano learning. Physical activities give students the opportunity to embody concepts in other parts of the body then transfer these ideas to the piano. Instructors must consider a variety of activities and choose the most appropriate methods to learn musical concepts for each individual student. Relating these concepts to other aspects of their lives will help students discover connections and improve their piano playing.

## **Motivating Young Beginning Piano Students By Rhythm Counting Activities**

Soyoun Sheehan

Faculty Mentor: Soohyun Yun

Rhythm counting is one of the fundamental skills in music. Fun rhythm counting activities can help young beginning piano students to get motivated. My poster presentation will provide

three rhythm-counting activities to help students' learning: foot tapping, conducting, and a percussion game. From the foot tapping activity, students will learn and hear the constant rhythm patterns of the 3/4 and 4/4 meters easily. By raising and lowering their feet in the rhythmic pattern, students will become more acquainted with duple counting. The second activity is for students to conduct their piece by drawing shapes, such as a triangle or square, in the air using their arms while hearing the music. The benefits of this activity are: helping students learn the music physically, listening to down-beats of the music, and understanding rhythm clearly through the continuous movement of their arms. The percussion game is for students to play rhythms with objects such as cups, sticks, castanets, or maracas. This exercise can be an enjoyable group activity because students get to listen and play various rhythms as an ensemble. These activities will allow students to learn repertoire faster because they will have a full understanding of the rhythms before applying the pitches. Various fun activities in music learning will keep students motivated. These activities will keep students' attention to music and make music learning more entertaining. The easiest way for beginning students to understand rhythm is to experience it with their body. Adding fun musical activities that draw students' attention will encourage their learning.

### **Popular Music Arranging As A Tool To Teach Functional Theory**

Beth Anne Ake, Haley Myers, Soyoun Sheehan, Ai Nguyen  
Faculty Mentor: Soohyun Yun

Supplementing traditional classical material with pop arranging will inspire students to learn about fundamental theory concepts while increasing their artistry and passion for music. Students should be encouraged to enhance their creativity as they arrange simple melodies as they recognize, enforce aural skills, harmony, and compositional concepts.

### **The Effects Of Music Training In Primary School Children: Memory Improvement**

Kim Royer  
Faculty Mentor: Edward Eanes

Regular music training over time can significantly improve auditory memory performance, causing "improvement in verbal learning and retention abilities" (Ho 439-450), as well as in various other cognitive abilities in primary school children. However, one must first understand "the ways in which mind and brain are used in the perception and comprehension of music" (Snyder 107-117). Children who receive weekly musical training, over the course of a number of years, will show improvement in the working memory/operations of the Central Executive area of the brain, thus improving verbal and auditory (but not visual) memory performance. Along these lines, "making music may actually enhance children's abilities in other domains of reasoning" (Rauscher, 244-252). Researchers in one study of two groups of children examined the effects of regular instrumental musical instruction on children's

cognitive abilities, and concluded that "music training affects the development of spatial intelligence in young children" (Rauscher, 244-252). According to an article found in *Psychology of Music* by Ingo Roden, "instrumental music training has been shown to enhance cognitive processing beyond general intelligence" (Roden 284-298). Significant cognitive abilities in children who participate in regularly scheduled extensive music instruction in early development "may become hard wired and produce permanent changes [in the brain], in the way information is processed" (Rauscher, 244-252). An article by Yim-Chi Ho further delineated the positive effects of music training on memory and cognitive function in children, and addresses how verbal memory is improved while visual memory is not. The results of the analysis found that "individuals with music training should demonstrate better verbal but not visual memory, given that their left but not right temporal lobe is assumed to be better developed. Indeed, our results support the finding that young adults with at least 6 years of music training demonstrate better verbal but not visual memory than those without such training" (Ho, 439-50). In conclusion, the studies mentioned in this project support that regular music training over time can significantly improve memory performance (both verbal and auditory), and various other cognitive abilities of primary school children. The research highlighted in this project can be a helpful argument for creating new music programs in schools.

### **The Evolution Of Music Education From Ancient Greece To The 21st Century**

Sara Knapp, Madison Hall

Faculty Mentor: Edward Eanes

An examination of the evolution of music education philosophies and practices is crucial for the preservation of the arts in public education. This oral presentation will examine the roots of music education in Ancient Greece and how these ideals have been both preserved and adapted through the 21st century.

### **Contrasting Technological Views Between Brazil And United States**

Samantha Slicker, William Tyler, Sean Whealton

Faculty Mentor: Amy Buddie, Ken Hill

The purpose of the present study was to examine attitudes about technology among students in the U. S. and Brazil. A sample of students in both countries completed an online survey with questions on technology, such as "Technology brings new challenges to society," and "The benefits of technology outweighs the risks." Students answered the questions on a scale from 1 (disagree completely) to 7 (agree completely). The results showed several significant differences between the samples. For example, students in the U. S. were more likely than students in Brazil to believe that the benefits of technology outweigh the risks, that transformations happen in the same way in developed and developing countries, and that the

internet has been fundamental to the globalization process. Limitations and ideas for future research will be discussed.

### **Automatic Integrated Vehicle Jack**

Eliana Pippen, Christopher Beals, Duy Tran, Adam Shirley  
Faculty Mentor: Mir Atiqullah

Automotive technology has made significant advancements in the past few decades. One seemingly unchanged element is the vehicle jack. With the evolution of features of consumer vehicles becoming ever more user-friendly, the vehicle jack is due for an upgrade. The current mode of lifting a car is physically demanding, dirty, and often requires expertise that many users lack. This leads to an unpleasant and potentially unsafe situation for many drivers. A reconsideration of the vehicle jack strives to deal with each of these issues, and make the operation of lifting a car significantly safer as well. A possible and practical solution presented with Automatic Integrated Vehicle Jack design which provides ease of use for the driver, more stability for the car, and a more convenient solution for lifting a vehicle.

### **Dynamic Elastography**

John Cronin, Anderson Drew, Thomas Ryles  
Faculty Mentor: Muhammad Salman

This study examines wave propagation along the surface of muscle tissue in order to determine the health of the site. The key parameters for examination focus on displacement versus time from metered points along the surface of the muscle. For the purposes of this study, the surface of the biceps brachia will undergo forced vibration. The surface displacement per unit time and rate of wave reduction relative to distance from the excitation source gives wave speed values.

Signal processing algorithm in MATLAB is used mainly with the cross correlation method which measures the time delays between the source and the sensor. There is an elastic stiffness model which gives the stiffness value provided the wave speed is given. Wave speed in the biceps is compared for three major cases, 1) Relaxed muscle, 2) Flexed muscle and 3) fatigued muscle. These values may then be compared to known values and tissue health may be determined.

Key components of the apparatus include a displacement scanning laser, a stinger creating metered frequency, LabVIEW signal Express and a motion isolation apparatus. The illustrated procedure for examination provides a low cost method of tissue health examination versus the more invasive ultrasound method.

Results were taken from 3 participants with the average wave speed varying from 122 to 234 cm/sec. The found values mirror previous results.

## **Heavy Lifting Clutch**

Jose Orozco, Waheed Choudhry, Syed Humail  
Faculty Mentor: Mir Atiqullah

In the field of automobile production time and speed are very important aspects. There are many processes to the automobile production, and one of these processes includes the production of clutches. In the line of production, it is important to get the work done fast while maintaining the operations and their operators safe as well as a high quality of the product. The scope of this project was entirely focus on the raw metal casting of truck clutches. Initials goals and requirements were set by a real customer on the business whom is dealing with operator's fatigue and downtime in production, due to the fact that operators from different machines inside a production cell have to lift the raw clutch casting multiple times during their working shifts. At the same time other challenges are added to the process due to the used of multiple machines and the small space inside this production cell.

## **Long Hair In Football: Visible Impact, Invisible Penalty**

Emerald Alexis  
Faculty Mentor: Laura Ruhala, Richard Ruhala

Long hair is visibly observed in both professional and collegiate football athletes. Players who adorn long hair, leave a viable tool to aid in their takedown and possibly their subsequent injury. While general tackling is an essential component of football that is carefully regulated to reduce the occurrence of injury, there are no specifics regulations against using a player's hair to perform a tackle. This research project focuses on the effects of player's using long hair as a tackling tool. Specifically, engineering dynamics analysis is used to evaluate the forces applied when a player is tackled by the hair. An emphasis is placed on how these forces can cause player injury.

## **Rescuer**

Brett Hardy, Brian Maki, Parin Patel, Erick Steele  
Faculty Mentor: Mir Atiqullah

Since roller coasters were first constructed and put into use there has been the issue of ride malfunctions. This is a fear felt by all involved, from the riders to the manufacturers. As roller coasters have grown larger, faster, and more complex, these malfunctions have become harder to foresee and prepare for. In the past couple of decades there have been several cases of roller coasters getting stuck somewhere along the tracks and passengers being stranded for hours. There are several newspaper articles detailing these situations. Each time this scenario occurs people get injured and the theme park has the potential to lose a lot of money in lawsuits.



Previous ideas to combat this problem have included breakaway sections of track, long sections of walkway that run along the tracks, parallel track systems and more. This project proposes solving this problem in a different manner, by sending a tow vehicle down the track after the stalled train to bring it back to the loading platform, or move it to an area easily accessible by rescue teams.

### **Sound Levels Of Chiller Units On KSU Marietta Campus And Consequences**

Jacob Davis

Faculty Mentor: Richard Ruhala

This research involves making measurements of the sound levels near the chillers on SPSU's campus. The goal was to show the A-weighted continuous level of the sound pressure of the chillers across campus, relate them to OSHA recommendations and local noise ordinance, and to make recommendations on how to improve the problem of noise pollution on campus.

### **Two-Way Powered Rickshaw**

Karen Boze, Ubaidullah Muhammad, Matthew Hamilton

Faculty Mentor: Mir Atiqullah

The older designed rickshaws present a problem with its overall safety when being utilized for transportation around town. There have been several cases of people being injured and even killed from the accidents of this transportation service. Along with hazards to safety, this vehicle's range of travel is also very limited. Because of an inefficient design, the driver tires quickly, and the ergonomics are not great for the longevity of its occupants. The electric rickshaws also have unsafe battery locations under the seat of the passengers. These batteries are inefficient and do not last a very long time. The two-way powered design presented will ensure the safety of the passengers and the driver. The final design is ergonomically sound for both the driver and passenger, along with having a lighter, stronger frame with a more efficient electric system, which in turn will last for longer travels on a single charge.

### **Wheelchair Carrier For Use In Airports**

Chase Davani, Luke Mullins, Greg Paris, Donald Lockwood

Faculty Mentor: Mir Atiqullah

Some of the biggest complaints among airline passengers with disabilities are the quality and convenience they receive while traveling. This disconnect comes from the availability and completeness of the assistance offered for travelers with disabilities. This senior design group has proposed a method of transportation for individuals who use wheelchairs, or other mobility devices that offers minimal strain on the passengers as well as those assisting with

their transportation. The team has designed a safe and simple wheelchair carrier that, when hitched to the back of a golf cart, will alleviate much of the complications associated with airline travel for individuals with disabilities.

### **Depictions Of Leadership In Television, Film, And Advertising.**

E. Monique Jones, J. Kevin Brown, Leroy John, Timothy Saint-Fort, Wassim Khalek, J. TJ Duhart, J. TJ Duhart, Akash Patel, Tenae Henderson, Erica Malcom, Ayanna Ward, DeVontre Echols, William Lowman, Corinthian Grace, Caitlin Callaway, Sarah Coicou, Bethany Barrera, Austin Molkie

Faculty Mentor: Nyasha GuramatunhuCooper

Television, film, and media have a significant impact on the way we view and navigate the world. Our frames of reference are filled with images that implicitly and explicitly influence how we conceptualize life's phenomena. While LDRS 3000/Foundations of Leadership uses an academic lens to view one of life's phenomena: leadership, we cannot ignore how television, film, and media influence how we think of/about leadership. Students in LDRS 3000/Foundations of Leadership will evaluate and discuss how a particular leadership theory or approach is depicted in a television show, film, or commercial. Additionally, students will explain and analyze the cultural myths, values, ideas or stereotypes about a selected leadership theory or approach as portrayed in various forms of media.

### **Leadership Development And Practice: A Narrative Of Peer Mentorship And Leadership**

Alicia Whittle

Faculty Mentor: Nyasha GuramatunhuCooper

There is very little research that highlights the perspectives of student-athletes about their socially constructed identities and how they express their agency through their voices and experiences. What does exist is literature on common stereotypes imposed on the academic prowess of the student-athlete and his or her overall potential of succeeding in the classroom (Parsons, 2013; Cameraux, 2012). Common stereotypes include perceived special attention or treatment from professors who want the athlete to do well in their course, and even services only made available to student-athletes (i.e. tutoring, classes, advisors) that other students see as an extra benefit (Andrassy, Svensson, Bruening, Huml, & Chung, 2014). Positioning myself as the researcher and participant, my case study attempts to challenge the stereotypes of student-athletes. My research draws connections between my experiences and the stereotypes that have been imposed upon student-athletes. My pursuit of developing my leadership philosophy and practice through peer mentoring in the classroom and on the trackfield demonstrates a nuanced identity that rejects the limiting stereotypes of student-athletes.

## **Association Of Physical Inactivity With Visceral Fat Accumulation In Pregnant Women**

Ashlyn Showalter, Danielle Brown  
Faculty Mentor: Katherine Ingram

**Introduction:** Abdominal obesity is associated with diseases such as diabetes and coronary artery disease. Abdominal, or visceral, fat is strongly correlated with an inactive lifestyle. Recent research shows that pregnancy is associated with high levels of visceral fat; however, no studies have linked this accumulation of visceral fat in pregnancy with physical inactivity. **Objective:** The purpose of this study is to examine the relationship between physical inactivity and visceral fat accumulation in pregnancy. **Methods:** We recruited twenty women who are currently in their first pregnancy from WellStar Kennestone OB/Gyn. The subjects were fitted with accelerometers to measure their minute-to-minute movement over the course of a week, and the four most compliant days will be analyzed. Actigraph software was used to compile and quantify the accelerometer data. Visceral fat was measured between the 17th and 22nd week of pregnancy by ultrasound. **Results:** We will be presenting preliminary data to test our hypothesis that physical inactivity is associated with an accumulation of abdominal fat in pregnant women.

## **Is Prenatal Exercise Participation Associated With Reduced Discomforts Of Pregnancy**

Danielle Brown, Melanie White, Alexandra Grant, Taylor Swanson  
Faculty Mentor: Katherine Ingram

**INTRODUCTION:** During pregnancy, symptoms such as headache, nausea, low back pain, and food cravings are common complaints. Women that participate in regular exercise during pregnancy have fewer complaints of pregnancy-related discomforts. It has been observed that exercising throughout pregnancy is associated with health benefits including reduced back pain and reduced weight gain. However, the effects of different types of exercise during pregnancy on these symptoms have not been reported. **PURPOSE:** The purpose of this study is to determine whether different types (aerobic, anaerobic, group setting, individual training) and intensities (low, moderate, or high) of exercise are associated with reductions in pregnancy-related discomfort each trimester. **METHODS:** To address this research question, we are developing an online survey that asks participants to detail the type, amount, and intensity of daily activity they perform, along with the frequency that they experience common physical complaints during each trimester of pregnancy. The survey is expected to launch this spring and run over the course of the 2015/2016 academic year. The survey respondents will be divided into groups based on the type and amount of daily physical activity they report. Through correlation and regression analyses, we will examine the relationships between activity level at each trimester and pregnancy discomfort. Analyses will be controlled for reported pre-pregnancy activity and weight-changes during pregnancy. With a target sample size of 300 participants, we will

recruit participants from social media websites and businesses that cater to pregnant women, such as Babies 'R' Us, OH Baby! Fitness, and maternal health medical practices.

RESULTS: We hypothesize that moderate levels of exercise participation is associated with reduced pregnancy-related discomforts each trimester.

CONCLUSION: The results of this study will further our understanding of how different exercise modalities and intensities throughout pregnancy may influence the common discomforts associated with pregnancy.

### **Is There A Relationship Between Visceral Fat Accumulation And Insulin Resistance In Pregnant Women**

JaBreia James, Michelle Scroggins, Alexandra Grant

Faculty Mentor: Katherine Ingram

#### **INTRODUCTION:**

Over the last decade, the rate of diabetes during pregnancy has doubled, along with the rate of obesity. Diabetes during pregnancy may lead to problems for the baby such as macrosomia (large size), low glucose levels, respiratory distress, and jaundice. In non-pregnant adults, high levels of abdominal fat, or visceral fat, may be associated with insulin resistance, which is the hallmark characteristic of diabetes. However the relationship between obesity and insulin resistance during pregnancy is not fully understood.

#### **OBJECTIVE:**

The purpose of this study is to determine if there is a relationship between visceral fat accumulation and insulin resistance in pregnancy.

#### **METHODS:**

Participants included in this study are 20 pregnant women, aged 20-34, and recruited from Wellstar Kennestone OB/GYN clinic during their first pregnancy. Visceral fat was measured via ultrasound during the participants' regularly scheduled 20-week ultrasound visit. Fasting glucose and insulin were measured between weeks 25 and 27 at the clinic. Insulin resistance was determined through the use of the Homeostasis Model Assessment of Insulin Resistance (HOMA-IR) index.

#### **RESULTS:**

For this project, we will use correlation statistics to test our hypothesis that abdominal obesity during pregnancy is associated with insulin resistance.

### **Is There an Association Between Sex Hormone Levels And Visceral Fat Accumulation In Postpartum Women**

Kayleigh Noble, Ayles Herrington

Faculty Mentor: Katherine Ingram

**Introduction:** Pregnancy involves several physiological changes, two of which include hormone fluctuation and increased abdominal fat. An increase in body fat is important for providing adequate nutrition to the fetus. Hormone fluctuation aids in the development of both the fetus and the mother. While some addition of body fat is needed, there is a concern about where the fat is deposited. Certain sex hormones are associated with fat accumulation in the abdomen, or visceral fat. This is of concern because abdominal fat is associated with an increased risk for diabetes, cardiovascular disease, hypertension and hyperlipidemia. In non-pregnant women, high abdominal fat levels are associated with low levels of sex hormone-binding globulin. This relationship in postpartum women is unknown, therefore this research is important to pursue.

**Objective:** The purpose of this research is to examine the relationships between sex hormone levels and abdominal body fat during the postpartum period

**Methods:** Sixty pregnant women between the ages of 18-35 will be recruited to participate in our study. Participants will come to our laboratory for testing approximately one month after having their baby. Body composition will be assessed through several body measures, including skinfolds, waist and hip circumferences, iDXA, BodPod and Bioelectrical Impedance Analysis. A fasting blood draw will be used to analyze for testosterone, estradiol, progesterone and sex hormone-binding globulin. To account for the effects of fitness, cardiorespiratory fitness will be measured with a submaximal treadmill tests. Subjects will be asked to return three more times over the course of the year, in which body composition and blood will be assessed again.

**Results:** This study is currently pending IRB approval to start recruiting participants. Data collection will begin in fall of 2015.

**Discussion:** The purpose of this study is to analyze the relationship between sex hormones and body fat accumulation in the postpartum period. This study is important because of the many risks associated with a high level of abdominal fat. Gaining knowledge about the influence of sex hormones on body fat distribution in the postpartum woman will help researchers and clinicians better understand the complex array of factors that are associated with weight control and maternal health following pregnancy.

## **Maternal Abdominal Fat And Birth Weight**

Mary Kate Higgins, Ayles Herrington

Faculty Mentor: Katherine Ingram

Research indicates that a correlation exists between weight at birth and health later in life. Babies that are small for their gestational age have a high risk of developing cardiovascular disease, while babies that are large for their gestational age are more likely to become obese in their adult lives. Maternal weight gain during pregnancy is a major determinant for the weight of the baby at birth, however little is known about the role of maternal body composition in intrauterine development. The objective of this study is to determine if a relationship exists between maternal body composition, and specifically abdominal fat, and infant birth weight.

Ten women, aged 18-34, were recruited from WellStar Kennestone OB/Gyn during their first pregnancy. Participants were free from diabetes prior to pregnancy and had a BMI of 18-35. Measurements of abdominal fat were obtained between 17 and 22 weeks of pregnancy by ultrasound. Birth weights were collected from hospital records. The ultimate goal for the study is to recruit eighty women, but only preliminary results are presented in this report. The current data will be analyzed for correlations between maternal abdominal fat during pregnancy and birth weight. When more participant data becomes available, additional analyses will be performed with controls for maternal age, gestational age at birth, insulin sensitivity, and maternal fat free mass. These results will be useful to maternal health professionals worldwide for understanding the importance of maintaining a healthy body composition during pregnancy.

## **Utilization Of Workplace Health Promotion (WHP) Programming To Improve Health Literacy**

Lyric Hayden-Lanier

Faculty Mentor: Mari-Amanda Dyal

### **Organization**

The organization is a municipal workplace in metro Atlanta, GA with an authorized strength of 1,500 individuals. The organization houses a wellness program that goes to great lengths to provide evidence-based best practices that focus on providing employees with knowledge, skills, and application opportunities that improve health. The latest push is related to health literacy, which has been identified as a priority area in the healthcare setting but has only been recently and minimally explored in the workplace setting.

### **Program Plan**

The wellness program provides knowledge and skills for improvement of health outcomes on several levels: promotion, prevention, treatment, management, and diagnostic. While knowledge and skills are important, an employee's ability to obtain, process, and understand the knowledge and skills is equally important, which sets the stage for occupational health literacy (OHL), an extension of health literacy that influences the degree to which employees make appropriate health decisions in the workplace.

The healthcare setting has identified specific skills (prose literacy, document literacy, and numeracy) for health literacy that improve knowledge and skill acquisition, application, and adherence. The current research demonstrates a translation for the workplace setting that provides guidance for assessment and improvement of OHL in workplace health promotion (WHP) programming.

### **Evaluation Plan**

Incorporating OHL into WHP programming underwent several forms of evaluation. An annual health risk assessment (HRA) with an OHL-oriented component provided data that was used to determine increases/decreases in OHL. Exit interviews followed specific program offerings to assess immediate absorption of OHL, and focus groups evaluated the value of

OHL in WHP programming.

#### Program Impact

HRA data shows increases in OHL among program members, more specifically 29% experienced an overall improvement in FY2013-14 (n=383) with specific skill increases as follows: 35% for prose literacy, 69% for document literacy, and 45% for numeracy.

Program planning has incorporated several improvements based upon exit interviews and focus groups such as emphasis on critical review of health promotion print materials, practice with tabulating percent values of intake and output, and offerings that focus on communication between practitioners and partakers.

Research and practice implications for this OHL translation set the stage for further steps to incorporate additional health literacy skills into WHP programming so that employees can be well-informed consumers of knowledge and skills in and out of the workplace.

### **Georgia Latino & Immigrant-Serving Nonprofit Organizations: Identifying And Mapping Human Services**

Karen Costa, Gabriela Mosso

Faculty Mentor: Darlene Rodriguez

In the past decade, the Hispanic/Latino population has grown to become the largest and fastest growing minority group in the United States (Passel, 2008; U. S. Census Bureau, 2006). Such a demographic shift has led scholars and practitioners to pay increased attention to Latinos' needs and concerns, especially regarding legal and illegal immigration. Considerable debate surrounds how to serve native and immigrant Latinos. However, limited research, using nonprofit sector organizations as the unit of analysis, has sought to understand the empirical impact of Latino-serving nonprofit organizations and their effectiveness.

This research builds upon original field and survey data of 201 Georgia Latino-serving nonprofit organizations between 2004-2008, during the height of the pro- and anti-immigration related demonstrations and legislation throughout the country, and in specific Georgia. Nearly a decade later, we examine if the organizations originally studied are in existence and if so, what how have they evolved. This is all the more relevant with changes in federal policy in the last two years, and most recently an Executive Order issued by President Obama, on November 20, 2014, regarding immigration.

This is a multi-phase project, hence what is being reported on at this time is the updated 2015 database of Latino- and immigrant-serving nonprofit organizations in Georgia. The database consists of information obtained for each organization through the National Center for Charitable Statistics and their IRS Form 990. This was followed up with a review of their websites, to determine what infrastructure, fiscal, and policy-related changes have taken place within the organization, provided they still exist. This sets the stage for comparative analysis over a ten-year span regarding this sub-sector.

NOTE: Funding to underwrite this phase of the research was provided by the SALT Scholars

Program. The student researchers and I express our gratitude for the financial support offered to collaborative gain new skills to advance this research.



# Poster Placement Assignment

**1:** *Message Design Logics Theory And Messaging In The Ebola Crisis*

Gregory Bieger

Faculty Mentor: Deanna Womack

**2:** *A Linguistic Phenomenon: Code-Switching In Media And Advertisement*

Rebecca Tuck

Faculty Mentor: Jeanne Bohannon

**3:** *Anonymous Discourse In Digital Spaces - A Microstudy*

Matthew Russell

Faculty Mentor: Jeanne Bohannon

**4:** *IDK, WTF: The Growth Of Acronyms from The Roman Empire To The iPhone 6*

Carson Long

Faculty Mentor: Jeanne Bohannon

**5:** *Just Text Me: Exploring Breakdowns In Human Communication And Technology*

Allyson Hight

Faculty Mentor: Jeanne Bohannon

**6:** *Math Education: A Failed Rhetorical Situation*

Elizabeth Melendez

Faculty Mentor: Jeanne Bohannon

**7:** *Mother Tongue Silenced: The Decay-ing Of The Gullah-Geechee Language And Culture*

Elizabeth Morris

Faculty Mentor: Jeanne Bohannon

**8:** *Talking White VS. Talking Black*

Sharon Roberts

Faculty Mentor: Jeanne Bohannon

**9:** *A Stormy Summer*

Suzanne McWhirter

Faculty Mentor: Melanie Sumner

**10:** *Love, A Dream*

Brittany Cordaro

Faculty Mentor: Melissa Keith

**11:** *Deviant Art? From The European Avant-Garde To Pop Culture*

Kevin Latta

Faculty Mentor: Federica Santini

**12:** *El Bloqueo Cubano*

Lourdes Gendreau

Faculty Mentor: June Laval

**13:** *Le Monde Naturaliste Dans "Le Ventre De Paris" D'Emile Zola : Une Approche Évolutive*

Emily Kraus

Faculty Mentor: William Griffin, Federica Santini

**14:** *The Fox And The Curtain: On Translating The Poetry Of Alda Merini*

Emily Kraus

Faculty Mentor: Federica Santini

**15:** *Love And Death: A Creative Look At The European Romantic And Decadent Movements*

Levan Lamont

Faculty Mentor: Federica Santini

**16:** *A Family's Experience Caring For A Child Living With Spinal Muscular Atrophy*

Samantha Lawson

Faculty Mentor: Brandon Lundy

**17:** *An Anthropological Analysis Of The Chalcolithic Material Culture Found At Pachamta In The Mewar Plain, India*

Charles Brummeler

Faculty Mentor: Teresa Raczek

**18:** *And What Are You Going To Do With That?: The Usefulness And Applications Of An Anthropology Degree In The Modern Business World*

Cheyenne Dahlmann

Faculty Mentor: Brandon Lundy

**19:** *Bone Deterioration Due To Domesticated Rodent Scavenging*

Logan Howard

Faculty Mentor: Alice Fazlollah

**20:** *Craft Beers Make "Hoppy Locals"*

Cristal Inoh

Faculty Mentor: Brandon Lundy

**21:** *Diversity And Tolerance: Acceptance Of Minority Religious Faiths On A University Campus*

Michele Kumar

Faculty Mentor: Brandon Lundy

**22:** *Examination Of Blunt Force Skeletal Injuries As A Result Of Falls From Heights*

Michele Kumar

Faculty Mentor: Alice Fazlollah

**23:** *Effects Of Speed And Vehicle Weight On Pedestrian-Motor Vehicle Collisions*

Connor Plumley

Faculty Mentor: Alice Fazlollah

**24:** *Forensic Examination Of Sharp Force Trauma*

Anthony Rotoloni

Faculty Mentor: Alice Fazlollah

**25:** *Gardening In North Georgia: The Contemporary Struggle*

Stormy Jeans

Faculty Mentor: Brandon Lundy

**26:** *Going Greek: The Implications Of Collegiate Hellenic Culture At A Southeastern Comprehensive University*

Joshua Guilbaud

Faculty Mentor: Brandon Lundy

**27:** *How Does The Exploitation And Degradation Of Finite Natural Resources By Industrial Oil Producers Effect Our Future Planetary Environment*

Zachary King

Faculty Mentor: Jun Tu

**28:** *Investigation Of The Effects Of Canid Scavenging On Remains*

Lindsey Goff

Faculty Mentor: Alice Fazlollah

**29:** *Cultural Critics: An Intimate Look At The Complexity Of Pursing Comedy In A Public Arena*

Kristofer Wachner

Faculty Mentor: Brandon Lundy

**30:** *Macroscopic Analysis Of Variations Of Machete Damage In Dismemberments Of Long Bone*

Kristofer Wachner

Faculty Mentor: Alice Fazlollah

**31:** *Make My Datum: Student Perceptions Of The Geographic Information Science Degree*

Kanne Ikwuezunma

Faculty Mentor: Nancy Hoalst-Pullen

**32:** *Demonic Dogs: How Newspapers Portray Pit Bulls In The Atlanta Area And Help Shape Public Opinion*

Jessica Williams

Faculty Mentor: Brandon Lundy

**33:** *Mummification: A Critical Literature Analysis*

Jessica Williams

Faculty Mentor: Alice Fazlollah

**34:** *Positional Relationship Of The Fibula Relative To The Tibia In Collegiate Athletes*

Katherine Lane

Faculty Mentor: Alice Fazlollah

**35:** *Putting On A Show: Coping Strategies In The Restaurant Industry*

Madison Brennan

Faculty Mentor: Brandon Lundy

**36:** *Replicability Of Archaeological Quartz Lithic Analysis*

Staci Lusk

Faculty Mentor: Teresa Raczek

**37:** *Symbolism In Indian Pottery Production*

Staci Lusk

Faculty Mentor: Teresa Raczek

**38:** *Sex Estimation Techniques Of The Adult Pelvis*

Elizabeth Pomawski

Faculty Mentor: Alice Fazlollah

**39:** *"We Need To Talk": Methods, Timing, And Motivation For Coming Out LGBTQ*

Lindsay Montgomery

Faculty Mentor: Brandon Lundy

**40:** *Sharp Force Trauma Analysis: Hacking Wounds From Axe And Hatchet*

Lindsay Montgomery

Faculty Mentor: Alice Fazlollah

**41:** *Simulation Of A Civilian Blast Trauma Event In A Public Area*

Michael McClung

Faculty Mentor: Alice Fazlollah

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

David Zeh

Faculty Mentor: Nancy Hoalst-Pullen

**43:** *Stay-At-Home Fathers And Flexible Masculinities*

Brittany LaFace

Faculty Mentor: Brandon Lundy

**44:** *Structure And Composition Of The Kennesaw State University: Past And Present*

Stephanie Roper

Faculty Mentor: Nancy Hoalst-Pullen

**45:** *Sustainability Perceptions In The Brewing Industry: Regional/Regional Craft, Microbreweries And Brewpubs*

William Blake Pierson

Faculty Mentor: Nancy Hoalst-Pullen, Mark Patterson

**46:** *The Availability Of Puplic Transport And its Effect On Carbon Dioxide Pollution In Atlanta*

Nikki Lyons

Faculty Mentor: Jun Tu

**47:** *The Revolution Of Fitness: A Contemporary Analysis Of How Technological And Personal Training Influences Consumer Behavior In Two Atlanta, Georgia Fitness Centers*

Krista Cross

Faculty Mentor: Brandon Lundy

**48:** *The Social Construct Of Race In Forensic Anthropology: Complications In Ancestry Estimation*

Irina Paymer

Faculty Mentor: Alice Fazlollah

**49:** *Transitions In Material Culture And Transitions In Social And Economic Values: An Ethnoarchaeological Study Of A Basket-Weaver In Udaipur, India*

Duke Thomas

Faculty Mentor: Teresa Raczek

**50:** *Variability In Decomposition Dependent On Water Environment*

Raeanna Duck

Faculty Mentor: Alice Fazlollah

**51:** *A Study Of Undergraduate Alcohol Consumption: Students Who Perceive One Or More Of Their Parents To Have A Drinking Problem Versus Students In Greek Life*

Jessica Dean

Faculty Mentor: Saul Alamilla

**52:** *An Analysis Of Male Versus Female Juror's Attitudes And Decision-making In A Rape Case: The Influence Of Legal Definitions And Rape Myth Beliefs*

Victoria Meier

Faculty Mentor: Dorothy Marsil

**53:** *An Assessment Of Undergraduate Research In The First Year*

Leslie Small

Faculty Mentor: Amy Buddie

**54:** *Can The Misattribution Of Blame Contribute To Falsely Taking The Blame*

Geena Washington, Olivia Alexander

Faculty Mentor: Jennifer Willard

**55:** *Effects Of Menstrual Cycle On Time Urgency And Anxiety*

Torrey Hill, Nicole Davis, Mariah Corey, Timothy Thurman, Courtney Skeete

Faculty Mentor: Ebony Glover

**56:** *Effects Of Menstrual Cycle Phase In Anxiety Responses*

Timothy Thurman, Nicole Davis, Mariah Corey, Torrey Hill, Courtney Skeete  
Faculty Mentor: Ebony Glover

**57:** *Menstrual Cycle Effects On OCD Symptoms And Severity*

Nicole Davis, Torrey Hill, Mariah Corey, Timothy Thurman, Courtney Skeete  
Faculty Mentor: Ebony Glover

**58:** *Sex And Menstrual Cycle Effects On Autonomic Nervous System Activity*

Mariah Corey, Nicole Davis, Timothy Thurman, Torrey Hill, Courtney Skeete  
Faculty Mentor: Ebony Glover

**59:** *Tobacco Use And Anxiety In Premenopausal Women*

Courtney Skeete, Nicole Davis, Timothy Thurman, Torrey Hill, Mariah Corey  
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**60:** *Reducing Automatic Stereotyping And Increasing Humanization Through Situational Attribution Training*

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**63:** *Comparing Faculty's And Student's Perceptions Of Chemical Representations*

Kayla Yoder, Elaina Genton  
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**64:** *Determining Usability Of The SCI Hub Concept Inventory Database*

Zachary Farley  
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**65:** *Dissolution And HPLC Analysis Of Glucosamine Tablets: An Analytical Method Transfer That Failed*

Andrew Warren, Cory Turner

Faculty Mentor: Marina Koether

**66:** *eNOS Regulation By MAP Kinases*

Myles Robinson, Virginie Stein

Faculty Mentor: Carol Chrestensen, John Salerno, Jonathan McMurry

**67:** *Gold Nanoparticles Immobilization On Fibrous Substrates: Heterogeneous Catalysis*

John Elliott, Theresa Kusumadjaja

Faculty Mentor: Bharat Baruah

**68:** *Mixed N-Heterocyclic Carbenes Based On Triazine Backbones: Synthesis And Catalytic Applications*

Aqsa Adnan, Chidi Amah

Faculty Mentor: Daniela Tapu

**69:** *Multisite Phosphorylation Of eNOS By Various Kinases And The Impact Of Calmodulin*

Alberto Romero, Mallory Welton

Faculty Mentor: Carol Chrestensen, John Salerno, Jonathan McMurry

**70:** *Notetaking: A Window Into Metacognition And Student Success In Chem 1211*

Katarina Dass, Elizabeth Johnson

Faculty Mentor: Michelle Dean

**71:** *Structural Optimization And Determination Of Dissociation Energies For Water Clusters Utilizing Computational Techniques*

Zobia Qureshi

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**72:** *Surfactant Assisted Exfoliation Of Graphite Into Graphene: Water Purification Properties Of Graphene*

Garrison Kohler

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**73:** *Synthesis Of 1,3-O,S-Esters*

James Law, David Kercher

Faculty Mentor: Christopher Alexander



**74:** *Synthesis Of Alpha-Hydroxy Phosphonates From Aldehydes And Ketones*

Jazmine McIntyre, Andrew Camp, Matthew Shipp, Derek Amponsah, James Law

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**75:** *Teacher And Student Perceptions Of Biochemistry Representations*

Chloe House

Faculty Mentor: Kimberly Linenberger

**76:** *Time Dependent Phosphorylation In eNOS Linked Signal Transduction Pathways In Endothelial Cells Reveals Feedback Mechanisms*

Alden Lathrop, Joseph Blake, Nicholas Talley

Faculty Mentor: John Salerno

**77:** *Toward The Synthesis Of A Star-Shaped Tris(N-Heterocyclic Carbenes)*

Jordan Ossie Buckner, Chance Boudreaux, Bradley Norvell

Faculty Mentor: Daniela Tapu

**78:** *Towards Water Soluble Porphyrins*

Brandon Easparro

Faculty Mentor: Janet Shaw

**79:** *Carbon Balance Of Green Roof Plants*

Keyaira Littles

Faculty Mentor: Matthew Weand

**80:** *Developing A Research Method To Evaluate The Effect Of Drought On Two Riparian Tree Species, With And Without Mycorrhizae*

Reuben Hilliard, Chelsea Harris, Joshua Hashemi

Faculty Mentor: Paula Jackson

**81:** *Do Eastern Mosquitofish (Gambusia Holbrooki) Take Advantage Of The "Cheerios Effect" To Consume Small Planktonic Prey*

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**82:** *Molecular Analysis Of Gut Content In The Striped Bark Scorpion Centruroides Vittatus*

Melissa Green, Paige Henley, Demtrius Geiger

Faculty Mentor: Thomas McElroy, Eric Albrecht

**83:** *A Differential Equation Model Examining The Impact Of Post-Mortem Practices On The Spread Of Ebola*

Saniita FaSenntao, Denise Hernandez

Faculty Mentor: Meghan Burke

**84:** *A Search For Optimal Living Arrangements For Kennesaw State University Students Completing A Four-Year Degree*

Cody Baum, Justin Farmer, Katelyn Marsala, Wesley Queen, Allison Sommers

Faculty Mentor: Flor Espinoza

**85:** *Hall Pre-Colorings Of Graphs*

Hunter Rogers

Faculty Mentor: Jennifer Vandenbussche

**86:** *Models Of Progressive Addiction Of: Alcohol, Alprazolam, Cannabis, And Cocaine*

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**87:** *Helicobacter Pylori Type III Secretion Genes fliI And fliJ Are Required For Efficient Flagellar Assembly And Motility*

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**88:** *Identification Of Novel Kallmann Syndrome Genes By Fluorescence-Activated Cell Sorting And Expression Profiling*

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**89:** *Molecular Characterization Aspergillus Flavus In Peanuts*

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**90:** *Ontogenetic Variability In Centruroides Vittatus (Bark Scorpion) Venom Toxicity*

Kelci Knight, Whitney Smith

Faculty Mentor: Eric Albrecht, Thomas McElroy

**91:** *Purification Of Recombinant Lingulodinium Polyedrum Luciferase Protein*

Mareidith Sapp

Faculty Mentor: Susan Smith

**92:** *Putative Voltage Sensitive Enzymes In Prokaryotes*

Joshua Clark

Faculty Mentor: Susan Smith

**93:** *Syndecan And Wnt Signaling Are Required To Orient Early Embryonic Cell Migration In C. Elegans*

Aaron Pital

Faculty Mentor: Martin Hudson

**94:** *Understanding Voltage-Gated Ion Channels Via Bioinformatic Analyses*

Nadav Topaz, Jonathan Winkjer, Cori Moore, Rosalyn Price

Faculty Mentor: Tsai-Tien Tseng

**95:** *Black Hole Jets In Active Galaxies*

Aaron Lowery

Faculty Mentor: David Garofalo

**96:** *Investigating Bioactive Borate Glass For Biological Applications*

Samuel Parker, Gregory Humble

Faculty Mentor: Kisa Ranasinghe

**97:** *Studying The Aerodynamics Of Wind Turbines using LabVIEW*

Chris Rose

Faculty Mentor: Ratnappuli Kulasiri

**98:** *Benefits And Methods Of The Scale Practice For The Beginner Piano Students*

Ai Nguyen

Faculty Mentor: Soohyun Yun

**99:** *Motivating Young Beginning Piano Students By Rhythm Counting Activities*

Soyoun Sheehan

Faculty Mentor: Soohyun Yun

**100:** *Incorporating The Art Of Dance In The Piano Lesson*

Haley Myers

Faculty Mentor: Soohyun Yun

**101:** *Popular Music Arranging As A Tool To Teach Functional Theory*

Beth Anne Ake, Haley Myers, Soyoun Sheehan, Ai Nguyen

Faculty Mentor: Soohyun Yun

**102:** *Contrasting Technological Views Between Brazil And United States*

Samantha Slicker, William Tyler, Sean Whealton

Faculty Mentor: Amy Buddie, Ken Hill

**103:** *Automatic Integrated Vehicle Jack*

Eliana Pippen, Christopher Beals, Duy Tran, Adam Shirley

Faculty Mentor: Mir Atiqullah

**104:** *Dynamic Elastography*

John Cronin, Anderson Drew, Thomas Ryles

Faculty Mentor: Muhammad Salman

**105:** *Heavy Lifting Clutch*

Jose Orozco, Waheed Choudhry, Syed Humail

Faculty Mentor: Mir Atiqullah

**106:** *Long Hair In Football: Visible Impact, Invisible Penalty*

Emerald Alexis

Faculty Mentor: Laura Ruhala, Richard Ruhala

**107:** *Rescuer*

Brett Hardy, Brian Maki, Parin Patel, Erick Steele

Faculty Mentor: Mir Atiqullah

**108:** *Sound Levels Of Chiller Units On KSU Marietta Campus And Consequences*

Jacob Davis

Faculty Mentor: Richard Ruhala

**109:** *Two-Way Powered Rickshaw*

Karen Boze, Ubaidullah Muhammad, Matthew Hamilton

Faculty Mentor: Mir Atiqullah

**110:** *Wheelchair Carrier For Use In Airports*

Chase Davani, Luke Mullins, Greg Paris, Donald Lockwood

Faculty Mentor: Mir Atiqullah

**111:** *Association Of Physical Inactivity With Visceral Fat Accumulation In Pregnant Women*

Ashlyn Showalter, Danielle Brown

Faculty Mentor: Katherine Ingram

**112:** *Is Prenatal Exercise Participation Associated With Reduced Discomforts Of Pregnancy*

Danielle Brown, Melanie White, Alexandra Grant, Taylor Swanson

Faculty Mentor: Katherine Ingram

**113:** *Is There A Relationship Between Visceral Fat Accumulation And Insulin Resistance In Pregnant Women*

JaBreia James, Michelle Scroggins, Alexandra Grant

Faculty Mentor: Katherine Ingram

**114:** *Is There an Association Between Sex Hormone Levels And Visceral Fat Accumulation In Postpartum Women*

Kayleigh Noble, Ayles Herrington

Faculty Mentor: Katherine Ingram

**115:** *Maternal Abdominal Fat And Birth Weight*

Mary Kate Higgins, Ayles Herrington

Faculty Mentor: Katherine Ingram

**116:** *Utilization Of Workplace Health Promotion (WHP) Programming To Improve Health Literacy*

Lyric Hayden-Lanier

Faculty Mentor: Mari-Amanda Dyal

**117:** *Georgia Latino & Immigrant-Serving Nonprofit Organizations: Identifying And Mapping Human Services*

Karen Costa, Gabriela Mosso

Faculty Mentor: Darlene Rodriguez

# Oral Presentation Schedule

**Convocation Center 2015: Pearl Young, Sarah Jia Min, and Sunil Pokhrel as judges, Chris Palmer as moderator**

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

*The Capture And Imprisonment Of Henry Laurens*

Aaron Clarke

Faculty Mentor: Jim Piecuch

**6:35pm - 6:50pm**

*The Hessian Jager In The New York And Pennsylvania Campaigns, 1776-1777*

David Ross

Faculty Mentor: Jim Piecuch

**6:55pm - 7:10pm**

*Thomas Jefferson, Scientist*

Travis Martin

Faculty Mentor: Jim Piecuch

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

*The Success Of Hashtags In Social Media Movements: A Linguistics Approach*

Hannah Smith

Faculty Mentor: Letizia Guglielmo, Chris Palmer

**7:35pm - 7:50pm**

*Ride Or Die: Gender & Survival In The Fast And Furious Franchise*

Andrew Kemp

Faculty Mentor: Letizia Guglielmo

**Convocation Center 1055: Sarah Holliday, Amy Buddie, David Glassmeyer as judges with David as the moderator**

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

*Modeling Traffic At An Intersection*

Saniita FaSenntao, Kaleigh Mulkey

Faculty Mentor: Anda Gadidov

**6:35pm - 6:50pm**

*Study Of Multiply And Completely Monotone Sequences And Functions*

Ryan Cottrill

Faculty Mentor: Yuliya Babenko

**6:55pm - 7:10pm**

*Optimal Recovery Of Solutions To Dirichlet Problem For Laplace And Poisson Equations Based On Incomplete Information*

Najia Bacha

Faculty Mentor: Yuliya Babenko

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

*Students' Thinking About Proportional Relationships Between Quantities Of A Circle*

Mariah Simmons

Faculty Mentor: David Glassmeyer

**7:35pm - 7:50pm**

*Applying The Gauss-Jordan Method For Group Inverse To An Irreducible Singular M-Matrix*

Jillian Kuether

Faculty Mentor: Jun Ji

**Burruss Building 109: Crystal Douglas and Sandra Barclay, judges, with Nyasha as the moderator**

**6:35pm - 6:50pm**

*The Effects Of Music Training In Primary School Children: Memory Improvement*

Kim Royer

Faculty Mentor: Edward Eanes

**6:55pm - 7:10pm**

*The Evolution Of Music Education From Ancient Greece To The 21st Century*

Sara Knapp, Madison Hall

Faculty Mentor: Edward Eanes

**7:15pm - 8:15pm**

*Depictions Of Leadership In Television, Film, And Advertising.*

E. Monique Jones, J. Kevin Brown, Leroy John, Timothy Saint-Fort, Wassim Khalek, J. TJ

Duhart, Akash Patel, Tenae Henderson, Erica Malcom, Ayanna Ward, DeVontre Echols,

William Lowman, Corinthian Grace, Caitlin Callaway, Sarah Coicou, Bethany Barrera, Austin

Molkie

Faculty Mentor: Nyasha GuramatunhuCooper

**8:20pm - 8:35pm**

*Leadership Development And Practice: A Narrative Of Peer Mentorship And Leadership*

Alicia Whittle

Faculty Mentor: Nyasha GuramatunhuCooper

## **Burruss Building 368: Mary Garner and Silvia Trejo as judges; Marina as the moderator**

**6:35pm - 6:50pm**

*The Impact Of Mycorrhizal Colonization On The Growth Of American Sycamore (Platanus Occidentalis) And Black Willow (Salix Nigra) Under Drought Conditions*

Joshua Hashemi, Reuben Hilliard, Chelsea Harris

Faculty Mentor: Paula Jackson

**6:55pm - 7:10pm**

*Toward The Synthesis Of New Polydentate N-heterocyclic Carbenes*

Chance Boudreaux, Jordan Ossie Buckner, Bradley Norvell

Faculty Mentor: Daniela Tapu

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

*REPSA-Directed Identification Of DNA-Binding Specificity For The E. Coli Transcription Factor LexA*

Kamir Hiam

Faculty Mentor: Michael Van Dyke

**7:35pm - 7:50pm**

*Dissolution Analysis Of Potassium Gluconate Tablets: The First Step In An Analytical Method Transfer*

Cory Turner, Andrew Warren

Faculty Mentor: Marina Koether

## **Burruss Building 371: Kristine Hwang and Linda Stewart as judges; Jessica Stephenson as moderator**

**6:35pm - 6:50pm**

*Mohamed Banawy's "The Valley" And The "Treasures Of Knowledge"*

Emily Knight

Faculty Mentor: Jessica Stephenson

**6:55pm - 7:10pm**



*Mami Wata: The Story Of A Femme Fatale*

Kelsey Moran

Faculty Mentor: Jessica Stephenson

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

*Angu Walters And Contemporary Cameroonian Art*

Stephanie King

Faculty Mentor: Jessica Stephenson

**7:35pm - 7:50pm**

*Rethinking The Representation Of Prostitution In Ancient Greek Vase-Painting*

Madeline Beck

Faculty Mentor: Kristen Seaman

## **Burruss Building 382A: Crystal Money and Mimi Endale as the judges; David Garafalo as the moderator**

**6:35pm - 6:50pm**

*Supermassive Black Holes Near The Birth Of The Universe*

Derrick Pruitt

Faculty Mentor: David Garofalo

**6:55pm - 7:10pm**

*Spinning Black Holes In The Universe*

Emily Hollingworth

Faculty Mentor: David Garofalo

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

*Crystal Nucleation Of Palladium Doped Lithiumdisilicate Glass*

Gregory Humble

Faculty Mentor: Kisa Ranasinghe

**7:35pm - 7:50pm**

*Understanding Zinc Trafficking During Snake Envenomation*

Evan Williams

Faculty Mentor: Eric Albrecht

# 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

Camille McDonald, Student Assistant, Center for Excellence in Teaching and Learning

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