



OFFICE OF UNDERGRADUATE  
RESEARCH AND INQUIRY

Florida Atlantic University

DISTINCTION  
THROUGH DISCOVERY

F I F T H

annual

UNDERGRADUATE  
RESEARCH SYMPOSIUM

04.03.2015



DISTINCTION  
THROUGH DISCOVERY

April 3rd, 2015

Live Oak Pavilion and  
Grand Palm Room  
Boca Raton Campus

# WELCOME

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Welcome to the 5th Annual Undergraduate Research Symposium, which showcases undergraduate students at FAU who are engaged in research, scholarship and creative activities. Students present their findings through poster or visual and oral or performing arts presentations, and represent all disciplines, all colleges, and all campuses of FAU.

Few activities are as rewarding intellectually as research and inquiry. In addition to the acquisition of invaluable research skills, students learn how knowledge is created and how that knowledge can be overturned with new evidence or new perspectives. Such scholarly activities engage students in working independently, overcoming obstacles, and learning the importance of ethics and personal conduct in the research process. The Office of Undergraduate Research and Inquiry (OURI) serves as a centralized support office for both faculty and students who are engaged in undergraduate research and inquiry. We offer and support university wide programs such as undergraduate research grants, annual undergraduate research symposia, and undergraduate research journals, to name a few. We also support all departments and all colleges across all campuses in their undergraduate research and inquiry initiatives.

**The Undergraduate Research Symposium is part of our University's Quality Enhancement Plan (QEP) efforts at expanding a culture of undergraduate research and inquiry at FAU.**

For more information on how OURI can help you, please visit our website at [www.fau.edu/our](http://www.fau.edu/our).

# SPECIAL THANKS TO:

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Council for Scholarship and Inquiry (CSI)

Distinction through Discovery committee members

Distinction through Discovery Peer Mentors

Division of Research

Division of Student Affairs

Faculty judges

Faculty mentors/advisors

Graduate and Professional Student Association (GPSA)

Graduate College

Graduate student judges

Student Government

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Undergraduate Studies

University Communications - Marketing and Creative Services

University Libraries

# ARTIST STATEMENT

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**Naadiya Mills**

**Undergraduate Major: Graphic Design**

My career path as a Graphic Designer is essentially the exploration and understanding of perception and creativity. Creativity has enchanted me since I was a child and continues to peak my curiosity. To take an idea or concept and place it firm into reality in a tangible form is nothing short of amazing.

As a Graphic Designer, I am a problem solver. My visual problem solving talent is limited to no one culture or discipline. It instead allows me to gain knowledge in different areas, while enabling me the ability to transcend different realities. Through my explorations, It is understood that to be perceived warrants an interaction which then has a subsequent response. The response is usually a thought however, it is the emotional response, the driving force behind human behavior that causes a strong impact to happen in a momentary occurrence.

The image on the cover of this book is a photograph of a dissected rose. While I would never forget the gesture in which the rose was given to me, the rose on the other hand would see an untimely faith. I soon began to view the rose as heroic, a visual symbol that represented an intangible experience in its form. I decided to immortalize this dying rose in a series of photographs. The photograph on the cover is the final state of the rose. This was the most intriguing part of the flower for myself.

Art and Design is much more than making things beautiful. I hope that for the span of my existence and beyond that when my work is perceived it would make for a memorable experience. FAU has given me a platform to refine my skills, as well as, actively explore and develop my creative talents and understanding.

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# AGENDA

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<b>Time</b>	<b>Event</b>	<b>Location</b>
8:00 a.m. - 2:00 p.m.	On-Going Registration	Outside of Live Oak Pavilion
7:30 a.m. - 8:30 a.m.	Light Breakfast	Live Oak Pavilion D
8:30 a.m. - 12:00 p.m.	Oral Presentations	Live Oak Pavilion A, B, C
12:00 p.m. - 1:15 p.m.	<b>Lunch</b> Welcome message President John Kelly Keynote Speaker: Robert Danzig, Hall of Fame speaker FAURJ co-editors	Live Oak Pavilion A-D
1:30 p.m. - 3:30 p.m.	Poster Presentations	Grand Palm Room
4:00 p.m. - 7:00 p.m.	Awards Ceremony and Social hosted by the Council for Scholarship and Inquiry	Live Oak Pavilion A-D

# KEYNOTE SPEAKER

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## Robert Danzig

### Common Powers in Cream of the Crop Leaders



Robert Danzig grew up in foster homes. His first job was as an office boy at Albany (New York) Times Union, and nineteen years later he was named Publisher of that newspaper overseeing 1,200 employees. Robert continued to excel to later become the President of Hearst Newspapers, a multi-billion revenue business. He took Hearst from \$3 million to \$300 million in profits, with 6,000 employees across the nation, in

cities like Houston, San Francisco, Seattle and San Antonio. His business career has spanned 46 years. In addition to being a highly successful corporate executive, Robert is also an author. He has published nine books two of which are, "Vitamins for the Spirit" and "The Leader Within You." Robert has had leadership roles in the Newspaper Association of America, Newspaper Advertising Bureau, New Directions for News and the American Press Institute. He was the first recipient of the National Speaker's Association Philanthropist of the Year Award and the "Champion for Children" award from the Child Welfare League of America. Robert is currently the Dean of The Hearst Management Institute and teaching faculty at New School University in New York.

As one of the nation's most spellbinding motivational speakers, and member of the coveted Speakers Hall of Fame, Robert Danzig centers his talk on a key concept he calls 'threads of life.' In his own words ... "threads of life are the people who crossed my path and gave me their gifts... and in giving me their gifts, I was able to grasp the threads that they were offering and weave these, over time (unconsciously and unwittingly), into a tapestry that became part of the story of my life and career." Part of Robert's message is the need to be aware of the gifts that are offered to you and to share the gifts that you have.



# ORAL PRESENTATION SCHEDULE

SESSION I  
8:30 a.m. -9:40 a.m.

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## Live Oak A

### Basic Sciences

#### Justin Amato

*Faculty Mentor: Evonne Rezler*

Integration of a Medicinal Chemistry Experiment into the Florida Atlantic Organic Chemistry Laboratory Curriculum: Dilantin Synthesis

#### Sean Cruikshank & Elizabeth Rubino

*Faculty Mentor: Grigoriy Kreymerman*

Laser Tweezers and Orbital Angular Momentum Photons

#### Andrew Horowitz & Brandon Macknofsky

*Faculty Mentor: Evonne Rezler*

Modeling Molecular Vibrations in Raman Spectroscopy for a General Chemistry Bonding Activity

#### Martha Narvaez & Chad Coarsey

*Faculty Mentor: Joseph Caruso*

Preliminary Characterization of Antibiotic-Producing Soil Bacteria Found by Fall 2014 Small World Initiative Lab Students

#### William Santiago

*Faculty Mentor: Patricia Snyder*

Application of a Remote Hosting Program in Conducting Molecular Modeling Research without Geographic Restrictions.

## Live Oak B

### Engineering

#### Liam Francis

*Faculty Mentor Allan Phipps*

FAU High GT-EV Supercar - Electrifying interest in STEM Education

#### Aimee Hanley, John Allison, Khezar Raja & Jameel John

*Faculty Mentor Tsung-Chow Su*

Eliminating Fluid Suspension in Tubing: Studying a One-Ended Closed System

#### Evan Latshaw

*Faculty Mentor Oscar Curet*

Understanding the Effects of Morphology on Ribbon Fin Propulsion with a Robotic Device

#### Maria Carolina Machado

*Faculty Mentor James VanZwieten*

Gulf Stream Potential to Harness Electrical Energy: Measurement Based Analyses

#### Austin Scharff

*Faculty Mentor Allan Phipps*

Changing the Current: Improving Performance of FAU's Electric Supercar

# ORAL PRESENTATION SCHEDULE

SESSION I  
8:30 a.m. -9:40 a.m.

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## **Live Oak C**

Behavioral, Educational &  
Social Sciences I

**Paul Donovan, Nicholas  
Terlonge & Dulani Wijeweera**

*Faculty Mentor: Monica Escalares*

Trends of the Hispanic Consumer Sentiment  
Index in the United States

## **Ashley Spring**

*Faculty Mentor: Michael Harris*

The Unknown of Addiction: an Analysis of the  
Subculture of a Recovery Community

## **Jennifer St. Sume**

*Faculty Mentor: Becky Mulvaney*

"L" is for Licentious: A Literature Review on  
Identity, Rhetoric, and the LGBTQ Counterpublic

**Samica Telhomme, Thomas Dunn  
& Ryanna Becker**

*Faculty Mentor: Monica Escalares*

Gender Gap in Hispanic Voting Behavior

## **Leehe Negri**

*Faculty Mentor: Alan Kersten*

Event Memory: Remembering Intrinsic Motions  
versus Extrinsic Motions

# ORAL PRESENTATION SCHEDULE

SESSION II  
9:50 a.m. -11:00 a.m.

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## **Live Oak A**

Health & Medical  
Sciences

### **Rachel Berrie**

*Faculty Mentor: James Hartmann*

Targeting Abnormal Metabolism in Breast  
Adenocarcinoma Cell Lines to Induce an  
Immunogenic Phenotype (Response?)

### **Randy Ellis**

*Faculty Mentor: Robert Vertes*

Antidepressant Efficacy of Dextromethorphan  
in the Forced Swim Test: An Extension of the  
NMDA Antagonist Paradigm for Major  
Depressive Disorder

### **Nathalia Gazaniga**

*Faculty Mentor: Vijaya Iragavarapu - Charyulu*

Increased CHI3L1 Levels due to Preexisting  
Pulmonary Inflammation Accelerates Breast  
Cancer Metastasis

### **Shalondria Sears**

*Faculty Mentor: Ewa Wojcikiewicz*

Single Cell Force Spectroscopy to Characterize  
the Interaction Between Two PfEMP1 Domains  
and Host Immune Cells

## **Live Oak B**

Music, Art, Literature, Theater,  
History & Philosophy

### **Erin Fee**

*Faculty Mentor: Michael Harrawood*

Reading Francis Bacon's "New Atlantis" as a Fable

### **Zachary Humphrey**

*Faculty Mentor: Michael Harrawood*

"The New Sincerity:" Finding Wallace's Literary  
Rebels in the Alt-Lit Poetics of Mira Gonzalez and  
Spencer Madsen

### **Nolan McKenna**

*Faculty Mentor: Daniel White*

Evangelical Christian Mission Trips in a  
Post-Colonial Culture

### **Aleksandar Vuk Nikolic**

*Faculty Mentor: Simon Glynn*

Reality: A Subjective Empirical Illusion

### **Carlos Pena**

*Faculty Mentor: Mauricio Almonte*

Pelota Dominicana

# ORAL PRESENTATION SCHEDULE

SESSION II  
9:50 a.m. -11:00 a.m.

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## **Live Oak C**

Behavioral, Educational  
& Social Sciences II

**Pieter Conradie &  
Giovanni Campusano**

*Faculty Mentor: Henning Haupt*

Color Space

**Lisa Deacon**

*Faculty Mentor: Evonne Rezler*

Integrating Computer-Based Technologies for  
Peer-Led Team Learning into Organic Chemistry I

**Lauren Koff**

*Faculty Mentor: Kevin Lanning*

Privilege, Entitlement and Honesty

**Kimberly Quinn**

*Faculty Mentor: Evonne Rezler*

Visualizing Organic Chemistry: A Multi-Media  
Approach to the Organic Chemistry Lab

# ORAL PRESENTATION SCHEDULE

SESSION III  
11:10 a.m. -12:00 p.m.

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## **Live Oak A**

Environmental, Ecological  
& Marine Sciences

### **Nicholas Brandimarte & Andrew Tabaque**

*Faculty Mentor: Dale Gawlick*

Determining Invasive Fish Species Distributions  
In South Florida

### **Blanca Martinez**

*Faculty Mentor: Keith Van de Riet*

Digital Fabrication Processes for  
Bio-Morphological Panels

### **Ian Moore**

*Faculty Mentor: William O'Brien*

The Political, Environmental, and Economic  
Impact of the Dry-cleaning Industry

### **Sara Thomas**

*Faculty Mentor: Jon Moore*

Lionfish Gastic Evacuation Rate

# POSTER PRESENTATION SCHEDULE

Grand Palm Room  
1:30p.m. -3:30 p.m.

## Basic Sciences

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- 1. Kerriann Badal**  
*Faculty Mentor: Robert Stackman*  
  
Exploring the Role of Rodent Hippocampal D1 Receptors in Non-Spatial Object Recognition Memory
- 2. Loren Barcenas**  
*Faculty Mentor: Koray Karabina*  
  
Biometrics: The New Face (or Fingerprint?) of Identification Technology
- 3. Daniel Benitez**  
*Faculty Mentor: Kate Detwiler*  
  
Paleopathological Analysis of a Pre-Columbian Native American population from Highland Beach Florida
- 4. Stevens Dormezil, Julia Seay, Sam Schlegel**  
*Faculty Mentor: Daniela Popova*  
  
The Mathematics and Art Connection--Algorithmic Classifications of Symmetry Groups
- 5. Juliana Gomez**  
*Faculty Mentor: Paul Kirchman*  
  
The Development of Inhibitory Neuron Distribution Through Ferret Visual Cortex
- 6. Zachary Harrison, Ryan Crichton**  
*Faculty Mentor: Daniel de Lill*  
  
Understanding the Role of Capping Ligands in Lanthanide Coordination Polymer Synthesis
- 7. Andrew Horowitz, Dominic Rucco**  
*Faculty Mentor: Evonne Rezler*  
  
Implementation of an Inquiry-Based Experiment Using Novel Cation- $\pi$  Research into the Undergraduate Organic Chemistry Labs at Florida Atlantic University

# Behavioral, Educational & Social Sciences I

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- 8. Christina Jean**  
*Faculty Mentor: Sarah Milton*  
Investigating the Expression of UCP2 in  
*Trachemys scripta* Tissues
- 9. Jessica Kris**  
*Faculty Mentor: David Binninger*  
Inducibility of Methionine Sulfoxide Reductase in  
*Drosophila Melanogaster*
- 10. Veronica Molina**  
*Faculty Mentor: Nwadiuto Esiobu*  
Genomic Diversity and DNA Fingerprints of the  
Oral Wash Microbiome in US and Southern  
Nigerian Populations
- 11. Andrea Padron, Wen-Chung Cheng**  
*Faculty Mentor: Korey Sorge*  
The Maxwell Coil
- 12. Paul Scesa**  
*Faculty Mentor: Lyndon West*  
New Acidic Terpenoids from  
*Pseudopterogorgia acerosa*
- 13. Kenneth Shelley**  
*Faculty Mentor: Daniel de Lill*  
Metal Cation Detection Using a Novel Small  
Molecule Chemosensor
- 14. Vallabh Suresh**  
*Faculty Mentor: Salvatore Lepore*  
Synthesis of Lariat Crown Ether Based  
Catalysts and Their Application in the  
Hydrolysis of Esters
- 15. Lee Sutherland, Chad Perna**  
*Faculty Mentor: Brenda Claiborne*  
Construction of a Musical Brain
- 16. Stephen Zorc**  
*Faculty Mentor: Stéphane Roche*  
Synthesis of Complex Polycyclic Scaffolds  
Incorporating  $\alpha$ -Amino Acids
- 17. Katherine Brana**  
*Faculty Mentor: Orin Kirshner*  
Sanctions: The Double-Edge Sword of  
Foreign Policy
- 18. Kayla Campbell**  
*Faculty Mentor: Mirya Holman*  
The Biological Theories of Crime and Causality
- 19. Chaunesey Clemmons**  
*Faculty Mentor: Michael Harris*  
Impact of Fragmentation in Determining  
Number of Individuals
- 20. Jessica Concepcion**  
*Faculty Mentor: Jeffrey Morton*  
The International Court of Justice  
and Regional Bias
- 21. Deniz Dolun**  
*Faculty Mentor: Mirya Holman*  
Determining Factors of Democratic  
Consolidation in Eastern Europe
- 22. Marina Giral Lores, Ryan Clukey, Jee Paik**  
*Faculty Mentor: Monica Escaleras*  
Hispanic Perspectives on Lifting the  
Cuban Embargo
- 23. Doren-Elyse Marquit**  
*Faculty Mentor: Susan Dyess*  
Meditation Practice for Nurse  
Leaders in Acute Care Settings.
- 24. Jimmy Mauk, Keith Ingham, Ryan Gondek**  
*Faculty Mentor: Monica Escaleras*  
Do Different Modes of Data Collection Yield More  
Extreme Positive Responses from Hispanics?

**25. Erik Rodriguez, Kevin Gajjar, Alexandra Acosta**

*Faculty Mentor: Monica Escaleras*

Health Care and Hispanics: The Disparity in Health Care Coverage and Affordability Between Genders

## Behavioral, Educational & Social Sciences II

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**26. Oceane Boulais, Max Torres**

*Faculty Mentor: Hari Kalva*

Applied Electronics Bootcamp: The Enhancement of Electrical Engineering Curriculum Through Student-Directed Learning Programs

**27. Joshua Conniff**

*Faculty Mentor: Monica Rosselli*

Drinking Behavior in Relation to Age of College Students

**28. Lizbeth Garcia, Gabriel Pena, Raiza Perez**

*Faculty Mentor: Paul Peluso*

Levels of Tension in Relation to Video Use in Therapy Sessions

**29. Katherine Gonzalez**

*Faculty Mentor: Monica Rosselli*

A Cross-linguistic Analysis of Language Effects on Personality Measures in Spanish-English Bilinguals

**30. Arthur Molinari, Marco Mandra**

*Faculty Mentor: Mate Thitisawat*

Community Performative Parametric Design

**31. Ana Moyano, Jazarae McCormick**

*Faculty Mentor: Rangasamy Ramasamy*

Understanding Autism and Collaboration Skills: Evaluation of Asynchronous Presentations for Postsecondary Students

**32. Jana Olivova**

*Faculty Mentor: Nancy Jones*

The Effects of Oxytocin and Cortisol Pre and Postpartum Levels in Mother-Infant Bonding

**33. Giselle Santos**

*Faculty Mentor: Monica Rosselli*

Neuropsychological Evaluation of Spanish-English Bilingual Pre-school Aged Children

**34. Evelyn Skinner**

*Faculty Mentor: Shihong Huang*

Assessment of Mobile Technology for Students with Autism Spectrum Disorder

**35. Janet Weinthal, Karim Raisa**

*Faculty Mentor: Edgar An*

STEM Education Through Underwater Robotics

## Business, Marketing, Public Administration & Finance

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**36. Joanna Bitton\***

*Faculty Mentor: Mirya Holman*

U.S. Navy vs. Marine Mammals



**37. Danielle Gordon\*, Daler Gilyazov***Faculty Mentor: Allen Smith*

Do Birds of a Feather Really Flock Together?:  
The Effects of Relatability of College Lifestyles  
in Ads Promoting the Starbucks Brand

**38. Michael Jofre***Faculty Mentor: Eduardo Fernandez*

HIPAA's Security Mechanisms for Medical Devices

**39. Henry June\****Faculty Mentor: Allen Smith*

Hedonistic or Epistemic Cultural Immersion: What  
Message Should Cruise Lines Emphasize? Insights  
from Photo Sorts Methodology

**40. Katherine Llanos\*, Jerry Oscar***Faculty Mentor: Allen Smith*

Are Stripped Down Versus Lifestyle Embellished  
Visual Concepts Prudent or Imprudent: Implications  
for Concept Test Design

**41. Nicole Perez***Faculty Mentor: Mirya Holman*

Possible Solution to Excessive Fishing in Biscayne Bay

## Engineering

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**42. Timothy Wehage, Christian Caracci, Bryan Mechmet,  
Julian Garzon***Faculty Mentor: Tsung-Chow Su*

Studying the Relationship between Harmonic Forces  
Acting on a Pipe with a Flowing Fluid and the Resulting  
Hydraulic Jump of the Jet Impacting a Circular Flat Plate

**44. Colin Callahan***Faculty Mentor: Eduardo Fernandez*

Multi-factor Authentication

**45. Brayán Delgado, Raquel Quinones***Faculty Mentor: Bassem Alhalabi*

Detecting Repetitive Motion in People with Autism

**46. Amir Ferouz, Anthony Pipitone, Norbert Nasi,  
Richard Gill***Faculty Mentor: Tsung-Chow Su*

The Formation of Water Rings around a Rotating  
Centroid

**47. Michael Foley, Matthew Zitani, Abel Ortega,  
Kyle Schiegner***Faculty Mentor: Tsung-Chow Su*

Water Cone Improvement Project

**48. Alyssa Harris, Denys Purdy***Faculty Mentor: Daniel Meeroff*

Characterization of Leachate Clogging Solids

**49. Andres Jaramillo, Derek Jolly, Farah Gumrawi***Faculty Mentor: Tsung-Chow Su*

Non-Newtonian Fluid Circular Hydraulic Jump

**50. Erik Lindstedt***Faculty Mentor: Tsung-Chow Su*

Comparison of the Rotational Behavior of Coffee  
Creamer in Two Different Liquid Media

**51. Andrew Long***Faculty Mentor: Edgar An*

Automated Chlorination System

**52. Luiz Medeiros***Faculty Mentor: Waseem Asghar*

Devising an Efficient System for Identifying  
Circulating Tumor Cells from Whole Blood

- 53. Stanley Merantus**  
*Faculty Mentor: Dronnadula Reddy*  
Correlation of Chloride Diffusivity and Electrical Resistance for Cracked Concrete
- 54. Bianca Mesa**  
*Faculty Mentor: Karl Von Ellenrieder*  
Development of an Autonomous Surface Support Vessel
- 55. Anthony Pipitone, Amir Ferouz, Michael Foley, Johnathan McAlistar**  
*Faculty Mentor: Erik Engeberg*  
Limited Movement Assistant to Arthritic Hands
- 56. Brandon Shaw, Jonathan Murphy, Dylan Trotsek**  
*Faculty Mentor: Daniel Meeroff*  
Stucco Removal Engineering
- 57. Dyllan To**  
*Faculty Mentor: Eduardo Fernandez*  
Misuse Pattern: Keyboard Injection through the USB Human Interface Device Class

## Environmental, Ecological & Marine Sciences I

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- 58. Benjamin Berglund**  
*Faculty Mentor: Dianne Owen*  
Nesting Habits of Florida Sea Turtles and Beach Characteristics
- 59. Nicholas Blume**  
*Faculty Mentor: Jeanette Wyneken*  
What are the Effects of Hooking Loggerhead and Leatherback Sea Turtles on Longline Fishing and How Do They Differ
- 60. Spencer Brown**  
*Faculty Mentor: Evelyn Frazier*  
Bacterial Community Analysis of Soil Samples beneath Decomposing *Sus scrofa* Carcasses
- 61. Brian Cooney**  
*Faculty Mentor: Evelyn Frazier*  
A Comparative Survey of Gopherus Polyphemus Hemoparasites in Two Differing South Florida Habitats
- 62. Sara Dempsey, Siddharth Satishchandran**  
*Faculty Mentor: Kate Detwiler*  
The Use of Camera Traps to Study Group Size of an Endangered African Forest Monkey
- 63. Kathryn Hermit**  
*Faculty Mentor: Caiyun Zhang*  
Mapping Potential Habitats of Lionfish in South Florida
- 64. Liana Houston**  
*Faculty Mentor: Jon Moore*  
Foraging Strategies: Mechanism for Niche Partitioning between *Octopus vulgaris* and *Macrotritopus defilippi*
- 65. Carly Lambert, Falon Velez**  
*Faculty Mentor: Kate Detwiler*  
A Comparison of DNA Degradation Between Aged and Recent Monkey Fecal Samples
- 66. Sarah Mitchell**  
*Faculty Mentor: Evelyn Frazier*  
Investigating Ground Penetrating Radar (GPR) Potential for Detecting Subsurface Gopher Tortoise Nests within South Florida Soils
- 67. Roberto Ramirez**  
*Faculty Mentor: Nwadiuto Esiobu*  
Getting to the Roots of Plant Invasion
- 68. Estevao Santos**  
*Faculty Mentor: John Baldwin*  
Genetic Identification of Juvenile Freshwater Apple Snails
- 69. Rachel Shanker, Kent Haizlett**  
*Faculty Mentor: Evelyn Frazier*  
Baseline Study for Identification of Parasites in Gopher Tortoises Found in Blazing Star and Pine Jog

**70. Narcissus Smith**

*Faculty Mentor: John Baldwin*

Comparison of Polymorphic Sites in *Caretta caretta* from the Dry Tortugas, Florida

**71. Jessie Stevens**

*Faculty Mentor: Elizabeth Murdoch Titcomb*

"Tiger Stripe" Phenomena in Indian River Lagoon Dolphins

**72. Michael Teti**

*Faculty Mentor: Scott Markwith*

Growth Rate Estimation of Neonatal *Pomacea maculata*

**73. Jonathan Troiano, Spencer Brown**

*Faculty Mentor: Evelyn Frazier*

Identification of Arthropod Species on Decomposing *Sus scrofa* in Florida

**74. Rebecca Tsang**

*Faculty Mentor: Mirya Holman*

The Gray Wolves' Path to Recovery

**75. Molly Winn**

*Faculty Mentor: Scott Markwith*

A Comparative Study on the Effects of Water Depth in Relation to the Egg Laying Events of *Pomacea maculata* and *Pomacea paludosa*

## Environmental, Ecological & Marine Sciences II

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**76. Rachel Bobich**

*Faculty Mentor: James Gammack-Clark*

Case Study: The Variance of Water Quality Parameters to Depth in Coupon Bight

**77. Annie Causey**

*Faculty Mentor: Leonard Berry*

Analyzing Changes in Salinity and Evaporation on Water Quality

**78. Andrew Fahmy\***

*Faculty Mentor: Mirya Holman*

The Implementation of a Cap and Trade Policy

**79. Alexander Garcia**

*Faculty Mentor: Xavier Comas*

Temporal Variability of Biogenic Gases in Peat Soils from the Everglades Using Capacitance Moisture Probes

**80. Megan Gastineau\***

*Faculty Mentor: Mirya Holman*

Urban Sprawl: The Invisible Destroyer of the Environment

**81. Avion Goordeen**

*Faculty Mentor: Leonard Berry*

Evaporation Rate with Variable Salinity

**82. Tyler Hoom\***

*Faculty Mentor: Mirya Holman*

Co-Development of Renewable and Nonrenewable Energy as a Solution to Environmental Degradation

**83. Daniele Leoce**

*Faculty Mentor: Tobin Hindle*

Littering Behavior and the Effect of Trash Management in a City Park

**84. Valerie Sapienza\***

*Faculty Mentor: Mirya Holman*

Urban Growth's Effect on the Everglades

**85. Carly Wagner**

*Faculty Mentor: Charles Roberts*

Mapping the Distribution of Salinity in Venetian Canals

# Health and Medical Sciences

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**86. Camilla Castro**

*Faculty Mentor: Vijaya Iragavarapu-Charyulu*

Chitinase-3-like-1 (CHI3L1) Expressed During Allergic Pulmonary Inflammation Promotes Metastasis of Mammary Tumor Cells to the Lung

**87. Lebaron Agostini**

*Faculty Mentor: Joseph Caruso*

Isolation and Characterization of Antibiotic-Producing Bacteria from South Florida Soil The Small World Initiative: Antibiotic Discovery

**88. Sean Bacha**

*Faculty Mentor: Joseph Caruso*

Isolation and Identification of Bacteria Making Antibiotics in the Soil of South Florida Canals: the Small World Initiative for Antibiotic Discovery at FAU.

**89. Andrew Bent**

*Faculty Mentor: Massimo Caputi*

Creation of SRSF1 and Tat CPP Chimeric Proteins as Therapeutic Agents Against HIV-1

**90. Zizah Blair**

*Faculty Mentor: Colin Hughes*

Variation in a Major Histocompatibility Gene is Maintained by Selection Imposed by Infectious Disease

**91. Mohamed Elbashir**

*Faculty Mentor: Joseph Caruso*

Antibiotic Drug Discovery

**92. Brandon Fico**

*Faculty Mentor: Chun-jung Huang*

The Impact of Obesity on Calprotectin Response to Acute Aerobic Exercise

**93. Brandon Gilliland**

*Faculty Mentor: Gregory Macleod*

Nf1 Mutations Impair Memory-Related Plasticity in the Drosophila Melanogaster Mushroom Body

**94. Harris Goldsmith, George Kaldas, Stephanie Khoury, Nora Alnoury**

*Faculty Mentor: Kwasi(James) Kumi-Diaka*

Chemotherapeutic Effects of the Topoisomerase-I Inhibitor, Topotecan, and the micronutrient, Vitamin C on Prostate Cancer Cells

**95. Danick Joseph**

*Faculty Mentor: Ceylan Isgor*

The Over-Expression of BDNF on Adult Neurogenesis and Seizure Vulnerability

**96. Michael Kiken**

*Faculty Mentor: Joseph Caruso*

Isolation of Antibiotic-Producing Bacteria from South Florida Soils: the Small World Initiative at FAU

**97. Mary Mansour**

*Faculty Mentor: Frank Mari*

Isolation of Conotoxin  $\kappa$ -PVIIA for in vivo Analysis in Shaker Channels of Drosophila Melanogaster

**98. Alexander Santos**

*Faculty Mentor: Joseph Caruso*

Discovery of Antibiotics from Unknown Soil Bacterium

**99. John Sousa**

*Faculty Mentor: Rui Tao*

Novel In Situ Hybridization Method Measuring Serotonin 2A Receptor mRNA Levels in Rats Exposed to MDMA

**100. Alexander Voitkov, Erick Espana**

*Faculty Mentor: Joseph Caruso*

Efficacy of Antibiotic Producing Material from FAU SWI Life Sciences Lab Tested against Close Relatives of ESKAPE Pathogens

# Music, Art, Literature, Theater, History & Philosophy

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**101. Valeria Baldocchi**

*Faculty Mentor: Myriam Ruthenberg*

The Controversial Usage of Neologisms in the Italian Language

**102. Joshua Fentanes\*, Maria Mecoli**

*Mentor: Angel Nevin*

Agnosia

**103. Annaleah Morse**

*Faculty Mentor: Sandra Norman*

Public History in the Digital Age

**104. Sonja Smith**

*Faculty Mentor: Marylou Naumoff*

Multiculturalism in America's Workplace

**105. Michelle Trujillo**

*Faculty Mentor: Gerald Sim*

See Her: Women's Representation in Contemporary Hollywood Film Culture

*\*Freshman Classroom Pilot Project*

# SPECIAL E-LEARNING SESSION

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Grand Palm Room  
1:30 p.m. -3:30 p.m.

## **Company Research in Operations Management**

### **Faculty:**

Ravi Behara

rbehara@fau.edu

561-297-2778

College of Business: IT & Operations Management

*This is a poster presentation of research on company operations conducted by over 250 students of the business core class in Operations Management.*

Each student conducts research into the 2014 operations at a unique Fortune 500 company. The students are part of a large in-class/distance-learning lecture capture video streaming format course. The research is based primarily on business databases and company regulatory filings of the publicly traded firms involved. In addition to understanding the industry context of the companies, specific operational challenges faced by them in 2014 and their accomplishments, are the focus of the students' research. Individual student posters are presented together in a slide show format.

# ABSTRACTS

## I. Oral Presentation Abstracts

## II. Poster Abstracts

(alphabetical by student's last name)

### **Integration of a Medicinal Chemistry Experiment into the Florida Atlantic Organic Chemistry Laboratory Curriculum: Dilantin Synthesis**

*Justin Amato, Andrew Horowitz*

**Evonne Rezler**

Charles E Schmidt College of Science:  
Behavioral Neuroscience

Students who enroll in the Organic Chemistry Laboratory course at Florida Atlantic University (FAU) usually aim for a career in medicine, pharmacy, or veterinary science. Hence we have undertaken the development of a novel Organic Chemistry Laboratory experiment which focuses on the synthesis of an anti-epileptic drug, 5,5-Diphenylhydantoin or Dilantin. In this experiment several key reaction mechanisms taught in Organic I and II Lecture courses will be reinforced through the hands-on experience of synthesizing Dilantin. In addition, students will research the history of the development, medical uses and the pharmacological properties of this routinely-prescribed medication. We anticipate that the large group of pre-health professional students in this course will appreciate and benefit from this new experiment due to its medicinal focus. Ultimately, our goal is to enhance the FAU Organic Chemistry Laboratory curriculum by connecting the learning goals in this course to medicinal applications.

### **Targeting Abnormal Metabolism in Breast Adenocarcinoma Cell Lines to Induce an Immunogenic Phenotype (Response?)**

*Rachel Berrie, Kevin Lang*

**James Hartmann,**

Charles E Schmidt College of Science: Biology

Most standard chemotherapies induce cell death by targeting DNA. Cancer phenotypes exhibiting the Warburg Effect primarily obtain ATP from glycolysis, producing a highly acidic tumor environment. 3-BromoPyruvate (3BP) inhibits enzymes required for aerobic glycolysis, forcing

oxidative phosphorylation, free radical production and death. Whether 3BP will induce an apoptotic-immunogenic cell death, maximizing uptake and presentation of dying breast cancer cells to the immune system is unknown. Mouse breast cancer cells exhibited 50% apoptosis at a concentration of 3BP 1000X lower than the therapeutic dose while doxorubicin required a dose equivalent to its therapeutic dose in order to achieve 50% apoptosis. Since 3BP does not cause severe immunosuppression seen with doxorubicin therapy, my results indicate it may be superior in inducing an apoptotic-immunogenic cell death. Discovering whether 3BP elicits markers of immunogenic death, such as HMGB-1, may further our understanding of cancer immunotherapy.

### **Determining Invasive Fish Species Distributions In South Florida**

*Nicholas Brandimarte, Andrew Tabaque*

**Dale Gawlik, Tobin Hindle**

Charles E Schmidt College of Science: Biology

We want to figure out how invasive fish species populations are distributed between urban, herbaceous, and forested habitats of south Florida. The two most prominent species of invasive fish based from the Florida Driving and Transportation sample data are Mayan Cichlids, originally from Central America, and African Jewelfish from Africa. The locations of sampling sites include urban, herbaceous, and forested canals located south of Lake Okeechobee and north of Alligator Alley (75). Methods of acquiring data include minnow traps that are adjusted to a fixed diameter of around 10 cm oval with a maximum width of 3 cm. An ANOVA will be used to compare relative abundances among landscape and habitat types.

### **Color Space**

*Pieter Conradie, Giovanni Campusano*

**Henning Haupt**

College for Design and Social Inquiry: Architecture

Color often plays a secondary role in architecture and is generally found as a single color on a single surface of an architectural element such as line, plane, or volume in order to enhance the three-dimensional composition. Through procedure and process, the intent of understanding color mediums and its properties redevelops how we see color and its influence towards space. Through our research we are exploring the relationship between color and space and its impact on our perception of depth, shape and atmosphere in architectural design. To understand the relationship between color and space we are conducting projects that explore the use of color as an architectural element.

### **Laser Tweezers and Orbital Angular Momentum Photons**

*Sean Cruikshank, Elizabeth Rubino*

**Grigoriy Kreymerman**

Wilkes Honors College: Physics

In the field of quantum optics, one idea that has been getting a lot of attention lately is that of micro-particle manipulation through the use of photons, specifically photons carrying either translational or orbital angular momentum. These types of photons are particularly interesting due to their uses in the life sciences with regards to the translational photon's ability to directly manipulate particles and the orbital angular photon's potential to unravel DNA spirals. Information technology also sees orbital angular photons as a new means of sending more data at once over long distances. Through this presentation, we will explain the underpinnings of both orbital angular momentum photons and matter manipulation through the use of radiation. We will also provide evidence of such photons being created as well as them being used to manipulate micro-particles through data we have collected from an experiment conducted at the optics lab in the physics department.



## **Integrating Computer-Based Technologies for Peer-Led Team Learning into Organic Chemistry I**

*Lisa Deacon*

**Evonne Rezler**

Charles E Schmidt College of Science: Chemistry

The Department of Chemistry & Biochemistry at Florida Atlantic University is conducting a study on the effects of integrating a web-based learning system for organic chemistry into our existing Peer-Led Team Learning "Orgo-BOND" discussion sections. In this new method, students worked in one hour sessions in groups on problems supplied by a commercial online homework system (Sapling Learning Inc.). Student performance on the American Chemical Society (ACS) standardized organic chemistry final exam was evaluated and compared with students in discussion sections from previous semesters where there was no computer based learning system. Results indicated that students using the computer assisted method statistically outperformed the students in the traditional paper based classes. Student attitudinal surveys also suggest an overall positive response towards the new intervention. Recommendations and impacts of these new computer based methods will be discussed.

## **Trends of the Hispanic Consumer Sentiment Index in the United States**

*Paul Donovan, Nicholas Terlonge, Dulani Wijeweera*

**Monica Escalares, Eric Levy**

College of Business: Economics

The Hispanic population is the fastest growing minority in the United States. In fact, the Hispanic population has more than doubled since the year 2000. Therefore, studying their buying habits and perceptions of the economy is vital to our future as a nation. The Hispanic population has been growing so rapidly that they are becoming a leading consumer base in the United States. For that reason, we calculate an important economic leading indicator such as

the consumer sentiment index but only for Hispanics. To do so we conduct a monthly survey of 500 Hispanics nationwide and ask them questions regarding their financial status, attitudes towards the economy, and their purchasing power. These questions can lead the way into discovering what the quickest growing populace in the U.S. thinks about the current conditions of our economy, as well as their perceptions of the economic outlook of the country in the future.

## **Antidepressant Efficacy of Dextromethorphan in the Forced Swim Test: An Extension of the NMDA Antagonist Paradigm for Major Depressive Disorder**

*Randy Ellis,*

**Robert Vertes**

Charles E Schmidt College of Science:  
Neuroscience & Behavior

Major depressive disorder affects approximately 300 million people worldwide, and all medical treatments for this disease have focused on a small set of neurotransmitters in the brain: serotonin, dopamine, and norepinephrine. A "Rule of Thirds" describes their efficacy: one third of patients never respond, one third respond and later cease responding, and one third experience lasting remission. The current study shows that dextromethorphan, a drug currently approved as a cough suppressant, is an effective antidepressant in the most widely used animal model of depression, the forced swim test. Dextromethorphan exerts its antidepressant action by modulating the activity of glutamate, a sparsely studied yet most prevalent excitatory neurotransmitter in the brain. This result warrants not only the conduction of human trials with this drug, but further investigation into the brain circuits controlling glutamatergic activity.

## Reading Francis Bacon's "New Atlantis" as a Fable

Erin Fee

**Michael Harrawood**

Wilkes Honors College: English

This project examines the utopic fictional narrative published by the scientist-philosopher Francis Bacon, "New Atlantis", as an early-modern fable. First I will address the seeming illogicality that Bacon, who soundly condemned frivolous fantasies as truth-corrupting "idols of the mind" in his "Essays and Religious Meditations", would later choose to write within that same genre. A comprehensive reading of Bacon's works, including his essays "Of Counsel" and "Certain Considerations For the Better Establishment of the Church of England" reveals that he viewed fables as a means to impart applicable truths through accessible stories. Just as he championed science as a path to humankind's betterment, Bacon's ideal literature aims to instruct and improve readers. By writing "New Atlantis" with the characteristics of a fable, which is by its very nature didactic, Bacon was able to transform his scientific and moral philosophy into a concrete model.

## FAU High GT-EV Supercar - Electrifying interest in STEM Education

Liam Francis,

**Allan Phipps**

College of Engineering and Computer Science:  
Mechanical Engineering

The FAU High Electric Vehicle Racing Team built a full-size, street legal electric supercar, the GT-EV. The GT-EV is undergoing testing to further analyze the characteristics of the car in preparation for the EV Challenge, a national competition held at the North Carolina Center for Automotive Research. Preliminary results suggest the GT-EV will have a range of over 100 miles, be capable of 0-60 mph in less than 5 seconds, and have a top speed of approximately 140 mph. The objective of the project since its inception

has been to spark interest in High School STEM education through hands-on, project-based learning, while also answering questions regarding viability of electric vehicles for the average consumer. Through this electric vehicle project, students have gained valuable hands on experience with technology that has the potential to become a dominant industry. The GT-EV will soon be seen on the streets of Boca Raton, educating the general public about the benefits of electric vehicles. Students will continue to research, modify, and test the GT-EV for years to come as they improve upon our original electric supercar.

## Increased CHI3L1 Levels due to Preexisting Pulmonary Inflammation Accelerates Breast Cancer Metastasis

Nathalia Gazaniga, Stephania Libreros, Ramon Garcia-Areas

**Vijaya Iragavarapu - Charyulu**

Charles E Schmidt College of Science: Biology

Inflammation is known to play a significant role in cancer. Chitinase 3-like-1 protein (CHI3L1) is involved in pulmonary inflammation. We have shown that mice with preexisting pulmonary inflammation have accelerated metastasis and higher circulating levels of CHI3L1. Expression of CHI3L1 by myeloid derived cells has been shown to promote pro-tumorigenic effects. Thus, we hypothesize that preexisting pulmonary inflammation leads to an increase in the production of CHI3L1 by myeloid derived cells resulting in accelerated breast cancer metastasis. Flow cytometric analysis of wildtype mice with preexisting pulmonary inflammation revealed an increase in pulmonary myeloid derived cell subpopulations. These subpopulations were further increased in these mice after tumor cell implantation. More importantly, CHI3L1 knockout mice induced with pulmonary inflammation showed a decrease in these cell subpopulations compared to wildtype mice and correlating with

decreased metastasis. Targeting specific immune populations could lead to safer and more effective strategies against breast cancer.

### **Eliminating Fluid Suspension in Tubing: Studying a One-Ended Closed System**

*Aimee Hanley, John Allison, Khezar Raja, Jameel John, Tsung-Chow Su*

College of Engineering and Computer Science:  
Mechanical Engineering

When a small tube is partially filled with water and closed at one end, the tension acting on the water surfaces hold the water in the tube, making efficient flow impossible. Inserting a small wire could produce a capillary effect to break the surface tension. To examine such effect, two tube sizes were tested; each was inserted with plastic coated wire of various diameters in an attempt to release the suspended water. In addition, a braided copper wire was also tested. It was found that inserting a plastic coated wire resulted in a higher flow-rate in tubes, whereas a braided copper wire improves the flow even more. It was concluded that with the insert of braiding of wires and increasing diameter of inserting wire, liquid flow could be improved in a partially filled closed tube. The result could have a significant implication in the design of catheter drainage tubes.

### **Modeling Molecular Vibrations in Raman Spectroscopy for a General Chemistry Bonding Activity**

*Andrew Horowitz, Brandon Macknofsky, Jerome Haky Andrew Terentis*

Charles E Schmidt College of Science: *Biology*

A new General Chemistry Bonding activity is being developed to visually demonstrate how molecules vibrate when excited by light in Raman and infrared spectroscopy. Our model is being constructed and adapted from the motorized molecular vibration model in the Molecular

Spectroscopy film of the 1962 CHEM Study [1]. Using a variable speed controller and motor as an oscillator, a ball and spring model representing carbon dioxide oscillates at increasing frequencies. As the frequency of the motor increases, the spring model oscillates faster and eventually assumes three distinct resonance states, analogous to the natural vibrational modes in an actual carbon dioxide molecule. This activity will be the first time General Chemistry students are exposed to a visual and interactive hands-on a model of a molecule displaying the effects of vibrational spectroscopy.

### **“The New Sincerity:” Finding Wallace’s Literary Rebels in the Alt-Lit Poetics of Mira Gonzalez and Spencer Madsen**

*Zachary Humphrey  
Michael Harrawood*

Wilkes Honors College: English Literature

In the conclusion of his 1993 critical essay “E Unibus Pluram: Television and U.S. Fiction,” David Foster Wallace predicts “The New Sincerity,” a novel literary movement comprised of authors whose central principles emphasize the creation of a vulnerable, seemingly naïve, and ultimately sincere product primarily in reaction to the metafictional and self-conscious irony so prevalent in postmodern fiction. In this presentation, I will argue that the poets Mira Gonzalez and Spencer Madsen, as members of the contemporary poetic movement known as “alt-lit,” undoubtedly match the characteristics of these “new literary rebels” that Wallace describes in his essay as well as appear to be heavily influenced by the work of Wallace himself, specifically his attempts to portray this novel sincerity within his 1996 magnum opus *Infinite Jest*.

## **Privilege, Entitlement and Honesty**

*Lauren Koff, Daniel Lopez, Melanie Thompson, Brian Pennington*

**Kevin Lanning**

Wilkes Honors College: Psychology

The objective of the research is to investigate the association between privilege (including socioeconomic status or SES) and honesty (cheating behavior). The work will further our knowledge of perceptions of social justice and the mechanisms underlying unethical behavior. Participants will complete a questionnaire on Amazon MTurk to measure constructs of privilege (subjective SES, race, education, occupation, gender, age) and unethical behavior (participants complete three skill and chance-based tasks, each of which will afford the opportunity to report scores honestly or dishonestly). Participants will be randomly assigned to either a money (participants are told they can win a bonus of \$1 for successfully completing tasks) or intelligence (participants are told the tasks are measuring their intelligence) condition to incentivize unethical behavior. Following Piff (2012), we expect to find that individuals who are less privileged are more likely to report scores honestly, and, conversely, that those who are privileged are more likely to cheat. In addition, we further expect that participants in the money condition will be more likely to cheat than those in the intelligence condition.

## **Understanding the Effects of Morphology on Ribbon Fin Propulsion with a Robotic Device**

*Evan Latshaw, Hanlin Liu*

**Oscar Curet**

College of Engineering and Computer Science:  
Mechanical Engineering

The Black Ghost Knifefish of South America uses a propulsion mechanism known as a ribbon fin, a long fin traveling from the dorsal to the anus of the fish, allowing

three dimensional movements. A robotic fin system built by students at Florida Atlantic University, under advisement from Dr. O. Curet, is used to experiment on changing fin morphology. Fifteen segments of links and gears, or nodes, are connected together in a series, each oscillating an individual ray extended perpendicular to the serial gear connection. This mechanism is designed to oscillate the rays in a sinusoidal wave pattern, resembling the Knifefish. The ray height was varied from 20 mm to 70mm with a constant length, oscillating up to 6 Hz. Our data suggests there is an optimal ratio between fin height and fin length at certain frequencies based on the propulsive efficiency of the fin.

## **Gulf Stream Potential to Harness Electrical Energy: Measurement Based Analyses**

*Maria Carolina Machado, Allan Callou, Isabella Pinos*

**James VanZwieten**

College of Engineering and Computer Science:  
Energy Engineering

The focus of this measurement based analyses is quantifying the spatial distribution of the kinetic energy available from the Gulf Stream current. This analysis is conducted to guide the site selection process for commercial turbines without potential biases that numerical models can introduce. Drifter data from the World Ocean Circulation Experiment are used to map the energy density from South Florida to North Carolina, showing that the most energy dense areas exist off the east coast of Central Florida. Bottom and vessel mounted ADCP measurements are used to conduct a more detailed study near 26°N and 27°N respectively. These results quantify the energy profiles in these regions suggesting that 54% more energy is available at 27°N than at 26°N. The drifter data and ADCP are great tools for assessing the spatial distribution of current energy and it highlights the potential of the Gulf Stream current as a hydrokinetic energy source.

## **Digital Fabrication Processes for Bio-Morphological Panels**

Blanca Martinez, Jessene Aquino - Thomas

**Keith Van de Riet**

College for Design and Social Inquiry: Architecture

Conventional seawall edges accommodate urban development along water ways and increase economic value by providing waterfront access for humans. Unfortunately, they also lower environmental quality for human activities and inhibit marine ecosystem development and health. By addressing the material interface (seawalls) between urban development and natural systems, this work seeks to promote a more productive environment to increase biodiversity and improve quality of water resources and overall habitat. The methodology relied on feedback between digital and analog techniques to translate photographic evidence and research data into three-dimensional models. These models were reviewed with mentor (architecture) and collaborator (biological sciences) as part of an ongoing interdisciplinary design process. Digital technologies were utilized to accommodate multiple interdisciplinary criteria to explore several seawall panel iterations as part of an ongoing field of inquiry. This research served to investigate the potential of integrating traditional architectural design tools with emerging digital trends.

## **Evangelical Christian Mission Trips in a Post-Colonial Culture**

*Nolan McKenna*

**Daniel White**

Wilkes Honors College: Philosophy

Aimé Césaire argues colonialism has never been a progressive movement that seeks to improve the quality of life of the colonized. Instead, colonizers construct a dichotomy between the civilized and the savage to justify violent practices that promote domestication rather than human flourishing. Césaire includes Christian missionaries in the

gamut of guilty colonizers despite their claims of spiritual freedom. I explore Leo Tolstoy's as well as Howard Thurman's interpretation of Christianity as a social movement for oppressed peoples to develop a decolonized technique for Christian missions in a post-colonial culture. Both Thurman and Tolstoy glean a philosophy of non-violent resistance and social responsibility in their reading of the New Testament. My essay provides a critique of colonial and contemporary Christian missions in light of Césaire's ideas, as well as a missiology enlightened by Tolstoy's and Thurman's philosophy that promotes human flourishing in light of my personal experience as a missionary.

## **The Political, Environmental, and Economic Impact of the Dry-cleaning Industry**

*Ian Moore*

**William O'Brien, Kanybek Nur-tegin**

Wilkes Honors College: Environmental Studies

The dry-cleaning industry relies on solvents to perform the cleaning, and there are several environmental issues that result from the use of these solvents, which are dangerous to human and environmental health. These solvents are regulated by several agencies, but pollution can still be found in at least 75% of active drycleaners. This pollution is very expensive to remediate, and would put most drycleaners out of business unless they are in the Dry-cleaning Solvent Cleanup Program, which is a State Government program that finances the remediation costs for these businesses. I will analyze literature on the environmental impacts of dry-cleaning solvents, the economic burdens that the industry places on our society, and the policies regulating the dry-cleaning industry. There are several viable alternatives for operation, solvent choice, and regulation methods that would greatly improve the quality of the environment and the health of humans who are involved with the industry.

## **Preliminary Characterization of Antibiotic-Producing Soil Bacteria Found by Fall 2014 Small World Initiative Lab Students**

*Martha Narvaez, Chad Coarsey, Natalie Israel*

**Joseph Caruso**

Charles E Schmidt College of Science: Biological Science

Several assays were done on antibiotic-producing bacterial isolates found by the Fall 2014 Small World Initiative Life Sciences Lab students. Gram-stains done thus far showed nine gram-negative and six gram-positive isolates; several Gram-positive strains appeared to be spore-formers, although spore staining remains to be done. Catalase tests with hydrogen peroxide showed 7 out of 27 that tested positive. Growth on starch agar showed four of 17 isolates tested hydrolyzed starch. Twenty-two isolates were tested by Sulfur-Indole-Motility agar for H<sub>2</sub>S and indole production (for Trp synthesis) and motility. All isolates tested to date were motile, did not produce H<sub>2</sub>S, and less than 40% were indole positive.

## **Event Memory: Remembering Intrinsic Motions versus Extrinsic Motions**

*Leehe Negri*

**Alan Kersten**

Charles E Schmidt College of Science:  
Psychology/Sociology

This study suggests evidence for a division when representing two different kinds of motion. First, in extrinsic motions, an actor takes on a path in relation to an external object. Second, in intrinsic motions, the motion of an actor's parts is presented in relation to the actor as a whole. Participants were better at remembering which person performed intrinsic motion over which person performed extrinsic motion. This research suggests that intrinsic motions include information about the identities of the actors who perform them, whereas extrinsic motions are not associated with identity information.

## **Reality: A Subjective Empirical Illusion**

*Aleksandar Vuk Nikolic*

**Simon Glynn**

Charles E Schmidt College of Science: Neuroscience

This paper investigates the human perception of the world around us and the way we perceive and experience it. Driven by curiosity about the "real world," and if it truly exists, our senses, as a way of interpreting the real world, are explored. I also analyze theories about this topic presented by Rene Descartes and British empiricists John Locke, David Hume and Bishop Berkeley, while ultimately disproving certain aspects of them. In this quest of exploring reality, ideas like the mind, primary and secondary qualities and subjective sense experiences are addressed. I ultimately argue that there is no way of knowing if the real world exists, because we can only know what we experience. Furthermore, if the real world did exist, it would, by definition, not be as it appears to us, because our senses can only interpret the real world-not perceive it as it truly is.

## **Pelota Dominicana**

*Carlos Pena*

**Mauricio Almonte**

Dorothy F. Schmidt College of Arts and Letters:  
Sociology/Spanish

"Currently, there are 83 Dominicans in Major League Baseball, 28% more than any other ethnic group. The figure is much greater in the Minor Leagues - approximately seven thousand hailed from the Dominican Republic. Current investment by MLB in the Dominican Republic is estimated well over 100 million dollars; it varies from team to team. Clearly, this is an important relationship. The presentation surveys the historical and present relationship between Major League Baseball and the Dominican Republic, with particular emphasis

on the factors that have it so successful and current challenges. Is the general opinion about baseball changing within the Dominican community? If so, why? How has baseball helped or hindered political relations between the Caribbean nation and the United States? These and similar questions are explored in the research presentation at FAU's Undergraduate Research Symposium."

### **Visualizing Organic Chemistry: A Multi-Media Approach to the Organic Chemistry Lab**

*Kimberly Quinn*

**Evonne Rezler**

Charles E Schmidt College of Science: Chemistry

We are currently developing methods for improving students' preparation and knowledge of the experiments they perform in the Organic Chemistry Laboratory course at FAU. This lab course requires students first to learn techniques and concepts and then efficiently apply them during lab time. Students often have difficulty visualizing reaction mechanisms, experimental procedures, and laboratory techniques to conduct a successful experiment. Short video clips titled Visualizing Organic Chemistry (VOC), will be developed and implemented in an effort to assist students in preparing for the lab. The goal of these VOC videos will be to give specific information such as: safety hazards, mechanism of the reaction, and procedural techniques regarding the experiment. VOC will use visualization to facilitate the student's understanding of the material presented and thereby enhance the laboratory experience.

### **Application of a Remote Hosting Program in Conducting Molecular Modeling Research without Geographic Restrictions.**

*William Santiago*

**Patricia Snyder**

Charles E Schmidt College of Science: Chemistry

Remote hosting is a process by which a user is able to access

a computer remotely. Once a user has gained access to the remote computer, the user is able to view and edit files and run applications. In this study, Chrome Remote Desktop version 41.0.2272.41 was tested in its ability to allow a user to remotely control the program Hyperchem Professional version 8.0.7. The program was downloaded at no cost from the Google Chrome Web Browser Extensions Page version 40.0.2214.111m. The remote computer, containing the modeling software, was located at a student's home and was accessed remotely from Florida Atlantic University via the Internet. All of the mentioned software will be demonstrated live and handouts will be distributed. Remote hosting will allow the scientific community to share powerful computing resources from a distance, thus providing scientists with access to supercomputers without all the added expense of building and maintaining them.

### **Changing the Current: Improving Performance of FAU's Electric Supercar**

*Austin Scharff*

**Allan Phipps**

College of Engineering and Computer Science:  
Mechanical Engineering

The main focus on the FAU High TechGarage program is to inspire students to engage in hands-on, project-based STEM education initiatives. This provides our high school student with real world experience in their related field of study. Our largest and most visible STEM initiative is the FAU High School Electric Vehicle Racing Team's full-size electric supercar, the GT-EV. Our team is using a new charging station to enhance the rate of charge for the GT-EV which will lead to improved performance. Data collected will allow the team to better tune the peak efficiency of each charge point to maximize the range of each test session. Students are able to perform efficiency testing with the motor in different gears ratios to determine which gear we should use in the national EV Challenge's endurance race hosted at the North Carolina Center for Automotive Research.

## **Single Cell Force Spectroscopy to Characterize the Interaction Between Two PfEMP1 Domains and Host Immune Cells**

*Shalondria Sears, Jordan Merritt*

**Ewa Wojcikiewicz, Andrew Oleinikov**

Charles E Schmidt College of Science: Biology

Plasmodium falciparum has the highest mortality rates of all malarial infections. Parasitic invasion of red blood cells (RBCs) causes P. falciparum Erythrocyte Membrane Protein 1 (PfEMP1) expression on the surface of infected red blood cells (IRBCs). PfEMP1s facilitate IRBC adhesion to monocytes. During infection, monocytes are recruited to eliminate IRBCs. Phagocytosis of IRBCs is mediated by several host receptors, including scavenger receptor CD36 and Ig superfamily molecule, ICAM-1. Currently, it is not elucidated if specific PfEMP1 domains mediate adhesion to monocytes and to what extent they bind. Using single cell force spectroscopy, we provide compelling evidence that CD36 binds DBL1-CIDR1PBF0010w (0010w) and DBL2C2PF11\_0521 (0521) binds to ICAM-1, both with high affinity. We observed a ~94% increase in adhesion between 0010w and monocytes and a ~98% increase in 0521 binding compared to the negative control. Characterizing the interaction between PfEMP1s and monocytes will have significant implications in developing tailored anti-adhesion therapies.

## **The Unknown of Addiction: an Analysis of the Subculture of a Recovery Community**

*Ashley Spring*

**Michael Harris**

Dorothy F. Schmidt College of Arts and Letters:  
Anthropology

Anthropological research conducted on addiction has been disproportionately focused on active addiction rather than recovery from addiction. This study examines the subculture

of a recovery community and the lives of individuals who are no longer using or abusing substances in active addiction. Using ethnographic methodologies including participant observation and formal/informal interviews, this research seeks to illustrate the dimensions of the recovery community experience for a recovering addict/alcoholic as a member of a recovery community. Investigated concepts include gender relations and “thirteenth stepping,” the distinctions between Alcoholics Anonymous and Narcotics Anonymous, how the geographical location influences the community, relapse, and the meanings created by the members of the community. This research seeks to illustrate what life is like to be a member of a recovery community in South Florida from an ethnographic perspective.

## **“L” is for Licentious: A Literature Review on Identity, Rhetoric, and the LGBTQ Counterpublic**

*Jennifer St Sume*

**Becky Mulvaney**

Dorothy F. Schmidt College of Arts and Letters:  
Communication and Media Studies

Recent traction in the United States’ legal sector has turned the tide for the LGBTQ community as same-sex marriages are increasing recognition in a number of states. The Equal Marriage debate has created a unique binary that we have not yet faced within American history - the traditional vs. the same-sex couple. As this movement challenges the norms of traditional marriage, it also calls traditional gender roles into question and, consequently, the identity of the “modern American woman”. I believe the discourses surrounding this binary create a constraining effect on rhetoric of female identities. This paper will take a critical rhetorical approach to identifying and analyzing the relationship between social movements and the individual identity within the framework of the Equal Marriage movement, placing a particular interest on the development of the modern American female identity.



## **Gender Gap in Hispanic Voting Behavior**

*Samica Telhomme, Thomas Dunn, Ryanna Becker,*

**Monica Escaleras, Eric Levy**

College of Business: Economics

Voters and their preferences are the most important issues faced by political candidates. Extensive research has proven the existence of a gender gap in voting behavior, which is the difference between political and voting choices of men and women. Thus, it is crucial for candidates to understand the gender gap to strategize their campaign. Since the Hispanic population is the largest-growing demographic group, this study aims to examine if there is a gender gap in their voting preferences and party affiliations. Consequently, we have conducted a survey of 500 Hispanics before the midterm elections of 2014. Our results show that there is a statistically significant relationship between gender and voting preferences as well as between gender and party affiliation. Armed with this knowledge, candidates will be able to adapt their campaign accordingly and the population will have a new tool to estimate the outcome of a political campaign.

## **Lionfish Gastric Evacuation Rate**

*Sara Thomas*

**Jon Moore**

Wilkes Honors College: Marine Biology

Invasive lionfish (*Pterois volitans/miles*) have rapidly spread throughout the Atlantic and Caribbean waters in the past 30 years and represent a threat to fish communities through predation. As voracious predators, the majority of lionfish have anywhere from 5-20 prey items in their stomach when collected, which is represented by varying levels of digestion, suggesting that they are continuously feeding. Gastric evacuation rate of lionfish was tested through live feeding trials with varying amounts of prey and lengths of duration. Lionfish were fed 1, 3, or 5 prey fish and were allowed to digest stomach contents for 1.5, 4, 7.25, 10.75, or 14 hours. It is hypothesized that more prey fish in a lionfish's stomach will slow the gastric evacuation rate. This study will help quantify

how long after feeding a lionfish is able to consume additional prey and potentially aid in management our native reef fish populations.

## **Isolation and Characterization of Antibiotic-Producing Bacteria from South Florida Soil The Small World Initiative: Antibiotic Discovery**

*Lebaron Agostini*

**Joseph Caruso**

Charles E Schmidt College of Science:

Biological Sciences/Molecular Biology

Soil was collected from Topeekeegee Yugnee Park (26 02'8.81" N 80 10'26.55" W), diluted in sterile water and plated on GYE agar. Initial plates had up to 24 colonies with areas of inhibition picked and subcultured onto agar plates with a grid drawn on the bottom. ESKAPE pathogen relatives *E.coli* and *B. subtilis* were used to test subcultured soil bacteria for antibiotic production, using Small world Initiative (SWI) protocols. Isolate #4 inhibited *E.coli* with Turtle tracks testing and was grown on GYE agar to yield a confluent lawn, used for antibiotic extraction with ethyl acetate. The organic phase was tested in a bioassay against *E.coli* and inhibited growth. Identification of the unknown isolate with stains and metabolic tests was done and single colony PCR for the bacterial 16S rRNA gene was successfully completed. PCR amplicons were purified and will be sequenced by the Core Genomics Facility at Yale University.

## **Isolation and Identification of Bacteria Making Antibiotics in the Soil of South Florida Canals: the Small World Initiative for Antibiotic Discovery at FAU.**

*Sean Bacha*

**Joe Caruso**

Charles E Schmidt College of Science: Biology

Antibiotic resistance continues to be a growing health issue, but the search for new antibiotics has declined due to the

large investment needed. To help solve this, we hypothesized undergraduate researchers would be able to isolate antibiotic-producing bacteria from South Florida soils. Soil was collected near a drainage canal (Latitude 26.4, Longitude - 80.07), diluted, plated on Glycerol yeast extract agar (GYE) and grown at 30 C. Colonies of bacteria with a zone of clearing were subcultured and tested against several drug-resistant ESKAPE pathogen relatives (Staphylococcus spp., Pseudomonas putida and Acinetobacter spp.). Isolates inhibiting ESKAPE relatives were streaked for single colony PCR and some yielded ~1479 base pair gene products. PCR products were purified and sent to Yale for sequencing. Ethyl acetate extracts showed activity in a bioassay vs. Bacillus subtilis and Staphylococcus spp. Isolates were also tested for Sulfide-indole-motility, Catalase, gram staining, and starch hydrolysis, as described.

### **Exploring the Role of Rodent Hippocampal D1 Receptors in Non-Spatial Object Recognition Memory**

*Kerriann Badal, Sarah Cohen*

**Robert Stackman**

Charles E Schmidt College of Science:  
Neuroscience and behavior

Current models propose a phasic release of hippocampal dopamine facilitates the encoding of novel information. We will test the hypothesis that dopamine D1 receptors in the dorsal hippocampus of male C57BL/6J mice are required for accurate performance in the novel object recognition task (NOR). SCH 23390 (D1 receptor antagonist) or saline will be microinfused into hippocampus and then the mice will be tested in NOR. Saline-treated mice are expected to demonstrate novel object preference, while SCH 23390 would eliminate object discrimination. These results would indicate that dorsal hippocampal dopamine D1 receptors are necessary for the retrieval of non-spatial object memory, or the detection of novelty required for object discrimination.

### **The Controversial Usage of Neologisms in the Italian Language**

*Valeria Baldocchi*

**Myriam Ruthenberg**

Dorothy F. Schmidt College of Arts and Letters:  
Italian Studies

Globalization has become an agent of socioeconomic and communicative integration and today it envelops all aspects of human life. The quasi-immediate exchange of information that surpasses the now ancient barriers of time and space has triggered a sociocultural revolution with perceptible effects on the linguistic characteristics that are at the core of collective and individual identities. Among the most noticeable cultural changes are neologisms, which are often at the center of heated linguistic debates. Some claim that the increased use of neologisms in the Italian language is a natural component of the fluctuating nature of a language and that their use enriches it. Linguistic purists take a more conservative stance and view neologisms as a linguistic enemy who blurs the distinctive differences among languages and robs them of their uniqueness. Neologisms are a mirror of contemporary Italian society and their use entails an often subconscious support of certain social currents.

### **Biometrics: The New Face (or Fingerprint?) of Identification Technology**

*Loren Barcenas*

**Koray Karabina**

Charles E Schmidt College of Science: Biology

Our study explores the social acceptance and implementation of biometrics, the identification of specific individuals by unique physical characteristics. Biometrics promises greater convenience and security than traditional identification methods, as physical features cannot (easily) be lost, stolen, shared, or forgotten. First,

we study privacy and benefit trade-offs of biometric systems compared to that of social media applications such as facebook and tinder. Our ultimate goal is to construct a biometric mathematical acceptability model as a function of time, privacy, benefit and usability. Second, we explore a particular application of biometrics: student identification through fingerprints or faces, and its advantages and disadvantages over traditional forms of ID. We will support our hypotheses by conducting extensive surveys using the fingerprint based authentication system deployed at FAU's Recreation and Fitness Center. As biometric technology becomes increasingly useful in everyday life, it is vital to evaluate its social acceptance and the associated privacy/security issues.

### **Paleopathological Analysis of a Pre-Columbian Native American population from Highland Beach Florida**

*Daniel Benitez*

**Kate Detwiler**

Dorothy F. Schmidt College of Arts and Letters:  
Anthropology

The prevalence of disease is a proxy to estimate the overall health of a population. Paleopathological analysis of the Highland Beach sample provides insight into the overall health of people that lived in South Florida between 800 to 1400 years ago, and can give a better understanding of what challenges pre-Columbian populations faced. I examined individual skeletons (N = 94) for pathological conditions that could be attributed to infectious diseases and nutritional deficiencies. I laid out each individual skeletal fragment, and examined for abnormal bone formation or destruction. Afterwards, I recorded skeletal abnormalities and referenced them to a standard's manual, and compared these specimens against known pathological conditions. However, taphonomic damage and comingled remains posed a challenge during my research. My data suggest at least 26% of individuals had clear signs of pathological conditions. The results indicate that this population suffered from nutritional deficiencies and infectious diseases.

### **Creation of SRSF1 and Tat CPP Chimeric Proteins as Therapeutic Agents Against HIV-1**

*Andrew Bent*

**Massimo Caputi**

Charles E Schmidt College of Science:  
Biology-Premed/Biochemistry

Human Immunodeficiency Virus type 1 (HIV-1) is afflicting 34 million people worldwide. Serine/Arginine-Rich Splicing Factor 1 (SRSF1) is a host RNA splicing protein, which we have recently shown to reduce HIV-1-replication in infected cells 200-fold. However, virally infecting and transfecting T-cells with DNA coding for SRSF1 have proven unsuccessful. We hypothesize that SRSF1 can be delivered to infected cells as a cloned fusion protein in order to downregulate viral replication. We have achieved this by constructing chimeric proteins from the RNA-Recognition-Motifs (RRMs) of SRSF1 and a cell-penetrating peptide derived from the protein Tat (Tat CPP) by cloning into a bacterial expression system. Expression of the chimeric protein in a transient transfection system resulted in a downregulation of viral replication. We have found that we can purify recombinant proteins in the 50-100 uM range. If further cellular assays prove successful, the proteins can be tested as an HIV-1 therapy in vivo.

### **Nesting Habits of Florida Sea Turtles and Beach Characteristics**

*Benjamin Berglund, Lee Mehan, Kelsey White*

**Dianne Owen**

Charles E Schmidt College of Science: Biology

One of the greatest risks to the endangered sea turtles that nest on Florida beaches is the loss of nesting locations due to development and erosion. This study was performed to gain a better understanding of what type of beach they prefer, with the aim of improving beach management and restoration. Red Reef Beach was surveyed every 200 meters; along each transect, three

measurements were made at five meter intervals from the high water mark to the dune; sand surface slope, depth of the sand, and the slope to the horizon over the dune. During nesting season the same measurements were also made at turtle nest locations, along with a sand sample to determine sand texture and moisture. Geospatial data on nest sites was used to analyze the data collected relative to the density and proximity of nests to identify patterns in the beach characteristics preferred by nesting turtles.

### **U.S. Navy vs. Marine Mammals**

*Joanna Bitton*

***Mirya Holman***

Other: Computer Science

Whales, dolphins, and other marine mammals depend on their hearing to survive, but human technology is now invading their world. Military sonar used by the US Navy to detect submarines emit noises as loud as rocket blasts. These noises infiltrate the ocean and marine mammals get disoriented, have permanent hearing loss, get stranded, or die. With practical safety procedures in place, whales and other marine mammals can be protected from navy sonar. Striking a balance between the nation's security and the safety of marine mammals can be achieved by passing legislation that takes into consideration both needs. With quality policies such as reducing sonar usage in times of peace in locations that have a high concentration of marine mammals and avoiding sonar use in areas in which they migrate to and feed from, marine mammals can be protected. These safety measures can be passed by using adjudicatory actions.

### **Variation in a Major Histocompatibility Gene is Maintained by Selection Imposed by Infectious Disease**

*Zizah Blair*

***Colin Hughes***

Charles E Schmidt College of Science: Biology

Major Histocompatibility (MH) genes play critical roles in mounting adaptive immune responses to infectious diseases and parasites. There are two classes of MH genes: Class I and II; Class II can be further divided into Class II A and II B genes, this study focuses on Class II B. Class II B genes are exceptionally variable in sequence. Leading hypotheses propose that this genetic variation is maintained by selection for resistance to pathogens. Since pathogens are constantly evolving to avoid detection, and new pathogens regularly enter populations, which MH proteins confer immunity fluctuates over time. This study examines MH Class II B in *Centroponus undecimalis*, the common Snook. Genes will be sequenced, and their variability quantified using approaches that include: database searches (NCBI), PCR, and sequencing. Sequencing of the MH gene will provide insight on how high polymorphism results from immune responses to infectious pathogens.

### **What are the Effects of Hooking Loggerhead and Leatherback Sea Turtles on Longline Fishing and How Do They Differ**

*Nicholas Blume*

***Jeanette Wyneken***

College of Business: Business Management

Fisheries bycatch is a significant source of mortality for sea turtles and other species worldwide (Lewison et al. 2004, Wallace et al., 2013). Such mortality is significant and contributes to the decline (and prevents recovery) of these imperiled species (Wallace et al., 2013). Loggerhead (*Caretta caretta*) and leatherback (*Dermo-*

chelys. coriacea) sea turtles are the species most often caught on longlines (Lewison et al. 2004). Sea turtles become entangled in the gear, getting hooked externally or swallowing the hook. Mortality from longline bycatch is implicated in the declines of these species in the Atlantic and Pacific Oceans (Wallace et al., 2013). Loggerhead sea turtles are often hooked in the mouth while leatherback sea turtles are often hooked externally on the shoulder or flipper (Epperly et al. 2012). This study determines how the visual field of the two species differ and if these differences can explain why the species are caught differently.

### **Case Study: The Variance of Water Quality Parameters to Depth in Coupon Bight**

*Rachel Bobich, Nicole Gamboa, Sunnie McAllister*

**James Gammack-Clark**

Charles E Schmidt College of Science: Geology-GIS

Coupon Bight is an aquatic preserve located in the eastern portion of Big Pine Key, Florida Keys. Students sought to test the aquatic habitat for water quality parameters of total dissolved solids, salinity, conductivity, pH, and temperature. When obtaining the surface water quality data, a parameter of depth was gathered at each collection test site. Students captured ground control points at above locations using satellite enabled handheld instruments. In doing so, GIS based interpolation techniques were run on the parameters to see if there were correlations between the surface water quality and depth. Statistical analysis was used to correlate data parameters with each other and with the variance of depth. The conductivity, salinity, and total dissolved solids parameters were not only close in measurements, but equal in spatial distribution. Visual representation of the water quality parameters' dependence to themselves and depth was depicted through surfaces in Arc Scene.

### **Applied Electronics Bootcamp: The Enhancement of Electrical Engineering Curriculum Through Student-Directed Learning Programs**

*Oceane Boulais, Max Torres, Juan Ramirez*

**Hari Kalva**

College of Engineering and Computer Science:  
Electrical Engineering

"At Florida Atlantic University, Electrical Engineering is a severely underrepresented field and the amount of Electrical Engineering students have steadily decreased since 2009 (According to the FAU Undergraduate Statistics Report). In order to bring more accessibility to FAU students from the Electrical Engineering program, Applied Electronics Bootcamp is FAU's first student-led learning initiative that aims to enhance the Electrical Engineering curriculum while simultaneously promoting the student's educational awareness of the Electrical Engineering field. This completely student-directed program offers weekly workshops to all students at FAU with two-day components of a lecture and hands-on session. It is hypothesized that Applied Electronics Bootcamp enhanced the education of the Engineering students and promoted awareness of the Engineering field to the general student body at FAU. In order to assess the level of student interaction and educational enhancement, attendance data was collected twice a week for both the lecture and workshop components of this 9-week program. Five anonymous polls of program participants were also used as tools to determine the majors of the attendees, their level of interest in certain lectures or workshops, and how whether they were able to incorporate their knowledge from the program into their coursework at FAU.

After observing the participants that remained active in the program until the end of the semester, it was concluded that AEB not only enhanced the education of the engineering students by providing a review of the fundamental basic theories covered in courses such as Circuits I, but also exposed groups of non-engineering

students to a tangible approach of what Electrical Engineering is. The non-engineering students were intrigued after exploring different topics of lecture such as "Electronics Application I-III" and "Techniques of Soldering" which were followed with soldering workshops or a session where the students could construct small-scale light simulations. AEB not only saw a 56% increase in attendance in comparison to when it first began operating in the Spring of 2013, but has also seen students from a variety of majors at FAU take interest in the lectures and workshops."""

### **Sanctions: The Double-Edge Sword of Foreign Policy**

*Katherine Brana*

**Orin Kirshner**

Dorothy F. Schmidt College of Arts and Letters:  
Political Science

For centuries Sanctions have been a major recourse of Foreign Policy. As a complex tool of International Relations, Sanctions are subject to many determinant factors, this research seeks to prove the value of time in the sanctioning process. In recent times the focus has been on seeking answers to questions of what type of sanctions equalize, what type of regimes are more amenable and the success and failures of the enforcing bodies or countries. This research expands the existing case analysis and rekindles once again the traditional question of whether the suspension of economic relations can offset military power. It considers active time as a condition to the success or failure of the Sanctions and essentially leads to a socio-economic argument by looking further at the effects the country and its people face, both at the receiving and sending ends of the diplomatic tool.

### **Bacterial Community Analysis of Soil Samples beneath Decomposing *Sus scrofa* Carcasses**

*Spencer Brown, Ryan Ebanks*

**Evelyn Frazier**

Charles E Schmidt College of Science: Chemistry

The post-mortem interval (PMI) is the time elapsed from the time of death until the discovery of a decomposing body, which forensic scientists utilize to decipher how and when a death occurred. Much of decomposition is attributable to bacterial activity. Identifying a net change in bacterial composition throughout the PMI of a decomposing carcass helps to explain the mechanism of decomposition. Carcasses of four feral swine were placed in cages in direct sunlight, whereby soil samples were taken prior to and following seven days of decomposition. Bacterial DNA was then isolated from the soil samples and amplified via polymerase-chain reaction. Further metagenomic analysis was conducted by an outside agency using 16S ribosomal RNA (rRNA) amplicon sequencing to determine the composition of the bacterial community. A relationship between the stages of decomposition and the anatomy of bacterial communities involved was determined, which helps to elucidate the process of decomposition.

### **Multi-factor Authentication**

*Colin Callahan*

**Eduardo Fernandez**

College of Engineering and Computer Science:  
Computer Science Engineering

An important authentication method is multi-factor authentication (MFA). Products such as Enterprise Office 365 are already using it, available for any user in Office 365 Midsize Business, Enterprise, Academic, and Nonprofit plans as well as the standalone versions of Exchange Online and SharePoint Online. The log-in verification feature is aimed at reducing users' vulnera-

bility to online identity theft, phishing, and other scams by adding a second level of authentication to an account log-in. Twitter, Apple, PayPal, Google, Facebook, and other vendors already have implemented it. After correctly entering their username and password, users need to acknowledge a phone call, text message, or an app notification on their smartphone before they can gain access to their account. Two-factor authentication is the most common form of MFA and requires the use of two of the three authentication factors: Something only the user knows, something the user has, and something only the user is. In this work we will analyze some varieties, do UML models of their structure and dynamics, and compare MFA to other authentication approaches.

### **The Biological Theories of Crime and Causality**

*Kayla Campbell*

**Mirya Holman**

Dorothy F. Schmidt College of Arts and Letters:  
Political Science

This research looks at the biological theories of crime and causality, particularly as they apply to the legal setting in courtroom. The purpose of this research is to identify whether or not biological theories to crime and causality are being used as prime defense of a criminal case when appropriate, and to determine judicial feelings regarding these theories, particularly in the way judges' sentence offenders. To accomplish the goals of my research, I will be using data from actual cases tried and convicted in Palm Beach County. This research looks to see first, if the case under review used the biological theories of crime, and in what manner were the theories mentioned? Did the judge's sentence reflect the theories introduced in the defense? The expected outcome will prove that there is room to introduce biological theories in criminal defenses to help prevent the over sentencing of criminal offenders.

### **Chitinase-3-like-1 (CHI3L1) Expressed During Allergic Pulmonary Inflammation Promotes Metastasis of Mammary Tumor Cells to the Lung**

*Camilla Castro*

**Vijaya Iragavarapu-Charyulu**

Charles E Schmidt College of Science:  
Biology/Undergraduate Honors Thesis Program

Inflammation contributes to tumor initiation and metastasis. Our studies have shown that pre-existing pulmonary inflammation accelerates primary tumor growth, increases metastasis, and shortens survival in mammary tumor bearing mice. We and others have reported that chitinase-3-like-1 protein (CHI3L1) is upregulated during allergic pulmonary inflammation and tumor progression. CHI3L1 expression is implicated in the regulation of tissue repair and immune response during inflammation. However, the role of CHI3L1 in establishing a pulmonary pre-metastatic niche is still unknown. We hypothesize that pre-existing pulmonary inflammation alters the lung parenchyma via upregulation of CHI3L1, and thus accelerates pulmonary metastasis. CHI3L1 KO allergic mice showed a decrease in mucous production, smooth muscle, and collagen deposition prior to tumor inoculation compared to WT. In addition, CHI3L1 KO mice showed a reduction in pulmonary inflammation and tumor burden. Delineating the contribution of pre-existing pulmonary inflammation in the progression of breast cancer could lead to targeted therapies.

### **Analyzing Changes in Salinity and Evaporation on Water Quality**

*Annie Causey, Donna Selch Kara Abbott, Avion Gordeen, Renata Lemos*

**Leonard Berry**

Charles E Schmidt College of Science: Biology

The evaporation of water in the ocean can lead to hyper salinity caused by the extra substances left behind during

the process. The Florida bay is surrounded by the Florida loop current and the Florida Keys, its salinity reading has been recorded as high as 70 ppt, double the normal capacity of seawater. The bay salinity depends on the amount of fresh water released from the Everglades and the magnitude of water outputted to the Gulf of Mexico and the Atlantic Ocean, as well as the ratio between the amount of water evaporated and the amount of precipitates left in the remaining water pool. For this research nine saltwater treatments from 0 to 40 ppt in increments of 5 ppt were constructed to examine how evaporation rates are affected by varying salinities. During this study, data were collected from each of the nine treatments before and after evaporation. The data recorded included salinity readings, pH levels and volume of water evaporated. The analyses of this data will determine the relationship between salinity levels and evaporation rates.

### **Impact of Fragmentation in Determining Number of Individuals**

*Chaunesey Clemmons*

**Michael Harris**

Dorothy F. Schmidt College of Arts and Letters:  
Anthropology

In skeletal analyses, estimating the number of individuals is essential in constructing demographic profiles. The minimum number of individuals (MNI) is the most widely accepted estimator for determining a skeletal assemblage's population size. An alternate estimator is the most likely number of individuals (MLNI). Adams and Konigsberg (2004) argue MLNI offers a more accurate estimate of the number of individuals in an assemblage. Both estimators require a well-preserved sample for the best results. In contrast, I explore assessing MNI and MLNI on highly fragmented skeletal remains. This study's sample is the skeletally fragmented Boynton Mounds collection housed at the Department of Anthropology at Florida Atlantic University. This fragmentation creates difficulty in determining the number of individuals present. Thus, this

work is significant in that it has implications for determining the number of individuals in fragmented materials, which are encountered in forensic contexts such as mass graves and mass disasters.

### **The International Court of Justice and Regional Bias**

*Jessica Concepcion*

**Jeffrey Morton**

Dorothy F. Schmidt College of Arts and Letters:  
Political Science/ Honors

The International Court of Justice (ICJ) presides over the contentious issues, such as boundary disputes and military conflict, for all United Nation's (UN) members. Its rulings, legally binding, guide international affairs between states by holding them accountable to international law. Previous studies have found that the judges on the ICJ display judicial bias. However, scholars have yet to evaluate whether judges are influenced by a regional association with a party in the cases. To evaluate the role of region in ICJ rulings, I developed a dataset containing: 1) nationality of judges in contentious cases, 2) states party to a case, 3) states' regions, and 4) case subject. This data is then used to evaluate the relationship between ICJ judges, state region, and the outcome of case rulings in order to determine whether regional bias exist today within the UN.

### **Drinking Behavior in Relation to Age of College Students**

*Joshua Conniff, Andre Paz, Brianna Gonzalez*

**Monica Rosselli**

Charles E Schmidt College of Science: Neuropsychology

Consuming alcohol at a young age has been associated with a greater likelihood to become a frequent drinker, engage in binge drinking, and develop alcohol dependence as an adult. The goal of the study was to examine



how the current age of college students relates to their alcohol consumption habits. 189 college students (79 males), with a mean age of  $20.93 \pm 1.87$  and an age range 18-25, from three universities in South Florida. Moderate negative correlations were found between current age of the participants and their average number of drinks consumed during the previous 6 months, greatest number of drinks in one occasion during the previous 6 months AUQ binge score, and AUDI score. The data indicates that the younger the participants, the more likely they are to engage in higher rates of alcohol consumption.

### **A Comparative Survey of Gopherus Polyphemus Hemoparasites in Two Differing South Florida Habitats**

*Brian Cooney, Dana Elhassani*

**Evelyn Frazier**

Charles E Schmidt College of Science: Biology

The gopher tortoise (*Gopherus polyphemus*) is a keystone species which affects the biodiversity that shares its burrow and habitat. Habitat fragmentation has led to a decline in populations within southeastern ranges. Haemogregarines (intracellular parasites) have been identified in the blood of gopher tortoises, possibly due to the lack of prescribed fires which are known to kill ticks. However, little is known about their health significance. Two study sites, Blazing Star Preserve (BSP), and Pine Jog Preserve (PJP), differ in the degree of prescribed fires. Our research objective is to: (1) detect any hemoparasite species and (2) determine hemoparasite intensity levels within two gopher tortoise populations at these two sites. We hypothesize that intensities will be higher in BSP due to increased overcrowding and lack of prescribed fires. This study will benefit current conservation and management practices for gopher tortoises and provide a baseline study for intracellular parasites.

### **Detecting Repetitive Motion in People with Autism**

*Brayan Delgado, Raquel Quinones*

**Baseem Alhalabi**

College of Engineering and Computer Science:  
Computer Engineering

The purpose of this research is to use inexpensive sensors in conjunction with a unique mathematical algorithm to detect violent repetitive motion in individuals with autism. Using a simple notification system to communicate with a second device that monitors an individual's status remotely, the device can alert the user when an abnormal repetitive motion has been detected and notify the second device. The algorithm design will differentiate between normal and abnormal motions. This vital data is collected so that it can be analyzed and used in other areas of research while being easily accessible by doctors or family members to enhance the care of the individual.

### **The Use of Camera Traps to Study Group Size of an Endangered African Forest Monkey**

*Sara Dempsey, Siddharth Satishchandra*

**Kate Detwiler**

Dorothy F. Schmidt College of Arts and Letters:  
Anthropology

In this study, we evaluate the group size of a new species of monkey, *Cercopithecus lomamiensis*, found in the Democratic Republic of Congo. This study includes two camera trap surveys: one completed in 2014 at the Losekola Site within Lomami National Park and the other survey completed in 2013 at the Okulu Site outside the park. The main purpose was to estimate maximum group size of *Lesula* within and outside of Lomami National Park. Camera traps were set up at 500m intervals in a grid at each site. We analyzed these videos for a total number of individuals per camera trap encounter. Results indicate that the largest group size of 12 individuals occurred at the protected Losekola site. This study

increased the known group size of Lesula from 5 individuals to 12, which is similar to the average group size (15 individuals) of Lesula's sister species *C. hamlyni*.

### **Determining Factors of Democratic Consolidation in Eastern Europe**

*Deniz Dolun*

**Mirya Holman**

Dorothy F. Schmidt College of Arts and Letters:  
Political Science

The process of democratization still remains an ongoing process in the majority of the Eastern Bloc nations. A quarter century after the dissolution of the USSR and her satellite states, only eight of twenty-eight transitioning states have been able to fully democratize. Several of these anocratic states are today characterized by routine human rights violations, state repressions of civil society, and incarcerations of political opposition. There is limited cohesive research on how the Post-Communist formation of oligarchs across Eurasia and increases in democratic transitioning period have influenced democratization. In this study, I research, test, and explain the effects of Post-Communist oligarchies and the periods of democratic transitions on current levels of democratic consolidation in twenty-eight former socialist states through publicly available statistics and primary sources. I find that while oligarchical influence on democratization is limited, shorter democratic transitions produce significantly higher levels of democratic consolidation than their prolonged counterparts.

### **The Mathematics and Art Connection--Algorithmic Classifications of Symmetry Groups**

Stevens Dormezil, Julia Seay, Sam Schlegel

**Daniela Popova**

Charles E Schmidt College of Science: Mathematics

Symmetry has been used to add beauty and intrigue to art for centuries. A tessellation, a particular type of symmetric

pattern found commonly in art is a tiling of the Euclidean plane in which the same figure is repeated without overlaps or gaps. Tessellations undoubtedly have artistic value, but they also offer the mathematician insight into the realms of geometry and abstract algebra, including the study of symmetry groups. We are able to demonstrate the prevalence and pragmatic beauty of symmetry groups in our perceivable world by analyzing the works of graphic artist M.C. Escher and sample images of local Florida art and architecture. By mathematically and algorithmically classifying tessellation patterns with the use of symmetry groups, we endeavor to draw a connection amongst the realms of mathematics, computer science and the arts.

### **Antibiotic Drug Discovery**

*Mohamed Elbashir*

**Joseph Caruso**

Charles E Schmidt College of Science: Biology

There is an unseen crisis currently spreading throughout the world. At least 2 million people become infected in the United States with antibiotic-resistant bacteria and at least 23,000 people die each year from these treatable infections (CDC, 2013). For the past 70 years antimicrobial agents have been used to treat infectious disease. However, the same drugs have been used for so long that some infectious organisms have begun to proliferate adaptations, decreasing the efficiency of the drugs. In 2004, the Small World Initiative was established with the mission to discover new antimicrobial agents by crowdsourcing antibiotic discovery using undergraduate researchers. Through the isolation and repetitive testing of bacterial colonies under laboratory conditions we found 8 possible bacterial colonies that might be producing antimicrobial compounds in soil collected from the Boca Raton TriRail Station. The novel antibiotic producing bacteria were effective against *Pseudomonas putida*, *Staphylococcus epidermidis*, and *Acinetobacter baylyi*.

## **The Implementation of a Cap and Trade Policy**

*Andrew Fahmy*

**Mirya Holman**

Charles E Schmidt College of Science: Biology

This research discusses how a cap and trade policy could be established in the US to reduce greenhouse emissions in order to avoid the expected disastrous consequences that these emissions might have on our planet. Cap and trade potentially embodies an effective political compromise that helps protect our planet as well as ensure economic prosperity. Cap and trade sets a limit on greenhouse emissions while allowing business to trade their emissions under free market rules. Cap and trade has been successfully implemented both internationally in Europe, as well as domestically in California. This project looks at implementing a similar model nationally which might lead to advantageous breakthroughs in reducing greenhouse emissions. Moreover, the project discusses the political feasibility and alternative policy pathways and measures that can be taken to pass this policy on a national level.

## **Agnosia**

*Joshua Fentanes, Maria Mecoli*

**Angel Nevin**

Charles E Schmidt College of Science: Psychology

Agnosia is illustrated by Oliver Sacks' "The Man Who Mistook His Wife for a Hat" as he discusses the life of a 60 year old blind woman named Madeleine J. who was diagnosed with the disease. Developmental agnosia is characterized by the patient's inability to recognize sensory information, and is normally caused by trauma to parts of the brain involved in perception and memory. The three major categories of agnosia are visual, auditory, and somatosensory. Madeline referred to her hands as useless, but could identify light, touch, pain, temperature, and passive movement in her fingers. On the other hand, she had no perception and was unable to identify anything that was put into her hands. This

research explores Madeline's story and agnosia further.

## **The Formation of Water Rings around a Rotating Centroid**

*Amir Ferouz, Anthony Pipitone, Norbert Nasi, Richard Gill*

**Tsung-Chow Su**

College of Engineering and Computer Science:  
Mechanical Engineering

In a tank filled with water at the bottom and oil floating on top, a straight rod reaching into the oil is set to rotate. The rotating rod is brought just above the oil/water boundary and is set to rotate at a speed greater than 200 revolutions per minute. It became evident that the rod's rotation caused the oil/water interface to curve upward around the center of rotation, reaching up to the bottom of the rotating rod. Visible rings of water formed around the rod, starting at the bottom (at the oil/water interface) and ascending the rod, one by one. The water rings remained separate and ascended the rod until they eventually dispersed into the oil. Such quantization of water into rings has never been reported on before and represents a novel area of investigation in fluid dynamics. This study aims at obtaining quality photographic evidence to explain this phenomenon.

## **The Impact of Obesity on Calprotectin Response to Acute Aerobic Exercise**

*Brandon Fico, Aaron Slusher, Arun Naharaj, Michael Whitehurst*

**Chun-jung Huang**

College of Education: Exercise Science and Health Promotion

The secular issue of obesity has been linked to increased inflammatory mediators, such as calprotectin (S100A8/A9). This study examined the effect of acute aerobic exercise on plasma calprotectin response in

obese and normal-weight subjects and its relationship with inflammatory cytokine (IL-6). All subjects (11 obese and 10 normal-weight) performed 30 minutes of treadmill exercise at 75% maximal oxygen consumption (VO<sub>2</sub>max). Blood samples were collected prior to, immediately following exercise, and one hour after exercise. Our results showed higher baseline levels of calprotectin in obese subjects than normal-weight subjects. While acute aerobic exercise increased an elevation in calprotectin and IL-6, no difference was found between two groups. Furthermore, a positive relationship was observed between calprotectin area-under-the curve "with respect to increase" (AUC<sub>i</sub>) and IL-6 AUC<sub>i</sub>, even after controlling for cardiorespiratory fitness (VO<sub>2</sub>max). Our results support previous finding that IL-6 may potentially regulate calprotectin expression in skeletal muscle during exercise.

### **Water Cone Improvement Project**

*Michael Foley, Matthew Zitani, Abel Ortega, Kyle Schiegner, Gordon Sissen*

#### **Tsung-Chow Su**

College of Engineering and Computer Science:  
Mechanical Engineering

The object of this research is to improve a solar desalination device known as the Water Cone that creates potable water using solar energy. The water cone is a polymeric cone that sits overtop a dish of saline water. The water is evaporated by the sun and condenses back onto the surface of the cone creating fresh water. In an attempt to improve the cone's water production, two different hydrophobic coatings are applied to the inside of two cones, which allow water droplets to flow at a much faster rate, collecting water more quickly. Two water cones are coated separately, and are exposed to sunlight for five days. Water collection for the coated portion of the cone is compared to the uncoated portion of the cone. Results after a first trial show that coating A on the water cone impedes water collection whereas coating B appears to increase water collection.

### **Temporal Variability of Biogenic Gases in Peat Soils from the Everglades Using Capacitance Moisture Probes**

Alexander Garcia

#### **Xavier Comas**

Charles E Schmidt College of Science: Geology

The objective of this research is to test the use capacitance moisture probes to better understand temporal variability in biogenic gas release and accumulation from peat soil monoliths in the laboratory from different locations in the Florida Everglades. Once installed in the soil samples moisture probes are connected to dataloggers and measurements of moisture content, temperature and electrical conductivity are automatically collected at 15 minute intervals. Probe measurements are constrained with gas traps and time-lapse cameras to directly estimate gas flux releases. This preliminary laboratory study represents a first step before deployment in the field, which can potentially help us to better understand patterns of gas release and accumulation from peat soils in the Everglades at high temporal resolution and how climate change may affect gas dynamics.

### **Levels of Tension in Relation to Video Use in Therapy Sessions**

*Lizbeth Garcia, Gabriel Pena, Raiza Perez*

#### **Paul Peluso**

Charles E Schmidt College of Science: Psychology

Through video recording, clinicians have the ability to further analyze their clients, being provided with micro and macro expressions, vocal cues and body language. The objective of the research is to test whether the size and positioning of a video camera affects the client's levels of tension while under surveillance and simultaneously receiving therapy. By utilizing contrasting recording methods, it is predicted that the client will

feel more comfortable in front of an inconspicuous, wall-mounted camera as opposed to the tripod-mounted camera. The results of this research have the potential to revolutionize the methods used by the therapy and counseling community to further analyze their clients as well as psychotherapeutic methods. Data will be collected from a total of four clients' fourth sessions in order to rule out anxiety experienced as a result of adjusting to a new therapeutic relationship or other factors inherent to a therapeutic session.

### **Urban Sprawl: The Invisible Destroyer of the Environment**

*Megan Gastineau*

**Mirya Holman**

Dorothy F. Schmidt College of Arts and Letters:  
Political Science

The purpose of this research is to inform Americans of what sprawl is and the negative effects it has on the environment. Sprawl is the unnecessary expansion of urban areas onto valuable unused land. In 2013, only 26% of Americans saw sprawl as a problem at all. Yet sprawl is the culprit behind better known issues, such as air pollution and water contamination. The increased use of vehicles and runoff makes sprawled out areas more polluted than compact cities. Because condensing a city is not a workable solution, another way is to improve public transportation. Places that have more sprawl force people to use cars. Improving public transportation by making it more accessible and reliable would encourage people to not use their cars, which saves them money and, in turn, causes less pollution.

### **Nf1 Mutations Impair Memory-Related Plasticity in the *Drosophila Melanogaster* Mushroom Body**

*Brandon Gilliland*

**Gregory Macleod**

Wilkes Honors College: Biological Sciences

During olfactory classical conditioning, large subsets of dopaminergic neurons are activated, releasing dopamine across broad sets of postsynaptic neurons. However, it is unclear how the diffusion of dopamine causes highly localized patterns of plasticity required for memory formation. Knocking down Nf1 disrupts cAMP-dependent plasticity in the gamma lobes. Dopaminergic neurons drive compartmentalized elevation of postsynaptic cAMP, and this cAMP elevation drives postsynaptic plasticity in the mushroom bodies.

### **Hispanic Perspectives on Lifting the Cuban Embargo**

*Marina Giral Lores, Ryan Clukey, Jee Paik*

**Monica Escaleras**

College of Business: Economics

The Cuban Embargo has restricted economic, cultural and diplomatic ties between the United States and Cuba for 53 years. On December 17th, 2014, President Obama made a televised-speech on "normalizing relationship with Cuba," instead of continuing an "outdated approach [that] has failed to advance our interests." This study will examine and analyze the attitudes of Hispanics living in the United States' towards the lifting of the Cuban Embargo. We are interested on the Hispanic population because they represent one of the largest and fastest-growing minority groups in the United States. We conducted telephone and online surveys of 500 Hispanics around the country. Our findings indicate that Hispanics have statistically significant different perspectives on lifting the Embargo, expanding trade and reestablishing diplomatic relations depending on their age, gender and other socio-demographic factors.

### **Chemotherapeutic Effects of the Topoisomerase-I Inhibitor, Topotecan, and the micronutrient, Vitamin C on Prostate Cancer Cells**

*Harris Goldsmith, George Kaldas, Stephanie Khoury, Nora Alnoury*

**Kwasi (James) Kumi-Diaka**

Charles E Schmidt College of Science: Biology

"Prostate cancer is the second most common cancer in American men. The American Cancer Society's 2015 estimates for prostate cancer in the United States are approximately: 220,800 new cases, and 27,540 deaths. Topotecan is a chemotherapeutic agent primarily used to treat small cell lung cancer. Topotecan inhibits the enzyme topoisomerase-I producing double-strand breaks in DNA. This enzyme is crucial to maintain the proper shape of DNA during division. Topoisomerase-I is more prominent in cancer cells due to rapid reproductive rates. The effects of vitamin C on cancer cells are well documented. Studies portray high concentrations of vitamin C inputted directly into the blood stream by intravenous infusion, which could lead to death of cancer cells due to the production of hydrogen peroxide. The aim of our current research is to investigate the properties of topotecan and vitamin C as monotherapies, and as a combination on LNCaP prostate cancer cells."

### **The Development of Inhibitory Neuron Distribution Through Ferret Visual Cortex**

*Juliana Gomez, David Fitzpatrick*

**Paul Kirchman**

Wilkes Honors College: Biology and Mathematics

The development of inhibitory interneurons plays a key role in maturation of functional properties within cortical circuits. Inhibitory neurons use GABA ( $\gamma$ -aminobutyric acid) as their primary neurotransmitter and are highly diverse, with classes characterized by electrophysiological, morphologi-

cal, and expression of certain molecular markers. To better comprehend functional implications of interneuron maturation, we used immunohistochemistry to analyze the distribution of inhibitory neurons within ferret visual cortex over development. Immunohistochemistry was used to label inhibitory cells with molecular markers: the calcium-binding protein, parvalbumin (PV) and the neurotransmitter, somatostatin (SOM). By determining the density of cortical neurons expressing PV and SOM, we examined GABAergic distribution across the six layers of visual cortex. This distribution was evaluated over six time points surrounding onset of visual experience, allowing assessment of the contribution that experience has on the development of cortical inhibitory neurons. Understanding organization of interneurons throughout development allows correlation of the time course of their maturation with functional changes potentially caused by visual experience.

### **A cross-linguistic analysis of language effects on personality measures in Spanish-English Bilinguals**

*Katherine Gonzalez*

**Monica Rosselli**

Charles E Schmidt College of Science: Neuroscience

The Big Five inventory is a 44-item scale that classifies participants based on five dimensions of personality with versions available in English and Spanish. Previous studies have found differences in BFI dimensions of Spanish-English bilinguals. We asked if Spanish-English bilinguals described themselves differently when answering in different languages. The present study investigated how Spanish-English bilinguals are classified when answering the BFI in both languages. In a cross-linguistic design, we assessed a sample of Spanish-English bilinguals. We hypothesized that we would find that bilinguals would score significantly different in both languages in the dimensions of extraversion and conscientiousness,

with English scores being expected to be significantly higher than Spanish scores. Results revealed significantly different scores in Spanish and English in all five dimensions of the BFI. These results emphasize the issue of language in psychological evaluations, with the possibility of language dependence skewing the results for bilingual patients.

### **Evaporation Rate with Variable Salinity**

*Avion Goordeen, Donna Selch, Kara Abbott, Renata Lemos, Annie Causey*

**Leonard Berry**

College of Engineering and Computer Science:  
Ocean Engineering

During evaporation, water vaporizes leaving behind dissolved substances in the remaining water. When this occurs in seawater, hypersalinity (>33 ppt) may result. In Florida Bay, salinity readings have reached as high as 70ppt, twice the average ocean salinity (33 ppt). Salinity rates in this region are influenced by the discharge of freshwater from the Everglades, precipitation, the removal of water by evaporation, and the output channels to the Gulf of Mexico and the Atlantic Ocean. In this experiment, nine saltwater treatments from 0ppt increasing in increments of 5ppt to an upper limit of 40ppt were constructed to examine how varying salinities affects evaporation rates. This study compares the volume of water evaporated from each treatment every week and will determine how the level of salinity statistically affects evaporation rates.

### **Do birds of a feather really flock together?: The effects of relatability of college lifestyles in ads promoting the Starbucks brand**

*Danielle Gordon\*, Daler Gilyazov*

**Allen Smith**

College of Business: Marketing

Relatability underlies successful advertising. Yesteryear, purchasing was rational. Advertisements used experts to persuade. Can experts remain persuasive as motives shift

from rational needs to emotional lifestyle-based desires? Assimilation-Contrast Theory suggests that birds of a feather flock together; people who embrace a lifestyle would relate more to others who share an identical lifestyle. The research questioned whether yesterday's experts would remain relatable to people driven to satisfy lifestyle desires rather than functional needs. The research explored whether college students would relate more to their peers in a lifestyle brand advertisement than they would relate to either an expert or to a spokesperson neither perceived to be an expert nor a lifestyle-referent. Sources were subjected to manipulation checks, each placed in an identical ad for the lifestyle brand, and control tested for relatability. The college student was found highest in relatability, appeal, and personal connection. Recommendation: Use referents in lifestyle brand advertising.

### **Characterization of Leachate Clogging Solids**

*Alyssa Harris, Denys Purdy*

**Daniel Meeroff**

College of Engineering and Computer Science:  
Electrical Engineering

The Solid Waste Authority (SWA) of Palm Beach County collects leachate from its landfill in a gravity pipe leachate collection system (LCS), which is experiencing clogging due to calcium carbonate scale. An investigation was conducted to determine the solids composition and provide engineering solutions to this challenge. During testing, it was found that aerated leachate produced foam, which after vibration and evaporation, formed crystalline solids similar to those found in the SWA LCS. The following tests were conducted to determine the water quality of the leachate and the properties of the solids: pH, turbidity, chemical reactivity, biological growth, surface characteristics, and microscopic analysis. After five days of evaporation, the solids collected in all samples represented 46-47% of the leachate's initial weight. On visual observation, the leachate remnants left both a crystalline and a dark slimy solid, with larger particles in the aerated samples, a possible source of the clogging.

## **Understanding the Role of Capping Ligands in Lanthanide Coordination Polymer Synthesis**

*Zachary Harrison, Ryan Crichton*

**Daniel de Lill**

Charles E Schmidt College of Science: Chemistry

A coordination polymer (CP) is a solid state material that consists of metal ions tethered by organic species, called "linkers", in a repeating fashion. This repeating entity can extend in to form one, two, or three dimensional structures. Lanthanide coordination polymers (Ln-CPs) have applications in catalysis, bioimaging, and chemical sensing. In this project, we are working on tailoring syntheses for bioimaging and catalysis, where size and shape of the Ln-CP play a significant role. We used a series of different length capping ligands in our syntheses to determine how they affect the Ln-CP's size, shape, and other properties.

## **Mapping Potential Habitats of Lionfish in South Florida**

*Kathryn Hermit, Donna Selch*

**Caiyun Zhang**

Charles E Schmidt College of Science: Biology

The canal system of South Florida has become a new distributive focus for the invasive Lionfish (*Pterois volitans*). Lionfish are considered a pest here, having up to 18 venomous spines that can inflict pain if stepped on or handled. These fish also eat a variety of juvenile species affecting the commercial and recreational fishing industry. The canal system in south Florida is also a center for recreational activities. Water land cover information will aid in species removal by offering species information to areas with a high percent of water land cover and who are more likely to come into contact with Lionfish. This research, comparing classification techniques to map water land cover, is the first step to mitigate the stronghold the lionfish have in South Florida. Once mapped, species information can then be distributed to residents that have close proximity to danger zones.

## **Co-Development of Renewable and Nonrenewable Energy as a Solution to Environmental Degradation**

*Tyler Hoorn*

**Mirya Holman**

College of Education: Exercise Science

The purpose of this research is to propose a potential solution to the continuous problem of environmental degradation. One of the primary concerns about environmental salvation centers around the balance between economic growth and environmental protection, a delicate balance that is dictated by the public, in favor of the economy. This balance often does not allow for the advancement of one without the hindrance of the other. Ideally, this research would identify and suggest a feasible compromise that would be acceptable to environmentalists and economic businesses alike that particularly emphasizes the relationship between renewable and nonrenewable energy sources and explores how simultaneous development of both fields would be possible in order to satisfy each opposing side. This solution would see the Department of Interior take charge in a leasing plan that would give additional access to oil while also requiring renewable energy growth, addressing both environmental degradation and economics together.

## **Foraging Strategies: Mechanism for Niche Partitioning between *Octopus vulgaris* and *Macrotritopus defilippi***

*Liana Houston, Chelsea Bennice*

**Jon Moore**

Wilkes Honors College: Marine Biology

To determine how two species coexist, any occurrence of biotic interactions (intra- and interspecific competition) and how each species exploits its niche must be evaluated. The research objective is to evaluate the foraging strategies of *Octopus vulgaris* and *Macrotritopus defilippi* to understand the mechanisms that allow



for coexistence in an intracoastal habitat. SCUBA and underwater videography are used to collect foraging behaviors. An ethogram of foraging behaviors, substrate types, and camouflage/ color patterns is used to score behavior. Correlations between foraging behaviors, substrate types, and camouflage/ color patterns will be determined. Results show *O. vulgaris* and *M. defilippi* forage on sand using speculative bottom searching (14.5% and 31.1%, respectively) and primarily use a mottle body pattern (53.9% and 60.97%, respectively). This ongoing research study will expand scientific knowledge and public awareness regarding the mechanisms used by two cephalopods for coexistence and establish conservation management plans for sand-dwelling organisms.

### **Implementation of an Inquiry-Based Experiment Using Novel Cation- $\Pi$ Research into the Undergraduate Organic Chemistry Labs at Florida Atlantic University**

*Andrew Horowitz*, Dominic Rucco, Elijah St. Jermain  
**Evonne Rezler**  
Charles E Schmidt College of Science: B.S. Biology

An inquiry-based Organic Chemistry Lab experiment has been developed and adapted from the work recently published by Maity and Lepore investigating the cyclization of  $\beta$ -alkynyl hydrazines [1]. In this experiment, students use the scientific method to question, hypothesize, test, and conclude whether the cyclization is affected by solvent and/or catalytic interaction. This approach provides students with critical thinking skills necessary for scientific discovery. For the first time, Organic Chemistry Lab students are performing the same experiment that led to the possible discovery of a unique, pharmacologically-useful intermolecular interaction. Using standard organic chemistry techniques (including thin-layer chromatography, infrared and Raman spectroscopy), undergraduate students observe a putative cation- $\pi$  interaction between the alkynyl hydrazine and tetrabutylammonium ion in the cyclization reaction for this experiment.

### **Non-Newtonian Fluid Circular Hydraulic Jump**

*Andres Jaramillo*, Sarah Gumrawi, Derek Jolly  
**Tsung-chow Su**

College of Engineering and Computer Science: Mechanical Engineering

When a fluid has a non-linear shear rate to shear stress ratio, and there is a time dependency to its viscoelasticity or time independent viscosity, physical interaction behavior can be studied through a series of experiments. A circular hydraulic jump experiment measures the capacity of a fluid to establish a circular pattern due to its surface tension gradient. The intent of this study is to seek, experimentally, Froude numbers that governed the change of momentum until reaching equilibrium. The Froude number would then aid the theoretical understanding of a viscoelastic fluid like some lubricants and a time independent viscosity "shear thickening" like corn starch diluted in water. The inertial forces of the liquid affect the Froude relationship, as per previous experimentation revealed, and it drives the circular behavior of the fluid.

### **Investigating the Expression of UCP2 in *Trachemys scripta* Tissues**

*Christina Jean*  
**Sarah Milton**

Charles E Schmidt College of Science:  
Neuroscience and Behavior

A consistent level of oxygen is required by most living organisms and its absence can have detrimental effects. Unlike most vertebrates, the freshwater turtle *Trachemys scripta* can withstand days to weeks without oxygen and recover with little damage. *T. scripta* employs protective mechanisms to prevent cell damage caused by an accumulation of ROS (reactive oxygen species); however, the mechanisms behind this are not fully understood. In studies of other animal models, uncoupling protein two (UCP2), was found to protect the mammalian cell from

ROS damage. We hypothesized that *T. scripta* tissues contain UCP2 which may play a role in reducing superoxide formation during reoxygenation. We found that *T. scripta* liver tissues express UCP2 as a band at about 35 Kda. The study of anoxic survival mechanisms in an animal adapted by millions of years of evolution to withstand anoxia may lead to possible therapeutic interventions for stroke and ischemic related ailments.

### **HIPAA's Security Mechanisms for Medical Devices**

*Michael Jofre*

**Eduardo Fernandez**

Dorothy F. Schmidt College of Arts and Letters:  
Political Science

The HIPAA (Health Insurance Portability and Accountability Act) defines regulations to help protect patient's information. Now as the health information technology (Health IT) environment becomes an even more integral part in the field of medicine, it is vital that HIPAA's privacy protection is applied to the handling of patient's information by medical devices. These devices not only perform their intended medical functionality, but they also perform other functionalities that can be affected by security threats. As a result, HIPAA's privacy guidelines need to be enforced by appropriate security mechanisms within these medical devices. Security mechanisms can be described by software patterns. A few of these patterns will be discussed, showing how they can handle such threats. We will survey existing patterns and identify which other patterns would be necessary.

### **The Over-Expression of BDNF on Adult Neurogenesis and Seizure Vulnerability**

*Danick Joseph, Kathleen Guthrie, Paulette Coombs*

**Ceylan Isgor**

Charles E Schmidt College of Science: Neuroscience

Epileptic seizures are characterized by the abnormal protrusion of cells into various brain structures such as the hippocampus. This region of the brain is one of the primary zones of adult neurogenesis, and it is characterized by concentrated amounts [R2] of brain-derived neurotrophic factor (BDNF). Other studies have shown how the exogenous infusion of BDNF affects neurogenesis; however, little is known in regards to how the endogenous over-expression of BDNF affects Adult neurogenesis and seizure vulnerability. We will use immunohistochemistry procedures combined with age-specific cell markers to compare the rate of adult neurogenesis (population size, maturation and survival of new-born cells) in our transgenic mouse model with those of the wild type (WT) controls. Understanding the mechanisms that contribute to the progression of seizures in this animal model will facilitate our ability to intervene and prevent this disorder.

### **Hedonistic or Epistemic Cultural Immersion: What Message Should Cruise Lines Emphasize? Insights from Photo Sorts Methodology**

*Henry June*

**Allen Smith**

Christine E. Lynn College of Nursing: Nursing

The research determined whether hedonistic immersion imagery or epistemic cultural immersion imagery would be more likely to attract college students to book a spring break cruise. Photo Sorts, a projective method, was used to present seven hedonistic and seven epistemic cultural photographs to a convenience sample of college students to determine preferences for Caribbean island excursions. Subjects were asked to assume that they were on a cruise in the Caribbean island; deciding which excursions to take. Forty respondents were tasked with looking at fourteen photographs; placing each one into either the "Do not want to do" or "Want to

do" bin. Nominal variables, categories (Want to do/Do not want to do), and an analysis based on counts rather than rating scales characterized the research. Thus, the Chi-Square method found, at 90% confidence, that Royal Caribbean should emphasize hedonistic imagery in its video and digital brochure to attract cruise-bound college students.

### **Isolation of Antibiotic-Producing Bacteria from South Florida Soils: the Small World Initiative at FAU**

*Michael Kiken*

**Joseph Caruso**

Charles E Schmidt College of Science:  
Biological Sciences

Soil was collected from the Wakodahatchee Wetlands in Delray Beach, FL (26° 28.985" N 80° 0.8550" W), diluted in sterile water and plated on agar. Potential antibiotic-producing bacteria were then identified based on zones of inhibition. These isolates were tested against ESKAPE pathogen relatives. Two isolates were found that inhibited bacterial growth. One inhibited *Acinetobacter baylyi* and *Pseudomonas putida* while the other inhibited *Staphylococcus aureus* and *Escherichia coli* (all *S. aureus* work was done in a BSL-2 biological safety cabinet). Ethyl acetate extraction and bioassays were done on both isolates, as were multiple staining and metabolic tests. The 16S rRNA genes of isolates were amplified by single colony PCR; amplicons were then purified and sent to Yale University's Core Genomics facility for sequencing and species determination.

### **Inducibility of Methionine Sulfoxide Reductase in *Drosophila Melanogaster***

*Jessica Kris*

**David Binninger**

Charles E Schmidt College of Science: Biology Honors

In anoxic environments, most animals can survive for a short period of time before vast amounts of cellular damage occurs. Reactive Oxygen Species (ROS) are a byproduct of anoxic stress, and are responsible for some cellular damage. Methionine, once oxidized by ROS, can be restoratively reduced by enzymes called methionine sulfoxide reductases A and B (MsrA and MsrB). Msr has been studied, but its inducibility under stress conditions has not been confirmed. When exposed to prolonged anoxia, *Drosophila* enter a protective coma allowing them to survive before recovering during reperfusion. The objective of this experiment is to determine the inducibility of Msr in *Drosophila*. It is hypothesized that this ability to safely recover is due to an upregulation of Msr, which will be induced by anoxic stress and characterized via western blotting. Dangerous reperfusion events can be devastating, so understanding Msr could yield numerous neuroprotective benefits.

### **A Comparison of DNA Degradation Between Aged and Recent Monkey Fecal Samples**

*Carly Lambert, Falon Velez*

**Kate Detwiler**

Dorothy F. Schmidt College of Arts and Letters:  
Anthropology

The collection of fecal samples in the field enhances a primatologist's research, and the methods in which these samples are stored influences DNA extraction quality. Natural inhibitors exist in fecal samples, which can degrade the quality of DNA over time, generating poor results and a loss of potential information. However, it may be possible to reduce the degradation of DNA, and yield better results, if samples are stored in cryosafe tubes and an ultra low freezer. This study compares the quality of DNA from recent (1-2 years) and aged (10 years) fecal samples by using DNA extractions and quantitative PCR to analyze the concentration levels of DNA between the two sample groups. By comparing the

degradation of DNA between recent and aged samples, proper protocol can be determined for DNA extractions and storage. Our study will determine if aged samples can still contribute to research.

### **Littering Behavior and the Effect of Trash Management in a City Park**

*Daniele Leoce*

**Tobin Hindle**

Charles E Schmidt College of Science: Geography

This poster will present research on littering patterns in James A. Rutherford Park. The study uses the juxtaposition of areas with readily available trash management resources and areas with no trash management plan, to explore how this affects the distribution of litter. This research will be contextualized by a focus on trash psychology, or how demographic, cognitive and environmental variables affect littering conduct. Methods include several field experiments performed over a four week period, with each week changing one trash management variable and observing the effects through detailed park cleanups. Specific trash properties will be observed, such as recyclability and decomposition potential of individual trash items, in order to prescribe the most effective trash management plan for our public parks.

### **Comparison of the Rotational Behavior of Coffee Creamer in Two Different Liquid Media**

*Erik Lindstedt, Sarel Sandoval, Sebastian Gavalas, Kevin Nguyen, Kamanie Balark*

**Tsung-Chow Su**

College of Engineering and Computer Science:  
Mechanical Engineering

The purpose of this research was to explore dispersion patterns of coffee creamer when exposed to rotating fresh water. The dispersion patterns of the creamer were

observed after being both added directly to the rotating water and when having to first traverse a layer of vegetable oil. A rotating platform supporting a beaker was controlled through a power supply. The power supply was adjusted and the dispersion patterns of the creamer were observed at 2, 4, and 6 volts. When added directly, at 2 and 6 volts, the coffee creamer displayed a pattern of swirling around the vertical axis with some dispersion radially towards the bottom of the beaker. At 4 volts bands were formed, which was likely the result of experimenter error. After the vegetable oil was added, the coffee creamer again displayed as swirls after crossing the oil but was not as distinct as when applied directly.

### **Are Stripped Down Versus Lifestyle Embellished Visual Concepts Prudent or Imprudent: Implications for Concept Test Design**

*Katherine Llanos, Jerry Oscar*

**Allen Smith**

College of Business: Business

The development of innovations is a company's lifeline to a successful future. However, the rate of new product failures is alarming. Companies are faced with important decisions regarding which new products should be launched. The purpose of this study is determine if a stripped down concept formulation generated different reactions from respondents than did a lifestyle embellished visual concept formulation in a concept test for an innovative lifestyle brand. Fifty participants answered questions regarding a set of t-shirts with catchy sayings, designed specifically to fit college lifestyles. The embellished version produced higher scores in how participants thought the new t-shirts reflected who they are and how the t-shirts can fit in situations similar to respondents. Our recommendation to companies is to use an embellished concept test when marketing lifestyle products. Adding more detail to the concept test can help consumers visualize how the new product will fit with their lifestyles.

## **Automated Chlorination System**

*Andrew Long*

**Edgar An**

College of Engineering and Computer Science:  
Ocean Engineering

The objective of this project is to design, build, and implement an automated chlorination system for the test tank located at Building 36, Engineering West. This system will be able to actively monitor the pH level in the pool and maintain it at a specific pH standard using liquid chlorine. With pH monitored, the tank will be accessible for use more often. There are currently several clubs and groups of students that use this pool for testing; however, due to it being outside, it is not always clean enough and at a safe pH level for use. This system will maintain a pH level, thus maintain a clean and safe standard for use.

## **Isolation of Conotoxin $\kappa$ -PVIIA for in vivo Analysis in Shaker Channels of *Drosophila Melanogaster***

*Mary Mansour, Alena Rodriguez, Mickelene Hoggard*

**Frank Mari**

Charles E Schmidt College of Science: M.S. Biology

Conotoxin  $\kappa$ -PVIIA is a peptide toxin from the venom of the marine cone snail *Conus purpurascens*.  $\kappa$ -PVIIA blocks the Shaker channel, a voltage-gated, membrane potassium channel at the *Drosophila melanogaster* neuromuscular junction. The mammalian homolog of the Shaker channel is the Kv1.3 channel, which in humans, is highly expressed in effector memory T-cells, cells highly involved in the autoimmune response. The conotoxin was isolated through RP-HPLC and its identity was confirmed using MALDI-TOF MS. Since  $\kappa$ -PVIIA blocks the Shaker channel in vitro, it will be tested in vivo in *D. melanogaster* to determine if  $\kappa$ -PVIIA blocks the Shaker channels. The conotoxin will then be tested in Kv1.3 channels and in mammalian effector memory T-cells. This will determine whether  $\kappa$ -PVIIA is an effective blocker of the Kv1.3 channel and whether it

produces a significant reduction of activity in effector memory T-cells, indicating implications for autoimmune disease treatment.

## **Meditation Practice for Nurse Leaders in Acute Care Settings.**

*Doren-Elyse Marquit, Angela Prestia*

**Susan Dyess**

Dorothy F. Schmidt College of Arts and Letters: Psychology

Nurse leaders need to possess stress management skills to support their effective and successful management of their patient service units. Meditation is frequently cited within the literature as an option for a number of workforces to cultivate being present, and recognizing and reducing stress. Few researchers have studied the bearing of meditation for nurse leaders within acute care practice settings. Therefore, the purpose of this study is to examine the impact of a personal systematic meditation practice for nurse leaders on their reported stress, mindfulness, sense of control and self-esteem and patient satisfaction on the nursing units they manage. The study employs a repeated measures intervention design for nurse leaders at two sites with a mixed method integrated approach. Focus group interviews, patient satisfaction scores and four valid instruments are used for data collection at baseline, week 6 and week 12; the instruments Mindful Attention and Awareness Scale (MAAS), Perceived Stress Scale (PSS), Rosenberg Self-Esteem (RSE) and Locus of Control (LOC).

## **Do Different Modes of Data Collection Yield More Extreme Positive Responses from Hispanics?**

*Jimmy Mauk, Keith Ingham, Ryan Gondek,*

**Monica Escaleras, Eric Levy**

College of Business: General Economics

Does the mode of data collection affect respondent's behavior? Specifically, do telephone interviews or online surveys lead to extremity of responses? Many may assume that there is no difference in survey responses conducted online or over the phone. However, evidence supports that respondents give more extreme responses over the telephone than an online survey. We would like to test if what has been found in previous research holds for the Hispanic population, since it is the fastest growing ethnic minority in the United States. Therefore, they are impacting the culture, the marketplace, and politics within the country. We conducted our analysis by surveying 500 Hispanics nationwide using telephone interviews and online surveys in order to compare the difference in responses between the two modes of data collection. Our analysis supports that there is a statistically significant difference in respondent's behavior between online surveys and telephone interviews.

### **Devising an Efficient System for Identifying Circulating Tumor Cells from Whole Blood**

*Luiz Medeiros*

**Waseem Asghar**

College of Engineering and Computer Science:  
Electrical Engineering and Computer Science

The research is composed of designing and experimenting with different nano structures and multidisciplinary sub-systems to create a better sensing device for Circulating Tumor Cells (CTCs). The results of an optimal end product are herein presented. Concerning the different nano structures, work is demonstrated on devising appropriate nano materials to correctly allow for the creation of different affinity levels, surface geometry and topologies that are CTC friendly. This will provide the ground work for the capturing, sensing and collection of information regarding the CTCs. The multidisciplinary systems will be paired with the nano topographies developed to bring about different forms to collect information and restrain the CTCs with the least percentage of error.

In addition, nano circuitry is produced to create systems that co-work with and retain information regarding the particular type of inputs passing through the end device.

### **Correlation of Chloride Diffusivity and Electrical Resistance for Cracked Concrete**

*Stanley Merantus*

**Dronnadula Reddy**

College of Engineering and Computer Science:  
Civil Engineering

The Durability of Reinforced Concrete (RC) structures in the marine environment is causing increasingly serious concern in the structural infrastructures. RC structures, exposed to aggressive environments, are expected to last with little or no maintenance for long periods of time. However, one of the most serious environmental exposures that causes degradation is chloride diffusion, with tide-simulated wet and dry conditions at the air-water interface. This investigation, a joint project with Cemex (a cement mixing company), will address the change of chloride diffusion current resistivity due to macro and micro cracking, which is inevitable in all concrete structures. The correlation of chloride diffusivity with electrical current resistivity of sound and cracked concrete is studied experimentally, and the results compared with analytically determined values. The principal benefit of the research is the formulation of models to predict time-dependent chloride penetration into sound and cracked concrete in the marine environment.

## **Development of an Autonomous Surface Support Vessel**

*Bianca Mesa, Ian Martens, Pedro Muslera, Shay Tzinder  
Karl Von Ellenrieder*  
College of Engineering and Computer Science:  
Ocean Engineering

The Autonomous Surface Support Vessel (ASSV) project encompasses the first stage of development of an autonomous ocean vessel designed to spend extended periods of time operating without human contact, be it direct or indirect. The goal in developing such a vessel is to provide a potential surface support vessel for autonomous underwater vehicles (AUV) undertaking oceanographic and archeological exploration, and allow the AUV to operate more effectively in areas too remote for constant human support. A majority of the project's resources and time are focused on the development of the sensor array and navigation system, as well as the characterization of the vessel's control parameters. In its development, this project will undertake that first step towards a rudimentary form of artificial intelligence by attempting a vehicle that uses little power for normal operation, can generate and store excess power, and can navigate/route itself given basic mission parameters.

## **Investigating Ground Penetrating Radar (GPR) Potential for Detecting Subsurface Gopher Tortoise Nests within South Florida Soils**

*Sarah Mitchell, Xavier Comas, Jessica Huffman  
Evelyn Frazier*  
Charles E Schmidt College of Science: Geology

*Gopherus polyphemus* is a burrowing keystone reptile of the southeastern United States. Current population declines are creating a need to improve the ability to accurately locate nests to assess clutch survival. Recent studies have shown potential in non-invasive methods (ground penetrating radar,

GPR). Our preliminary work is focused within the FAU Preserve (FAUP), a fragmented habitat with 80-100 tortoises. Previous FAUP studies suggest disproportional age distributions and inability to detect nests using wire-probing techniques. In 2014, an egg was found suggesting nesting potential; however more efficient techniques are needed to fully characterize the preserve. Utilizing GPR, we imaged an active tortoise burrow to detect the presence of chicken eggs buried on the apron. As anticipated, eggs acted as point reflectors in our GPR profiles, allowing us to characterize their extent and depth. This research has implications for improved nest detection and could lead to a better understanding of tortoise reproduction.

## **Genomic Diversity and DNA Fingerprints of the Oral Wash Microbiome in US and Southern Nigerian Populations**

*Veronica Molina, Shreyasee Chakraborty  
Nwadiuto Esiobu*  
College of Engineering and Computer Science: Biology

Human oral microbiome plays an important role in the cardiovascular and gastro-intestinal health through its behaviors and interactions with other parts of the body. This study is the first to employ metagenomic sequencing of 16S rDNA gene analyzing the oral microbiomes from southern Nigeria. We contrast genomic diversity of an oral wash from the U.S. and west Africa with the goal of defining the composition and structure of oral bacteria to understand oral health, and to inform possible early detection and prediction of disease. Microbial community shifts in healthy subjects, in smokers and in oral disease samples were also compared. The V3 - V4 hyper-variable regions of 16S rDNA, extracted directly from 20 individuals from 2 populations (U.S. and Nigeria) and 3 sub-groups, were amplified by PCR and sequenced by Illumina Miseq system using tagged and barcoded primers. This presentation discusses the implication of the high variance in diversity and richness of key bacteria.

## Community Performative Parametric Design

*Arthur Molinari, Marco Mandra*

**Mate Thitisawat**

College for Design and Social Inquiry: Architecture

The study will result in a demonstration visualization of street light with kinetic response to environmental and user inputs. We will investigate feasibility and possibilities of using the street light to enhance the well being of residents. The study involves Pines Village, the first neighborhood in the City of Pembroke Pines. The street light will address important issues such as the lack of street illumination, crime prevention and neighborhood aesthetics. The study is based on a combination of performance simulation and parametric modeling techniques. They are advanced skills sought after in the profession of architecture.

## Public History in the Digital Age

*Annaleah Morse*

**Sandra Norman**

Dorothy F. Schmidt College of Arts and Letters: History

As society is continuing to become digitally integrated, many museums and archives are facing difficulty appealing to newer generations, especially those that are raised on digital availability of resources. Beginning with an explanation of the history of museums, my thesis expands on the evolution of museums, focusing on the current digital climate. The current digital revolution is an exigent matter that museums and non-profits must respond to, and without proper financial assistance and adaptation of new technologies, museums and non-profits cannot fully achieve digital integration. New technologies allow museums to appeal universally: rather than being available to only a specific community, digitization has allowed museums to dissipate information globally. Ultimately, the question for archives and museums has evolved from how to provide information to the public to how museums and other non-profit organizations can better adapt to the growing needs of the digital age and those within it.

## Understanding Autism and Collaboration Skills: Evaluation of Asynchronous Presentations for Postsecondary Students

*Ana Moyano, Jazarae McCormick*

**Rangasamy Ramasamy**

College of Engineering and Computer Science:  
Psychology

Understanding effective methods of instruction is an important component of maximizing time and resources in education. The present study evaluates the efficacy of an asynchronous method of presentation on knowledge and skills of future education professionals. The findings of this action research study result from presentations focused on increasing collaboration with families of children with Autism. The presentation provides skills and knowledge for postsecondary students who will be working with children and families in the community. The outcomes illustrate an increase in knowledge in the area of collaboration and the utility of the presentation format.

## The Effects of Oxytocin and Cortisol Pre and Postpartum Levels in Mother-Infant Bonding

*Jana Olivova*

**Nancy Jones**

Charles E Schmidt College of Science:  
Neuroscience/Behavior

Despite all the work on how oxytocin ("love" hormone) and cortisol ("stress" hormone) affect behavior, it is not well known how these hormones' levels, pre and postpartum, affect the mother-infant quality of bonding. Therefore, oxytocin and cortisol levels and mother-infant quality of bonding were studied to determine possible correlations. Oxytocin and cortisol levels were measured pre and postpartum in mothers and infants. Hormones released were induced in mother-infant dyads by exposure to either a nurturing condition or to a stressful condition. Results have



found no correlation between oxytocin and the nurturing condition, but positive correlations between oxytocin and the expressed feelings of mothers toward their infant, as well as a negative correlation between cortisol and less bonding feelings (afraid/resents infant). Understanding how mother-infant bonding develops into a lasting bond should be a valuable tool for pediatricians and psychologists in promoting behaviors that will benefit society at large.

### **The Maxwell Coil**

*Andrea Padron, Wen-Chung Cheng*

**Korey Sorge**

Charles E Schmidt College of Science: Physics

The Maxwell Coil is a collection of different sized current-carrying rings that, when placed in a specific arrangement, produces a uniquely uniform magnetic field. We have composed numerical representations of this coil arrangement using Microsoft Excel, and visual simulations using Mathematica, to study the uniformity of the magnetic field produced by the Maxwell Coil. We also construct a physical Maxwell coil using 3D printing and traditional electronic components and compare results of field uniformity with those of the numerical simulations. We find that the Maxwell coil provides the benefit of both high uniformity in field and high mechanical accessibility to that field. These properties allow us to better study special properties of this field experimentally.

### **Possible Solution to Excessive Fishing in Biscayne Bay**

*Nicole Perez*

**Mirya Holman**

Charles E Schmidt College of Science: Biological Science

Overfishing in Biscayne Bay, a National Park near Miami, Florida, causes declining snapper and grouper populations, and fishing boats impact marine life. Federal officials want to ban fishing in an area for these reasons. The state

and marine industry disagree because of the money recreational fishing brings; they prefer stricter rules like the time of year people fish. An optimal solution for the wildlife and economy will be examined through scientific literature and previous successful solutions. I propose that one solution could be through President Obama's executive order for the National Ocean Policy to make a National Ocean Council, which would help federal agencies, the state, and marine industry work together, which is needed for a compromise. A fishing season for impacted fish, which would ban fishing for a specified time of the year, might help fish populations and not affect the economy as much as banning fishing completely.

### **Limited Movement Assistant to Arthritic Hands**

*Anthony Pipitone, Amir Ferouz, Michael Foley, Johnathan McAlister*

**Erik Engeberg**

College of Engineering and Computer Science:  
Mechanical Engineering

The purpose of this project is to create a mobile remote controller that operates a mechanical device that plays the piano. We have in our means to design a finger and wrist system that can play every key on the piano. The group has created 4 fingers that play the piano by pulling tendons on a robotic hand. The remote input device is a gloved sensor fitted with flexing sensors that monitor an arthritic patient's joint movement. The controller then sends the signal to be amplified to a normal full range of motion. That signal is sent to the robotic hand which plays the piano. Linear movement of the wrist is transferred with a sliding device. This project was a success and actually was able to assist people in remotely playing a scale on the piano.

## Getting to the Roots of Plant Invasion

*Roberto Ramirez*

**Nwadiuto Esiobu**

Charles E Schmidt College of Science: Biological Science

In Florida, there is an aggressive, invasive, tree species called the *Schinus terebinthifolius*, or more commonly known as the Brazilian pepper tree (BP). This plant has been proven to be a more successful invader, due to higher growth rates, improved survival, and biomass production, labeling it as a category 1 invasive species. One of the most interesting factors of this species is that once uprooted from the soil, the soil composition seems to change, inhibiting the growth of native plant species. In this study, 16s rRNA from the BP, native plant, *Persea borbonia* (Red Bay) rhizospheric microbial communities as well as physiological community profiles (CLPP) were extracted and analyzed using 31 different environmental substrates using the BioLog's multi-substrate ecoplates. The genetic and phenotypic fingerprints of both species were compared by calculating the average metabolic response (AMR) and the community metabolic diversity (CMD). The AMR results for  $\alpha$ -D-Lactose, L-Serine, and L- $\alpha$ -Glycerol Phosphate in BP were significantly lower than those for native plants. The results indicate that the substrates were highly metabolized in the rhizosphere of the native Red Bay plant, and dramatically lower in the BP rhizosphere. This could indicate that the reason why native plant growth is hindered in soil previously sustaining the BP, is that the BP produces biochemical changes in the soil that inhibit the growth of Arbuscular Mycorrhiza necessary for the health and development of native plants. With this information a new and more efficient method of control could be established against the BP.

## Health Care and Hispanics: The Disparity in Health Care Coverage and Affordability Between Genders

*Erik Rodriguez, Kevin Gajjar, Alexandra Acosta*

**Monica Escaleras**

College of Business: Business Economics

Historically, Hispanics have been the ethnic minority in the United States with the highest rate of adults without health care insurance. Before the Affordable Care Act passed in 2013, 36 percent of working-age Hispanics were uninsured in the United States. After the bill was passed, the percent of uninsured Hispanics in the population declined to 23 percent in June 2014. This study examines the impact of the Affordable Care Act implementation on the Hispanic population. We conducted a survey of 500 Hispanics nationwide to test the hypothesis on the dissimilarity in health care coverage and affordability among Hispanics males and females. Our results revealed a significant disparity in health care insurance coverage and affordability between Hispanic males and females. The dissimilarity in coverage and affordability between genders has continued after the passing of the Affordable Care Act, a point often overlooked.

## Discovery of Antibiotics from Unknown Soil Bacterium

*Alexander Santos*

**Joesph Caruso**

Charles E Schmidt College of Science: Biology

To discover novel antibiotics, soil was collected at 26.566641, -80.201949 in Lake Worth, FL. Soil was diluted in sterile H<sub>2</sub>O, plated on Potato Dextrose Agar + cycloheximide (to inhibit most fungi) and incubated at 30°C. When colonies appeared, those showing a zone of inhibition were subcultured onto another petri dish to test vs. ESKAPE drug-resistant pathogens or related spp. *Staphylococcus epidermidis*, *Escherichia coli*, *Pseudomonas putida* and *Staphylococcus aureus* (handled in a BSL-2 biosafety cabinet) were used as tester strains. Isolates #1, #13, #19 were swabbed over another plate to extract inhibiting compounds with Ethyl acetate which were then tested with a bioassay. Isolated colonies of these bacteria were also used for single

colony PCR to amplify the 16S rRNA gene. After amplification, purified PCR products were sent to Yale University's Core Genomics facility for sequencing and speciation.

### **Genetic Identification of Juvenile Freshwater Apple Snails**

*Estevao Santos*

**John Baldwin**

Charles E Schmidt College of Science: Biology

In many parts of the world invasive species of apple snails (*Pomacea* spp.) are the culprit of millions of dollars in damage to agricultural crops. These snails have since been extensively studied in parts of Asia and South America, but have been less studied in Florida where at least one species has established alongside our native Florida apple snail (*Pomacea paludosa*). No methods have been established to distinguish juvenile stages of apple snails, but survival of juvenile stages probably limits population sizes and distributions. We are developing a genetic technique to distinguish between native and non-native snails. This technique uses custom designed DNA primers along with universal gene primers to amplify sequences of DNA of different lengths that are specific to different species. This technique will bypass DNA sequencing and allow a large number of individuals to be identified simultaneously, making ecological studies of apple snails cost and time efficient.

### **Neuropsychological Evaluation of Spanish- English Bilingual Pre-school Aged Children**

*Giselle Santos, Sonia Vanegas, Monica Bernal, Esmeralda Matute*

**Monica Rosselli**

Charles E Schmidt College of Science:  
Neuroscience and Behavior

In certain parts of the US, children of Hispanic descent

form the majority in public schools. However, only few neuropsychological tests have been developed to gather normative data for Spanish- English bilingual children. A comprehensive neuropsychological battery (*Evaluación Neuropsicológica Infantil para Pre-Escolares*), developed and administered in Spanish, was used to evaluate 45 Spanish-English bilingual pre-school aged children born in the US to immigrant parents from Spanish speaking countries. The pre-school children were tested using the neuropsychological battery in three, one-hour sessions. The evaluation assessed a wide spectrum of cognitive functions such as constructional and motor abilities, memory, and executive functions. A significant age effect was observed in most tests and a non- significant gender effect was found. The findings suggest the need for appropriate norms that can be used to test Spanish-English bilingual children living in the US. However, the small sample size limits the generalization of these results.

### **Urban Growth's Effect on the Everglades**

*Valerie Sapienza\**

**Mirya Holman**

Charles E Schmidt College of Science: Neuroscience and Behavior

Urban growth, also known as urbanization or urban sprawl, is the spreading of metropolitan growth that consumes natural areas, which has many harmful effects on the environment. This study provides information on how urban growth is affecting the Florida Everglades in destructive ways, with a focus on the water in the Everglades. A plethora of water pollutants, such as phosphorous, nitrogen and mercury come directly from human activities associated with urban sprawl. This pollution affects many parts of the Everglades' natural ecosystem including sawgrass marshes and mangrove swamps, as well as endangered species, such as the crocodile and Florida panther. This study also addresses limits on chemical pollution that can be placed by the President through

executive orders. Overall, the water pollution in the Everglades is destructive in many ways and can be reduced through executive orders from the President to limit the use of chemicals in urban fringe areas.

### **New Acidic Terpenoids from Pseudopterogorgia acerosa**

*Paul Scesa*

**Lyndon West**

Charles E Schmidt College of Science: Chemistry

One new cembranoid and two new pseudopteranoids were found in the gorgonian coral Pseudopterogorgia acerosa collected in the Bahamas. Isolation of these compounds was performed using a combination of column chromatography and preparative high pressure liquid chromatography. The structural elucidation was performed using extensive spectroscopic analysis, including mass spectrometry and 1D and 2D NMR spectroscopy. The structural elucidation of these compounds will be described.

### **Baseline Study for Identification of Parasites in Gopher Tortoises Found in Blazing Star and Pine Jog**

*Rachel Shanker, Kent Haiziett*

**Evelyn Frazier**

Charles E Schmidt College of Science:  
Biological Sciences

Gopher tortoise (*Gopherus polyphemus*) populations are diminishing in South Florida due to habitat fragmentation in urban sites. As a keystone species, gopher tortoises have important ecological roles. The goal of this study was to establish a baseline of intestinal parasites in two South Florida populations. One population resides in a fragmented and non-fire maintained site, Blazing Star, and the other in a fire maintained site, Pine Jog. Fire is a natural factor in these habitats reducing canopy cover and

killing parasite eggs. The lack of fire in Blazing Star can lead to overgrowth of vegetation, forcing tortoises to crowd where lower vegetation is found. We hypothesize that tortoises from Blazing Star will have a higher degree of intestinal parasites, when compared to those from Pine Jog due to potential crowding. Data is currently being collected, and may provide insight to improve future management and conservation practices.

### **Stucco Removal Engineering**

*Brandon Shaw, David Cowan, Johnathan Murphy, Dylan Trotsek*

**Daniel Meeroff**

College of Engineering and Computer Science:  
Civil Engineering

Construction workers are exposed to fine particulate inhalation hazards during stucco removal. The ultimate goal of this research is to test a new chemical-assisted method that will reduce workers' exposures to safer levels. To that end, the minimum specimen size must be determined that will replicate this hazardous work environment. Samples of concrete stucco surfacing material (CSSM) of various sizes ranging from 1" x 1" to 8" x 16" were applied to masonry blocks. These specimens were tested to determine the minimum size needed to produce 150mg/m<sup>3</sup> (one order of magnitude larger than the OSHA exposure limit of 15mg/m<sup>3</sup>) of airborne particulate in a 1 m<sup>3</sup> test chamber when removed with a chipping hammer. Testing results revealed that 5" x 5" specimen size yielded on average 180mg/m<sup>3</sup> of particulates.

## **Metal Cation Detection Using a Novel Small Molecule Chemosensor**

*Kenneth Shelley, Arianna Gagnon*

**Daniel T. de Lill**

Charles E Schmidt College of Science: Chemistry

This presentation focuses on the continual research of a novel small molecule sensor, benzo[1,2-b:4,5-b']dithiophene-4,8-dione ("dione"), and its capacity to sense group one and group two metal cations using absorption spectroscopy as well as ratiometric analysis of these spectra. Through weak intermolecular interactions, the dione can quantitatively detect various metal cations by analyzing their absorption intensities and comparing them to their respective concentrations. Current research is focused on ascertaining the detection limits for each targeted metal cation. Attempts to grow crystals of the dione with metal salts is currently in progress as experimental evidence for weak intermolecular interactions. The dione's capacity to sense biologically hazardous transition metal species will also be studied.

## **Assessment of Mobile Technology for Students with Autism Spectrum Disorder**

*Evelyn Skinner*

**Shihong Huang**

College of Engineering and Computer Science: Biology

Autism Spectrum Disorder is a rapidly growing concern among our community today. Many people with ASD are faced with neurological problems that may impede on the way they communicate with others, as well as learning new information from an early age until adulthood. Students classified with ASD often have problems communicating with their peers and caregivers. Eye contact, focusing on one topic, sensory overload induced tantrums, and formulation of words are a few obstacles this group faces. When a user interacts with mobile interfaces, the speed at which they access the content is

limited by the ease of navigation. By studying mobile navigation methods for ASD students we can decrease their level of mental stress induced from having to spend a longer amount of time looking for desired information.

## **Multiculturalism in America's Workplace**

*Sonja Smith*

**Marylou Naumoff**

Dorothy F. Schmidt College of Arts and Letters:  
Communication

American society has been focused on creating diversity within the workplace for decades. However, the United States has surpassed the mere promotion of diversity as it is well on its way to becoming the most multicultural country in the world. This change suggests that we have moved past diversity and are becoming a nation that is melding different cultures together. The purpose of this paper is to investigate the factors that are creating the largest demographic shift in the history of the United States. I am specifically interested in how those demographic changes are being addressed in the workplace therefore I analyze various programs being implemented within companies and organizations such as the colorblind, multicultural, and the AIM approach. The paper concludes by addressing how the American workplace can serve as a case study in how these tensions associated with living in a multicultural society are playing out.

## **Comparison of Polymorphic Sites in *Caretta caretta* from the Dry Tortugas, Florida**

Narcissus Smith

John Baldwin

Other: non degree

The purpose of this study was to identify the parallelisms or differentiations between polymorphic sites within the

haplotypes of 72 nesting female loggerhead sea turtles from the Dry Tortugas, Florida. Genomic DNA was extracted from blood samples provided by the United States Geological Survey (USGS), the 817 base pair mitochondrial DNA region was amplified using Polymerase chain reaction, sequenced, and sequences were examined, aligned, edited, and compared to 817 bp fragments published on the Archie Carr Center for Sea Turtle Research. Of the 72 DRTO samples, 48 individuals were found to be consistent with haplotype CC A2.1, 5 were all consistent with haplotype CC-A1.1, 2 were found to be consistent with haplotypes CC A3., and 1 was found to be consistent with haplotypes CC A9.1. Two individuals were found to have haplotypes inconsistent with sea turtle haplotypes native to the Dry Tortugas and 8 individuals are still under investigation.

### **Novel In Situ Hybridization Method Measuring Serotonin 2A Receptor mRNA Levels in Rats Exposed to MDMA**

*John Sousa, Ibrahim Shokry, John J. Callanan, Rui Tao*  
Charles E Schmidt College of Science: Neuroscience

This study aimed to identify changes in the expression of serotonin (5-hydroxytryptamine; 5-HT) receptor 5-HT<sub>2a</sub> mRNA in paraformaldehyde prefixed rat brain tissue after exposure to 3, 4 methylenedioxymethamphetamine (MDMA). Rather than use traditional, time-consuming methods that were highly prone to error, such as the use of radioactive riboprobes, we used recent advancements in the development of rapid in-situ hybridization to our advantage. The use of rapid in-situ hybridization (such as the RNAscope assay) has allowed us to use paraformaldehyde prefixed brain tissue sections, which are more widely available and easier to use, instead of fresh frozen tissue. Here we describe the results from the use of the RNAscope assay to measure the amount of *dapB* (a bacterial gene), *ppiB* (a eukaryotic housekeeping gene), and *htr2a* (a eukaryotic gene coding for 5-HT<sub>2A</sub> receptors) mRNA.

### **"Tiger Stripe" Phenomena in Indian River Lagoon Dolphins**

*Jessie Stevens, Bryanna Lum, Cameron Blocker, Molly Ferch, John S. Reif*

**Elizabeth Murdoch Titcomb**

Charles E Schmidt College of Science: Biology

A previously undescribed skin abnormality, which we refer to as "tiger stripes," has been identified in Indian River Lagoon bottlenose dolphins through photo-identification surveys. The condition presents as parallel stripes on the ventral and lateral aspects on the torso of the dolphin with varying length and depth. The condition may be indicative of rapid weight loss, similar to human "stretch marks", debilitating illnesses resulting in emaciation or a result of starvation due to lack of prey. Goals of this study were to determine if tiger stripes are: (1) a marker of rapid weight loss, (2) more prevalent in post-partum females, and to (3) examine the spatial and temporal distribution in the IRL. Preliminary findings indicate that tiger striping is a useful marker suggestive of rapid weight loss. The next phase of research is to determine if the condition can be utilized as a pre-mortem marker of emaciation in IRL dolphins.

### **Synthesis of Lariat Crown Ether Based Catalysts and Their Application in the Hydrolysis of Esters**

Vallabh Suresh, Susovan Jana

**Salvatore Lepore**

Charles E Schmidt College of Science: Chemistry

The syntheses of various Lariat crown ethers including several not previously reported and their efficient purification are presented. The synthesis route brings together reactions from a variety of previous works leading to a robust and generalized approach to these C-pivot lariats. The main steps are condensation of functionalized diols with penta-ethylene glycol

ditosylate in the presence of potassium as a templating cation. Purification of the final products was achieved without chromatography by forming crown ether complexes with potassium nitrate followed by their precipitation. The catalytic activity of these lariat ethers in the hydrolysis of carboxylic esters was explored.

### **Construction of a Musical Brain**

*Lee Sutherland, Chad Perna*

**Brenda Claiborne**

Wilkes Honors College: Biology

The primary objective of this research is to build a scale model of an experimental musical instrument based on anatomical model of the human brain. This device will respond to touch, electromagnetic energy and light to create sounds and project images. With each area of the brain corresponding to a different input and output, the overall goal is to create a musical instrument that can play an orchestra of sounds in a similar way our human brains react to sight, sound and vibration. This instrument will be constructed using off the shelf electronics, circuit boards, electro conductive paint, luminescent wiring and projectors. The basis for the brain will be constructed using a custom fabricated transparent enclosure, over a cardboard brainframe.

### **Growth Rate Estimation of Neonatal Pomacea Maculata**

*Michael Teti, Dean Monette*

**Scott Markwith**

Charles E Schmidt College of Science: Biology

The exotic apple snail *Pomacea maculata*, found in increasing numbers in aquatic ecosystems in Florida, is a major food source of the endangered snail kite (*Rostrhamus sociabilis plumbeus*), yet little is known about its growth patterns and fecundity. This ongoing study examines 20 egg clusters laid by *P. maculata* that were collected in Lake

Okeechobee and placed in an incubator. The neonates that hatched were counted, and 200 of these were divided equally into 10 1500mL aquaria. The number and collective weight of the snails in each aquaria was recorded weekly for 133 days. The average weekly per capita growth over this period was found to be 0.1836g, and there was a decrease in growth potential of 0.1512g per individual as the number of individuals in each tank increased by one. These findings could aid water managers in population size and growth rate estimation of this species.

### **Misuse Pattern: Keyboard Injection through the USB Human Interface Device Class**

*Dyllan To*

**Eduardo Fernandez**

College of Engineering and Computer Science:  
Computer Science

We are presenting a misuse pattern, Keyboard Injection through the USB Human Interface Device (HID) class. This paper describes how such a misuse is performed from the view from an attacker, describes the systems involved in the misuse, analyzes methods of stopping or preventing the attack through potential security patterns, and details techniques that can be used to detect or trace such an attack after it has occurred. Such a pattern can inform IT managers, device manufacturers, or even device driver developers of the vulnerability, as well as detail methods or security patterns that can prevent an attack. A keyboard injection misuse attempts to infiltrate a system or network through a variety of techniques. Such a misuse impersonates a keyboard HID, which most systems inherently trust.

## **Identification of Arthropod Species on Decomposing Sus scrofa in Florida**

*Jonathan Troiano, Ryan Ebanks, Spencer Brown*

**Evelyn Frazier**

Charles E Schmidt College of Science: Psychology

The rate of carcass decomposition is accelerated in South Florida unlike temperate regions. This is attributed to environmental factors such as increased sun exposure, high humidity, heat, and the arthropod species present in the environment. The goal of this study was to document the arthropod species that consume carrion. Four *Sus scrofa* carcasses were individually caged in sites exposed to direct sunlight in September, at Jonathan Dickinson State Park. Arthropod eggs and larvae were then collected utilizing aseptic techniques, and then reared in the laboratory. Only adult flies emerged and no dermestid beetles were observed from the rearing chamber. They were euthanized immediately, and pinned for identification. Pinned arthropods have been sent to a taxonomist and are pending identification. Data obtained from this investigation will enhance the body of knowledge on the known species of carrion flies in Florida.

## **See Her: Women's Representation in Contemporary Hollywood Film Culture**

*Michelle Trujillo*

**Gerald Sim**

Dorothy F. Schmidt College of Arts and Letters:  
Communications

See Her is a found footage montage that identifies the issue of women's representation in contemporary Hollywood film culture. It analyzes different ways that spectatorship develops through the division of the film into four sections of which three analyze film from the perspective of Laura Mulvey, Mary Ann Doane, and Linda Williams. These three sections also approach the representation of women as a

sociological issue of oppression as discussed by sociologist Patricia Hill Collins. The last section serves as a speculative vision of the future of female representation in Hollywood Film Culture. While this film is critical on the current state of representation, it presents hope for a more equal future.

## **The Gray Wolves' Path to Recovery**

*Rebecca Tsang*

**Mirya Holman**

College of Business: Pre-Business

The gray wolf is a native species to North America, but settlers in the 1800s started to shoot, poison, and trap them. In the 1930s the species was eradicated from the Northern Rockies, and eventually were on the brink of extinction. Thankfully, the Endangered Species Act was put in place in 1973, and the gray wolf was one of the first species to be protected. Because of these new protections, the species was able to start their road to recovery. In 1995 and 1996, the gray wolf was reintroduced to Yellowstone National Park and the Northern Rockies. However, starting in 2009 the northwestern states began to delist the gray wolf from their protections. This shifted the power from the federal level to the state level, giving each state control over their wolf populations. When Wyoming was given this power in 2012, their gray wolf population began to plummet again, and in 2014, the courts overturned this decision, giving power back to the federal government. The gray wolves are a very significant species to the ecosystems they inhabit; therefore, their existence and recovery must be allowed to remain flourishing. For this to happen, power should be turned back over to the government and the gray wolf should continue to be protected under the ESA as well.



### **Efficacy of Antibiotic Producing Material from FAU SWI Life Sciences Lab Tested against Close Relatives of ESKAPE Pathogens**

*Alexander Voitkov, Erick Espana*

**Joseph Caruso**

Charles E Schmidt College of Science: Biology

Antibiotic resistance is a growing medical problem world-wide, prompting scientists to face the prospects of a post-antibiotic world. To help prevent this, the Small World Initiative (SWI) was formed in 2014 to crowd-source antibiotic discovery. Over 20 antibiotic-producing bacteria were isolated from soil by the Fall 2014 SWI Life Sciences Lab students. These were tested vs. close relatives of ESKAPE drug-resistant pathogens. ESKAPE relatives included *Enterococcus raffinosus*, *Bacillus subtilis*, *Enterobacter aerogenes*, *Escherichia coli*, *Acinetobacter baylyi*, *Pseudomonas putida*, *Staphylococcus epidermidis* and also the eukaryote *Candida albicans*. Many strains had activity vs. multiple ESKAPE relatives. In contrast, one (#14) strongly inhibited and another (#22) slightly inhibited *C. albicans*. Isolates had their 16S rRNA gene amplified by PCR and these have been sent to Yale University for sequencing.

### **Mapping the Distribution of Salinity in Venetian Canals**

*Carly Wagner*

**Charles Roberts, Donna Selch**

Charles E Schmidt College of Science: Geography

In Venice, Italy, rising sea levels and increased subsidence has led citizens to erect structures to hold back the rising waters (known as Project Mose) during aqua alta events where seas rise over 3.5 feet. Seawater also causes damage to stucco and brick facades, damaging the structural integrity of buildings. This study, conducted to establish a hydrologic baseline in Venetian canals, mapped salinity levels throughout the city at 31 sampling sites in major and minor canals over a six week period.

Geographical interpolated maps of salinity were created using the collected values. Within Venice salinity may vary up to 15 ppt. Once completed Project Mose will have the ability to hold back seawater, thereby affecting salinity distribution. This research established a baseline for future hydrologic research.

### **Studying the Relationship between Harmonic Forces Acting on a Pipe with a Flowing Fluid and the Resulting Hydraulic Jump of the Jet Impacting a Circular Flat Plate**

*Timothy Wehage, Christian Caracci, Bryan Mehmet, Julian Garzon*

**Tsung-Chow Su**

College of Engineering and Computer Science:  
Mechanical Engineering

Within the framework of ongoing research studying the effects of oscillatory forces on pipe flow, an experiment was conducted to investigate the relationship between the nature of said forces and hydraulic jump resulting from the impact of the exiting flow onto an orthogonal surface. To this end, a reservoir supplying constant head and near-hydrostatic conditions was equipped with an exit fitting in its lower section. A section of PVC tubing extended vertically downward from this exit point and was straddled by a pair of dynamic loudspeakers placed opposite each other and connected to a receiver's inputs so as to play a signal of specified frequency. The resulting turbulent jet flow was then allowed to drop to a horizontal plate of circular shape. The outer lip of the plate triggered a circular hydraulic jump whose location was found to be directly dependent on the frequency of the forces exciting the flow.

## **STEM Education Through Underwater Robotics**

*Janet Weinthal, Raisa Karim*

**Edgar An, Allan Phipps**

College of Engineering and Computer Science:  
Electrical Engineering

It is vital to encourage young students to pursue careers in STEM (Science, Technology, Engineering, and Mathematics) to build an innovative workforce. In order to generate student interest in the field of engineering, we implemented underwater robotics instruction through peer mentoring at A.D. Henderson Middle and FAU High School. To determine whether this program was effective in inspiring students to pursue engineering, we analyzed the success of the students at the National SeaPerch Underwater Robotics Competition, the number of STEM-related projects that students later created, and the number of students who have joined the robotics program. We found that the middle and high school teams won 11th and 8th place at Nationals. Five of the students created award-winning STEM projects; student membership in SeaPerch has increased from five to twenty-six within two years. Future plans to generate interest in engineering include forming a more challenging MATE Robotics team.

## **A Comparative Study on the Effects of Water Depth in Relation to the Egg Laying Events of *Pomacea maculata* and *Pomacea paludosa***

*Molly Winn, Dean Monette*

**Scott Markwith**

Charles E Schmidt College of Science: Biology

The exotic snail *Pomacea maculata* has widened its geographical range, encroaching and overlapping territories of the native apple snail, *Pomacea paludosa*, in South Florida. Due to the fact that both species are an important food source for the endangered species *Rostrhamus sociabilis*, water resource managers want

to know if hydrological factors influences native and exotic reproduction. The purpose of this study is to examine how water depths influence egg clutch laying events of *P. maculata* and *P. paludosa*. Based on our results, between the range of 5-90 cm, the native and exotic snail egg clutches were found equally distributed across water depths. This may indicate that water depths alone below 90 cm may not contribute to an increase or decrease in egg laying events that may promote population expansion or decline of either *P. maculata* or *P. paludosa*.

## **Synthesis of Complex Polycyclic Scaffolds Incorporating $\alpha$ -Amino Acids**

*Stephen Zorc, Shyam Samanta*

**Stephane Roche**

Charles E Schmidt College of Science: Neuroscience

In order to keep up with the high demand for biologically active molecules, chemists devised synthetic strategies to access novel chemical spaces. The two main strategies are to revisit and expand existing reactions or to create new transformations. We are exploring a unique and underexploited reaction, the Himbert-Henn cycloaddition, to produce complex molecular scaffolds in a single step. In a second novel approach, we are modifying the Hantzsch 4-component reaction (4-CR) by incorporating an  $\alpha$ -amino acid residue to construct new molecules. Both of these reactions have great potential to synthesize novel and chiral molecules from proteinogenic  $\alpha$ -amino acids. These unprecedented and complex polycyclic scaffolds have potential application in medicinal chemistry and natural product synthesis. 4-Aza-podophyllotoxins obtained by the Hantzsch-4CR have been proven to be potent as anti-leukemia, anti-colon cancer and vascular disrupting agents.

# NOTES

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