



# SHOWCASE OF UNDERGRADUATE RESEARCH EXCELLENCE

CELEBRATING UNDERGRADUATE RESEARCH AND CREATIVITY ACROSS THE CURRICULUM



2016

THURSDAY, APRIL 7, 2016

PEGASUS BALLROOM  
UCF STUDENT UNION

## **Welcome to the 13th Annual Showcase of Undergraduate Research Excellence.**

The Showcase is a poster-based forum for University of Central Florida undergraduates to present their research and creative projects to the university community. Undergraduates from all disciplines are encouraged to present current or recently completed academic projects showcasing the diversity of topics, approaches, and interests at UCF. The Showcase serves as a resource for undergraduates not yet engaged in research and creative pursuits to learn how fellow students have developed their intellectual interests, current projects, and faculty connections. The Showcase also demonstrates to students, faculty, staff, alumni, and the Central Florida community that student research builds upon and enriches the UCF undergraduate experience. The Showcase is sponsored by the Office of Undergraduate Research, which is a unit of the College of Undergraduate Studies. For more information about undergraduate research, please visit **[www.our.ucf.edu](http://www.our.ucf.edu)**.

The Showcase is part of the 2016 Research Week at UCF.

**[www.showcase.ucf.edu](http://www.showcase.ucf.edu)**

UNIVERSITY OF CENTRAL FLORIDA | ORLANDO, FLORIDA

# SHOWCASE OF UNDERGRADUATE RESEARCH EXCELLENCE

Celebrating undergraduate research and creativity across the curriculum.

OFFICE OF UNDERGRADUATE RESEARCH  
COLLEGE OF UNDERGRADUATE STUDIES

## ORDER OF EVENTS

STUDENT PRESENTATIONS (*Pegasus Ballroom*) . . . . . 1:00–4:00 P.M.

FACULTY MENTOR OF THE YEAR (*Cape Florida Ballroom*) . . . . . 4:20 P.M.

**Student Undergraduate Research Council**

REMARKS AND PRESENTATION  
OF SCHOLARSHIPS (*Cape Florida Ballroom*) . . . . . 4:30 P.M.

**John C. Hitt**  
President

**Elizabeth Dooley**  
Vice Provost for Teaching and Learning  
Dean of the College of Undergraduate Studies

**2016 UCF STUDENT RESEARCH WEEK**

## SHOWCASE JUDGES

The Office of Undergraduate Research is indebted to the following faculty for devoting a substantial amount of their time serving as Showcase judges.

Ahlam Al-Rawi	Laurel Gorman	Jonathan Powell
Claudia Andl	Florencio Hernandez	Silvia Pulido
Thomas Andl	Woo Hyoung Lee	Shawn Putnam
Cindy Bayer	Jana Jasinski	Susan Quelly
Kathleen Bell	Travis Jewett	Michael Rovito
Bill Blank	Bill Kaden	Herve Roy
Patrick Bohlen	Joo Kim	Bridget Rubenking
Bob Borgon	Viatcheslav Kokoouline	Anwar Sanmani
Lisa Chambers	Dmitry Kolposhchikov	Valerie Sims
Mathew Chin	Stephen Kuebler	Jacqueline Towson
Manoj Chopra	Mingjie Lin	Rani Vajraveli
Karin Chumbimuni Torres	Victoria Loerzel	John Venecek
Rosa Cintron	Caroline Marrett	Linda Walters
Leslee D'Amato-Kubiet	Taleo Mayo	Lei Wei
Kimberly Dever	Elizabeth Mustaine	Kerry Welch
Christa Dierksen	J. Thomas Owens Jr.	Chrysalis Wright
Joseph Fanfarelli	Anthony Pak Hi Kong	

## SHOWCASE BENEFACTORS

Through the generosity of the following organizations and individuals, substantial scholarships will be awarded to students judged to have the best projects presented at the Showcase. The Office of Undergraduate Research and the planners of 2016 Student Research Week are grateful to these benefactors for their encouragement and support of student research at UCF.

We are especially appreciative to the **UCF Student Government Association** for its generous contribution.

### UNITS AND COLLEGES

The Burnett Honors College  
 College of Arts and Humanities  
 College of Engineering and Computer Science  
 College of Medicine  
 College of Nursing  
 College of Sciences  
 College of Undergraduate Studies  
 Florida High Tech Corridor  
 Institute for Social and Behavioral Sciences  
 Rosen College of Hospitality Management  
 Student Government Association

### INDIVIDUAL DONORS

Shannon Colon  
 Mr. Richard Harrison II  
 In honor of Dr. Jana L. Jasinski,  
 dedicated Showcase judge  
 for 12 years  
 Aubrey Kuperman  
 Colleen Marquart  
 Kimberly Schneider



## FACULTY MENTORS

The faculty is a university's paramount asset, and the Office of Undergraduate Research recognizes the following UCF faculty mentors who have advised, counseled, tutored, and encouraged students presenting at today's Showcase.

Kareem Ahmed	Seth Elsheimer	Stephen Kuebler	Mohtashem Samsam
Kelly Allred	Alvaro Estevez	Ariel Lang	Steven Saunders
Ahlam Al-Rawi	Luis Favela	Joseph LaViola	Anna Savage
Deborah Altomare	Ken Fedorka	Gary Leavens	Kristen Schellhase
Amanda Anthony	Cristina Fernandez-Valle	Ji-Eun Lee	Alfons Schulte
Uluc Aysun	Madelyn Flammia	Ana Leon	Axel Schülzgen
Jack Ballantyne	Keith Folse	Yingru Li	Sudipta Seal
Enrique del Barco	Jason Ford	Nichole Lighthall	William Self
Issa Batarseh	Maria Franco	Victoria Loerzel	Lawrence Shah
Matthieu Baudalet	Marcy Galbreath	Kevin Mackie	Michael Sigman
Jeffrey Bedwell	Luciana Garbayo	Kate Mansfield	Elzbieta Sikorska-Simmons
Steven Berman	Martha Garcia	Hansen Mansy	Valerie Sims
Richard Blair	Romain Gaume	Kim Manwaring	Pete Sinelli
Patrick Bohlen	Andrea Gelfuso	Carolyn Massiah	Aaron Smith
Clint Bowers	Ann Gleig	Artem Masunov	Eileen Smith
Martha Brenckle	Avelino Gonzalez	Fabrice Mathevet	Janan Smither
Candice Bridge	Laura Gonzalez	Pamela McCauley	Tara Snyder
Mary Ann Burg	Ali Gordon	Daniel McConnell	Mary Lou Sole
Angeline Bushy	Elizabeth Grauerholz	Stephen Medeiros	Lee-Anne Spalding
Giselle Carnaby	Peter Hancock	Piotr Mikusinski	Kiminobu Sugaya
Shannon Carter	William Hanney	Delbert Miles	Suren Tatulian
Necati Catbas	Erin Hanson	Doan Modianos	Laurene Tetard
Debopam Chakrabarti	Eric Hoffman	Karen Mottarella	Kenneth Teter
Ratna Chakrabarti	Bari Hoffman-Ruddy	Mustapha Mouloua	Jayan Thomas
Debashis Chanda	Richard Hofler	Daniel Murphree	Jacqueline Towson
Reshawna Chapple	Gail Humiston	Saleh Naser	Jennifer Toyne
Susan Chase	Jaehoon Hwang	Charles Negy	Anne-Charlotte Trinquet
Jason Chesnut	Woo Hyoungh Lee	Mark Neider	Anca Turcu
Lee Chow	Boo Hyun Nam	Shuo Pang	Volodymyr Turkowski
Karin Chumbimuni-Torres	Peter Jacques	Christopher Parkinson	Dawn Turnage
Lucia Cilenti	Racine Jacques	Griffith Parks	Fernando Uribe-Romo
Alexander Cole	Bruce Janz	Daniel Paulson	Anna Valdes
Ilenia Colon Mendoza	Kelly Jennings-Towle	Carla Poindexter	Carlos Valdez
Joshua Colwell	Mollie Jewett	Tison Pugh	Stephanie Vie
Norma Conner	Yier Jin	Guo-Jun Qi	Alvaro Villegas
Alicja Copik	Jayanta Kapat	Seetha Raghavan	Konstantin Vodopyanov
Anne Culp	Jeffrey Kaplan	Talat Rahman	Laurence von Kalm
Leslee D'Amato-Kubiet	Abdelkader Kara	Nazanin Rahnavard	Parveen Wahid
Kristopher Davis	Alain Kassab	Andrew Randall	Linda Walters
Ronald DeMara	Jeffrey Kauffman	Amy Reckdenwald	Lori Walters
Weiwei Deng	Michelle Kelley	Debra Reinhart	Ze Wang
Kimberly Dever	Jennifer Kent-Walsh	Maria E. Reyes	Tracy Wharton
Donovan Dixon	Mercedeh Khajavikhan	Beatriz Reyes-Foster	Stephanie Wheeler
Aristide Dogariu	Saiful Khondaker	Martin Richardson	Grace White
Amy Donley	Kelly Kibler	Fernando Rivera	Janet Whiteside
Melinda Donnelly	Yoon-Seong Kim	Hector J. Rivera Jacquez	Shannon Whitten
Adrienne Dove	Joshua King	Sherron Roberts	Lana Williams
Steven Duranceau	Stephen King	Kyle Rohde	Chrysalis Wright
Dorin Dutkay	Richard Klemm	Kevin Roozen	Ronggui Yang
Steven Ebert	Gregg Klowden	Michael Rovito	Yu Yuan
Barry Edwards	Claire Knox	Herve Roy	Antonis Zervos
Heather Edwards	Eda Koculi	Houman Sadri	Lei Zhai
Costas Efthimiou	Dmitry Kolpashchikov	Hari Saha	Vassiliki Zygouris-Coe
Jennifer Elliott	Alla Kourova	Suha Saleh	

## ARTS AND HUMANITIES

### AILEEN DOWLING

#### **Destabilizing Identity: The Works of Dorothy Cross**

**Mentor:** Dr. Ilenia Colon Mendoza (Visual Arts and Design)

Post-structural feminist analysis of the sculptural, installation, and video works of Irish contemporary artist Dorothy Cross in relation to dismantling traditional notions of gendered, cultural, and collective identity in 1990s post-conflict Ireland.

### CLAY DUNKLIN

#### **Contemporary Mythologies: Dissecting the Human-Other Animal Relationship Through Visual Forms**

**Mentor:** Ms. Carla Poindexter (Visual Arts and Design)

My work aims to mythologize the contemporary understanding of the human-other animal relationship through a series of drawings, sculptures, and videos. Animal imagery is used in a way that explores current trends in genetics, industry, consumerism, and power to reveal this contemporary mythology.

### ALANNA FULK

#### **Two Terms of the Cuban Counterpoint: Transculturation in the Poetry of Nicolás Guillén**

**Mentor:** Dr. Celestino Villanueva (Modern Languages)

The goal of this project is to demonstrate how Nicolás Guillén's use of traditional poetic forms, the Cuban son and portrayal of everyday Afro-Cuban life reveal his vision for a post-colonial, transcultured Cuban society, rather than a Cuba subject to colonialism and acculturation.

### RONNETRA GIBBONS

#### **Sustainable Living Project EASY — Environmentally Aware Sustainable Youth: Building a Better Community Through Changing Our Personal Habits to Reduce Waste**

**Undergraduate Co-Authors:** Timothy Widere, Andrea Bennett, Colton Wolfe, Brittany O'Connor, Lindsay Biancardi, Ashley Gallagher, Daniel Jalali, Bianca Currier, Jason Fronczek, Hieu Huynh, Whitney Morris

**Mentor:** Ms. Eileen Smith (Visual Arts and Design)

Sustainable Living Project EASY is an interactive website that informs, targets new supporters, and supports sustainable living lifestyles. By altering our lifestyles, we aim to achieve better, limited use of this Earth's natural resources in order to provide a better future for our planet.

### MADELINE HALVEY

#### **Simple Forms of Dance and Movement Literacy**

**Mentor:** Dr. Kevin Roozen (Writing and Rhetoric)

This research analyzes literacy practices (i.e., reading, writing, and verbal communication) used in two different dance and movement environments: an advanced level jazz class and a beginning level ballet class. This research aims to establish and contrast simple and complex forms of dance literacy.

### CHARLES HILL

#### **Understanding Medical Knowledge as a Social Achievement**

**Mentor:** Dr. Luciana Garbayo (Philosophy)

Medical knowledge is of great significance to all people of the world. In order to better understand the subject, a critical evaluation of the work of Miriam Solomon on making medicine will be advantageous for furthering our understanding of medicine and how all of this fits into our society.

### AMANDA HORNBERGER

#### **Native Performance Art in a Nonnative Setting: An American's Guide to Musical Theater Performance in Germany**

**Mentor:** Ms. Tara Snyder (Theatre)

The goal of this project is to provide academic and experiential research that will illuminate for American musical theater artists why working abroad is an avenue they should consider and the best ways to break into the European musical theater scene as an actor.

### MARTIN JEREZ

#### **Unknown Heroes: A Digitally Interactive Graphic Novel Experience Delving into the Spiritual and Psychological Growth Associated with and Using Psychosynthesis**

**Undergraduate Co-Authors:** Austin Brown, Joseph Trask, Rafael Rivero, Dylan Britton

**Mentor:** Ms. Eileen Smith (Visual Arts and Design)

The interactive graphic novel that we created will help in the treatment of psychosynthesis. It provides a new and intuitive way for people to discover and better themselves, while enjoying a story and allowing the person treating them to gain valuable information.

### KIMBERLY KUNDROTAS

#### **From the Ascetic to the Aesthetic: The Western Reinvention of Yoga**

**Mentor:** Dr. Ann Gleig (Philosophy)

This project will examine the development of modern postural yoga in order to challenge the popular notion that today's consumer-driven fitness and health-oriented yoga is a direct descendant of ancient Indian spiritual traditions.

### ALEXANDRA MCFEE

#### **Second Language Production and Comprehension of Bilingual Heritage Speakers**

**Undergraduate Co-Author:** Michael Scimeca

**Mentor:** Dr. Alvaro Villegas (Modern Languages and Literatures)

Not all bilinguals process language the same way. In this experiment, we compared the ability of heritage speakers and second language learners of English and Spanish to predict information while reading ambiguous sentences in Spanish. Results will demonstrate whether second language learners can attain native proficiency in their second language.

### PATRICIA MILLER

#### **Spinoza's Ethics and the Good Life: Eliminating Freedom of the Will in the Path to Practical Wisdom**

**Mentor:** Dr. Luciana Garbayo (Philosophy)

This work aims at investigating the philosophical relation between our beliefs about metaphysical and epistemic determinism as limits to the self and its effects in the development of prudence or practical wisdom in Spinoza.

### LARRY MORALES

#### **Process and Mind: Is Process Philosophy and Nonlinear Cognitive Systems Science Commensurate?**

**Mentor:** Dr. Luis Favela (Philosophy)

My goal was to show that the nonlinear dynamic systems theory approach to the study of cognition was commensurate with the metaphysics postulated by process philosophers and how each could be employed to confirm and inform the other.

## JESSICA NORFLEET

### Breaking Down the Rhetoric Podcast: Examining Professional Writings Through Multimedia Research

**Mentor:** Dr. Marcy Galbreath (Writing and Rhetoric)

Through the use of podcast interviews, this project examines the advanced writing skills workplace professionals are looking for when hiring new employees and provides students with a resource to teach them what they need to know about written communication in their field of study.

## KARLA ORIHUELA

### Closing the Gap Between STEM Researchers and Their Audience: Using Technical Communication in Poster Boards

**Mentor:** Dr. Madelyn Flammia (English)

The objective of the project is to take a deeper look into STEM research presentations and examine how complex research is presented to nontechnical audiences in poster board sessions. The project will also seek to develop means to help researchers communicate subject matter knowledge more effectively.

## SAMUEL ORTIZ

### Asserting Four Indigenous Women's Identity in a Colonial Setting

**Mentor:** Dr. Daniel Murphree (History)

The study explores these indigenous women's efforts (Doña Antonia, Kateri Tekakwitha, Sacagawea, and Pocahontas) in regard to the internal and external marriage pressures they faced and how these pressures affected their decisions.

## JACK PRETTYMAN

### Reflections of Project Apollo: Capturing the Memories of the Lunar Missions

**Undergraduate Co-Authors:** Hannah Estes, Devin Leitenberger, Ashley Weaver, Stephanie Valderrama, Sidnee Rodriguez, Angela Zanicchi, Lauren Finley, Sheherazade Thenard, Wyatt Shumate

**Mentor:** Dr. Lori Walters (History)

The objective is to capture Project Apollo through the recollections of those who participated in and observed the event and converge emerging media to convey its significance to succeeding generations.

## TAYLOR RAINES

### Women with Asperger's Syndrome in Popular Culture

**Mentor:** Dr. Martha Brenckle (Writing and Rhetoric)

The accurate portrayal of individuals with Asperger's syndrome in popular culture heavily contributes to awareness and acceptance of autistic individuals in our society. I researched the prevalence of women with Asperger's syndrome within well-known films about autism spectrum disorders that are considered educational or entertaining.

## KERRIANNE REILLY

### Learning Russian for More Than Ordering Vodka and Borscht: Grammatical, Paradigmatic Instruction of Verbs for Transferable Linguistic Skills

**Mentor:** Dr. Alla Kourova (Modern Languages and Literatures)

This project is a digital program for teaching Russian language verb tense, mood, and aspect with a concentration on principles of grammar. The purpose of this program is to reorient the Russian language learning experience to give students transferable skills in the disciplines of linguistics and foreign language acquisition.

## CAESAR RICCI

### VR in the Park: An Event Exposing the Public to Nontraditional Virtual Reality Applications for Local and Global Change

**Undergraduate Co-Authors:** Brandon Arrington, Elijah Brose Welch, Garrett Carlson, Francisco Jacobo, Winter King, Sharon Morales, Anthony Morello, Alicia White, John Andreoni, Alena Leerdam

**Mentor:** Dr. Eileen Smith (Visual Arts and Design)

VR in the Park aims to expose the world to the Orlando VR community of creative thinkers, designers and developers. We bring attention to local problems that can be solved through the use of VR mechanics and awareness to the Virtual World Society and its web of resources.

## SHANNON ROKAW

### But I Am the Chosen One: Use and Subversion of Biblical Themes in J.K. Rowling's Harry Potter

**Mentor:** Dr. Tison Pugh (English)

The goal is to analyze the themes used in the Harry Potter book series in order to possess a greater understanding of the ways in which these motifs in children's literature affect the creation of characters and worlds.

## HANNAH RUSSELL

### Transcending Disability: Providing Individuals with Aphasia the Tools to Communicate in an Interactive Environment that Stimulates Confidence in Daily Routines

**Undergraduate Co-Authors:** Alex Cruz, Hannah Moore, Nawara Foustok, Lauren Keys, Rachel Bray, Alexis Hart

**Mentor:** Dr. Janet Whiteside (Communication Sciences and Disorders)

Our goal is to create an engaging environment that encourages therapeutic interaction among those who have aphasia through an interactive simulation. The users will apply what they have learned through these interactions to their daily routines. Transcending Disability will be a virtual reality program that will achieve these goals.

## MARIELA SAAD

### Gendered Virtue: A Study of Its Meaning and Evolution in Early Modern France

**Mentor:** Dr. Anne-Charlotte Trinquet (Modern Languages and Literatures)

This research seeks to track the development of the notion of virtue and how it is related to gender and the evolution of morality in early modern France. The analysis maps one of the most relevant concepts evidencing social construction of gender differences and its conceptualization in Western civilization.

## MICHAEL SCIMECA

### Left Brain vs. Right Brain: An Analysis of Functionality in Cervantes' *Don Quixote*

**Mentor:** Dr. Martha Garcia (Modern Languages and Literatures)

Cervantes' discussion of medicine and his treatise on human consciousness will be considered through step-by-step analysis of the following: inclusion of scientific references and allusions to defined medical specialties, representation of pain as a selective experience, and characterization of the Don Quixote-Sancho relationship within various chapters of the work.

**ALEXANDRA STEPANOV****The Rhetoric of Prison Inmates: A Look at Identity Construction Through Writing****Mentor:** Dr. Stephanie Wheeler (Writing and Rhetoric)

This project is a look at the rhetorical strategies that inmates utilize in prison newspapers to construct their identity through this writing juxtaposed to the one constructed for them by society.

**EVAN WALLACE****Dante Alighieri's Mystical Influences****Mentor:** Dr. Bruce Janz (Philosophy)

My area of research focuses on the influence of Christian mystics and the inclusion of Christian mystical themes in Dante Alighieri's *Commedia* (*Divine Comedy*).

## ENGINEERING AND COMPUTER SCIENCE I

**JENNIFER AMBROSE****Notch Size Effect on the Tensile-Compressive Creep-Fatigue Behavior of Nylon 66****Mentor:** Dr. Ali Gordon (Mechanical and Aerospace Engineering)

Nylon 66 tensile specimens with various notch sizes have been subjected to combinations of mechanical and thermal loading to characterize how the notch size influences creep response.

**GRETHA ARRAGE****Machine Learning for the Beauty Industry****Mentor:** Dr. Stephen Medeiros (Civil, Environmental, and Construction Engineering)

Because cosmetics are difficult to customize, we designed an artificial neural network trained with facial images to analyze a woman's face to suggest one of four lipsticks. It was trained on 70 percent and tested on 30 percent, and results show that it can be trained to predict beneficial intervention.

**AHMAD AZIM****Hybrid Divided-Pulse Amplification****Mentor:** Dr. Lawrence Shah (Optics)

We have demonstrated the first ever hybrid coherent combination of pulses using nested active and passive divided-pulse amplification (DPA) techniques to achieve joule-level laser pulses. Measurements and diagnostics of our combined and uncombined output beam are presented. Analysis shows that hybrid DPA is worthwhile for energy scaling.

**KYLE BEGGS****Comparison of an In Vitro Windkessel Model to Its Computational Counterpart****Mentor:** Dr. Alain Kassab (Mechanical and Aerospace Engineering)

Many studies require experimental models to compare against computational counterparts to ensure a correct solution has been achieved. Recreating physiologically accurate fluid dynamics within the vascular system is necessary for evaluating vascular function. This project designed an in vitro (experimental) model of vascular mechanics and compared results to the computational solution.

**ITZA BELTRAN****Uniformity of Skin Temperature Distributions in Ultrathin Thermal Ground Planes Compared to Copper Heat Spreaders****Mentor:** Dr. Ronggui Yang (Mechanical and Aerospace Engineering)

Our objectives are to design and fabricate ultrathin thermal ground planes (TGPs), which have higher thermal conductivity than copper and can be easily integrated into printed circuit boards. When integrated into the electronics devices, TGPs can reduce the junction temperature and achieve more uniform skin temperature distributions of the devices.

**PATRICK BESANA****Effects of Binary Solvent System on Morphology of Particles****Mentor:** Dr. Weiwei Deng (Mechanical and Aerospace Engineering)

This research explores the consequences of using the electrospray to produce nanoparticles of pharmaceutical substances dissolved in a two-solvent system. In this study, the main focus is on the analysis of the morphology of the nanoparticles as a result of solvent volatility, thermal history, and droplet sizes.

**DANIEL BETANCOURT****Efficiency of Photovoltaic Systems****Mentor:** Dr. Issa Batarseh (Electrical Engineering and Computer Science)

To become familiar with photovoltaic systems and study ways in which their efficiency could be improved. This includes learning about recent advances in the field and studying the balance of the system (BOS) and other factors that have prevented the PV system from becoming a more conventional source of energy.

**SAMUEL BIGIO****Mobile Magnetic Tracking and Pose Recovery of the Hand****Undergraduate Co-Author:** Conner Brooks**Mentor:** Dr. Joseph LaViola (Electrical Engineering and Computer Science)

A novel input method leveraging independent electromagnetic field trackers on each finger without compromising the mobility of the hand is investigated in order to reconstruct the hand's pose. Maintaining complete dexterity without occlusion of the skin allows more expressive interaction in mixed and augmented reality scenarios.

**DASHELL BLAKE****Effect of Switch Delays on Piezoelectric-Based Semi-Active Vibration Reduction Techniques****Mentor:** Dr. Jeffrey Kauffman (Mechanical and Aerospace Engineering)

Through numerous experimental tests, data analysis, and examination, we will establish the optimal switching conditions for three common piezoelectric semi-active vibration reduction approaches. We specially consider forcing frequencies near resonance, where the level of vibration reduction is maximized.



## **MICHELLE BUITRON**

### **A Comparative Analysis of Grouted Splice Precast Columns vs. Standard Cast-in-Place Columns**

*Undergraduate Co-Author:* Lianne Brito

*Mentor:* Dr. Kevin Mackie (Civil, Environmental, and Construction Engineering)

Seismic design of concrete columns in bridges is heavily dependent on the allowable curvature. The objective of this study is to make a comparison between the standard cast-in-place concrete column design and precast reinforced concrete columns with grouted sleeve connections.

## **JESSICA CHAMBERS**

### **Flame Turbulence Interaction for Deflagration to Detonation**

*Mentor:* Dr. Kareem Ahmed (Mechanical and Aerospace Engineering)

In an effort to enhance the deflagration-to-detonation process, the interaction between a deflagrated turbulent flame and a fluidic jet is experimentally studied. Flame flow measurements throughout the interaction provide insight into key mechanisms that drive flame acceleration within a pulse detonation engine.

## **HARDEO CHIN**

### **The Effects of Blade Mistuning on Vibration Localization**

*Mentor:* Dr. Jeffrey Kauffman (Mechanical and Aerospace Engineering)

A simplified experimental setup was modeled and created to test its vibration characteristics. The purpose of this setup is to test how mistuning affects the forced response amplitudes. Since vibration localization can lead to premature fatigue, it is of great interest to predict and reduce the maximum blade response amplitudes.

## **SIERRA CONDO**

### **Noninvasive Measurement of Tympanic Membrane Oscillations**

*Undergraduate Co-Author:* Leslie Simms

*Mentor:* Dr. Hansen Mansy (Mechanical and Aerospace Engineering)

The objective of this project is to create a device that accurately measures and records the oscillations of the tympanic membrane noninvasively.

## **CASSIDY CONOVER**

### **Energy and Operating Cost Analysis Comparing Spiral-Wound and Hollow-Fiber Nanofiltration Pilot Systems**

*Mentor:* Dr. Steven Duranceau (Civil, Environmental, and Construction Engineering)

The objective of this project was to compare the operating pressures and energy operating costs of a spiral-wound nanofiltration pilot to a hollow-fiber nanofiltration pilot.

## **JOSE COTELO**

### **Characterization of 3-DP Polylactic Acid Under Monotonic and Cyclical Torsion**

*Mentor:* Dr. Ali Gordon (Mechanical and Aerospace Engineering)

The objectives of this study were to characterize the torsional monotonic and cyclical response of polylactic acid to develop a more thorough understanding of the effect of various fused-deposition modeling (FDM) parameters on the mechanical properties of 3-D printed components. The tested production variables included wall thickness, print angle, and heat treatment.

## **ABIGAIL EASTERDAY**

### **Observing Extreme Sensitivity in a Chaotic System**

*Mentor:* Dr. Jeffrey Kauffman (Mechanical and Aerospace Engineering)

Our objective is to analyze the chaotic dynamics of a nonlinear pendulum through numerical simulation and direct observation of an experimental system. The end goal is to combine sporadic imaging of the pendulum with the theoretical equations of motion to track the chaotic pendulum motion using minimal data.

## **TAYLOR FORTH**

### **Recycled Roads: Driving Down the Environmental Costs of Pavement Production**

*Mentor:* Dr. Boo Hyun Nam (Civil, Environmental, and Construction Engineering)

To determine if recycled roofing shingle can be used as an acceptable replacement for virgin aggregate. This study suggests that due to their similar properties, roofing shingle may be a sustainable replacement for virgin aggregate.

## **FRED GRAVIL**

### **Extending the Java Modeling Language to the Android Environment**

*Mentor:* Dr. Gary Leavens (Electrical Engineering and Computer Science)

The objective of the research is to provide a thorough understanding of how JML works in Java. Although JML offers programmers an easier way of reading and understanding other people's code, it is often overlooked in the programming community.

## **GEOFFREY GREGORY**

### **TCAD Modeling of TLM Contact Resistance Structures**

*Mentor:* Dr. Kristopher Davis (Optics)

The TLM approach to measuring contact resistivity is commonly performed in the solar cell community to help optimize cell design and for use in quality control. In an attempt to better understand the method and its sensitivities to the physical characteristics of test structures, a physical model has been constructed.

## **ARI HADAR**

### **Studying the Formation of Suspected Disinfection Byproduct Carcinogens Using Fluorescence Spectroscopy, UV254 Absorbance, and Apparent Molecular Weight Distribution**

*Mentor:* Dr. Steven Duranceau (Civil, Environmental, and Construction Engineering)

This research was conducted to develop an empirical model that relates the formation of disinfection byproducts (DBPs) — suspected carcinogens — to the characteristics of their natural precursors found in groundwater. Results may provide insight that would yield strategies that will reduce a person's exposure to DBPs when consuming drinking water.

## **REBECCA HARRIS**

### **Photo-Fermentation for Biological Hydrogen Production Using Organic Wastes**

*Mentor:* Dr. Woo Hyoung Lee (Civil, Environmental, and Construction Engineering)

The objective of this research is to produce hydrogen as a fuel from biological wastewater processes. The algal photo-fermentation is a novel approach in this project to produce hydrogen via algae metabolism in an anaerobic environment using organic waste like food waste, providing a beneficial use for waste products.

**MICHELLE HAWLEY****Embrace**

**Undergraduate Co-Authors:** Saeid Kheder, Any Lai, Daniel Rosato

**Mentor:** Dr. Adrienne Dove (Physics)

To design, build, test, and deliver 3-D printed leg braces to a young boy with a rare bone disease. The new braces hope to solve the established problems with his current braces, including difficulty with knee adjustment and waterproof limitations.

**ANTON KEYS**

**Euler Angle, Miller Index, and Rotation Matrix Conversion Tool Designed as a Simple Matlab Graphical User Interface**

**Mentor:** Dr. Ali Gordon (Mechanical and Aerospace Engineering)

Create a Matlab graphical user interface that can take user input or Excel data in the form of Euler angles, Miller Indices, or rotation matrices, convert between the different rotations systems, and either display the result within the GUI or output it to a new Excel file.

## ENGINEERING AND COMPUTER SCIENCE II

**LUCA LETIZIA**

**Structural Health Monitoring of Composite Overwrapped Pressure Vessels**

**Mentor:** Dr. Necati Catbas (Civil, Environmental, and Construction Engineering)

The research offers an in-depth study on composite overwrapped pressure vessels (COPVs) from a structural health monitoring (SHM) point of view. An engineering analysis provides us with a better understanding of the structural behavior of both damaged and undamaged tanks under pressure.

**NATALIE LOPEZ**

**Development of an Airflow Source with Low Acoustic Noise**

**Mentor:** Dr. Hansen Mansy (Mechanical and Aerospace Engineering)

The objective of this project is to design an air supply source with low acoustic noise. This will be used in studies of sound generation in branching airflow networks.

**MICHAEL LOPEZ-BRAU**

**Mining Collective Intelligence for Robust Spectrum Sensing in Cognitive Radio Networks**

**Mentor:** Dr. Nazanin Rahnavard (Electrical Engineering and Computer Science)

We adapt a Bayesian inference framework to infer the true values of occupied frequency bands observed from spectrum sensing in cognitive radio networks. Through extensive numerical simulations, we show that our proposed algorithm reduces the impact of malicious, dependent, or otherwise unreliable sources in these networks.

**STEPHANIE LOPEZ**

**Investigation of Pressure Drop and Heat Transfer Behavior of a Square Channel with 45-Degree Angle Ribs**

**Mentor:** Dr. Jayanta Kapat (Mechanical and Aerospace Engineering)

Research was based on internal duct cooling of a turbine blade. Data was collected in a square channel with 45-degree angle ribs at a wide range of Reynolds number to identify behavior in both heat transfer and friction in the flow channel.

**DUNCAN LOZINSKI**

**Fate of Organic Matter from Leachate Discharged to Wastewater Treatment Plants**

**Mentor:** Dr. Debra Reinhart (Civil, Environmental, and Construction Engineering)

The specific impacts of leachate on wastewater treatment plant effluent quality are not well-known. The goal of this proposed research is to increase our understanding of the nature and fate of recalcitrant, UV-absorbing, and organic nitrogen-containing compounds in leachate that is co-treated with domestic wastewater.

**REBECCA MCLEAN**

**Sodium Ion Effect on *Chlorella vulgaris* as a Means of Increasing Lipid Production for Bioenergy**

**Mentor:** Dr. Woo Hyoung Lee (Civil, Environmental, and Construction Engineering)

The objective of this research is to investigate the potential benefit of using the sodium ion to manipulate the metabolism of algae in order to increase its lipid production. Lipids are then to be processed for bioenergy, which is an emerging alternative energy.

**CRISTIAN MEJIA**

**Predicting Cyclic Hardening of Inconel 792 at Elevated Temperature**

**Mentor:** Dr. Ali Gordon (Mechanical and Aerospace Engineering)

The motivation of this research is to create mathematical models to assist in predicting the behavior of Inconel 792-5A under different temperatures. Data analysis, plotting, and math models derived from the power law can help predict benefits for future application of Inconel 792-5A in the aerospace or gas turbine industry.

**JULIAN MOORE**

**Coil-Type Asymmetric Supercapacitor Electrical Cables**

**Mentor:** Dr. Jayan Thomas (Materials Science and Engineering)

A new and improved dual-function supercapacitor device capable of simultaneous energy storage and transmission is presented. Combining different electrode materials for the anode and cathode, the working voltage is expanded from 0.8V to 1.6V. The coil-type wire design employed enables superior flexibility and durability without decreasing performance.

**MOHAMMED AL MUQBEL**

**Mechanisms of Vortex Oscillation in a Fluidic Flow Meter**

**Mentor:** Dr. Hansen Mansy (Mechanical and Aerospace Engineering)

The objective of this project is to study the mechanisms of flow instability in a fluid oscillator that can be used as a flow meter. Understanding this phenomenon will help optimize the design of the meter.

## **PHILIPPE NAJARRO**

### **A System for Reducing Structural Vibration Pollution**

**Mentor:** Dr. Hansen Mansy (Mechanical and Aerospace Engineering)

The objective of this project is to test a passive system for reducing the effect of polluting structural noise.

## **CATHERINE NINAH**

### **University Initiatives on the Food, Energy, and Water Waste Nexus**

**Mentor:** Dr. Debra Reinhart (Civil, Environmental, and Construction Engineering)

With the goal of the Environmental Protection Agency and Department of Agriculture to reduce food waste by 50 percent by 2030, this research models the waste flow and assesses alternatives and solutions to help achieve a more sustainable future. Specifically, sustainability initiatives across different universities are reviewed and compiled.

## **ANTONETT NUNEZ-DELPRADO**

### **Life Prediction of Engineering Structures**

**Undergraduate Co-Author:** Nick Jones

**Mentor:** Dr. Ali Gordon (Mechanical, Materials, and Aerospace Engineering)

We have tested fatigue analysis models in order to predict the history of materials with respect to cycles for failure. We then developed methods to streamline these computations and created a graphical user interface that allows users to query how materials would behave under complex thermal, mechanical, and vibratory loads.

## **WILSON PEREZ**

### **Finite Element Simulation of Single-Lap Shear Tests Utilizing the Cohesive Zone Approach**

**Mentor:** Dr. Ali Gordon (Mechanical and Aerospace Engineering)

This research develops a finite element simulation of the debonding that occurs during single-lap shear testing. Effective adhesive bonds are crucial in various mechanical and aerospace applications. Through the use of this simulation, adhesive strength can be assessed and newly formulated adhesives can be modeled and analyzed.

## **ALEX RODRIGUEZ**

### **Travel Time Optimization: Emergency Respondent Routing Under Variable Hazardous Conditions**

**Mentor:** Dr. Stephen Medeiros (Civil, Environmental, and Construction Engineering)

Emergency response teams must react quickly to a number of unforeseen events occurring at many locations within their service area. Using a Monte Carlo simulation framework, this project analyzed the variability in travel time from an Orange County fire station to four strategic locations on the UCF campus.

## **JOHN ROYERO**

### **Balloon Explosion Dynamics**

**Undergraduate Co-Author:** Jaysen Mulligan

**Mentor:** Dr. Kareem Ahmed (Mechanical and Aerospace Engineering)

The evolution of flame kernels under various fuel and pressure conditions was investigated through the use of high-speed schlieren imaging, revealing the hidden complexities of the combustion dynamics of premixed fuel in an everyday balloon.

## **BROOKE SARLEY**

### **Characterization of the Microstructure of SLM IN718 Under Extreme Environments**

**Mentor:** Dr. Seetha Raghavan (Mechanical and Aerospace Engineering)

Investigate the microstructure of selective laser-melted super alloy Inconel 718 to understand the effects of build direction and heat treatment as well as to capture in situ microstructure evolution with temperature using synchrotron measurements.

## **ALEX SELIMOV**

### **Effects of Silane Treatment on the Dispersion of Alumina Fillers in Hybrid Carbon Fiber Reinforced Polymers via Piezospectroscopy**

**Undergraduate Co-Authors:** Ryan Hoover, Valentina Villegas

**Mentor:** Dr. Seetha Raghavan (Mechanical and Aerospace Engineering)

To investigate the effects of silane coupling agents on the dispersion of alumina filler in hybrid carbon fiber-reinforced polymer and thereby their effects on the mechanical properties of these materials.

## **LEO SHANE**

### **A Human-Centric Approach to Research, Design, and Development of Innovation Workstation Module for the National Aeronautics and Space Administration**

**Undergraduate Co-Authors:** Brian Strevens, Karissa Hall, Sylvia Dipaulo

**Mentor:** Dr. Pamela McCauley (Industrial Engineering and Management Systems)

The objective of this research was to assess and design a NASA firing room to meet the dynamic and evolving needs of a diverse aerospace community. During launch week, the module NASA employees are working with needs to be ergonomically sound while retaining the necessary features required to operate efficiently.

## **DARREL THOMPSON**

### **A Graphic User Interface for Fluorescence Microscopy with Medical Imaging Applications Using a Talbot Grid with Incoherent Illumination**

**Mentor:** Dr. Shuo Pang (Optics)

A graphic user interface (GUI) was created using Matlab to control the parameters used in the imaging sequence of a fluorescence microscopy research project that utilizes the Lau effect to achieve a Talbot grid with incoherent illumination in the hopes of developing a more robust medical imaging technique.

## **JASMINE THOMPSON**

### **Laser-Induced Breakdown Spectroscopy of Sub-Nanoliter Droplets**

**Mentor:** Dr. Martin Richardson (Optics)

The elemental composition of a sample can be identified by radiation emitted from laser-induced plasmas. This technique, called laser-induced breakdown spectroscopy (LIBS), was used to detect the elemental composition of doped 0.2 nanoliter water droplet. This technique can be further utilized to identify biochemical threats to homeland security.

## **SHANTAL TUMMINGS**

### **Investigating Optimal Conditions for Glycerol Conversion to Propionic Acid During Prefermentation**

**Mentor:** Dr. Andrew Randall (Civil, Environmental, and Construction Engineering)

The objective of this project was to find what conditions during prefermentation were most suitable for propionic acid.

**JOEY VELEZ-GINORIO****Temporal Order-Based First-Take-All Hashing for Fast Attention Deficit Hyperactivity Disorder Detection**

**Mentor:** Dr. Guo-Jun Qi (Electrical Engineering and Computer Science)

Working on this project, I was able to research the potential for machine learning to assist in the detection of ADHD from fMRI time courses. With exciting success, our results aim to further the collaboration between computer science and computational neuroscience: to tackle problems pertaining to classification of medical imaging data.

**RYAN VILLANUEVA****A Study on How Underplatform Damper Material Properties Influence Contact Stiffness Values**

**Mentor:** Dr. Jeffrey Kauffman (Mechanical and Aerospace Engineering)

The material properties and geometry of an underplatform damper in a gas or steam turbine determine its contact stiffness values. These values are essential in accurately predicting the blade vibration response. This study's goal is to quantify the impact of altering certain material properties on the resulting contact stiffness values.

**STEPHEN WILLIAMS****Comparison of Real-Time Image Scaling Algorithms for Use in FPGA Image Processing Systems**

**Mentor:** Dr. Ronald DeMara (Electrical Engineering and Computer Science)

In this study, a framework is established in which real-time image scaling algorithms are compared for use in field-programmable gate array (FPGA) image processing systems. This framework can be used by engineers to identify the best-suited algorithm for their system's needs.

**KYLE WILLNOW****Distributed Teamwork Simulation in a Virtual World**

**Mentor:** Dr. Avelino Gonzalez (Electrical Engineering and Computer Science)

This project involves the creation of a virtual infrastructure in which to observe teamwork, in the form of a bucket brigade, and the capture of data from the observations. The data will then be leveraged to investigate the feasibility of virtual simulations for practicing teamwork.

**JACOB WURM****Security Analysis of Commercial and Industrial Internet of Things Devices**

**Mentor:** Dr. Yier Jin (Electrical Engineering and Computer Science)

To perform comprehensive security analyses on Internet-connected embedded devices from both the commercial area and critical infrastructure in order to showcase the types of vulnerabilities that are present in modern devices and also propose methods to mitigate them.

**HEALTH SCIENCES I****WESLEY ADAMS****Control Identity: Knowledge, Awareness, and Intention**

**Undergraduate Co-Author:** Sara Chimzar

**Mentor:** Dr. Michael Rovito (Health Professions)

The Control Identity typology was created to categorize males by personality traits in relation to health beliefs and values. Knowledge and awareness were evaluated as a new composite variable between the typology groups and assessed to see its predictive value in regard to intention to perform testicular self-examination.

**MICHELLE AIELLO****Is Meditation Good for the Heart? A Study of the Effect of Compassion Meditation on HRV Among Veterans with PTSD**

**Mentor:** Dr. Ariel Lang (Psychology)

The present study investigates the effects of compassion meditation (CM) on heart rate and heart rate variability (HRV) among veterans with post-traumatic stress disorder (PTSD). This project was conducted in order to provide insight into one mechanism by which CM may be effective to reduce PTSD symptoms.

**DEBERLY ANZUETO****Study and Analysis of Upper Gastrointestinal Symptoms Among Students at the University of Central Florida**

**Mentor:** Dr. Suha Saleh (Health Professions)

Study of how certain risk factors like stress, smoking, diet, alcohol intake, and nonsteroidal anti-inflammatory drug use among students at the University of Central Florida correlate with complaints of upper gastrointestinal symptoms. This contributes to the literature of upper gastrointestinal health among young adults because they are not well-represented.

**KAYLA BERRIOS****Predictive Study of Patients with Dysphagia in General Otolaryngology Practice**

**Mentors:** Dr. Bari Hoffman-Ruddy, Dr. Giselle Carnaby (Communication Sciences and Disorders)

The purpose of this study was to determine the prevalence of clinical and subclinical swallowing difficulty (dysphagia) in a population of patients seeking otolaryngologic evaluation. A convenience sample of 500 participants was included. Analysis of reported symptoms, medical diagnosis and implications for patient education and treatment will be discussed.

**TIYE BROWN****Analysis of Swallow-Related Quality of Life for Patients with Head and Neck Cancer**

**Mentor:** Dr. Barri Hoffman Ruddy (Communication Sciences and Disorders)

Swallow impairment frequently occurs in head and neck cancer (HNC) patients undergoing radiation treatment (RT) and may cause malnutrition, dehydration, and increased mortality secondary to aspiration-related lung infections. This study analyzed feeding tube presence from 30 participants five years post RT along with swallow-related QOL compared to national benchmarks.



## **MEREDITH CANTY**

### **Picture This: Using Picture-Naming Vocabulary Tests to Understand the Errors of Children with Expressive Language Impairments**

*Undergraduate Co-Author:* Juliana Hirn

*Mentor:* Dr. Jacqueline Towson (Communication Sciences and Disorders)

The results from expressive vocabulary tests given to preschool-age children with language impairments will be analyzed to determine the types of semantic errors and the correlation of those errors to their overall language ability. This study will help teachers and speech-language pathologists determine appropriate interventions when working with this population.

## **ANJU CHACKUNGAL**

### **Barriers for Elderly Oncology Patients**

*Mentor:* Dr. Victoria Loerzel (Nursing)

The purpose of this research study is to identify barriers in older oncology patients that prevent them from managing side effects like chemotherapy-induced nausea and vomiting (CINV) at home.

## **SARA CHIZMAR**

### **Knowledge, Attitudes, and Intention: Masculinity's Influence Upon Nutritional Habits of College Males**

*Mentor:* Dr. Michael Rovito (Health Professions)

An exploration of the relationship between masculinity and nutritional knowledge, including both perceived and actual levels of knowledge. An original survey investigated any existent relationships between masculinity, attitudes about nutritional behavioral, and intention to apply nutritional knowledge.

## **JENNIFER CLINE**

### **Preoperative Anxiety Interventions in School-Age Children and Their Effect on Postoperative Outcomes**

*Mentor:* Dr. Leslee D'Amato-Kubiet (Nursing)

Exploring the outcomes of the various preoperative interventions in children can help determine if there is a difference between the pharmaceutical or behavioral intervention aimed at reducing anxiety prior to induction of anesthesia that will produce greater optimal post-op outcomes.

## **ANNE DOLMOVICH**

### **Prevention of Reincarceration of Women with Mental Illness**

*Mentor:* Ms. Kimberly Dever (Nursing)

One group that, by percentage, is vastly overrepresented in the prison system is women with mental illness. This literature review looks at the factors behind incarceration, so as to suggest social and educational reforms with the potential to reduce this occurrence.

## **GIOVANNA GIANNINI**

### **Nutritional Resources for Student-Athletes in Division 1 College Football Institutions: The Athletic Trainers' Perspective and Role**

*Mentor:* Dr. Kristen Schellhase (Health Professions)

The purpose of this study was to examine the quantity, quality, and variety of nutritional support offered to Division I student-athletes who participate in football. Additionally, the purpose is to gain the perspective of the athletic trainer regarding their role and influence in educating student-athletes on basic nutrition principles.

## **EMIANGELIZ GONZALEZ LUNA**

### **Perceptions of Adherence to Clinical Practice Guidelines for Low Back Pain Treatment of Physical Therapy Students and Recent Graduates**

*Mentor:* Dr. William Hanney (Health Professions)

This study aims to analyze possible factors that can affect perceptions toward adherence of clinical practice guidelines for low back pain treatment of current and past physical therapy students. An original survey was created to measure demographics, current knowledge of guidelines, influential resources, and perceptions about adherence to these guidelines.

## **TAYLOR GOSS**

### **Are Nonsteroidal Anti-Inflammatory Injections More Effective at Reducing Chronic Pain Than Opioid Pain Treatment in Patients with Rotator Cuff Injuries?**

*Mentor:* Dr. Michael Rovito (Health Professions)

This study aims to compare preoperative nonsteroidal anti-inflammatory treatments to traditional opioid treatments as related to the reduction of long-term chronic pain and increase of range of motion in surgical rotator cuff repair patients.

## **JUSTIN GRACE**

### **Recognizing Pain Using Novel Simulation Technology**

*Mentor:* Dr. Kelly Allred (Nursing)

This research was designed to observe nursing students interacting with a human patient simulator with front projection technology displaying a face with the physical manifestations of pain. Eventually, the potential for increased identification of conditions requiring observation of subtle facial changes will be explored.

## **SHANNON HASSETT**

### **Technologies to Enhance Optimal Glycemic Control in Young Adults with Type 1 Diabetes**

*Mentor:* Dr. Laura Gonzalez (Nursing)

This study surveys a group of 18- to 30-year-old Type 1 diabetics on the types of technologies and tools they use to maintain their diabetes. It is predicted that the diabetics with the most modern diabetes maintenance technology have the greatest glycemic control.

## **CLAUDIA HERNANDEZ**

### **The Moderating Role of Caffeine Intake on Stress and Academic Performance**

*Undergraduate Co-Author:* Jasmine Samuel

*Mentor:* Dr. Mustapha Mouloua (Psychology)

The moderating role of caffeine on the relationship between stress and academic performance was studied.

## **CHELSEA HUGHES**

### **Dosing Accuracy When Administering Oral Medications**

*Mentor:* Dr. Kelly Allred (Nursing)

Determine if parents make dosing errors when administering liquid medication and explore relationships among subjects that make errors and those that do not. Provide this data to inform discharge education to address issues identified.

**SHANNON HUGHES****The Effects of Sleep Quality on Body Composition in Third-Shift Nurses***Undergraduate Co-Author:* Brittney Beckmon*Mentor:* Dr. Michael Rovito (Health Professions)

The objective of this proposal is to show a causal relationship between sleep quality in third-shift nurses and a significant change in biometric measurements of BMI and body fat percentage. Additionally, the effect of psychosocial stress as a covariate of sleep quality will be analyzed.

**KENISHA JOHNSON****Assessing the Food Environment Around Elementary Schools in the U.S. with GIS Analysis***Undergraduate Co-Author:* Maria Scott*Mentor:* Dr. Yingru Li (Sociology)

The childhood obesity rate has been rising rapidly in last few decades. Why has this trend occurred, and what is contributing to this epidemic?

**LINDA LAVADIA****Effects of A Parent-Focused Intervention on the Communication of Children Using Augmentative and Alternative Communication Technologies***Mentor:* Dr. Jennifer Kent-Walsh (Communication Sciences and Disorders)

This study investigated the effects of a parent instruction program on the communicative turn-taking of children with severe speech impairments. The specific objective was to examine how parent instruction, focusing on supporting children's communication using an iPad app, would affect the children's communication rate and type of communicative messages delivered.

**HEALTH SCIENCES II****STEPHANIE LEVINE****Music Therapy as an Intervention to Reduce Anxiety in Mechanically Ventilated Patients***Mentor:* Dr. Mary Lou Sole (Nursing)

The effects of music therapy on anxiety levels of mechanically ventilated patients will be examined in order to determine whether music is a recommended intervention for those in critical care environments.

**NICOLE LICATA****Yoga and Quality of Life in Breast Cancer Survivors***Mentors:* Dr. Victoria Loerzel (Nursing), Dr. Mary Ann Burg (Social Work), Dr. Dawn Turnage (Nursing)

The purpose of this research is to evaluate yoga's effect on quality of life in breast cancer survivors.

**NATHALIA LIMA****Benefits of Sea Salt Concentration on Lung Function and Quality of Life in Cystic Fibrosis Associated with Proximity to Ocean***Undergraduate Co-Authors:* Morgan Warshowsky, Taylor Sens, Alexis Curry-Hibbert*Mentor:* Dr. Michael Rovito (Health Professions)

To explore whether having constant exposure to sea salt aerosols in the atmosphere by living near the ocean is an alternative to hypertonic saline solution treatment. Findings would include knowledge that an individual with cystic fibrosis could use to make an evidence-based decision to relocate closer to the ocean.

**HANNA LINDNER****Identifying the Best Predictors of Intention to Perform Testicular Self-Examination in Young Adult Males***Mentor:* Dr. Michael Rovito (Health Professions)

Testicular self-examination (TSE) is a valuable tool to combat late-stage diagnoses of testicular cancer. This study identified the best predictors of intention to perform TSE in adolescent males in order to create tactical promotional messages to increase the use of TSE.

**CHELSEA MAPP****The Effects of Cerebrovascular Aging on Poor Sleep in Aging Adults Using an fNIR Machine***Mentor:* Dr. Daniel Paulson (Psychology)

Cerebrovascular burden (CVB) is a significant factor among the aging population. This study seeks to examine the relationships between sleep and cerebrovascular aging in a sample of older adults. The functional near-infrared spectroscopy (fNIR) will be a substantial mediator of the relationship between cerebrovascular burden and subjective sleep impairment.

**HANNAH MARTINEZ****The Efficacy of Nonpharmacological Pain Management Methods Amongst Premature Neonates in the Neonatal Intensive Care Unit (NICU)***Mentor:* Dr. Leslee D'Amato-Kubiet (Nursing)

The purpose of this study is to review current research examining the use of nonpharmacological pain management strategies in premature neonates and the relationship between health outcomes and time to discharge from the NICU. These nonpharmacological pain management strategies include gentle human touch, facilitated tucking, non-nutritive sucking, and kangaroo care.

**DONNELLE MCDONALD****The Immunological Effects of Childhood Asthma on the Development of Lung Cancer in Black Males***Mentor:* Dr. Michael Rovito (Health Professions)

The objective of this case-control study is to evaluate the effects of childhood asthma on the development of lung cancer in black males. In addition, this study will also compare both asthma severity and asthma medication used in relation to lung cancer occurrence.

**LEAH MCDONNELL****Self-Efficacy and Coping in Transition of Care After Remission of Cancer in Adolescents***Mentor:* Dr. Leslee D'Amato-Kubiet (Nursing)

The objective of this research is to understand, analyze, and identify the role of self-efficacy and coping in adolescents long term after cancer survival. Results of this study are expected to improve behavioral therapies used in the adolescent cancer survivor populations and improve their quality of life long term after remission.

**SABIHA NIZAM****Risks/Benefits of Selective Serotonin Reuptake Inhibitors and the Effect of Parent/Patient Compliance on Medication Teaching in Pediatric Anxiety Disorders***Mentor:* Ms. Kimberly Dever (Nursing)

Pediatric anxiety disorders are the most common psychiatric illnesses, and with the use of selective serotonin reuptake inhibitors (SSRIs) treatment can be very successful. This integrated literature review was to examine the risks and benefits of SSRIs and patient/parent teaching to reduce the risks and increase the benefits of SSRIs.

## **ARNALDO PEREZ NEGRON**

### **Assessing the Health of the Puerto Rican Population in Central Florida**

**Mentor:** Dr. Fernando Rivera (Sociology)

The health profile of Puerto Ricans, specifically its population living in the Orange and Osceola counties of Central Florida, will be examined in order to trace possible leading causes and medical conditions of why this group is categorized as having the lowest health status among Hispanics in the United States.

## **DANIELLE PERNA**

### **Health-Related Stressors and Prescription Drug Misuse: Findings from the National Survey on Drug Use and Health**

**Mentor:** Dr. Jason Ford (Biology)

The current research examines the relationship between various health-related stressors and prescription drug misuse in a national sample of adults.

## **TYLER PHILLIPS**

### **The Effects of Performance-Enhancing Drugs on Prostate-Specific Antigen Levels in Professional Martial Arts Fighters in Florida**

**Undergraduate Co-Author:** Andrea Siguenza

**Mentor:** Dr. Michael Rovito (Health Professions)

Our goal is to bridge a gap in understanding the relationship between performance-enhancing drug use and the levels of prostate-specific antigen in the blood. Researching these topics while exploring potential risk factors will improve athlete safety and awareness.

## **PAYTON RAUSCH**

### **The Relationship Between Childhood Physical Activity Levels and Obesity Incidence and Physical Education Requirements Mandated by State Boards of Education**

**Mentor:** Dr. Anna Valdes (Educational and Human Sciences)

To analyze and determine the relationship between the physical education requirements of state boards of education and levels of childhood physical activity and obesity in those states. State mandates will be quantitatively assessed to determine how closely their requirements meet current Centers for Disease Control recommendations.

## **SAMANTHA SERMARINI**

### **Black Caregiver Responses to and Perceptions of Signs, Symptoms, and Treatments at the End of Life**

**Mentor:** Dr. Norma Conner (Nursing)

The purpose of this study was to determine how black caregivers interpreted signs, symptoms, and treatments for symptom relief during the last months of their loved one's life. The effect on caregiver decision-making was explored.

## **ANDREA SIGUENZA**

### **Evaluation of the Health Provider Toolkit for Adolescent/Young Adult Males: Comprehensive Needs Assessment for Implementation in Central Florida Secondary Schools**

**Mentor:** Dr. Michael Rovito (Health Professions)

The research objective is to conduct a comprehensive needs assessment of the health concerns related to adolescent and young adult males within the Seminole and Orange county school districts. The data from the assessment will assist in creating an intervention program geared at providing adequate health care to this population.

## **BRIAN SKIBO**

### **Pharmacogenomic Management of Familial Hypercholesterolemia**

**Mentors:** Dr. Angeline Bushy, Dr. Leslee D'Amato-Kubiet (Nursing)

Familial hypercholesterolemia is a genetic disease that has been difficult to treat, and traditional therapies can have little effect on disease progression. New advances in pharmacogenomics allow individuals with familial hypercholesterolemia a more specific and effective treatment plan. This research looks to explore the effectiveness of new therapies.

## **ANGELIQUE TEJADA**

### **Kienböck's Disease in a High School Linebacker: A Case Study in Osteonecrosis and Lunate Replacement**

**Mentor:** Dr. Kristen Schellhase (Health Professions)

This case study was conducted to explore the ramifications of a common athletic injury, genetic disposition, and confusion due to a rare disease that has multiple common differential diagnoses.

## **BRIANNA TERRY**

### **The Synchronicity Between Hope and Quality of Life in Terminal Cancer Patients**

**Mentor:** Dr. Susan Chase (Nursing)

The objective of this research project was to investigate and analyze the relationship between hope and quality of life in terminal cancer patients. These findings were utilized to interpret and define the health care provider's role in supporting this relationship.

## **ASHLEY TIERNEY**

### **Developing the Young Adult and Adolescent Male Health Behavior Indicator Scale (YAAMHBIS)**

**Mentor:** Dr. Michael Rovito (Health Professions)

In order to address the gap in the available validated and comprehensive assessment tools in the young adult and adolescent male population, we developed the original Young Adult and Adolescent Male Health Behavior Indicator Scale (YAAMHBIS). This scale can provide a comprehensive assessment for health interventions and clinical assessments alike.

## **ADRIANNA TILTON**

### **What Are the Primary Variables that Affect Sexual Debut Timing in Adolescent Males?**

**Mentor:** Dr. Michael Rovito (Health Professions)

Sexual debut, or the age one has intercourse for the first time, is an important marker of personal and social identities. The objective of this project was to analyze the relationship between familial structure, masculinity, and peer groups and sexual debut timing in young adult and adolescent males.

## **FERNANDA TIRADO**

### **Identification of Median Elapsed-Time-to-Cardiopulmonary Resuscitation of Nursing Students Through a Simulated Adult In-Hospital Cardiac Arrest**

**Mentor:** Dr. Laura Gonzalez (Nursing)

The intent of this study is to define median elapsed-time-to-CPR in nursing students using simulation to recreate an adult in-hospital cardiac arrest (IHCA). This project was designed to explore the knowledge gaps in the actual performance of health care providers given that failure to execute CPR has been documented in clinical settings.

## ADEDAYO ABIOYE

### Toward A Light-Driven Release/Activation of Anticancer Drugs Within Metal-Organic Framework Materials

**Mentor:** Dr. Fernando Uribe-Romo (Chemistry)

In this research is presented a method and model for anchoring inactive forms of anticancer drugs inside crystalline metal-organic frameworks, which will be delivered upon irradiation with light of specific wavelength in targeted cancerous cells.

## ANDREW ABOUJAOUDE

### Characterization of the *Plasmodium* CDK-like Kinase PK6 Interactions Using In Vivo Fluorescent Techniques

**Mentor:** Dr. Debopam Chakrabarti (Biomedical Sciences)

The goal of this project is to confirm the protein-protein interactions identified by the co-immunoprecipitation experiments. In addition, this research aims to determine the subcellular localization of the putative interactors.

## MOHAMMAD ALI

### Growth of SV5 M-Mutant Oncolytic Vector in Normal Human Prostate BPH Cells

**Mentor:** Dr. Griffith Parks (Biomedical Sciences)

To analyze and determine the exponential growth curve of the oncolytic SV5 M-mutant virus in BPH cells.

## LACIE ANDERSON

### Location, Location, Location: Evaluating the Success of Future Oyster Real Estate in Brevard County, Florida

**Mentor:** Dr. Linda Walters (Biology)

Introduction of the eastern oyster into estuarine areas with limited current populations is considered a natural approach to improve water quality. Through this study we have evaluated the success of multiple treatments for reintroducing the eastern oyster to Brevard County, Florida. Factors considered include oyster survival, size, and natural recruitment.

## AMNIE ASHOUR

### Characterization of GABAergic Neurons from Induced Pluripotent Stem (iPS) Cells of Schizophrenic Patients

**Mentor:** Dr. Kiminobu Sugaya (Biomedical Sciences)

To differentiate adult schizophrenic and wild-type embryonic-like stem cells to neural cells and search for the presence of intracellular proteins GAD67 and p38. Cells positive for either marker were analyzed as quantitative data. The process for differentiation to the target morphology was well-documented as qualitative data.

## COURTNEY ASTORE

### Genes4Vaccines: A Computational Model that Utilizes Comparative Genetics to Identify DNA and Protein Sequences for Novel Vaccines

**Mentor:** Dr. Aaron Smith (Mathematics)

To eliminate the dated guess-and-check methodology in the early stages of vaccine research and development, Genes4Vaccines is a program that will aid in predicting the components of pathogens that can be used for effective vaccines. Genes4Vaccines can be utilized in developing novel vaccines.

## GRACE AVECILLA

### An Investigation of the Correlation Between Temperature, Cuticular Melanization, and Immune Function in the Asian Citrus Psyllid, *Diaphorina citri*

**Mentor:** Dr. Ken Fedorka (Biology)

This project explores how annual temperature fluctuations influence insect cuticles, immune function, and pathogen load. Specifically, we examine a wild population of Asian citrus psyllid, *Diaphorina citri*. *D. citri* vectors the bacteria responsible for citrus greening disease, which has caused devastating economic loss to the state of Florida.

## ZARINA MARIE BALDE

### Discovery and Characterization of Novel Antimalarials from NP-Inspired Compounds

**Undergraduate Co-Author:** Emily Eischen

**Mentor:** Dr. Debopam Chakrabarti (Biomedical Sciences)

We plan to discover potent antiplasmodial scaffolds by screening natural-based synthetic libraries. Our goal is to characterize the unique compounds by determining their cellular mechanism of action and selectivity for prioritized hits. These data will provide critical information that will serve as advanced starting points for the antimalarial drug discovery pipeline.

## YEPETH BERTHIE

### Biophysical Characterization of Human DEAD-Box Protein 1

**Mentor:** Dr. Eda Koculi (Chemistry)

The goal of this investigation was to biophysically characterize DEAD-box helicase 1, a protein implicated in HIV-1 and cancer progression. A combination of affinity, ion-exchange, and gel-filtration chromatography was used to purify the protein expressed in *Escherichia coli*. Biophysical characterization of purified DEAD-box helicase 1 was accomplished through biochemical assays.

## ALEXIA BOSSAN

### The Function of FGD4 and Its Role in the Development of Drug-Resistant Prostate Cancer

**Mentor:** Dr. Ratna Chakrabarti (Biomedical Sciences)

My objective is to explore the function of FGD4 and its role in development of drug-resistant PCa by identifying the effect of FGD4 expression reduction on the behavior of an aggressive prostate cancer cell line.

## VICTORIA BRODIE

### What Our Eyes Can't See: Distribution of Microplastic Pollution Within Mosquito Lagoon and the Eastern Coast of Central Florida

**Undergraduate Co-Authors:** Meagan Minadie, Aliris Loperena, Christian Pilato, Jennifer Griffith

**Mentor:** Dr. Linda Walters (Biology)

Determining the distribution and concentration of microplastic pollution through sediment and water samples collected on the Atlantic coast versus Mosquito Lagoon, up to 32 kilometers south from Ponce de Leon Inlet. The data collected improves our understanding of the abundance of microplastic debris in Florida.



## AUSTIN BURNS

### Characterization of Thioredoxin Reductase of *Clostridium difficile* from an *Escherichia coli* Culture

**Mentor:** Dr. William Self (Biomedical Sciences)

The aim of this research project is to characterize thioredoxin reductase (TrxR) from *Clostridium difficile* produced in an *Escherichia coli* culture system. The successful extraction of TrxR will enable the study of these proteins for drug discovery research.

## EMILY BUSSE

### Dasatinib Treatment of Orthotopic Allograft Mouse Model of Neurofibromatosis Type 2

**Mentor:** Dr. Cristina Fernandez-Valle (Biomedical Sciences)

Merlin-null Schwann cells and schwannomas from an orthotopic allograft mouse model were analyzed after treatment of the Src inhibitor, dasatinib, for drug target modulation using western blotting and immunohistochemistry.

## ZURIEL CARIBE

### Effect of Tyrosine Nitration of Hsp90 Activity

**Mentor:** Dr. Alvaro Estevez (Biomedical Sciences)

The objective of our research is to study and compare the effect of tyrosine nitration of Hsp90 activity to wild-type Hsp90 activity. Furthermore, my participation in said research aims to introduce and provide experience in the field of medical research.

## THOMAS CARPINO

### Unprotected Snakes: Always Use Genetics

**Mentor:** Dr. Eric Hoffman (Biology)

This study is to examine the critically endangered key ringneck snake. This species is not federally protected, partly since it has not been studied at a molecular level. Thus, we collected 22 snakes from throughout Florida to test the nomenclature and shed light into future conservation implications for the species.

## STEVEN CARRION

### Determining Factors that Influence Smooth Cordgrass (*Spartina alterniflora* Loisel) Transplant Success in Community-Based Living Shoreline Projects

**Mentor:** Dr. Linda Walters (Biology)

To increase *Spartina alterniflora* transplant success in community-based living shoreline projects, we examined the effects of cultivation salinity on growth and survival following transplantation to shore restoration sites. We also determined the effectiveness of plant-anchoring biodegradable mats and breakwaters (oyster bags) in facilitating re-establishment of transplants exposed to wave forces.

## DIANA CARVEL

### Interaction of P2X7 with HSP90 as Possible Involvement in Neurodegeneration

**Mentor:** Dr. Alvaro Estevez (Biomedical Sciences)

Research has shown the involvement of HSP90 in neurodegeneration. This protein, often modified by nitration, may be interacting with a Fas pathway that induces motor death. We will be investigating this interaction using protein separation techniques that will not denature the entire complex.

## JENNIFER CARVEL

### Increased HIV Transmission Due to Production of Protein NF-Kappa B Induced by Bacterial Vaginosis

**Mentor:** Dr. Alexander Cole (Biomedical Sciences)

This research seeks to discover the relationship between bacterial vaginosis and increased HIV transmission in the female reproductive tract.

## DIEGO CASTILLO

### Protein Disulfide Isomerase Prevents and Reverses the Fibrillization of Immunoglobulin Light Chain 6aJL2

**Mentor:** Dr. Kenneth Teter (Biomedical Sciences)

Antibody light chain (AL) amyloidosis is the most common type of amyloidosis, which is caused by the buildup of AL amyloid fibrils (abnormal protein aggregates). The primary objective of this study is to determine if protein disulfide isomerase can inhibit and reverse the aggregation of the AL protein, 6aJL2.

## LUKE CHANDLER

### Repopulation of the Long-Spined Sea Urchin to Promote Coral Reef Restoration

**Mentors:** Dr. Eric Hoffman, Dr. Linda Walters (Biology)

Microsatellite data was used to determine whether six south Florida and two broodstock populations of *Diadema antillarum* harbor different levels of genetic diversity. If they contain the genetic variation necessary to meet the FWC's genetic policies, reintroduction should be implemented as part of a comprehensive coral reef restoration strategy.

## MICHELLE CHERNE

### Characterization of *Mycobacterium tuberculosis* Hemerythrin-Like Protein Rv2633c

**Mentor:** Dr. William Self (Biomedical Sciences)

Rv2633c is a protein of *Mycobacterium tuberculosis* that is upregulated during macrophage infection. It contains a hemerythrin-like domain that binds oxygen with a diiron oxo-bridge. This project aims to characterize the in vitro response of Rv2633c to conditions present in the macrophage lysosome.

## ROSA CORONADO

### Detecting Protein-Protein Interactions Involved in the Transport of an Essential and Ubiquitous Metabolite Required for Cellular Growth

**Mentor:** Dr. Laurence von Kalm (Biology)

Polyamines are essential for life and can be obtained by biosynthesis or transport from outside the cell. Remarkably, the polyamine transport system is poorly understood in any multicellular organism. This project seeks to identify genes and proteins required for polyamine transport.

## AMANDA COX

### Improving Sensitivity and Detection Limits of Deoxyribozyme 10-23 Binary Sensor by Using DNA Antenna Tile

**Mentor:** Dr. Dmitry Kolpashchikov (Chemistry)

The purpose of this experiment was to use DNA nanotechnology to optimize the reaction conditions around deoxyribozyme 10-23 binary sensor to improve its sensitivity and detection limits toward *Mycobacterium tuberculosis* and *Mycobacterium smegmatis*. This design and the results demonstrate the potential to improve efficiency for diffusion-limited enzyme-based sensors.

## ANDI CUMMINS

### Characterization of Interactors of *Plasmodium falciparum* PfPK6, an Atypical Protein Kinase

**Mentor:** Dr. Debopam Chakrabarti (Biomedical Sciences)

This project focuses on the characterization and verification of proteins that have been shown to interact with *Plasmodium falciparum* protein kinase 6. Defining the protein-protein interactions occurring with PfPK6 will help to elucidate malarial signaling pathways and identify novel drug targets.

**HOLLIS DAHN****Perspectives on Southwestern Biogeography: Evolutionary Implications of the Continental Divide for Two Desert Snakes****Undergraduate Co-Author:** Alejandra Osorio**Mentor:** Dr. Christopher Parkinson (Biology)

In this study we investigated the evolutionary histories of two snake species in the American Southwest in order to compare their responses to identical historical geographical and climatic influences as well as assess the degree to which these influences affect the current arrangement of lineages.

**JOSEPH DEGU****Effects of Pelvic Movement on Digestive Breakdown of Chyme: A Study in Stomach Kinetics****Undergraduate Co-Author:** Bradley Kriznar**Mentor:** Dr. Mohtashem Samsam (Biomedical Sciences)

This research aims to determine if a relationship exists between pelvic kinetics upon digestive organs while in activity, thorough digestion, and clearing of a standardized chyme versus sedentary and recumbent test groups.

## LIFE SCIENCES II

**ERIN DRISCOLL****Validating Drug Targets Through Inhibition of Protein Interaction in *Mycobacterium tuberculosis*****Mentor:** Dr. Kyle Rohde (Biomedical Sciences)

The objective of this project is to optimize the M-PFC assay used for measuring protein-protein interactions and to use this system to find potential drugs that can interrupt vital protein interactions in *Mycobacterium tuberculosis*.

**CLARENCE EMILE****Integration of Cerium Oxide Nanoparticles into Silk Fibroin Matrices for Biological Applications****Mentor:** Dr. Sudipta Seal (Materials Science and Engineering)

The study aims at developing a smart combination of cerium oxide nanoparticles (CNPs) with polymeric silk fibroin nanostructures for wound healing and tissue engineering applications.

**BAGGIO EVANGELISTA****Blood Brain Barrier-Penetrable Aptamer-Based Radio-Probe Targeting Alpha-Synuclein Oligomers for Early Diagnosis of Parkinson's Disease Using Positron Emission Tomography (PET)****Mentor:** Dr. Yoon-Seong Kim (Biomedical Sciences)

Analyzed the binding capabilities and specificity of a small ssDNA aptamer at the cellular and tissue level for applications in pre-Parkinsonian diagnosis using positron emission tomography.

**CORINE FAEHN****Effects of Invasive Apple Snail (*Pomacea insularum*) on Aquatic Vegetation****Mentor:** Dr. Patrick Bohlen (Biology)

This project is researching the impacts of *P. insularum* freshwater ecosystems by observing how they alter the aquatic vegetation composition in a field experiment and lab feeding trial. I hope this research helps recognize the ability this invasive species has to alter its environment.

**JEANINE GARCIA****Ponatinib Is a Potential Therapeutic Drug for Neurofibromatosis Type 2****Mentor:** Dr. Cristina Fernandez-Valle (Biomedical Sciences)

The project objective is to perform an in vitro preclinical study of Ponatinib for neurofibromatosis type 2 therapeutics. Using human Merlin-null Schwann cells as a cellular model, this research evaluates Ponatinib's molecular targets and identifies downstream signaling cascades that lead to decreased viability of tumor cells.

**MICHELLE GAYNOR****Assessing Genetic Diversity Within Natural Populations of Smooth Cord Grass to Ensure Effective Restoration Efforts****Mentors:** Dr. Eric Hoffman, Dr. Linda Walters (Biology)

The main objective of my study is to evaluate the impact of current shoreline restoration efforts on genetic diversity of smooth cord grass, *Spartina alterniflora*, within the Indian River Lagoon (IRL). This study aims to identify a reliable method to ensure diversity is maintained in the long-term shoreline restoration efforts.

**ALEXIS GHERSI****Characterizing the Neurodevelopmental Effects of Charcot-Marie-Tooth Disease in H304R Mice****Mentor:** Dr. Stephen King (Biomedical Sciences)

This project focuses on examining the role of mutant dynein protein in neurodevelopment and in the pathogenesis of Charcot-Marie-Tooth disease type 2O. We created a mouse model bearing the disease-causing mutation, and we examined cellular differences in the brains of wild-type and mutant mice via immunostaining and microscopy.

**MIGUEL GIL****Understanding the Function of *Plasmodium falciparum* CDK-Like Kinase PfMRK****Mentor:** Dr. Debopam Chakrabarti (Biomedical Sciences)

Cyclin-dependent kinases are key regulators of the eukaryotic cell cycle and are known to be druggable targets. Although 6 CDK-like kinases have been identified in *Plasmodium falciparum*, their physiological functions are unknown. This study aims to characterize PfMRK, a conserved CDK-related kinase, by identifying its in vivo interactors.

**LUCIA GONZALEZ-LLANOS****Regulation of the Membrane Lipid Aminoacylation Pathway in *Enterococcus faecium*****Mentor:** Dr. Herve Roy (Biomedical Sciences)

The rakPGS gene in *Enterococcus faecium* confers resistance to an array of conditions, and although this gene has been characterized, little is known about the regulatory mechanism and environmental cues that trigger expression. Here, we perform sequence analysis and define these environmental cues triggering expression to address these disparities.

**SAMUEL HARRIS****A Study on the Mechanism of Loss of Expression of MicroRNAs in Cell Lines Developed from Racially Disparate Patients****Mentor:** Dr. Ratna Chakrabarti (Biomedical Sciences)

My goal is to analyze the mechanism of epigenetic regulation of four microRNAs through assessing the pattern of methylation found in their respective promoter regions. I will be directly comparing the degree of methylation between African-American and Caucasian prostate cancer cell lines.

### JARED HERBERT

#### The Role of Mulan E3 Ubiquitin Ligase in Mitochondrial Dynamics, Mitophagy, and Parkinson's Disease

**Mentors:** Dr. Antonis Zervos, Dr. Lucia Cilenti (Biomedical Sciences)

Mulan protein is regulated by Omi serine protease in the mitochondrial intermembrane space. The exact mechanism of this regulation is unknown but is linked to the depolarization of the mitochondrial membrane potential. The goal of my research is to characterize the interaction between Mulan and Omi and its physiological function.

### ABBY HUDAK

#### Long-Term Study of Dune Restoration Effects on Loggerheads (*Caretta caretta*) and Green Turtle (*Chelonia mydas*) Nesting Patterns

**Mentor:** Dr. Kate Mansfield (Biology)

Analyzing the effects of beach restoration projects is vital to sea turtle nesting. Minimizing human impact on sea turtle nesting is crucial to their conservation.

### PAIGE JAFFE

#### Does Plant Density Influence Growth of *Spartina alterniflora* and *Rhizophora mangle*? A Competition Study

**Mentor:** Dr. Melinda Donnelly (Biology)

Plants compete for elements vital to growth and survival, such as sunlight, water, and nutrients. This study evaluated growth of *Spartina alterniflora* and *Rhizophora mangle* when grown in varying density combinations.

### JACLYN JOHNSON

#### Done and Dusted: How Household Dust Can Aid in Criminal Investigations

**Mentors:** Dr. Jack Ballantyne, Dr. Erin Hanson (Chemistry)

Dust bunnies are an overlooked source of forensic evidence. This project tests and evaluates dust components, particularly biological material (i.e., shed skin cells). Since DNA from these cells is often degraded, an evaluation of enhanced typing methods and alternative DNA markers was carried out to improve DNA profiling success.

### SARA KHEDERZADEH

#### Bioengineering and Development of Exosomes for Expansion of Cytotoxic Natural Killer (NK) Cells for Cancer Therapy

**Mentor:** Dr. Alicja Copik (Biomedical Sciences)

Develop the use of engineered exosomes, which are cell-derived vesicles, for the specific expansion of cytotoxic natural killer (NK) cells from peripheral blood mononuclear cells (PBMCs).

### KRISTIN KRAMER

#### Wave Energy Dispersion on Restored Shorelines vs. Unrestored Shorelines

**Mentor:** Dr. Melinda Donnelly (Biology)

The topic being researched in this study was how wave energy affects sediment erosion at shorelines that have been restored. A study was conducted where wave energy reduction at restored sites was observed. The wave energy was recorded before and after multiple types of restoration methods.

### NICOLE LAMA

#### Nitrotyrosine and Peroxynitrite Formation in Breast Cancer Cells

**Mentors:** Dr. Alvaro Estevez, Dr. Maria Franco (Biomedical Sciences)

Our research includes studying the effects that nitration inhibitors have on breast cancer cell proliferation, growth, and differentiation.

### ANDREW LETTER

#### Refining Camera Trap Identification of Bobcats

**Undergraduate Co-Author:** Jeremi McRae

**Mentor:** Dr. Gregg Klowden (Biology)

Having an accurate, reliable count of apex predator populations is a vital part of keeping ecosystems healthy and functioning. This project proposes to refine the ability to identify individual animals, using bobcats as the test subject. This refined method can be incorporated into future capture-mark-recapture studies of other animals.

### CLARA LEUNG

#### Neuropeptides in Migraine Headaches

**Undergraduate Co-Author:** Marvi Qureshi

**Mentor:** Dr. Mohtashem Samsam (Biomedical Sciences)

The scope of this project is to examine the release of calcitonin gene-related peptide (CGRP) during migraine headaches. We also look at drug candidates that can act as CGRP antagonists.

### ZACHARY LOEB

#### The Impact of Endocrine-Disrupting Compounds Found in Wastewater Effluent on the Embryonic Development of *Oryzias latipes* (Medaka fish)

**Mentor:** Dr. Donovan Dixon (Chemistry)

Endocrine-disrupting compounds (EDCs) entering the environment from manufacturing and municipal wastewater effluent impact the development, reproductive processes, and health of aquatic life. This project's overall objective is to evaluate EDC wastewater treatment methods, identify a new method of high potential, and determine the effectiveness of that method.

### SANABEL MAHMOUD

#### Heat Shock Proteins as Quantifiable Stress Indicators in Bd-Infected Amphibians

**Mentor:** Dr. Anna Savage (Biology)

I will work to establish a molecular assay for quantifying stress across a broad range of amphibian taxa using genetic expression of heat shock proteins. In standardizing this method, we can apply it in future amphibian disease studies to answer the question: How does environment and stress influence immunity?

### MONICA MANSOUR

#### Role of Adrenergic Neurons in Motor Control: Examination of Cerebellar Purkinje Neurons in Mice

**Mentor:** Dr. Steven Ebert (Biomedical Sciences)

The purpose of this project is to determine if there is a change in Purkinje cells between wild-type mice and Pnmt-ablated mice. Using immunohistochemistry, cells are quantitatively and qualitatively examined for variations. Understanding Pnmt mechanisms in the brain is imperative for elucidating and targeting key players in neurodegenerative disorders.

**STEFFANY MEDINA****Wildlife Corridors: Assessing the Connectivity of Habitats in a Fragmented Landscape****Mentor:** Dr. Christopher Parkinson (Biology)

To determine how gopher tortoises are using corridors at Kennedy Space Center, movements along this habitat will be tracked and analyzed by calculating home ranges and distances traveled. Data will be compared to coastal tortoises and inland tortoises to determine if tortoises within these corridors function as residents or transients.

**JAICE METHERALL****Shorebird Abundance, Diversity, and Behavior Relative to Human Population Numbers****Undergraduate Co-Authors:** Andrew Letter, Morgan Cooney, Justin Brown, Savannah Mulvey**Mentor:** Dr. Linda Walters (Biology)

To quantify how human population numbers affect shorebird abundance, diversity, and behavior along Central Florida beaches. The implications of this study should serve as a guide for future coastal management decisions.

**JACQUELINE MEYER****Ecosystems in Peril: Cypress Domes at UCF****Undergraduate Co-Authors:** Amy Compare, Chelsey Sprouse**Mentor:** Ms. Jennifer Elliott (Biology)

This project collected data in UCF's six cypress ecosystems to measure the effects of urbanization on cypress recruitment. Number of juveniles and adults present, pH, water height, PSI, and other data were collected to establish a relationship between urbanization and cypress recruitment and propose a possible mechanism for this connection.

## LIFE SCIENCES III

**MEAGAN MINADIE****Mangrove-Herbivore Interactions in Mosquito Lagoon****Mentor:** Dr. Linda Walters (Biology)

To obtain a better understanding of the possible effects of mangrove-herbivore interactions on red, black, and white mangroves within Mosquito Lagoon in Canaveral National Seashore for the purpose of management of these threatened species.

**BAILEY MOURANT****Finding Novel Tuberculosis Drugs that Target Essential Protein Interactions****Mentor:** Dr. Kyle Rohde (Biomedical Sciences)

My research focuses on the exploitation of essential protein-protein interactions in *Mycobacterium tuberculosis* as a nontraditional method of identifying novel drug targets for the treatment of tuberculosis.

**AMNA NASER****Undercarboxylated Osteocalcin (ucOC) Supports a Role for *Mycobacterium avium* subspecies *paratuberculosis* (MAP) in Crohn's Disease****Mentor:** Dr. Saleh Naser (Biomedical Sciences)

Our study demonstrated that undercarboxylated osteocalcin (ucOC, a bone formation protein) is elevated in Crohn's disease (CD) cases associated with *Mycobacterium avium* subspecies *paratuberculosis* (MAP) infection. These findings may explain why CD patients have higher risk for developing osteoporosis.

**KHOA NGUYEN****Screening for Anticancer Agents to Inhibit Mitotic Kinases and Proliferation of Metastatic Prostate Cancer Cells****Mentor:** Dr. Ratna Chakrabarti (Biomedical Sciences)

Series of synthetic compound libraries will be screened to identify inhibitors for the mitotic kinase, Aurora A kinase, which is shown to be overexpressed in metastatic prostate cancer cells.

**MARIA ONATUNDE****Regulation of Energy Metabolism in Schwannoma-Related Cells****Mentors:** Dr. Cristina Fernandez-Valle, Dr. Maria Franco (Biomedical Sciences)

Neurofibromatosis type 2 is a disease characterized by mutations in the NF2 gene leading to formation of tumors in the nervous system. The aim of this project is to elucidate how the cells energy metabolism and oxidative phosphorylation are regulated in NF2 to favor tumor growth.

**ALEJANDRA OSORIO****Evolutionary Relationships of the Snake Tribe Lampropeltini****Mentor:** Dr. Christopher Parkinson (Biology)

To determine the evolutionary relationships among the genera within the snake tribe Lampropeltini using nuclear and mitochondrial DNA and incorporating multiple phylogenetic approaches, including concatenation and coalescence to generate species trees.

**ARSHIA PESSARAN****Identifying the Mechanism for the PM21 Stimulated Expansion of NK Cells****Mentor:** Dr. Alicia Copik (Biomedical Sciences)

To provide insight into the role of cytokines and other peripheral blood mononuclear cells (PBMCs) in the expansion of natural killer (NK) cells in order to identify the pathway by which the PM21 plasma membrane stimulated expansion is achieved.

**CHRISTIAN PILATO****The Effects of Grain Size Distribution on Red Mangrove, *Rhizophora mangle*, Root Structure****Mentors:** Dr. Linda Walters (Biology), Dr. Kelly Kibler (Civil, Environmental, and Construction Engineering)

The goal of this project was to determine the role sediment grain size has on the development of red mangrove root structures and better understand its effects on mangrove recruitment. The results of this study will allow for individualized restoration efforts, with the goal of creating stable mangrove populations.

**AARON POLLOCK****Elucidating the Scope and Regulation of Antibiotic and Macrophage Inducible whiB7 Regulon of *Mycobacterium tuberculosis*****Mentor:** Dr. Kyle Rohde (Biomedical Sciences)

Created various constructs related to the regulation and action of the whiB7 transcriptional activator. Clones include various reporters, overexpressors, and complementary constructs. Clones are then used under whiB7-inducing conditions to test whiB7's regulation of downstream virulence genes to determine its role in pathogenesis.



## MARVI QURESHI

### Evaluation of the Pathomechanism for Neuropeptide CGRP in Primary Headaches and Current Treatment Plans

**Undergraduate Co-Author:** Mansoor Qureshi

**Mentor:** Dr. Mohtashem Samsam (Biomedical Sciences)

The three phases of a typical migraine are researched with a focus on the neuropeptide CGRP. The pathophysiology of the migraine is analyzed in terms of the role of CGRP in migraine onset. Laboratory results are discussed for CGRP-related treatment plans.

## RYAN RIDENBAUGH

### Ground Beetles (Coleoptera: Carabidae) as Bioindicators in Pine Flatwoods Ecosystems

**Mentor:** Dr. Joshua King (Biology)

The species richness and abundance of ground beetles will be examined in comparison to overall arthropod abundance to determine the effectiveness of ground beetles as bioindicators in pine flatwoods ecosystems.

## ZACH RIVAS

### Is a Bacteria Contributing to the Death of North American Frogs Concurrently Infected with a Fungus?

**Mentor:** Dr. Anna Savage (Biology)

This study will explore a potentially lethal, multiparasitic relationship between a bacteria and a fungus, which in combination may be lethal in frogs. By quantifying both pathogens we can evaluate the infection dynamic by answering: Is the bacteria present in higher loads in frogs also infected with the fungus?

## JESSICA SANDOVAL

### Impact of Roosting Bats on the Urban Stormwater Quality of the UCF Campus

**Mentor:** Dr. Patrick Bohlen (Biology)

A large bat colony roosting in an urban stormwater pipe provided an opportunity to examine the impact of roosting bats on stormwater quality. Total guano input and nutrient characteristics of bat guano were assessed along with the nutrient content of stormwater samples taken at the site.

## MICHELLE SHAFFER

### Evaluating Black Mangrove, *Avicennia germinans*, Northern Range Expansion Impacts on Shoreline Bird Communities Along the Eastern Coast of Florida

**Mentors:** Dr. Melinda Donnelly, Dr. Linda Walters (Biology)

This study examines the impacts that the black mangrove northern range expansion along the eastern coast of Florida will have on shoreline bird communities. This data will help ecologists develop appropriate land management plans in preparation for the ecological and economical changes due to this shift in ecosystems.

## DELANEY SHERWIN

### Generation of iPSCs from ASCs Through Use of a Single-Gene Nanog Plasmid Vector

**Undergraduate Co-Author:** Tyler Hosterman

**Mentor:** Dr. Kiminobu Sugaya (Biomedical Sciences)

Enhanced generation of patient-specific induced pluripotent stem cells (iPSC) represents an important step toward the clinical use of stem cells to cure diseases and pathologies in medicine, and our research has sought to find a simpler, safer, yet more effective method to produce iPSCs from human adipose stem cells (ASC).

## ASHELYN SIDDER

### Expanding the Genetic Toolbox for Mycobacteria: Constructing the pheS Counterselection Marker

**Mentor:** Dr. Kyle Rohde (Biomedical Sciences)

The goal of this project is to develop a novel counterselection marker utilizing the pheS gene to further enhance the mycobacterial gene knockout strategy used to study uncharacterized genes that may be linked to their virulence.

## TYLER STUCK

### SmartPhrog: A Long-Term, Active Bioacoustic Recording Solution Using Raspberry Pi for Frog Population Monitoring

**Mentor:** Dr. Anna Savage (Biology)

To develop an intelligent bioacoustic monitoring system called SmartPhrog that can be field-deployed to record and store acoustic data for a period of at least four months.

## KATRINA TECXIDOR

### Sustainable Urban Gardening

**Mentor:** Ms. Jennifer Elliott (Biology)

Our study explores what compost type will maximize plant growth while limiting nutrient leaching. The analysis section of our experiment involves a locally maintained farm plan. A projected location and size for this garden plot is a calculated space based on available areas on the grounds of UCF's Arboretum.

## ALEXANDER TORRES

### Determining Polyhydroxylated Fullerene Interactions with Amyloid-Beta 42 Oligomerization and Understanding Their Role in A $\beta$ -Induced Oxidative Stress in Neural Stem Cells

**Mentor:** Dr. Kiminobu Sugaya (Biomedical Sciences)

To understand the ways in which a fullerene derivative inhibits oxidative stress in human neural stem cells exposed to protein peptide amyloid-beta, a native gel was performed to study the effects on oligomerization. PCR for stem cell, glia, and neuron characteristic genes was performed along with toxicity assays.

## TAINA TORRES

### Predicting the Distribution of the Amphibian Pathogen *Batrachochytrium dendrobatidis* in Two Regions of the United States Using Species Distribution Modeling

**Mentor:** Dr. Anna Savage (Biology)

A species distribution model will be created to identify areas in the southeastern and southwestern United States that have a high suitability for *Batrachochytrium dendrobatidis* (Bd). The model will provide new insight on the threat of Bd to amphibian biodiversity and identify geographic areas to focus on for pathogen studies.

## LAHARI TUMULURI

### Cardiac Consequences of Selective Adrenergic Cell Ablation in Mice

**Mentor:** Dr. Steven Ebert (Biomedical Sciences)

To examine the potential cardiac consequences of selective adrenergic cell ablation. This will be done through analysis of echocardiography data from mice with genetic ablation of adrenergic cells over the first six months after birth. Evidence of adrenergic cell ablation heart will be characterized using histological and immunofluorescence staining.

**RILEE WAGNER****Pancreatic Stellate Cells Secrete Increased Levels of IL-6 and IL-8 with Vitamin A Treatment***Undergraduate Co-Author:* Alexandra Stavros*Mentor:* Dr. Deborah Altomare (Biomedical Sciences)

We researched the interaction between vitamin A and two cytokines, IL-6 and IL-8, which are secreted from pancreatic cancer stellate cells. Results surprisingly stated that stellate cells treated with vitamin A showed an up-regulation of IL-6 and IL-8 secretion compared to stellate cells grown without vitamin A.

**COLE WASHINGTON****Using a High Through-Put Screen to Discover Novel Genes Involved in the Polyamine Transport System***Mentor:* Dr. Laurence von Kalm (Biology)

This project focused on studying the polyamine transport system, which is poorly understood. A high throughput screen was used to identify novel genes in the polyamine transport system.

**CHRISTOPHER YANICK****Movement of Gopher Tortoises with Relation to Railroad Tracks: Consequences of Anthropogenic Barriers for Terrestrial Species***Mentor:* Dr. Christopher Parkinson (Biology)

Utilizing radio-telemetry, this project will determine the frequency with which gopher tortoises' cross inactive railroad tracks at Kennedy Space Center. This information will be applicable for conservation efforts relating to the gopher tortoise and inform measures being taken to limit the anthropogenic impacts on their habitats.

**KATELAN YAP****Identifying Riboswitch-Based Gene Regulation In *Borrelia burgdorferi*, the Causative Agent of Lyme Disease***Mentor:* Dr. Mollie Jewett (Biomedical Sciences)

*Borrelia burgdorferi*, the bacterium that causes Lyme disease, is transmitted to humans through the bite of infected black-legged ticks. This project is working toward identifying riboswitch-based gene regulatory mechanisms in this organism in order to better understand how *B. burgdorferi* can adapt in a mammalian and tick environment.

## PHYSICAL SCIENCES AND MATHEMATICS I

**STEPHANIE ARMAS****Self-Reference Single Strip Paper-Based Sensors for Ion Detection***Undergraduate Co-Author:* Andrew Manhan*Mentor:* Dr. Karin Chumbimuni-Torres (Chemistry)

To develop a single strip paper-based ion-selective sensor with a reference membrane incorporated. This allows for an accurate, portable, and versatile sensor to participate in ion detection of biological and environmental samples. The analysis of these samples will provide a solution to underdeveloped countries with polluted drinking water.

**ADRIAN ARNETTE****Theoretical Study of the Excitation and Ionization of Atoms in the Upper Atmosphere***Mentor:* Dr. Hari Saha (Physics)

The electron impact ionization of highly charged sulfur atoms was analyzed by using the most accurate multiconfiguration Hartree-Fock method, which includes the initial state electron correlation effects and interactions of equally shared energy by two final-state continuum electrons.

**CAROLINE ARTEAGA****The Mechanochemical Synthesis of Alkaline Earth Metal Tantalates as a Catalyst for Green and Renewable Hydrogen Production***Mentor:* Dr. Richard Blair (Chemistry)

Our research has developed a simple mechanochemical method for alkaline earth metal tantalate synthesis. This material is used as a photocatalyst for water splitting to produce hydrogen gas. An energy-efficient process for calcium tantalate and magnesium tantalate synthesis was developed and optimized as a part of this work.

**DANIEL BATISTA****Optimization of the Fabrication and Processing of Multiphoton Direct Laser Writing (DLW) and Development Process for Spatially Variant Photonic Crystals (SVPC)***Mentor:* Dr. Stephen Kuebler (Chemistry)

The optimized processing used to fabricate 3-D polymeric spatially variant photonic crystals (SVPCs) by multiphoton direct laser writing was demonstrated. SVPCs are 3-D nanostructures that can bend light beams through tight turns through the phenomenon of self-collimation.

**ROBERT BAUER****Geodesics of the Projective Models for the Cayley-Klein Geometries of the Plane***Mentor:* Dr. Costas Efthimiou (Physics)

To compute the geodesics for the stereographic models of the Cayley-Klein geometries of the plane.

**BROOKE BAYLESS****Single Nucleotide Substitution Analysis Using OC Sensors***Mentor:* Dr. Dmitry Kolpashchikov (Chemistry)

The objective of this research is to selectively detect a single nucleotide polymorphism within a target DNA analyte sequence using a multicomponent hybridization probe called "OC sensor." Two sense strands work cooperatively when binding to the analyte and a molecular beacon probe to produce a fluorescent complex.

**AMANDA BINNION****Copper(I) Iodide for the Presumptive Illicit Drugs Identification for Law Enforcement***Mentor:* Dr. Richard Blair (Physics)

To improve the process of presumptive drug testing by using copper(I) iodide as a chemical indicator to presumptively identify illicit narcotics and other substances of abuse. Copper(I) iodide forms a luminescent cluster compound with alkaloids that can be analyzed by UV emission spectroscopy to ultimately identify drugs.

**BRADLEY BROWN****A Rapid, Scalable Synthesis of Carbon Quantum Dots (CQDs) Using Mechanochemistry and the Analysis of Its Tunable Fluorescence Emission**

**Mentor:** Dr. Richard Blair (Physics)

The objective of the research project was to develop an alternative method for the large-scale production of carbon quantum dots that is energy efficient and cost effective.

**MARIELENA BURDGE****Diffusion of Light in Disordered Materials**

**Mentor:** Dr. Aristide Dogariu (Optics)

We have investigated the effect of material structuring in light propagation by developing a technique using interferometry to characterize different regimes of light interaction. These techniques can be used to more accurately model energy transfer through disordered materials with applications such as energy harvesting and imaging biological tissues.

**ALEX BURNSTINE-TOWNLEY****Metal-Organic Frameworks for the Separation of Polycyclic Aromatic Hydrocarbons**

**Mentor:** Dr. Fernando Uribe-Romo (Chemistry)

The metal-organic frameworks (MOFs) presented are a likely solution to the separation of polycyclic aromatic hydrocarbons (PAH). Incorporated into a chromatography procedure, the MOFs will separate the very similar aromatic compounds. Uniform and custom pore size, exposed  $\pi$  surfaces, and high-surface area contribute to the separation.

**ANSON CARTWRIGHT****Design and Synthesis of Octupolar Molecular Building Blocks and Crystalline Covalent-Organic Framework Materials for Tunable Second-Harmonic Generation**

**Mentor:** Dr. Fernando Uribe-Romo (Chemistry)

Synthesis of molecular building blocks for crystalline porous covalent-organic frameworks that will be used in nonlinear optics applications.

**DANIEL CERKONEY****Ultrafast Breakdown of the Insulating Phase in Bulk  $V_2O_3$** 

**Mentors:** Dr. Volodymyr Turkowski, Dr. Talat Rahman (Physics)

We analyze theoretically the details of the metal-insulator transition in bulk  $V_2O_3$  after the system is perturbed by an ultrafast (femtosecond) laser pulse excitation using the time-dependent density functional theory plus dynamical mean-field theory (TDDFT+DMFT) approach.

**KATERINA CHAGOYA****The Synthesis of Delta Phase Molybdenum Nitride ( $\delta$ -MoN) for Use as a Catalyst in Ammonia Production via Mechanochemical Methods**

**Mentor:** Dr. Richard Blair (Physics)

An innovative means of synthesizing delta phase molybdenum nitride was developed and optimized using mechanochemical methods. This material can prove to become an integral part of commercial ammonia production by reducing the energy input required for the process and thus decreasing the cost of production.

**JENNY CHOY****The Search for Novel Naturally Occurring Organofluorine Compounds Through Lipophilic Extraction from Plants Near Prior Phosphate Mines in Central Florida**

**Undergraduate Co-Author:** Nathan Aleger

**Mentor:** Dr. Seth Elsheimer (Chemistry)

The objective of this project is to attempt to find novel naturally organofluorine compounds. Understanding of organofluorine-containing compounds has been limited due to their rarity in nature. Discovery of a novel organofluorine compound allows for its application and development in clinical and agricultural research.

**BURDLEY COLAS****Maximizing Power Density for Single-Mode Fiber Delivery**

**Mentor:** Dr. Axel Schülzgen (Optics)

The objective of this research was to design a single-mode fiber with maximized optical power density for a molecule trapping device. A single mode step-index fiber with  $2.9 \mu\text{m}$  core diameter and index difference of 1.5 percent relative to the cladding index was found to be optimal.

**CHRISTOPHER COLEMAN****Investigating the Quantum Properties of Individual Tunneling Electrons Within a Single Molecule Through the Application of Tunable Solid-State Devices**

**Mentor:** Dr. Enrique del Barco (Physics)

Diluted molecular solutions are deposited on the solid-state microchips, but I must also fabricate my own microchips. On these chips, by means of modern fabrication techniques, gold is evaporated onto the microchip perpendicular to previously evaporated aluminum strips then placed in an electric field when current is passed in an aluminum strip.

**SEAN CRYSTAL****Development of a Compact Broadband Optical Parametric Oscillator for Ultrasensitive Molecular Detection**

**Mentor:** Dr. Konstantin Vodopyanov (Optics)

To develop and test the capabilities of a compact broadband optical parametric oscillator for ultrasensitive molecular detection in applications of combustion gas investigation and medical breath analysis.

**KENNETH DUMAS****Growth of Few-Layer Molybdenum Disulfide Through Chemical Vapor Deposition**

**Mentor:** Dr. Saiful Khondaker (Physics)

Growth of molybdenum disulfide is to be achieved through the co-evaporation of molybdenum trioxide and sulfur precursors and the use of the chemical vapor deposition process. The resulting growth is to be confirmed and characterized through the use of optical microscopy, atomic force microscopy, and Raman spectroscopy.

**DAVID FOX****Solvent Annealing of Organic Nanowires on Graphitic Surfaces**

**Mentor:** Dr. Lei Zhai (Chemistry)

Growth methods for low-dimensional organic crystals are currently being researched for low-cost and flexible electronics. Graphene, a carbon monolayer with a 2-D honeycomb structure, has been highlighted for its impressive electronic, optical, and mechanical properties. The directed growth of organic polymers can be nucleated from graphitic surfaces and was explored.

**RUSSELL FRANK****Color-Changing Surfaces Enabled by Liquid-Crystal Plasmonics***Mentor:* Dr. Debashis Chanda (Optics)

Liquid crystal-plasmonic systems as dynamic color-changing surfaces for camouflage and display applications.

**LAUREN GANDY****A Combined Method of Detection for Organic and Inorganic Gunshot Residue***Mentor:* Dr. Candice Bridge (Chemistry)

I identified organic color spot tests with targets relatively specific to materials in gunshot residue; evaluated the intensity of their color reaction and limits of detection with standards, mixtures, and field samples; and visualized these samples post-spot test under an SEM-EDX to see the effect on the inorganic particulates.

**ZACHARY GELINAS****Transfunctions***Mentors:* Dr. Piotr Mikusinski, Dr. Heather Edwards (Mathematics)

The research I am conducting generalizes the notion of mappings between spaces of measures. These mappings are called transfunctions. I am examining the various conditions that can be used to characterize these mappings and examples therein.

**STEVEN HELLER****Modulation of Cerium Oxide Surface Chemistry in EPD Coatings to Maximize Antioxidant Capacity***Mentor:* Dr. Sudipta Seal (Materials Science and Engineering)

Through research it has been shown that altering the way that cerium oxide is coated on titanium plates can change the surface chemistry. In a series of experiments this research will aim to control the surface chemistry of the coated cerium oxide.

**DAVID HERNANDEZ FUNES****Quantification Analysis Using Direct Analysis in Real-Time Mass Spectrometry (DART-MS)***Mentor:* Dr. Candice Bridge (Chemistry)

Direct analysis in real-time mass spectrometry is a new analytical instrument that allows for rapid and simple analysis of pure substances and mixtures. This instrument provides a mass spectrum for every component in a sample. This project's objective was to develop a method that allows for quantification using DART-MS.

**COURTNEY HULCE****Optimization of Zinc Microsensor for Use in the Determination of Zinc Ion Concentration for Agricultural Applications***Undergraduate Co-Author:* Wynstona Louis*Mentor:* Dr. Karin Chumbimuni-Torres (Chemistry)

The primary research objective is to develop and apply an innovative zinc ion-selective microsensor that offers an unprecedented level of specificity and sensitivity required for the rapid detection of zinc ions in biological samples for environmental applications.

**JEFFERY JORGES****Collision of Dual Aggregates (CODA): Understanding Planet Formation Through Experimental Observations of Low-Velocity Collisions***Mentors:* Dr. Adrienne Dove, Dr. Joshua Colwell (Physics)

The Collision of Dual Aggregates (CODA) is a laboratory experiment designed to simulate the low-velocity collisions that are involved in early planet formation and planetary ring systems. The results of this experiment help to construct a better empirical model of the collisional outcomes within a range of different parameters.

**MATTHEW JULIAN****Quantification of Non-Stoichiometry in Transparent Ceramics Using Laser-Induced Breakdown Spectroscopy***Mentor:* Dr. Romain Gaume (Optics)

Investigate the potential of laser-induced breakdown spectroscopy (LIBS) for stoichiometry assessment in the fabrication process of transparent ceramics in order to improve their optical properties.

**JESLIN KERA****Microspectroscopy of Bioassemblies at the Single-Cell Level***Mentor:* Dr. Alfons Schulte (Physics)

The goal is to characterize biological assemblies in minuscule quantities and at the single-cell level nondestructively using microspectroscopy.

**SHELBY KHANDASAMMY****Analysis of Bullet Transfer onto Bone Using LIBS***Mentor:* Dr. Michael Sigman (Chemistry)

Laser-induced breakdown spectroscopy (LIBS) is a useful technique in deducing the elements that make up a sample. This project will investigate the potential use of LIBS in detecting the elements transferred onto bone from bullets of various types.

**ALI KHATER****Chemical Methods for Tuning the Optical Properties of Fluorescent Graphene Oxide Quantum Dots***Mentor:* Dr. Lei Zhai (Chemistry)

I controlled the optical properties of graphene oxide quantum dots through modification of synthesis parameters.

**MAXIMILIAN KOOPMAN****Theoretical and Computational Investigation of Photoionization Processes with Atoms and Molecules***Mentor:* Dr. Hari Saha (Physics)

Determine the excitation and ionization cross sections of atomic aluminum using a highly accurate and sophisticated method known as the multiconfiguration Hartree-Fock method.

**NICHOLAS KOSAN****Controlling Light with Spatially Variant Photonic Crystals and Waveguide Structures***Mentor:* Dr. Stephen Kuebler (Chemistry)

Spatially variant photonic crystals (SVPCs) can be utilized to reduce the attenuation of signals compared to waveguide structures. SVPCs and waveguides are created through multiphoton lithography in SU-8 and are characterized both structurally and optically.



## PHYSICAL SCIENCES AND MATHEMATICS II

### ISABELLE KRAUS

#### Harmonic Analysis of a Cantor Set

**Mentor:** Dr. Dorin Dutkay (Mathematics)

We studied some number theory problems related to the harmonic analysis of a Cantor set and continued generalizing ideas about relations between number theory and spectral measures.

### KELSI KUEHN

#### Elemental Analysis for Source Attribution in Forensic Anthropology

**Mentor:** Dr. Matthieu Baudet (Chemistry)

Forensic anthropology requires the classification of questionable fragmentary materials. The relatively unexplored use of laser-induced breakdown spectroscopy (LIBS) for elemental analysis in the field of anthropology is explored for rapid identification of osseous/dental fragments as well as their identification as human or nonhuman.

### CRISTIAN LACERA

#### Exploring the Volume of Heterogeneous Materials with Nanoscale Precision

**Mentor:** Dr. Laurene Tetard (Physics)

The objective of this project is to understand the different effects caused by polystyrene (PS) and polycaprolactone (PCL) thicknesses on the frequency shift, amplitude, and phase variations of the signals used for AFM-based subsurface imaging.

### DIANA LOPEZ

#### Theoretical Study of Chromophores for Biological Sensing: Understanding the Mechanism of Rhodol-Based Multichromophoric Systems

**Mentors:** Dr. Hector J Rivera Jacquez (Optics), Dr. Artem Masunov (Chemistry)

In order to aid in the effort of finding novel optical sensors for biological systems, theoretical methods are used to predict the optical properties of multichromophoric systems consisting on rhodol and aza-crown components. After understanding the properties we aim to design optimized metal sensors for biological systems.

### SAMANTHA MENSAH

#### A Mesogenic Oligomer with Alternating Electron Acceptor and Donor Units for Organic Electronic Applications

**Mentor:** Dr. Fabrice Mathevet (Chemistry)

Key requirements in the progress of materials for organic electronics include better charge transport properties and more stable, well-aligned organization of the supramolecular structure. The conjugated oligomer presented is a good candidate to form highly ordered supramolecular structures and offers promising solution processing capabilities.

### TATIANA MOLDEN

#### OC Sensor for Detection of DNA Methylation Sites

**Mentor:** Dr. Dmitry Kolpashchikov (Chemistry)

This project is focused on using multicomponent molecular sensor (OC sensor) for detection of DNA methylation sites. DNA containing 5-methyl cytosine was shown to form more stable base pairs with complementary probes. Therefore we expect binding of OC sensor to DNA containing 5-methyl cytosine with greater affinity than unmodified DNA.

### NICOLE MRVOS

#### The Mechano-synthesis of Propane Using Recycled Biomass for Renewable Energy

**Mentor:** Dr. Richard Blair (Physics)

The commercialized method to receive propane is to collect it as a byproduct of oil refining. In this experiment, we analyze our synthesis of propane from a naturally occurring source and identify the implications it has for the alternative fuel market.

### MICHAEL NAVARRO

#### Synthesis of Few-Layered Halogenated Graphene for Metal-Air Fuel Cells

**Mentor:** Dr. Richard Blair (Physics)

My research involved the synthesis of halogenated graphene, which will offer the potential for enhanced metal fuel cells. In the process, I constructed metal fuel cells using halogenated graphene as the oxygen-splitting catalyst and evaluated the lifetime and electrochemical properties of the fuel cells.

### WESLEY NEWSOME

#### Aniline-Containing Metal Organic-Frameworks with Redox Activity and Strong Dipoles

**Mentor:** Dr. Fernando Uribe-Romo (Chemistry)

The purpose of this research is to design and synthesize aniline-containing porous metal-organic frameworks that contain strong dipoles and are redox active to work as cathode materials in high-power lithium-ion batteries.

### ETHAN PEP MILLER

#### The Effects of Nanopores on Ionic Current

**Mentor:** Dr. Lee Chow (Physics)

In this project we researched the effects of varying pore sizes, electric potential, and concentration on ionic currents running through a nanopore. This serves as a preliminary investigation for the detection and identification of nano-objects in a solvent.

### JEFFER PINZON

#### Signal Amplification of a Highly Selective Universal MicroRNA Electrochemical Sensor for Single Nucleotide Polymorphism Detection

**Mentor:** Dr. Karin Chumbimuni-Torres (Chemistry)

The electrochemical four-way junction nucleic acid sensor was developed to detect microRNAs (miRNAs) and single nucleotide polymorphisms (SNPs), which have been proven to be potential diagnostic biomarkers for many human malignancies such as breast cancer and Alzheimer's disease.

### COURTNEY POWELL

#### Development of a Colorimetric Assay for Sex Determination in Ancient DNA

**Mentor:** Dr. Dmitry Kolpashchikov (Chemistry)

This research aimed to create a molecular sensor to recognize a fragment of the amelogenin gene and distinguish between the X-allele and Y-allele for sex determination.

### NOOR FATIMA QADRI

#### Enhancement of Ultraviolet Upconversion Emission Using Plasmonic Nanocavities

**Mentor:** Dr. Mercedeh Khajavikhan (Optics)

To enhance the emission of ultraviolet (UV) light through near-infrared (NIR) upconversion by trapping nanoparticles into uniquely designed plasmonic cavities. If accomplished, such innovations could lead to numerous applications in the field of biological sciences, such as drug delivery in medicine, bioimaging, and solar cells.

**JOSHUA RABANAL****Micro-Raman Spectroscopy of Electrochemically Grown Polymers and Incorporation of Lead****Mentor:** Dr. Alfons Schulte (Physics)

The characterization of the incorporation of lead with electrochemically grown poly(3-methylthiophene).

**ANA ROSARIO****iPURE: Interdisciplinary Physics Undergraduate Research Explorers****Undergraduate Co-Authors:** Yasmine Lanham, Ashley Gramajo, Rawan Almousa, Han Le, Claudia Ragosta**Mentors:** Dr. Ahlam Al-Rawi, Dr. Abdelkader Kara, Dr. Laurene Tetard, Dr. Alfons Schulte (Physics)

Exploring interdisciplinary research utilizing physics in a biological realm.

**KAMRY SAMUEL****Electrochemical Determination of Hybridization Kinetics on a Two-Way Junction DNA Sensor****Mentor:** Dr. Karin Chumbimuni-Torres (Chemistry)

Alternating current voltammetry and cyclic voltammetry will be used to determine an efficient method for analyzing nucleic acids on a two-way junction electrochemical DNA sensor.

**DANIEL SEGA****An Analysis of Bending Waves in Saturn's Rings****Mentor:** Dr. Joshua Colwell (Physics)

In order to gain a better understating of Saturn's ring-moon system we developed a program that simulates the dimming of starlight as it traverses Saturn's rings. The results from these simulations are to be compared with data received from Saturn's orbiter *Cassini*.

**JOSEPH SLEPPY****Use of Perovskite to Develop Flexible and Semitransparent Energy-Generating Solar Cells****Undergraduate Co-Author:** Caleb Morrison**Mentor:** Dr. Jayan Thomas (Optics)

To develop a flexible and semitransparent solar cell using PEDOT:PSS, perovskite, and PCBM. We expect a performance conversion efficiency of 7 percent to 9 percent and a voc of -0.8V. Such performance is enough for practical demonstrations such as lighting an LED or running a small electric motor.

**ANGELIQUE SOLANO****Characterizing Condom Lubricants Using Direct Analysis in Real Time-Mass Spectrometry****Mentor:** Dr. Candice Bridge (Chemistry)

Condoms are prepackaged and normally have personal lubricant present on the rubber for ease of insertion. Identifying the concentration of main components of these lubricants, i.e., polydimethylsiloxane, polyethylene glycol, and nonoxynol-9, will aid in the identification of unknown condom lubricants during sexual assaults in the absence of a known comparison.

**OSCAR TARANO****Iodinated Metal-Organic Frameworks for the Separation of Gases in Spent Nuclear Fuel****Mentor:** Dr. Fernando Uribe-Romo (Chemistry)

This project aims to produce metal-organic frameworks (MOFs) capable of separating gases from radioactive waste by functionalizing them with electronically soft substituents. Our current efforts focus on the syntheses of organic linkers containing large amounts of iodine along with the preliminary stages of crystallizing the MOFs.

**RONDEL THORPE****A Highly Scalable and Stereoselective Synthesis of L-Allo-Enduracididine****Mentor:** Dr. Yu Yuan (Chemistry)

To address the challenge of creating a highly stereoselective method for setting the C3-chiral center of the unnatural amino acid L-allo-enduracididine.

**NIKIA TOOMEY****Synthesis and Characterization of Fluorescent C-13 Derivatives of Podocarpic Acid****Mentor:** Dr. Delbert Miles (Chemistry)

The goal of this research was to prepare and characterize novel fluorescent C-13 derivatives of podocarpic acid, a natural conifer resin, for possible application in bioimaging, specifically fluorescence microscopy.

**TYLER TOWNSEND****Exploration of the Temperature Dependence for Spin Pumping in a Superconducting Niobium Thin Film****Mentor:** Dr. Enrique del Barco (Physics)

This study investigates the spin dynamics of superconducting thin films. An experiment is carried out using superconducting niobium by spin pumping below and above the superconducting regime in an attempt to understand the spin transport mechanisms in these devices.

**CONRAD TROHA****Effect of Uniaxial Strain on Band Structure of Multilayer WS<sub>2</sub>****Mentors:** Dr. Talat Rahman, Dr. Duy Le (Physics)

I wanted to see what would happen to the band structure of a multilayer tungsten disulfide structure after applying a one-dimensional strain. I built a virtual model and ran calculations using Python. I found that WS<sub>2</sub>, under strain, becomes more like a direct band gap material for higher photoluminescence.

**JOHN VASTOLA****The Effect of Impurities on the Superconductivity of BSCCO-2212****Mentor:** Dr. Richard Klemm (Physics)

BSCCO-2212 is a high-temperature superconductor whose electronic structure is poorly understood. I worked on quantum field theoretic calculations to elucidate it. These calculations are consistent with experimental evidence on this topic.

**JACQUELINE WILLIAMS****The Structural Basis of Neurotoxicity of Alzheimer's Amyloid  $\beta$  Peptide****Mentor:** Dr. Suren Tatulian (Physics)

The aim of this research is determine the structural basis of neurotoxicity of Alzheimer's Amyloid  $\beta$  Peptide. Additionally, the soluble oligomers of Amyloid  $\beta$  Peptide can be causatively linked as an alternative source of neurotoxicity as opposed to Amyloid  $\beta$  Peptide fibrils that form senile plaques as the source.

## MARCY YI

### Nanoscale Studies of Polymer by Novel Microscopy Techniques

**Mentor:** Dr. Laurene Tetard (Physics)

The objective of this study is to examine the influence of thickness on the nanoscale properties of polymer films using both atomic force microscopy (AFM) and mode-synthesizing atomic microscopy (MSAFM) techniques to establish new correlations between the variations in MSAFM signal and the sample properties.

## SOCIAL SCIENCES I

## SARA ADAMS

### How Trauma Paves Your Road Through Life: Reflections from Holocaust Survivors on Meeting Erikson's Stage of Integrity vs. Despair

**Mentor:** Dr. Ana Leon (Social Work)

While many survived, we know little about the impact that the Holocaust has had on their later years. This study aims to study the perceptions of Holocaust survivors on how the Holocaust experience has affected their ability to resolve Erikson's final stage of development crises experienced during integrity versus despair.

## GRISELDA ALAVEZ

### Rumination and the Effect of Directed Forgetting on Emotional Stimuli

**Mentor:** Dr. Valerie Sims (Psychology)

Looking at individual differences, we will replicate a study based on people's tendency to ruminate and the ability to forget emotional material as directed. The results will be examined to discover how much of an impact rumination and personal differences have on memory.

## ISMAR ALBURQUERQUE

### The Relationship Between Political Attitudes and Cynicism

**Undergraduate Co-Author:** Hannah Elmtioui

**Mentor:** Mr. Jason Chesnut (Psychology)

This study's purpose is to examine the relationship between cynicism and political attitudes. It is hypothesized that higher levels of cynicism will correlate with conservative political attitudes due to conservatives valuing tradition and disliking change. This research may allow individuals to better understand and relate to those who differ politically.

## ALESIA ALBURY

### Locus of Control as a Function of Age, Gender, and Ethnicity

**Mentor:** Dr. Doan Modianos (Psychology)

This study determined whether age, gender, and ethnicity are variables that can correctly predict whether one views themselves as being in total control, whether others hold all the power, or if there is a higher deity that has already planned our lives out for us.

## KATE BARBER

### Think About It: Journaling Prompts that Encourage Participants to Think Are Better at Alleviating Stress

**Undergraduate Co-Authors:** James Oskam, Maggie Harding, Allison Long

**Mentor:** Dr. Shannon Whitten (Psychology)

Expressive writing has been researched extensively, and benefits have been demonstrated for many circumstances, including physical and emotional trauma. The present study expands these findings by directly comparing different writing prompts. Furthermore, personality and the effects of short-versus long-term writing were investigated.

## VICTOR BASSEY

### Physics in the Wild: Developing Augmented Reality Tools for Education

**Mentor:** Dr. Joseph LaViola (Electrical Engineering and Computer Science)

We created an application using the Unity 3-D game engine to assist teachers in reinforcing physics concepts for students. The application allows students to interact with and visualize different fundamental physics concepts, like kinematics, while simultaneously being able to observe the physics equations, assisting in the learning and understanding process.

## CHRISTY BOX

### Work, Study, Save an Endangered Language

**Mentor:** Dr. Beatriz Reyes-Foster (Anthropology)

My research project analyzed whether support and inclusion of endangered languages in linguistically dominant institutions such as universities and businesses positively affects the societal perception of endangered languages.

## MORGAN BRAWNER

### Sustainability: Stewardship or Conformity? A Case Study of Sustainability Strategy Implementation in Green Universities Nationwide

**Mentor:** Dr. Claire Knox (Public Administration)

This project analyzes sustainability programs implemented by universities in the United States that are ranked in the top 10 greenest schools for sustainable initiatives and environmental awareness. The research aims to benchmark the effectiveness of these programs and to advise future sustainability efforts among colleges, universities, and small cities.

## DEVIN BURNELL

### Antecedent and Consequences of Right-Wing Authoritarianism and Social Dominance Orientation in the Workplace

**Mentor:** Dr. Doan Modianos (Psychology)

Right-wing authoritarianism and social dominance orientation are ideologies related to prejudice, group cohesion, and hierarchy favoring. The question driving this research is: How do these ideologies relate to workplace consequences such as bullying, vocational selection, leader style preference, and organizational commitment? Our objective is to investigate these ideologies and implications for organizations.

## NOEL CAL

### Gender Differences in Eyewitness Recall

**Undergraduate Co-Author:** Natallia Machecha

**Mentor:** Dr. Mustapha Mouloua (Psychology)

This study examines how leading and nonleading questions affect the number of recalled details between men and women. The study aims to support prior research that indicates a difference and re-examines how suggestive details impact recall.

**SIMONE CAMACHO****Attitudes Toward Human Papillomavirus (HPV) Vaccine Among Genders****Mentor:** Dr. Charles Negy (Psychology)

I will compare attitudes toward the HPV vaccine to determine if one gender is more open to the vaccination. And I will measure three indices of rational thinking: (1) appreciation of science, (2) religiosity, and (3) magical thinking, to determine their ability to predict resistance to the HPV vaccine.

**LUIS CAMPOS****The Bismarck Model: A Comparative Analysis of German and Japanese Political Process and Implementation****Mentor:** Dr. Anca Turcu (Political Science)

This research compares the effects of different political processes on the implementation of progressive social and mental health policy within Germany and Japan.

**BRACH CHAMPION****Correcting Medicaid Underreporting by the Current Population Survey: A Stochastic Frontier Analysis****Mentor:** Dr. Richard Hofler (Economics)

The current population survey is cheaper, easier, and the most widely cited source of estimation of Medicaid enrollment, but it's inaccurate. We will correct this inaccuracy using a stochastic frontier to predict the true value of Medicaid enrollment.

**REBECCA CHAPPELL****An Examination of the Extent to Which Word Work with Elementary Students Transfers to Authentic Reading and Writing Practices****Mentor:** Dr. Andrea Gelfuso (Teaching, Learning, and Leadership)

The objective of this study is to create a new understanding about word work to enable educators to more effectively teach phonics so that word work instruction does transfer to authentic reading and writing practices.

**EMILY CHESLEY****Let's Get Physical****Mentor:** Dr. Grace White (Psychology)

The primary goal(s) of this study are to: (1) Examine the relationship between physical activity and relationship satisfaction, and (2) examine how personality relates to physical activity and relationship satisfaction.

**NICOLE CHUDY****Performance of Basis Peak and Microsoft Band 2 During N-Back Task: A Validity and Reliability Study****Mentor:** Dr. Daniel McConnell (Psychology)

The objective of this study is to validate fitness-tracking devices as an alternative to ECG and thus make the inclusion of physiological data in psychological research more accessible.

**LUCY CLEMENT LA ROSA****The Significance of Narcoterrorism in Counterterrorism****Mentor:** Dr. Houman Sadri (Political Science)

"The Significance of Narcoterrorism in Counterterrorism" presents research on the relationship between narcotic traffickers and terrorist organizations. The relationship is analyzed in the context of terrorism's evolution over the past several decades. The research analysis is used to demonstrate the significance of the relationship in present-day counterterrorism strategies.

**MONIQUE COHN****Examining the Roles of a School Psychologist in Collaboration with Early Educators****Mentor:** Dr. Kelly Jennings-Towle (Teaching, Learning, and Leadership)

The goal of this study is to examine the roles of current school psychologists, their collaborative work with early intervention, and need for further supportive measures. The researcher realized the imperative position that a school psychologist is in and the need to define the role for this occupation.

**ASHLEY CRAIG****Empowerment Unit Plan for Haitian Restavek Children****Mentor:** Dr. Lee-Anne Spalding (Teaching, Learning, and Leadership)

"Restavek," French for "one who stays with," describes the situation of slave children in Haiti. The majority of these children are young females without access to education or family. This research demonstrates how empowering and educating these 8- to 12-year-old girls provides them with an opportunity for a better life.

**TARALEIGH DAVIS****Kazakhstan: From the Leftovers of a Dissolved Empire to Regional Power****Mentor:** Dr. Houman Sadri (Political Science)

This project will present a comparative analysis of ethnic-government relations, economy, and foreign policy in the former Soviet Republics of Kazakhstan, Georgia, and the Ukraine. This project will also compare these countries in regard to political stability, highlighting the importance of peace to combat growing concerns for global terrorism.

**WILLIAM DEAN****Policy Evolution in Costa Rica: The Road to Sustainable Ecotourism****Mentor:** Dr. Peter Jacques (Political Science)

I researched how Costa Rica altered its domestic economic policy to include environmental management and sustainable development. More specifically, I investigated how policymakers, grass-roots organizations, and nongovernmental organizations influenced this monumental policy change that resulted in the creation of a world-renowned ecotourism industry.

**TASHANDA DENNISON****A Different World****Mentor:** Dr. Amy Donley (Sociology)

Using a sample of over 300 adults, this study examines peoples' perceptions regarding the current state of race relations within the U.S. Specifically, respondents were asked if they think that substantial progress has been made since the 1964 civil rights movement.



### **JULIE DESLAURIERS**

#### **A Two-Way Rescue? College Students' Perceptions of Pet Adoption and the Effect an Animal Has on Overall College Experience**

**Mentors:** Dr. Linda Walters (Biology), Dr. Amanda Anthony (Sociology)

The objective of this research study is to view college students' perceptions of animal overpopulation and pet adoption. The study will also see if having a pet in college affects student GPA, leadership, extracurricular involvement, and overall college satisfaction.

### **DAVINA DHANI**

#### **The Impact of Time Orientation on Consumers' Online Reviews and Perceptual Value**

**Mentor:** Dr. Ze Wang (Marketing)

The objective of this course of study was to examine the potential influence of temporal orientation on consumer perceptions of product value and content emotionality.

### **SHIRLEY DORSAINVIL**

#### **Does Distance Matter?: Predictors of Infidelity and Jealousy in Geographically Close vs. Long-Distance Romantic Relationships**

**Mentor:** Dr. Grace White (Psychology)

This current study aims to examine differences in relational uncertainty, relationship satisfaction and quality, personality traits and attachment styles, and attitudes toward infidelity and jealousy among individuals in long-distance relationships (LDRs) versus geographically close romantic relationships (GCRs) in order to alleviate the concerns for couples interested in LDRs.

### **H. CHRISTOPHER ECKSTEIN**

#### **Generation Rated X: Personality Traits, Sexual Attitudes, and the Effects of Sexually Explicit Media on Attraction Among Men**

**Mentor:** Dr. Grace White (Psychology)

The current study examines the effects of pornography on males when rating unknown women on attractiveness in a one-group pretest-post-test design. The influences of personality traits and sexual attitudes are also investigated for meaningful interactions with the degree of desensitization after SEM exposure.

### **KRISTEN ELLIOTT**

#### **Student Engagement in the Marketing Major**

**Mentor:** Dr. Carolyn Massiah (Marketing)

During my undergraduate research with Dr. Massiah, we brainstormed ways to get students in the marketing degree more involved. Through our research, we analyzed what students like and dislike about the major and what their preferences are on how to learn and apply classroom knowledge beyond graduation.

### **ALYSSA FINNER**

#### **Transdiagnostic Exploration of Psychiatric Symptoms Related to Misattribution Errors to Neutral Faces**

**Mentor:** Dr. Jeffrey Bedwell (Psychology)

Several studies have demonstrated misattribution of emotion to neutral facial expressions among individuals with psychotic disorders. The present study aimed to identify particular transdiagnostic symptoms that relate to this abnormality. Findings from this study inform treatment for social cognition deficits in these disorders, which may lead to improved functional outcomes.

### **DAVID FORESMAN**

#### **Representations and Impacts of Transgender and Nonconforming Ideals in Children's Literature**

**Mentor:** Dr. Sherron Roberts (Teaching, Learning, and Leadership)

A content analysis of children's literature that contains a strong transgender and/or gender-nonconforming character. Trends, themes, and characteristics will be annotated and compared.

### **KIARA GARCIA**

#### **Exploring Dentists' Readiness to Work with Individuals with Disabilities**

**Mentor:** Dr. Maria E. Reyes (Child, Family, and Community Sciences)

Qualitative and quantitative research methods will be utilized to complete the study. Self-perceived efficacy patterns are analyzed at two different stages. First, an analysis of the curriculum of the three dental schools in Florida followed by a modified questionnaire instrument surveying undergraduates pursuing a career in dentistry and current dental students.

### **MEGAN GINN**

#### **A Comparative Study: Kazakhstan, Uzbekistan, and the Politics of Domestic Violence**

**Mentor:** Dr. Houman Sadri (Political Science)

The objective of this study is to assess women's rights in Central Asia. This study analyzes how each government has directly resuscitated the practice of domestic violence and what they are doing (or a lack thereof) to combat it.

## **SOCIAL SCIENCES II**

### **MELISSA GOMEZ**

#### **Stable Isotope Analysis of the Extracted Collagen from the Bahamian Hutia; Determining Role in Indigenous Agricultural Development**

**Mentors:** Dr. Pete Sinelli, Dr. Lana Williams (Anthropology)

Through the careful extraction and isotopic analysis of both collagen and dentin from the Bahamian hutia (*Geocapromys ingrahami*), we are attempting to provide insight into its role in the subsistence developments of the indigenous peoples of the Caribbean archipelago.

### **EMILY GONZALEZ-HOLLAND**

#### **Prosocial Behavior and Teamwork Outcomes in Serious Training Games**

**Mentor:** Dr. Clint Bowers (Psychology)

In this presentation I provide a theoretical analysis of the prosocial behavior literature in conjunction with its application toward team training and serious games. I attempt to bridge the gaps in the prosocial behavior literature by providing theoretical guidelines using a common learning model.

### **RYAN HAMMOND**

#### **Parks as Places of Solace: The Perceived Value of Public Parks After 9/11**

**Mentor:** Dr. Peter Jacques (Political Science)

I researched into how parks are viewed and utilized after large-scale traumatic events by selecting a specific case (9/11 in New York), coding newspaper reporting on parks, and quantifying the themes in order to draw conclusions. My goal was to increase our understanding of how and why people use parks.

**MARVIN HOO****The Relationship Between Education, Self-Esteem, and Body Image***Mentor:* Dr. Mustapha Mouloua (Psychology)

This research project explored the concept of education and the relationship it may have on self-esteem and body image.

**TENESHIA HUGGINS****Mentoring Future UCF STEM Scholars Through the UCF NSF ICubed Project (Innovation Through Institutional Integration I3)***Mentors:* Dr. Vassiliki Zygouris-Coe (Educational and Human Sciences), Dr. Parveen Wahid (Electrical Engineering and Computer Science)

To develop a STEM pathway for high school students that engages them in learning about STEM research in UCF research labs and equips them with relevant experiences and knowledge about STEM college studies and future related careers.

**CRISTINA HYMAN****Giving Up Our Pets: How Pet Owners' Attitudes Toward Animals Relate to Pet Relinquishment***Mentor:* Dr. Elizabeth Grauerholz (Sociology)

Pet relinquishment occurs when ownership of a pet is transferred to a shelter organization. This study explores the relationship between pet owners' cultural orientations toward animals and pet relinquishment; specifically comparing how owners who relinquish their pets differ from nonrelinquishers in their attitudes toward their pets and animals in general.

**ANDREI IRIMIA****The Shadow Rate and Its Effect on U.S. Assets and Bank Balance Sheets***Mentor:* Dr. Uluc Aysun (Economics)

This thesis seeks to determine the effect that the shadow rate, as presented in research by Wu and Xia, has had on U.S. asset prices and bank balance sheets in the period of 2010–15.

**VINCENT IULA****Free to Be Accountable: Extended Self as a Moderator of Cheating Among Those Primed with Determinism***Mentor:* Dr. Shannon Whitten (Psychology)

Prior research has shown that reading primes relating to determinism results in more anti-social behavior and more consequentialist views on justice. For the current research it is hypothesized that the introduction of a prime that extends the notion of self beyond that which we normally intuit will moderate these effects.

**KATIE KENNIE****Through the Eyes of the Child***Mentor:* Dr. Steven Saunders (Psychology)

A study of the patient files of Dr. Saunders in combination with survey research. The data results are to be used to establish correlation between childhood risk factors for adult propensity for crime and mental stability.

**VALERIE KESSLER****The Cognition of Expert Dancers***Mentor:* Dr. Valerie Sims (Psychology)

This project is an ongoing investigation into the cognition of dancers. The objective is to determine if dancers have a different way of processing information, and how this way of thinking affects their other cognitive abilities.

**JAMES KOZACHUK****An Investigation of the Effect of the Discrete Fitts' Pointing Task on Physiological Stress***Mentor:* Dr. Daniel McConnell (Psychology)

Fitts' law is a tool to quantitatively model human movement during a task, predict performance, and evaluate various input devices. As Fitts' tasks have many uses in psychological research, it is important to understand the effects it has on participants. The present study sets out to quantify task stress response.

**CHRISTINA KURSEWICZ****Palliative Care Education in American Medical Schools***Mentor:* Dr. Elzbieta Sikorska-Simmons (Sociology)

I assessed the curricular interventions designed by various American medical schools to improve undergraduate palliative care education. Ideally this will publicize the importance of early palliative care education and impact medical school education curricula to ultimately improve the quality of life for patients with chronic diseases.

**GRAYSON LANZA****A Contemporary Analysis and Comparison of the Kurdish Nationalist Movement: A Case Study on Syria***Mentor:* Dr. Houman Sadri (Political Science)

The main objective of this research paper is to analyze and compare the contemporary Kurdish nationalist movement in Syria compared to other Kurdish-dominated regions in the Middle East. Difference in ideology, allies, and ultimate end goals for the national movement are what will be examined and compared.

**NICOLETTE LEIBOWITZ****The Relationship Between Color and Trust When Building a Trustworthy Robot***Mentor:* Dr. Peter Hancock (Psychology)

We intend to evaluate attitudes about robots and investigate how robot appearance, particularly color, affects trust. Specifically, we will examine similarities in color choice when participants are given the task of "building a trustworthy robot" using simulated robot software.

**ALEXANDRA LOCCISANO****Getting Students Engaged in Honor Societies: What Factors Influence Level of Involvement***Mentor:* Dr. Stephanie Vie (Writing and Rhetoric)

This project will analyze how collegiate honor societies encourage students to become involved and engaged. To analyze this, I will use secondary research and interviews with student leaders in honor societies to determine factors like requirements, marketing strategies, activities, and the number of students actively involved in the organization.

### **JENNIFER MCDONNELL**

#### **Correlations Between Sexual Imagery and Sexual Cognitions**

**Mentor:** Dr. Chrysalis Wright (Psychology)

Correlational analysis between the sexual imagery displayed within the music video medium, and the sexual cognitions of viewers. The heterosexual script found across the majority of music videos is explored while also referencing theories of social learning, sexual objectification, and cognitive dissonance, among others.

### **EMMA MCGEATH**

#### **Driving Adjacent to an Autonomous Vehicle: A Survey of Trust**

**Mentor:** Dr. Peter Hancock (Psychology)

This poster focuses on the primary research that will lead to a study on trust in driving alongside autonomous vehicles.

### **MELISSA MERZ**

#### **The Effect of Decision Domain on Economic Decision-Making**

**Undergraduate Co-Author:** James Ross

**Mentor:** Dr. Nichole Lighthall (Psychology)

The main objective of this project is to better understand how people make economic decisions. Specifically, the project examined effects of decision domain (gains versus losses) on choice selection and probability estimations to improve our understanding of how value judgments evolve over time.

### **FERNANDO MONTALVO**

#### **Assessing Fitness Band Icon Usability**

**Mentor:** Dr. Janan Smither (Psychology)

Wearable fitness devices have quickly gained popularity in recent years while research on their usability has remained scant. The present study explored user interpretation and preference of common fitness device display icons to gauge barriers to device adoptability, ease of use, and user understanding of presented data.

### **LANDON MORLEY**

#### **Virtually Me: Personality Influences on Online Dating App Selection**

**Undergraduate Co-Author:** Emily Chesley

**Mentor:** Dr. Grace White (Psychology)

This study will explore personality predictors for specific use of certain online dating apps. Specifically, this study will explore whether certain personality characteristics predict the use of dating apps geared toward casual hookups or dating apps geared toward monogamous relationships.

### **YETZENIA NEGRON**

#### **Victimization Experiences and Its Influence on Job Choice**

**Mentor:** Dr. Amy Reckdenwald (Sociology)

The purpose of this project is to examine whether prior victimization experiences, particularly related to intimate partner violence, influence an individual's job choice. The study will analyze if individuals have chosen jobs that assist others in their everyday life and highlight areas of opportunity to enhance services and resources for career development.

### **SOFIA NEIRA**

#### **Perceptual Grouping in Visual Working Memory**

**Mentor:** Dr. Mark Neider (Psychology)

Gestalt principles promote the perception of an object without having physical connections and increase visual working memory capacity. Utilizing a change detection paradigm, we evaluated grouping by closure and proximity to determine whether closure produces similar or greater visual working memory capacity benefits compared to other Gestalt principles.

### **TAMAR NIR**

#### **Hebrew and Computer-Mediated Communication: The Effects of a Linguistic Manipulation on Perception, Identity, and Preservation**

**Mentor:** Dr. Valerie Sims (Psychology)

This project aimed to explore participants' perception of a specific computer-mediated linguistic manipulation of Hebrew. This manipulation, dubbed "Fakatsa," is characterized by overt, feminine deviations to standard grammatical Hebrew. Participants were asked to rate snippets of text on multiple levels with regard to the grammatical structure and perceived writer.

### **MEI OSUKA**

#### **The Impact of Price Deviation on the Perceived Quality, Value, and Revisit Intention in Hotels**

**Mentor:** Dr. Ji-Eun Lee (Hospitality Services)

The purpose of this study is to explore the impact of price deviation on the perceived quality, value, and revisit intention in hotels. More specifically, this study investigates the effect of three different directions of price deviation (positive, negative, and no deviation) on lodging consumers' judgments of quality, value, and revisit intention.

### **ZOE PHILIPSON**

#### **Parent-Child Cognition in the Performing Arts: How Perceived Parental Control Affects Parent-Child Relations in Youth Theater**

**Mentor:** Dr. Valerie Sims (Psychology)

This research project examines the effects of perceived parental control on children's enjoyment and participation in youth theater. Data collected from surveys taken by children in theater and their parents was analyzed using a regression analysis to examine the relationships between various factors, including perceived control factors and satisfaction factors.

### **ANDRE PIEREND**

#### **Role of Socialization Outlets and Environmental Factors on Virtual Sports Team Performance**

**Undergraduate Co-Author:** James Kozachuk

**Mentor:** Dr. Doan Modianos (Psychology)

Team-based video games are becoming popular, especially for students. The performance of high school students playing in gaming competition was used to determine what factors can affect performance. The importance of allowing students the opportunity to have an after-school social outlet around their competition shows an increase in performance, among other benefits.

**LAUREN REYNOLDS****Are Ag-Gag Laws Constitutional?***Mentor:* Dr. Peter Jacques (Political Science)

The objective of this research is to investigate and conclude the legality of “ag-gag” laws under the individual rights provided by the U.S. Constitution’s Bill of Rights through analyzing legal cases from the eight states that have enacted ag-gag laws.

**VANESSA RINKER****Criminal vs. Mentally Ill: A War on Drugs or a War on Society?***Mentor:* Dr. Amy Donley (Sociology)

This study examines the public’s views toward those who abuse substances. Specifically I assessed whether respondents believe that substance abusers should be viewed as criminals and should therefore face incarceration or if respondents viewed them as having a mental health issue that necessitates treatment in mental health or rehabilitation facilities.

**KARLENE RIVERA****What Would You Call Family?***Mentor:* Dr. Racine Jacques (Sociology)

This research explores whether a person’s own family influences their perceptions or definitions of family. The purposes of the research are to investigate (1) whether the definition of family will be reflective of one’s own family and (2) if one’s own family affects how family is defined.

**KYLE ROMANO****Public Discourse: Frames in Everglades Restoration***Mentor:* Dr. Peter Jacques (Political Science)

For this project, I analyzed letters to the editor that discussed Everglades restoration in three major Florida newspapers. After incorporating new data into the sample, I uncovered important themes within the public discourse involving the Comprehensive Everglades Restoration Plan. These themes have important consequences for the restoration effort in general.

**DAYANARA ROSADO****Identity Development and Motherhood***Mentor:* Dr. Steven Berman (Psychology)

Teen pregnancy and caring for a baby can cause rupture and loss to one’s sense of identity. Support for parenting may ameliorate some of these negative effects. The purpose of the present study is to investigate the links between identity, adjustment, and parenting support among adolescent mothers.

**SOCIAL SCIENCES III****KELLY ROSCH****The Effects of Metacognitive Prompting on Music Learning***Mentor:* Dr. Valerie Sims (Psychology)

This project studied the effects of various types of metacognitive prompting on novice musicians’ ability to retain musical knowledge and transfer it to new performance situations.

**ANDIA RUIZ PAYNE NARCIS****Addicted to Love: A Correlational Study of Personality, Commitment, and Attachment in Intimate Relationships***Mentor:* Dr. Grace White (Psychology)

The purpose of this research is to investigate how self-esteem, attachment style, personality traits, and commitment levels affect satisfaction within romantic relationships.

**BROOKE RUSOFF****Exploring Attachment Behaviors in Urban Mothers and Their Infants***Mentor:* Dr. Anne Culp (Teaching, Learning, and Leadership)

This study seeks to explore attachment behaviors in urban mothers and their infants who are enrolled in a nine-week parent education program. Using observational measures, the researcher anticipates growth in attachment behaviors as well as an increase in the frequency of positive interactions over the course of the program.

**NICOLE RYAN****American Agribusiness and Biotechnology: A New Era of Industry Farming***Mentor:* Dr. Houman Sadri (Political Science)

This research focuses on the evolution of U.S. agriculture and the regulation of genetically modified organisms. Under the direction of the Food and Drug Administration many GM plant species have been approved without extensive testing. The difference in adopted policy between the U.S. and EU serves to raise further questions.

**JASMINE SAMUEL****Authoritarianism and Collectivism: Antecedents and Consequences***Mentor:* Dr. Doan Modianos (Psychology)

The current research examines an individual’s morality and how it influences sociopolitical attitudes, sociopolitical ideologies, and self-view.

**AMAIRINI SANCHEZ****Social Media and Self-Presentation***Mentor:* Dr. Amy Reckdenwald (Sociology)

The purpose of this research is to compare the usage of social media with the presentation of one’s self. I hope to be able to explain if the level of online interaction is related to the way one chooses to create our online persona.

**ANGEL SANCHEZ****Can Independent Redistricting Commissions Lead Us Out of the Political Thicket?***Undergraduate Co-Author:* Tyler Yeagain*Mentor:* Dr. Barry Edwards (Political Science)

In response to partisan gerrymandering, legislative gridlock, and court interventions, states have responded with the creation of independent redistricting commissions (IRCs) to draw legislative lines in place of legislatures. The U.S. Supreme Court has recently declared IRCs constitutional. This research seeks to evaluate whether IRCs achieve their intended goals.

**JOSE SANCHEZ****Hinterland Relations: An Analysis of Values Governing the Salton Sea Restoration***Mentor:* Dr. Peter Jacques (Political Science)

The Salton Sea faces detrimental anthropogenic, abiotic, and biotic disturbances. I am investigating the values that govern Salton Sea restoration.



## **BRYANT SANTANA**

### **A Descriptive Analysis of DUI Arrests Across Florida Counties**

**Mentor:** Dr. Gail Humiston (Criminal Justice)

Theories determine how DUIs vary in Florida's wide range of offenders' age; county populations were analyzed to find out if universities and tourist destinations had an overall effect on the DUI rates and which age group impacted those rates the most.

## **ADRIANA SANTIAGO ACEVEDO**

### **Understanding How Cultural Gender Beliefs Affect Young Women's Leadership Identity Development**

**Undergraduate Co-Author:** Anjelica Doriety

**Mentor:** Dr. Amanda Anthony (Sociology)

This research examines influences of the Young Women's Leadership Program (YWLP) on young women's perceptions of leadership, personal ideals and aspirations, and self-confidence. YWLP is a research-based mentoring program with the mission of promoting leadership and girls' empowerment. This project utilizes mixed methods to explore these dimensions of identity and leadership development.

## **CAITLIN SAWYER**

### **Overcoming a Handicap: A Case of Foot Amputation in Pre-Hispanic Peru**

**Mentor:** Dr. Jennifer Toyne (Anthropology)

To identify the societal value handicapped individuals held in pre-Hispanic Peru, the case of an amputated individual from the Peruvian coastal site of Túcume from the Huaca Abejas monument will be assessed in regard to potential medical and social assistance observed in the bioarchaeological evidence.

## **NICOLAS SAWYER**

### **White Dudes Making Films About White Dudes: Using Computational Linguistics to Quantify the Agency of Characters in Contemporary American Films**

**Mentor:** Dr. Peter Jacques (Political Science)

The objective of this study is to provide a content analysis tool that uses computational linguistics to quantify the linguistic agency of characters in screenplays. Linguistic agency is the tendency for certain characters to act on other entities, be acted on by other entities, or be described in certain ways.

## **SAMANTHA SHEPARD**

### **Effects of Sexist Humor on Women**

**Undergraduate Co-Authors:** Alyssa Finner, James Kozachuk, Jacob Walters

**Mentor:** Dr. Doan Modianos (Psychology)

Humor is interpreted less critically than nonhumorous communication. Research shows that exposure to sexist jokes (versus nonsexist) causes men high in hostile sexism to discriminate against women. Prompted by the lack of research on female populations, this study seeks to understand how sexist humor affects women.

## **EMILY SIMPSON**

### **Family and Peer Influence on the Frequency of Swearing**

**Undergraduate Co-Author:** Joshua Duarte

**Mentor:** Dr. Chrysalis Wright (Psychology)

This project aimed to research the various sources of swearing. In an effort to educate the public, provide information regarding healthy child development, and prevent workplace disharmony, we determined a person's mother is the most influential regarding his/her swearing habits and frequency of usage.

## **CASSANDRA SMITH**

### **Sexual Orientation and Identity Formation**

**Mentor:** Dr. Steven Berman (Psychology)

The purpose of this study is to explore the complex relationships among prejudice, adjustment, and identity development. It was hypothesized that homophobia would be negatively related to psychological adjustment but that this relationship would be especially strong among those with less developed identity formation.

## **DEVIN SMITH**

### **The Relationship Between Political Attitudes and Self-Esteem**

**Undergraduate Co-Author:** Enrique Leon

**Mentor:** Mr. Jason Chesnut (Psychology)

The purpose of this study is to examine the relationship between self-esteem and political attitudes. A small but growing body of research exists on the relationships between particular personality traits and political attitudes, although little is known about the self-esteem-political attitude relationship. This study is intended to address this gap.

## **SONALI TEWATIA**

### **Forget Me Not**

**Mentor:** Dr. Grace White (Psychology)

The purpose of this study is to examine the role of personality and memory recall bias in romantic relationship satisfaction. This study intends to determine what influence, if any, these factors have on how current romantic relationships are perceived and past romantic relationships are remembered.

## **MICHAEL TORRES**

### **Mental Rotation with Martial Arts Experts**

**Mentor:** Dr. Valerie Sims (Psychology)

This project compared the reaction times of experts and novices in martial arts during a mental rotation task. Previous research suggests expertise may play a role in mental rotation speed, especially when the stimuli resembles the area of expertise. This project investigated that hypothesis.

## **CAROL TYLER**

### **Level of Satisfaction of Child Protective Services Based on Level of Interaction**

**Mentor:** Dr. Amy Reckdenwald (Sociology)

The goal of this research is to find, if any, a correlation between the level of interaction with child protective services and an individual's level of satisfaction of child protective services.

## **ALEXANDER VENCI**

### **Everything Is Awesome When You Create a Word**

**Mentor:** Dr. Michelle Kelley (Teaching, Learning, and Leadership)

My research project is about investigating structural analysis in an elementary classroom. This project will focus on how structural analysis is used in an intermediate-level and a primary-level classroom.

**SAMUELLE VOLTAIRE****The Usage of Young Adult Literature as a Vehicle to Teach Cultural Empathy**

**Mentors:** Dr. Tracy Wharton (Social Work), Dr. Reshawna Chapple (Social Work), Dr. Jeffrey Kaplan (Educational and Human Sciences)

This is an exploratory study aimed at assessing the current usage of the young adult (YA) literary genre as a learning tool or method to teach cultural empathy to social work students. Findings may be used to explore the different possibilities of incorporating YA literature in social work classrooms.

**TAYLOR WAGNER****What About the Others?**

**Mentor:** Dr. Fernando Rivera (Sociology)

Revision of over 10 years of articles from the American Sociological Association to identify the persistence of the "other" category in sociological studies. Also to analyze and discuss the reasons given for utilizing the "other" label. Overall, the results will shed light on the understanding and measurement of race in sociology.

**JENNY WALKER****An Examination of Individual Differences in the Context of Vigilance**

**Mentor:** Dr. Peter Hancock (Psychology)

This study examines the relationship between human performance, using a feedback versus no-feedback vigilance paradigm, and measures of individual differences. These include working memory capacity, propensity toward mind wandering, cognitive load, and need for cognition. The goal is to address the complexity of vigilance and build upon the direct-cost model.

**JESSICA WALKER****Student Perception of Barriers to Study Abroad**

**Mentors:** Dr. Carlos Valdez (Marketing), Dr. Keith Folse (Modern Languages and Literatures), Dr. Carolyn Massiah (Marketing)

This project investigated students at the University of Central Florida and their perceptions of studying abroad. The primary objective was to determine which perceived barriers were most obstructive in their participation of the program in addition to researching where and how students constructed these beliefs.

**DIAMOND WASHINGTON****Unique Challenges Faced by Homeless Single Fathers**

**Mentor:** Dr. Amy Donley (Sociology)

I am researching Orlando's male homeless population, specifically, homeless single fathers. I hope to gain qualitative information about their day-to-day lives and challenges. Homeless single fathers have remained underrepresented in the homeless population; as a result, there are few facilities or services tailored them.

**BETHANY WEDLUND****Student Perceptions of Birth Mothers of Adopted Children**

**Mentor:** Dr. Shannon Carter (Sociology)

This research aims to describe public perceptions of women who place their children for adoption, known in this study as birth mothers, and to identify factors that may contribute to these perceptions. This study attempts to analyze the relationship between attitudes toward abortion versus attitudes toward birth mothers.

**SAVANNAH WHEAT****"What I Wish I Knew:" Psychology Seniors' Advice to New Psychology Majors**

**Undergraduate Co-Author:** Randy Garland

**Mentor:** Dr. Karen Mottarella (Psychology)

This study examined over 950 letters in which psychology seniors provided their best advice to incoming psychology majors on how to make the most of their undergraduate experience. The letters were coded for common themes. These themes included both attitudes and behaviors that seniors believe promote success in the major.

**GABRIELA WOLK****Is the Doctor In? The Effects of Emigration on the Health Care Systems in Poland and Romania**

**Mentor:** Dr. Anca Turcu (Political Science)

Since joining the European Union and the Schengen Agreement, Poland and Romania have experienced significant emigration that has subsequently affected their health care systems. Motivations for emigrating from these two countries and the effects emigration has had on patients and other doctors will be considered in this research project.

**MEMONA ZAFAR****Ethnic Identity as a Buffer Against the Negative Effects of Perceived Discrimination**

**Mentor:** Dr. Steven Berman (Psychology)

The objective of this study is to investigate the incongruous relationships among ethnic identity, perceived discrimination, and psychological adjustment by testing the hypothesis that ethnic identity mediates the relationship between perceived discrimination and psychological adjustment.

**DANIELA ZAPATA-OCAMPO****Describing the User Experience of Wearable Fitness Technology Through Online Product Reviews**

**Undergraduate Co-Author:** Baotran Ho

**Mentor:** Dr. Daniel McConnell (Psychology)

An analysis of online product reviews focusing on wearable technologies such as fitness-tracking devices was done. Usability, trust, motivation, and wearability were the four high-level themes used to determine the user's overall experience with select devices.

## 2015 UNDERGRADUATE RESEARCH JOURNAL PUBLICATIONS

The *University of Central Florida Undergraduate Research Journal (UCF URJ)* encourages, recognizes, and rewards the intellectual scholarship of undergraduate students by providing a peer-reviewed forum to share their research. The journal accepts student articles, essays, and adapted thesis projects from all majors. Students who publish their work gain valuable academic experience, preparing them for future success. Collaborative research is always welcomed.

The *UCF URJ* showcases articles of exemplary works from a wide range of student scholarship in all fields. The journal seeks outstanding research submitted by undergraduate students who have been involved in faculty-mentored research projects and activities related to scholarship.

The *UCF URJ* is on display at [www.urj.ucf.edu](http://www.urj.ucf.edu).

### **COURTNEY A. ROY**

**"The Efficacy of Peer Presentations for English Language Learners"**

*Mentor:* Dr. Dan Ezell

*Published April 23, 2015*

### **IRINA PIDBEREJNA**

**"The Impact of Culture on Students' Motivation to Acquire a Second Language"**

*Mentor:* Dr. Alla Kourova

*Published April 30, 2015*

### **VICTORIA LEAGUE**

**"'On That Day We Will Be Free:' Reflecting Women's Real Experiences in Joanna Russ's *The Female Man* and Margaret Atwood's *The Handmaid's Tale*"**

*Mentor:* Ms. Farida Cato

*Published June 24, 2015*

### **GRANT W. MOHI**

**"Positive Outcomes of Divorce: A Multi-Method Study on the Effects of Parental Divorce on Children"**

*Mentor:* Dr. Elizabeth Grauerholz

*Published Sept. 22, 2015*

### **ASHLEY TORRES**

**"Teaching 'Like a Girl:' Student Reflection of the Benefits and Challenges of Feminist Pedagogy"**

*Mentor:* Dr. Cecilia Rodríguez Milanés

*Published Nov. 12, 2015*

### **TAYLER TRUHAN**

**"Parentification in Deployed and Non-Deployed Military Families: A Preliminary Assessment"**

*Mentor:* Dr. Sandra Neer

*Published Dec. 15, 2015*

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## **UNIVERSITY OF CENTRAL FLORIDA LIBRARIES**

**Annual Award for Excellence in Undergraduate Research Publishing in the  
*University of Central Florida Undergraduate Research Journal***

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The University of Central Florida Libraries is pleased to announce **Tayler Truhan**, *Parentification in Deployed and Non-Deployed Military Families: A Preliminary Assessment*, has won the 2016 Award for Excellence in Undergraduate Research Publishing.

Congratulations to **Tayler Truhan** and her mentor, **Dr. Sandra Neer**!

## DISTINGUISHED UNDERGRADUATE RESEARCHER AWARD (DURA)

In January 2010, the Student Undergraduate Research Council, in collaboration with the Office of Undergraduate Research, developed DURA, formerly known as the Undergraduate Researcher of the Month program. Each month a new student is honored with the award. The following students were recognized in 2015.

### JANUARY

#### **ANALISE MCGREAL**

Trauma Management Therapy (TMT) Program

*Mentor:* Dr. Deborah Beidel and Dr. Sandra Neer (Psychology)

### FEBRUARY

#### **IMAD HANHAN**

Assessment of Instructional Presentation for  
Emergency Evacuation

*Mentor:* Dr. Seetha Raghavan (Mechanical and Aerospace  
Engineering)

### MARCH

#### **JOANNA BORISSOVA**

Analyzing the Factors that Influence Dental Anxiety

*Mentor:* Dr. Fernando Rivera (Sociology)

### APRIL

#### **JULIES DESLAURIERS**

Minimum Dosage of Acetic Acid Needed to Eradicate  
Aquarium *Chaetomorpha*

*Mentor:* Dr. Linda Walters (Biology)

### MAY

#### **MANUEL MORALES**

Angular Dependence of the Emission from Pie-Shaped  
Wedge Triangular Mesas

*Mentor:* Dr. Richard Klemm (Physics)

### JUNE

#### **JARED MUHA**

An Empire on the Brink of Destruction: Seleucids After  
Antiochus III

*Mentor:* Dr. Robert Cassanello (History)

### JULY

#### **ANDREW DAKKAK**

Compound Screen for Identifying Novel *Clostridium*  
*difficile* Therapeutics

*Mentor:* Dr. William Self (Biomedical Sciences)

### AUGUST

#### **BURDLEY COLAS**

Designing a High-Power Wavelength Division  
Multiplexer

*Mentor:* Dr. Axel Schülzgen (Optics)

### SEPTEMBER

#### **BROOKE SARLEY**

Analyzing Microstructure of Additively Manufactured  
Inconel 718

*Mentor:* Dr. Seetha Raghavan (Mechanical and Aerospace  
Engineering)

### OCTOBER

#### **PREETI KUMRAH**

Antimicrobial Treatment of *Staphylococcus aureus*  
Biofilm Associated Skin Infections

*Mentor:* Dr. Swadeshmukul Santra (Chemistry)

### NOVEMBER

#### **GRACE AVECILLA**

Temperature, Cuticular Melanization, and Immune  
Function in *Diaphorina citri*

*Mentors:* Dr. Kenneth Fedorka, Dr. Hojun Song (Biology)

### DECEMBER

#### **DANIEL ELBRECHT**

Incorporation of Skin into In Vitro Drug-Screening  
Platforms

*Mentor:* Dr. James Hickman (Chemistry)

Applications are available at [www.our.ucf.edu/accomplishments](http://www.our.ucf.edu/accomplishments).



## UCF UNDERGRADUATE RESEARCH COUNCIL

The Undergraduate Research Council promotes the involvement of undergraduates in the ongoing activities of the UCF research community and advises the Office of Undergraduate Research about policies and programs that pertain to undergraduate research at UCF.

Ahlam Al-Rawi	Peter Jacques	Shelley Park
Michael Aldarondo-Jeffries	Robert Jones	Adam Pritchard
Morgan Bauer	Tammie Kaufman	Tison Pugh
Joseph Brennan	Jennifer Kent-Walsh	Shawn Putnam
Ratna Chakrabarti	Joo Kim	Andrew Randall
Matt Chin	Stephen Kuebler	Debra Reinhart
Latarsha Chisholm	Aubrey Kuperman	LeeAnn Roberts
Denise Crisafi	Ana Leon	Michael Rovito
Melissa Dagley	Amelia Lyons	Bridget Rubenking
Jonathan Decker	Stacey Malaret	Swadeshmukul Santra
Martin Dupuis	Colleen Marquart	Asli Tasci
Emily Flositz	Matthew Matusiak	Kenneth Teter
Martha Garcia	Vanessa McRae	John Venecek
Nora Lee Garcia	Abby Milon	John Walker
Enrique Guerra	David Mitchell	Linda Walters
Debbie Hahs-Vaughn	Christopher Niess	Ze Wang
Richard Harrison	Fidelia Nnadi	Lei Wei
Florencio Hernandez	Enrique Ortiz	Chrysalis Wright

## UCF STUDENT UNDERGRADUATE RESEARCH COUNCIL (SURC)

SURC was formed to promote awareness about undergraduate research for students at the University of Central Florida. Students actively engaged in research are selected each year to serve on this council. Through their support, the Office of Undergraduate Research has greater exposure on campus and gets continuous feedback on undergraduate research programs. Their help in promoting and running the Showcase of Undergraduate Research Excellence is greatly appreciated.

Thomas Carpino	Samantha Mensah	Marvi Qureshi
Emiangeliz Gonzalez-Luna	Catherine Ninah	Kelly Rosch
Linda Lavadia	Tamar Nir	Arjun Watane

## SPECIAL THANKS

The Office of Undergraduate Research thanks the following individuals and entities for their time, expertise, and support in the planning of today's event.

### Campus Partners

Michael Aldarondo-Jeffries  
Tinessa Callinan  
Sandra Cherepow  
Denise Crisafi  
Richard Harrison II  
President John C. Hitt  
Martha H. Hitt  
Paula Marchetti  
Vanessa McRae

### Eddy Mojica

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