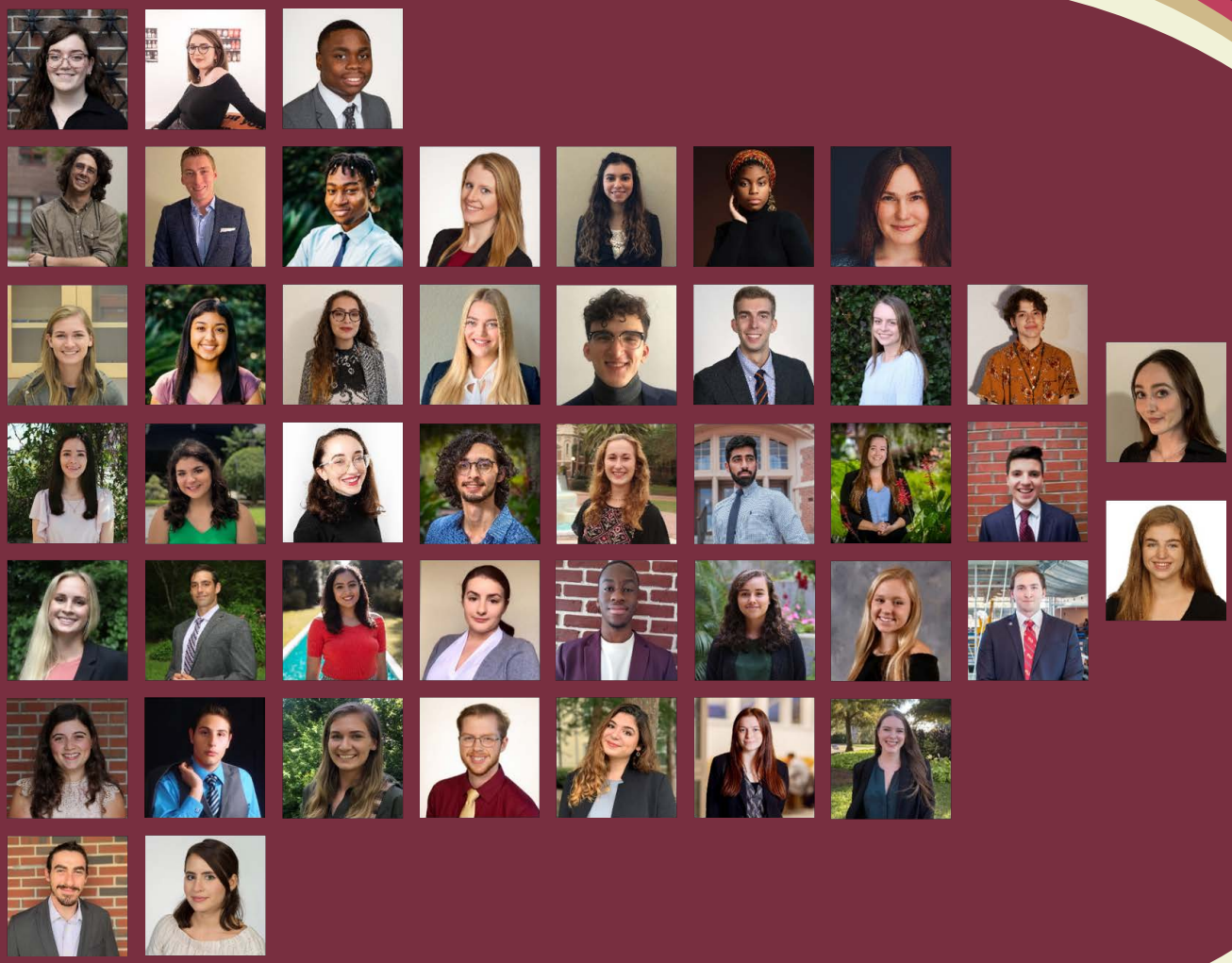
2020 PRESIDENT'S SHOWCASE of UNDERGRADUATE RESEARCH EXCELLENCE



FLORIDA STATE UNIVERSITY
DIVISION OF UNDERGRADUATE STUDIES
CENTER FOR UNDERGRADUATE RESEARCH AND ACADEMIC ENGAGEMENT

Thursday, November 19th
5:00pm to 8:00pm

Latika L. Young
Director
Center for Undergraduate Research and Academic Engagement (CRE)

Alicia Batailles
Senior Associate Director

Dave Montez
Associate Director

Warren Oliver
Associate Director

David Advent
Assistant Director

Yanira Campos
Graduate Assistant

WELCOME

to the 2020 President's Showcase of Undergraduate Research Excellence!

We are delighted that you could join us tonight in celebrating outstanding undergraduate research. The students who are presenting their projects have enhanced their undergraduate experience by taking on directed research and creative activity under the supervision and mentorship of some of Florida State University's most distinguished faculty.

Sponsored by FSU's Office of the President and the Center for Undergraduate Research and Academic Engagement (CRE), this event serves as the culmination of the IDEA Grant, Tech Fellows, and iGEM summer awards, but the work these students present tonight does not end here. Many of the award recipients will continue their intellectual pursuits through honors theses, independent study projects, graduate research, and entrepreneurial and creative work, both here on our campus and beyond.

Please also join us tonight in recognizing three truly special supporters whom we have tragically lost over the past year: David B. Ford, longtime supporter of FSU and the Honors, Scholars, and Fellows House, and sponsor of the David B. Ford Undergraduate Research and Creative Activity Award; Dr. Lisa Scott, longtime member of the CRE Faculty Advisory Committee and former Director of Clinical Education at the School of Communication Science and Disorders, who established the new Lisa Scott Endowed Undergraduate Research Award, which we will award for the first time this coming year; and, finally, our most stalwart and compassionate champion, Dr. Karen Laughlin, to whom we will remain in genuine awe and forever grateful. If you would like to join us in honoring Karen's legacy by contributing to her memorial opportunities, please visit this webpage.

We also want to offer our warmest thanks to Robert and Mary Frappier, Nancy Casper Hillis and Mark Hillis, Steve Madden, Dr. Jim Lee, Scott and Ina McNichols, Dr. Mark S. Wrighton, the Garnet and Gold Scholar Society, and Phi Eta Sigma for their continued financial support of our summer research awards. Our sincerest gratitude is also offered to FSU President John Thrasher for his office's continued support of the event, as well as to all the faculty members who have volunteered their time and expertise to mentor these student researchers, as these efforts would not be possible without them.

If you're attending this event as a student, we hope you'll be inspired to develop your own research or creative projects. Applications for next year's awards are due February 1, 2021 and are available at cre.fsu.edu.

5:00 pm

Opening Remarks and Recognitions

Zoom Link here

John Thrasher, President
Florida State University

Dr. Joe O'Shea, Dean
Undergraduate Studies

Latika L. Young, Director
Center for Undergraduate Research and
Academic Engagement (CRE)

5:30-6:30PM

Session One

Room One

Zoom Link here

Trystan Loustau, *Not Down with the Sickness: Interpersonal Moral Perceptions in the Time of COVID-19*

Celina Meyer and Emily Capote, *Buffering Effects of Adversity on Executive Function*

Ava Dodd, John Sutor, and Erin Murphy, *Synthetic Visual Data Generation and Marine Object Detection: A Case Study*

Morgan Hawkins and Benton Jaco, *Investigating Shifts in Saint Joseph Bay's Trophic Cascade Due to Recent Increases in Compound Ascidian Populations*

Kayla Broyles, *Pilot Testing of a Multi-Sensor Light Device: Quantifying Lux and Wavelength Data for Sea Turtle Management*

Room Two

Zoom Link here

Nicole Heim, *Effects of Abnormally Timed Burns in the Apalachicola National Forest on the Frosted Elfin Butterfly*

Rachel Corry, *Food for Thought: Perceptions of Local Organic Farms by Their Communities*

Anna Lewis, *Spatiotemporal Relationship of Liana Growth to Gaps/Trails on the Tropical Forest of Barro Colorado Island, Panama: Implications for CO^2 Sequestration*

Amber Hedquist, *Investigating Perceptions of Space Within the Tallahassee Community*

Evan Vinson, *Optimizing the Creation of Green Fertilizer with an Air, Water, and Plasma System*

PRESENTATION SCHEDULE

Room Three

Zoom Link here

Cole Hancock, *An Observation of the Preservation Compromise: The Adaptation and Alteration of Nature to Meet Visitor Demands*

Yadriel Hernandez Allende, *Fragmenting the New Nomad: A Visual Showcase Exploring Identity Within the Puerto Rican Diaspora*

Beatrice Dain, *Working to Save, Working to Resettle: The Role of the Hebrew Immigrant Aid Society in Refugee Resettlement in Latin America During the 1930s and 1940s*

Cooper Shapiro, *Sustainable Production Practices on Small-Budget Films*

Myah Freeman, *Nostalgia: Freeman*

Room Four

Zoom Link here

FSU Tech Fellows Program

Chris Lormeus, *Conquering E-Commerce*

Alexander Blanchette, *Generational Wealth: Its Influence and the Nuances Missed*

Adel Bebe, *Disruptive Technology and Medical Startups*

Nohemi Soza-Acevedo, *Cybersecurity Risks for Small Businesses*

Alex Jeannite, *Navigating Imposter Syndrome in the Tech Sphere*

Need help finding the right Room or Zoom link during the event?
Visit our Help Desk during the event here.

Find our Padlet activity here.

PRESENTATION SCHEDULE

6:45-7:45PM Session Two

Room One

Zoom Link here

Camden Neese, *Cracking the Neural Code Underlying Chemosensory Processing*

Anthony Ballestas, *Modeling the Spread of Panic Buying in Florida during the COVID-19 Pandemic*

Micah Sliverman, *Exploring the Soret Effect: Harnessing Polymers for the Future of Renewable Energy*

Charles Kennedy, *Study of Potential Energy Harvesting Opportunity Utilizing Thermoelectric Effect*

Osman Mahboob, *Measurement of Extracellular ATP Release from Islets of Langerhans Cells using Bioluminescence*

Room Two

Zoom Link here

McKenzie Bentley, *Geochemical Characterizations of Early Ceramics in the Aucilla Watershed*

Dylan Psulkowski, imulating Meniscus Deterioration for Personalized Treatment

Rosalind Helsinger, *False Flesh: Shakespeare and Adultery*

Karam Eeso, *Removing Emerging Contaminants Known as "Forever Chemicals" from Water*

Lauren Daley, *Testing State Functional Magnetic Resonance Imaging at 21.1 T of Ischemic Rats*

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PRESENTATION SCHEDULE

Room Three

Zoom Link here

Lilliana Reinoso, *For Your AI's Only: Exposing the Nipple Ban*

Elizabeth Slade, *Theatre Congregation: Breaking Down the Bicameral Relationship Between Actor and Audience*

Ariel Raskin, *Can You Hear Me?*

Grace Robbins, *Excavating and Digitizing Archaeological Practices: A Case Study of Cosa 1970 vs 2020*

Maeghan Kerins, *Violence Against Women in the Soviet Prison System*

Room Four

Zoom Link here

Sneha Kapil, *A Novel Genetic Platform: Building Genetically Heterogeneous Colon Tumors in Drosophila*

Diana Conrad, *Photoresponsive Coordination Polymers and Metal-Organic Frameworks*

Michelle Grand, *3-D Printed Modular Structures*

Samantha Politano, *Sponge Communities in Mesophotic Reefs of the Gulf of Mexico Before and After the Deepwater Horizon Oil Discharge*

FSU iGEM, *SPLASH: Sewage Purification Limiting Antibiotic Spread in Habitats*

Presenter information below is provided in alphabetical order by last name.

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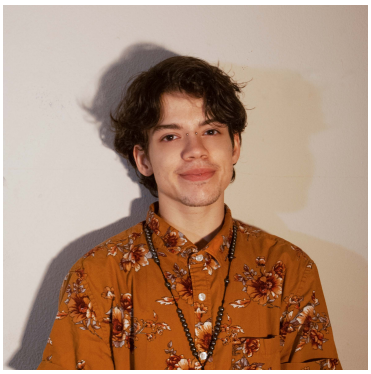
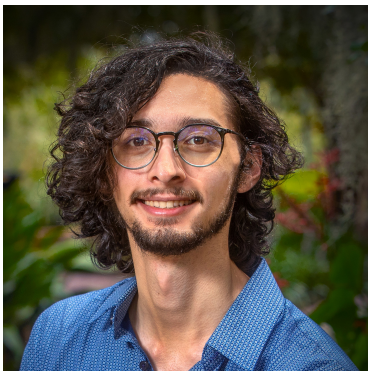


YADRIEL HERNANDEZ ALLENDE
Supervising Professor: Prof. Robert Duarte

Fragmenting the New Nomad: A Visual Showcase Exploring Identity within the Puerto Rican Diaspora

Yadriel Hernandez Allende is currently a BFA student in the Department of Fine Arts, and intends to continue scholarly research through the International Visual Sociology Association as they matriculate into the Department of Art Education, hoping to work with museum collections centering on Latinx Art.

Abstract: Through the integration of qualitative methodology–such as photo-elicitation, journal responses, and interviews–this study collaborates with participants over a two-week period to document, reflect, and discuss their perceptions and relationships to place, memory, and belonging. These conversations–made available online as blog-post entries along with supplemental materials including an extended prompt list, discussion section–trace generational and personal displacement from 'place of origin' through the documentation of real space as sacred to the extent of which they can reflect where our own nostalgia lies. Although documentation of the Puerto Rican 'new nomad' was of primary interest, I felt it was necessary to acknowledge the vast realities present in the transnational identities of a diaspora should audiences have little to no prior knowledge. Thus, individuals residing in (or originating from) the same geographical "melting pots" were included.



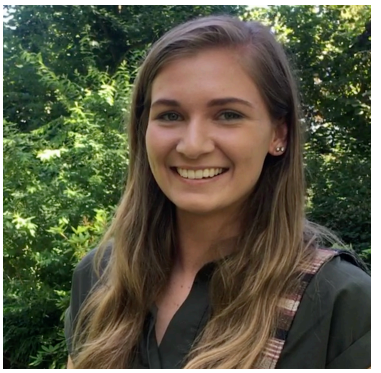
Scott & Ina McNichols Undergraduate Research Award

ANTHONY BALLESTAS
Supervising Professor: Dr. Francesca Bernardi

Modeling the Spread of Panic Buying in Florida during the COVID-19 Pandemic

Anthony Ballestas is an Economics and Statistics Senior. He has four years of undergraduate research experience on topics ranging from international relations to mathematics. Anthony is an UROP alumni and met his supervising professor, Dr. Bernardi, through the program. After graduation, he hopes to work as a full-time research assistant in the Economics department of a major university.

Abstract: Social media marketing and hyper targeted advertisements are quickly becoming the tool of choice for companies to utilize. Praised for being effective at capturing the interest of consumers they certainly do come with the drawback of a high monetary cost. This paper will look to utilize the Susceptible - Infected - Recovered (SIR) mathematical model to predict the success of a marketing campaign. The SIR model is typically used to predict the spread of a disease within a population; however, it has been used outside of the biological world in other academic disciplines such as social science, finance, and anthropology to model the spread of a particular "disease" within any sort of a population. This model, if successful, can help corporations see the estimated number of new consumers by predicting just how many individuals will be now be aware of the product in question after running the advertisement campaigns. Consumer data will be collected and matched against the SIR model to test the effectiveness and accuracy of the model.



MCKENZIE BENTLEY
Supervising Professor: Dr. Elizabeth Murphy

Geochemical Characterizations of Early Ceramics in the Aucilla Watershed

McKenzie Bentley is a Senior majoring in Chemistry and Interdisciplinary Humanities. During her time as an undergraduate, McKenzie has participated in both chemistry and archaeology research. Her work has been recognized with several awards, including the Johnsen Endowment for Fellowships, an IDEA Grant, and the Bess H. Ward Honors Thesis Award. After graduation, McKenzie plans to finish her internship with the National Council for Preservation Education before pursuing a M.A. in Archaeometry.

Abstract: Excavations at the Page-Ladson site in the Aucilla River Basin in NW Florida have recovered a variety of artifacts, including a collection of ceramics dating 3500 to 1800 years ago (some of the earliest ceramics in the Americas). This dataset chronologically brackets a transition toward settlement development by the hunter-gatherer groups living in the area. This project is the first ceramic-focused study conducted in the Aucilla Watershed with the purpose of determining whether the recovered ceramics are made using locally sourced clays and whether the clays used correspond to different functional types of pottery vessels. Geochemical characterization analyses were conducted using X-ray fluorescence spectroscopy on a sample set of 100 ceramic shards. For each measurement, 40 kV of energy was applied for 60 seconds to the exposed surfaces of each sample (interior, exterior, and naturally broken edge) and the internal clay body upon breaking a small edge of each shard. Thus far, the trace element analysis results have demonstrated distinct groupings according to concentrations of rubidium and strontium within the ceramic samples; these groupings correspond to various clay recipes, and the results will help to reconstruct the organization of pottery production in this very early settlement in the Americas.

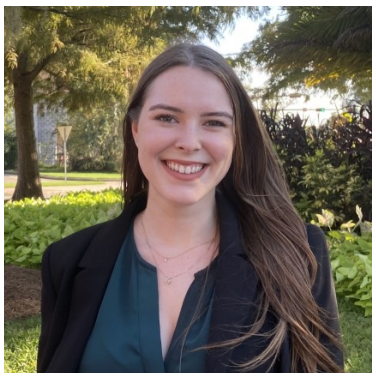
Scott & Ina McNichols Undergraduate Research Award

KAYLA BROYLES
Supervising Professor: Dr. Mariana Fuentes

Pilot Testing of a Multi-Sensor Light Device: Quantifying Lux and Wavelength Data for Sea Turtle Management

Kayla Broyles is a Senior at Florida State University studying Environmental Science. Kayla will graduate in the Fall of 2020 with a Bachelor of Science. She intends to pursue a Master's degree in Marine Biology, with a focus on marine mammal conservation.

Abstract: Loggerhead sea turtles (Caretta caretta) are a threatened species whose nesting beaches may be affected by anthropogenic light pollution. Turtles are adapted to laying nests and hatching on moonlit beaches. Light pollution disturbs nesting females that are not accustomed to bright, unnatural lights, and disorients emerging hatchlings that orient towards bright lights. If disorientation occurs at a site with lighting ordinances, it is crucial to identify the light pollution sources and areas where light pollution may be mitigated. This project focuses on the development and testing of a device that can be used to collect quantitative light data along a nesting beach in order to elucidate areas of light pollution. The data provided by this device includes lux values across five wavelengths. The device has seven different sensors, each collecting lux data every two seconds while simultaneously linking the data to GPS coordinates. The device collected spatial lux data and withstood hours of use over 11 surveys along a 3-mile route in Jacksonville, Florida. Post-processing of these data allowed for the identification of the brightest light source from any survey point, as well as quantitative analysis of 100m bins of the survey to identify the brightest areas.



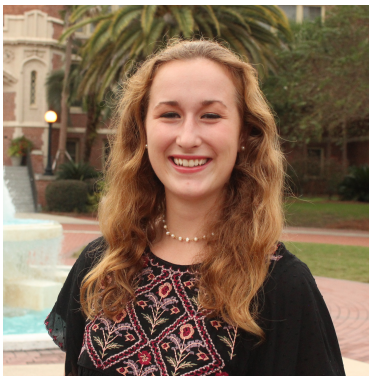
Scott & Ina McNichols Undergraduate Research Award

DIANA CONRAD
Supervising Professor: Dr. Michael Shatruk

Photoresponsive Coordination Polymers and Metal-Organic Frameworks

Diana Conrad is a Senior studying Chemistry. She has been conducting research under Dr. Michael Shatruk since 2019, studying spin crossover in iron coordination polymers. Upon graduation, she plans to continue her education by pursuing a Ph.D. in Chemistry with the goal of a career in research.

Abstract: The use of porous ligands for the synthesis of iron(II) spin-crossover (SCO) complexes is a topic of current interest in the field of Inorganic Chemistry. Metal organic frameworks (MOFs), a type of coordination polymer, have displayed the ability to flex during the change in spin state, allowing for bond rotation and rearrangement of the framework structure. Factors like structural rigidity and porosity affect the temperature and abruptness of SCO. These complexes have the potential to display large photo-responses via changes in structure, magnetic susceptibility, conductivity, and optical properties caused by light irradiation. The porosity provided by MOFs imparts interesting qualities to SCO complexes due to the ability of solvents or gases to inhabit the empty spaces in the coordination networks. The complex with the solvent coordinating molecule, [Fe(qbtr)2(MeCN)2(ClO4)2], displays a chain structure, with bridging ligands binding the chains into 2D layers. The conjugated π bonds in the L3 ligand vary the rigidity of the bridging ligands and give an insight into the influence of rigidity on spin-state switching.



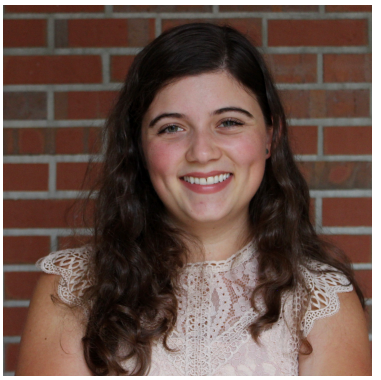
RACHEL CORRY
Supervising Professor: Dr. Patrick Merle

Food for Thought: Perceptions of Local Organic Farms by Their Communities

Rachel Corry is a Senior at FSU with a double major in Public Relations and Editing, Writing, and Media with a minor in Environment and Society. She plans to pursue a Master's degree at the University of Georgia's Interpersonal and Health Communication program and become a PR account manager specializing in the healthcare and environmental sectors.

Abstract: This project seeks to determine the level of existing public awareness and understanding related to organic agriculture within the scope of sustainability. Food consumption and production patterns are key drivers of environmental pressures. In the U.S., the conventional industrial agro-food system presents an urgent sector requiring transformation to a more sustainable model. The research project is composed of three studies. Study 1 consists of interviews with twenty local organic farms throughout the Southeast about their communicative strategies and outreach efforts in their communities. In Study 2, undergraduate students at FSU have been recruited for an online survey measuring consumer views on the interconnection between sustainability and organic agriculture. Study 3 consists of an online experiment with a sample representative of the U.S. population to compare how different communicative approaches by local organic farms are received by the public. The results of these three studies will be useful in suggesting the most effective communicative approaches for organic farms to establish positive perceptions and increase understanding among consumers. There is a fundamental need for new knowledge in this area due to insufficient research connecting communication and sustainable farming. Local organic farms cannot flourish, nor can the U.S. food production system improve, if consumers are not mindful of their role in sustaining local food networks.

PRESENTERS



David B. Ford Undergraduate Research and Creative Activity Award

BEATRICE DAIN
Supervising Professor: Dr Kurt Piehler

Working to Save, Working to Resettle: The Role of the Hebrew Immigrant Aid Society in Refugee Resettlement in Latin America During the 1930s and 1940s

Beatrice Dain, an FSU Senior, is majoring in International Affairs and Anthropology. At FSU, she has focused on immigration from Latin America and is writing her honors thesis under the guidance of Dr. Kurt Piehler. Upon graduation, Beatrice plans to continue advocating for immigration reform.

Abstract: One of the hotly debated issues surrounding World War II is: could the United States and Latin America have saved more Jews from the Holocaust? This project offers a case study of the role of one humanitarian organization, the Hebrew Immigrant Aid Society (HIAS), and their efforts in Latin America in response to the plight of European Jewry. After the U.S. placed strict limits on immigration from Europe in 1924, Latin America emerged as a promising destination for European Jews given the availability of land, shortages of professional labor, and relatively open borders. However, following the 1938 Evian Conference, increased tensions between Jewish refugees and Latin American countries led to increased visa restrictions, further challenging HIAS resettlement efforts. My project analyzes how HIAS responded to these challenges, exploring their non-governmental diplomacy efforts to expand resettlement opportunities and the services they provided in education, welfare, and religious life.

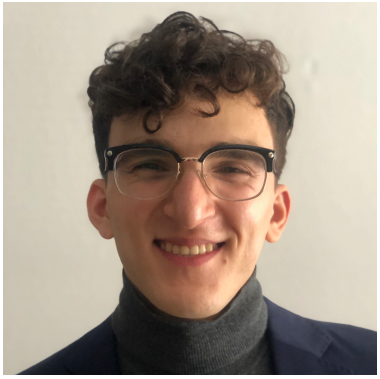
Scott & Ina McNichols Undergraduate Research Award

LAUREN DALEY
Supervising Professor: Dr. Samuel Grant

Resting State Functional Magnetic Resonance Imaging at 21.1 T of Ischemic Rats

Lauren is a current Senior in the recently implemented Biomedical Engineering B.S. program at the FAMU-FSU College of Engineering. She was a UROP participant, working in Dr. Nienhaus' lab, and is now a UROP leader, working in Dr. Grant's lab. She hopes to pursue a BME Ph.D. upon her degree's completion.

Abstract: This project utilizes resting state functional Magnetic Resonance Imaging (rs-fMRI) to characterize neurological impacts of cell therapy in cerebral ischemia. This form of fMRI employs Blood Oxygenation Level Dependent (BOLD) effect to quantify brain activity in the resting state to map default brain connectivity. rs-fMRI is performed on ischemic rats with/without adult human mesenchymal stem cells (hMSC) treatment compared to controls, conducted 21 days post-op. hMSC are non-tumorigenic, institute neuroregenerative processes (recruit endogenous progenitors), and protect at-risk stroke lesion cells (naturally targeted). This project tests this hypothesis: intra-arterial hMSC injection following stroke maintains functional brain connectivity in an ischemic brain, eventually restoring rs activation/correlations to naïve levels. Rs-fMRI scans are processed through FSL, yielding activation maps, to evaluate default cognitive networks impacted by ischemia/cell therapy via graph theory.

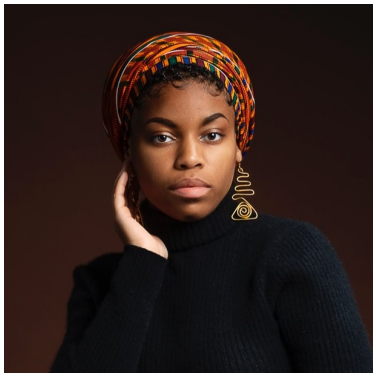


KARAM EESO
Supervising Professor: Dr. Youneng Tang
Removing Emerging Contaminants Known as "Forever Chemicals" from Water

Karam Eeso is a Junior in the Department of Chemical Engineering. He joined Dr. Youneng Tang's lab in his freshman year because he wanted to begin pursuing his interests in environment research. The first project was on odor control and now he is interested in plasma research.

Scott & Ina McNichols Undergraduate Research Award

Abstract: Per- and polyfluoroalkyl substances (PFAS) make up a group of approximately 5,000 human-derived chemicals that have attracted significant attention in the field of environmental engineering due to their severe toxicity, widespread occurrence, and recalcitrance to degradation. The current methods remove PFAS by separating them from water using carbon adsorption or membrane separation, which generate a residual that leads to secondary contamination. Literature has shown that non-thermal plasma can potentially destroy PFAS by breaking the stable carbon-fluorine bond. Unlike the other methods, residue is not generated, so this method is sustainable and preferable. This project will assess a plasma reactor's ability to remove PFAS in various types of water; with the water having a varied amount of total dissolved solids. The experimental results show that PFAS removal does not depend on the total dissolved solids, so this technology can potentially be used for treating various types waters.

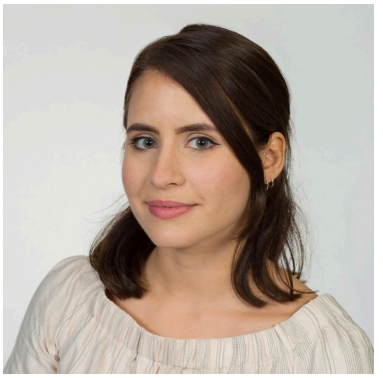


MYAH FREEMAN
Supervising Professor: Prof. Carrie Ann Baade

Nostalgia: Freeman

Myah Freeman is a Senior majoring in the Bachelor of Fine Arts Program. In 2019, she served as an FSU Global Scholar, conducting research on the talibé children in Senegal. Her previous awards include this year's FSU President's Humanitarian of the Year Award, the Benjamin A. Gilman Scholarship, and the Ada Belle Winthrop-King Visual Arts Endowment. Myah's career goals include working in creative design alongside her business where she uses art as advocacy.

Abstract: Returning to 1619, the enslavement of Africans began in the Western World, causing years of generational scarring and loss of origin for African Americans. The topic of Black genealogy must be approached differently due to this very history, making it difficult to trace our ancestors. Many of their names went undocumented under the ownership of their slave masters. Ancestry is important as it aids in helping us understand our full identity and purpose of being. My research project consists of using genealogical databases and assistance from the National Museum of African American History and Culture's Robert Frederic Center to unveil my very own story. I have been able to trace parts of my family back to the year of Emancipation Proclamation in 1863 by accessing hundreds of records including censuses, marriage, and death certificates. My research aims to educate my community, serving as a blueprint on how to go about such a task themselves. As a result, I have created a body of mixed media work, honoring and representing my story.



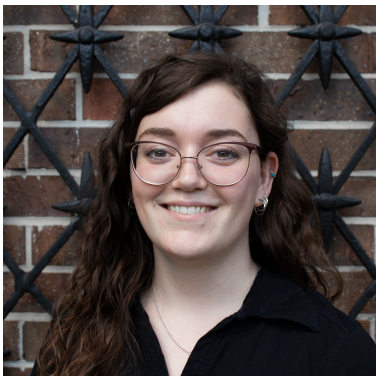
Garnet and Gold Scholar Society IDEA Grant

MICHELLE GRAND
Supervising Professor: Dr. Qian Zhang

3-D Printed Modular Structures

Michelle Grand is a Civil Engineering student graduating this Fall 2020. During her undergraduate studies, she conducted her first research project through the Honors in the Major program. Her thesis received support through the IDEA Grant (Garnet and Gold Scholar Society Award) and her academic achievements were also recognized through the Alexander Rochell Opportunity Scholarship in Engineering Award. Michelle looks forward to continuing her studies in structural engineering as a graduate student.

Abstract: The surge of single-use plastics consumption has generated vast volumes of polymer waste, threatening water supplies, marine wildlife, and quality of life in low-income communities. Mechanical recycling is suggested as the most sustainable method to reduce polymer pollution because it may extend the life cycle for these products. This study aims to use 3D printing technology as a means to process recycled High-Density Polyethylene (HDPE) to produce honeycomb sandwich core panels. These structures benefit from the lattice design as it can provide greater strength with a relatively low weight nature and is commonly used in the automotive, aerospace, and the architecture industry. Honeycomb sandwich core panels' wide range of applications may benefit from the transition from directly sourced polymers to a recycled alternative. To test the hypothesis that recycled HDPE may be used as an alternative material for the fabrication of honeycomb sandwich core panels, the material properties were analyzed through a tensile strength test, geometries were modeled under Finite Element Analysis, recycled HDPE filament was obtained in the laboratory to produce panels via 3D printing, and the panels' mechanical properties were observed.



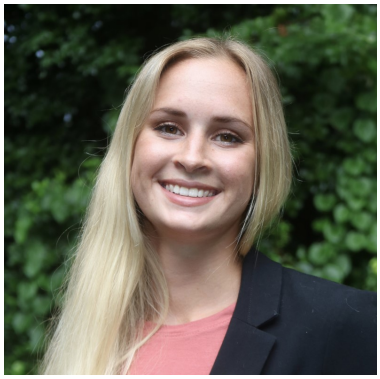
Robert and Mary Frappier Undergraduate Research Award

COLE HANCOCK
Supervising Professor: Prof. Denise Bookwalter

An Observation of the Preservation Compromise: The Adaptation and Alteration of Nature to Meet Visitor Demands

Cole Hancock is a Senior working toward her BFA at Florida State University, where she is also co-director of Phyllis Straus Gallery. She has been in a number of art shows, including HSF Excellence in the Visual Arts Exhibition locally at FSU, curated a number more, and has won a number of awards within the art department. Her work focuses on the Anthropocene and leans on traditional craft techniques in paint, print, photography, and book art.

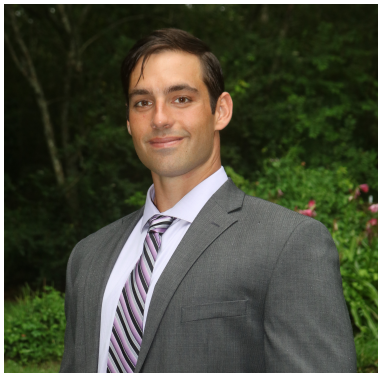
Abstract: As humans become the dominant species on the planet, nature is shunted aside, but for the areas we try to preserve, where people and nature compromise on existence, the space becomes fundamentally altered. I am documenting the interaction and effect of visitors to such places by observing local parks in Tallahassee, with a focus on how the volume of visitors might affect the general upkeep of the individual parks. This summer was spent obtaining observational data of visitors, evidence of their presence (trash and forgotten items), and local flora and fauna. The ultimate goal of this project is the creation of five artist books with paper I make that incorporates the natural vegetation and the refuse of five corresponding locations. Each unique book and its paper will be designed and made with its respective park in mind, which will then be filled with sketches from the park that draw attention to the interactions of visitors as well as text instructing the reader on how to consider the park. The intent is to pique visitors' awareness of their own impact, as well as that of the greater community, on local environments and how each has adapted to occupying the same space.



MORGAN HAWKINS AND BENTON JACO
Supervising Professor: Dr. Janie Wulff

Investigating Shifts in Saint Joseph Bay's Trophic Cascade Due to Recent Increases in Compound Ascidian Populations

Morgan Hawkins is a Senior here at Florida State studying Biological Science with an interest in Marine Biology. She has been involved in the Marine Biology Honors program for two years, writing her own honors thesis which she will defend this semester. Morgan plans on attending graduate school to earn a master's and eventually a Ph.D. in Marine Biology.



Benton Jaco is a Senior at FSU studying Biological Science. He is a graduate of the Undergraduate Research Opportunity Program, in which he researched mutually beneficial associations of sponges in Dr. Janie Wulff's lab. Benton is a member of the Marine Biology Honors Program and is currently writing an honors thesis, which he will be defending this semester. He intends to pursue a Ph.D. in Marine Biology with a focus on conservation.

Abstract: Seagrass meadows are a vital ecosystem for juvenile fish, marine invertebrates, and larger marine species including turtles, sharks, and manatees. Seagrass meadows also benefit humans, as they sequester carbon, hold down sediment, and provide great fishing and snorkeling spots. An area of Florida's pristine seagrass meadows in Saint Joseph Bay has recently become inundated with compound ascidians. These animals, which feed by filtering phytoplankton from the water column, encrust the blades of the seagrass, weighing them down to form large mats. Few predators are known to eat compound ascidians. However, we discovered that the native *Echinaster spinulosus* starfish feed upon various ascidian species in the bay. We sought to understand the ecological aspects of compound ascidian overpopulation and subsequent starfish predation. Our data address the following aspects of this unexpected interaction: *E. spinulosus* starfish size and distribution, various ascidian species distributions, seagrass coverage, seagrass blade health underneath compound ascidians, and *E. spinulosus* feeding rate on ascidians. This research provides insight into how the trophic ecology of seagrass meadows is impacted by compound ascidians and to what degree *E. spinulosus*'s predation affects their populations.

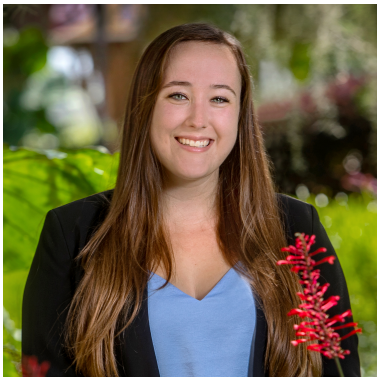
Scott & Ina McNichols Undergraduate Research Award

AMBER HEDQUIST
Supervising Professor: Dr. Tarez Graban

Investigating Perceptions of Space Within the Tallahassee Community

Amber Hedquist is a Senior majoring in English with a Communications minor. She's engaged in research-oriented and leadership roles on campus including instructing a UROP Colloquium, working with research interns at the DeVoe L. Moore Center, and contributing to the Students, Schools, and Social Media research team at FSU's College of Education. After graduation, Amber will pursue her Ph.D. in Rhetoric to continue analyzing intersections of space, discourse, and theories of the public sphere.

Abstract: The city of Tallahassee is a nexus of history, diverse communities, and institutions, with its two major Universities, Florida A&M and Florida State, situated on either side of a railroad track. Tallahassee is utilized as a case study to examine the rhetorical impacts of space on community and cross-institutional identification. Focusing on discourse, this study explores the power of localized spaces and how they affect, determine, reflect, or are used by individuals and communities. It includes a comprehensive review of student and local publications to assess the role of the railroad in public memory, perception, and discourse. It also analyzes present perceptions through a survey and subsequent interviews of students and faculty at both institutions. Over one hundred individuals participated in the study and a relevant corpus of student publications was constructed. The study reveals how a consideration of spatial rhetoric can enrich a study of public discourse by indicating how geographies, such as railroads, can act as complex physical and conceptual spaces that move through past and present consciousness. The link between spatiality and discourse raises new questions related to how populations map, imagine, and mobilize within urban spaces.



Helen Louise Lee Undergraduate Research Award

NICOLE HEIM
Supervising Professor: Dr. Nora Underwood

The Effects of Abnormally Timed Burns in the Apalachicola National Forest on the Frosted Elfin Butterfly

Nicole is a Senior majoring in Biological Science. She participated in UROP during her freshman year and has been involved in research ever since. She will be defending her Honors in the Major thesis in the upcoming months. After her time at FSU, Nicole hopes to attend veterinary school.

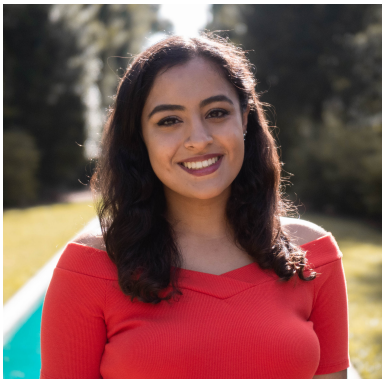
Abstract: The Frosted Elfin is a specialist butterfly found within the Apalachicola National Forest that relies upon the sundial lupine plant as a larval food source and oviposition site. Both the sundial lupine and the Frosted Elfin depend upon periodic forest fires. Prescribed burns in the national forest occur either during the summer months, the natural time for burns to occur, or during the winter months, an abnormal burn. To determine if abnormally timed burns affect the phenology of the sundial lupine and Frosted Elfins, data was collected throughout 2018, 2019, and 2020 from 62 permanent plots detailing abundance of lupine and Frosted Elfin. After statistical modeling, abnormal burns were found to delay the first appearance of sundial lupines and Frosted Elfins in subsequent springs. Frosted Elfins are only present for a few weeks each year and the phenological changes associated with abnormally timed burns may be detrimental to their ability to find suitable food and oviposition sites.

ROSALIND HELSINGER
Supervising Professor: Dr. Terri Bourus

False Flesh: Shakespeare and Adultery

Rosalind is a Senior majoring in Creative Writing. She is currently applying to graduate schools both inside and outside the country to become a professor of Creative Writing. Her work has been published by YouthPlays and the Evening Street Review.

Abstract: My Honors Thesis explores the nuances of Shakespeare's adulteresses, focusing on both the women who do commit adultery and the false adulteresses, who are innocent women accused of adultery by their husband or fiancé. The unifying thread of these plays showcases how the societal power of adultery, and the accusation of it, shaped the identity of Elizabethan women, with adultery being fused into their purity. My research argues that the trope of the adulteress, whether they are guilty or not, increases the dramatic stakes because chastity was considered the core identity for women. The Elizabethan era conflation of chastity and life for women meant that an accusation of adultery would cost a woman not only all her societal power and position, but also her voice and identity as a woman. This great potential loss serves as a theatrical device to elevate the stakes and as a lens to explore societal and gender power dynamics throughout the Shakespeare canon.

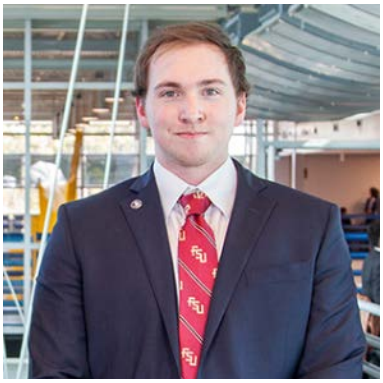


SNEHA KAPIL
Supervising Professor: Dr. Erdem Bangi

A Novel Genetic Platform: Building Genetically Heterogeneous Colon Tumors in Drosophila

Sneha Kapil is a third year student majoring in Biochemistry at Florida State. She is a recipient of the Freddye T. Davy Scholarship from the National Collegiate Honors Council. Previously, she participated in the Mayo Clinic Clinical Research Internship Program (CRISP) where she researched the effect of quality improvement trainings on patient and provider satisfaction. Currently, she works in the lab of Dr. Bangi studying tumor heterogeneity in colorectal cancer. After her time at FSU, Sneha intends to pursue an M.D. and practice medicine as well as continue research.

Abstract: Colorectal cancer patients accumulate many different combinations of mutations called subclones as tumors progress that can hinder the effect of treatment. Currently there is a lack of research in the progression of subclonal tumors in a biological model. My research focuses on creating a genetic construct in Drosophila that allows sequential introduction of subclonal mutations into developing tumors. This will more accurately portray the possible difference in tumor appearance between mutation combinations including subclones and eventually test the effect of these subclonal mutations on drug effectiveness and pathogenesis. I have designed two test genetic constructs that allow for the sequential expression of fluorescent proteins using the molecular cloning software SnapGene. I am in the process of working with the FSU Molecular Cloning facility to generate the genetic constructs. Once created, we will use the DNA plasmids to produce transgenic flies carrying these constructs. These transgenic flies will allow me to determine if these constructs allow for sequential expression of fluorescent proteins. If successful, the test constructs will be modified to build subclonal tumors that successively introduce genetic mutations in adult Drosophila intestinal cells. We can utilize this technology to study the impact of genetic heterogeneity on tumor progression and drug response.



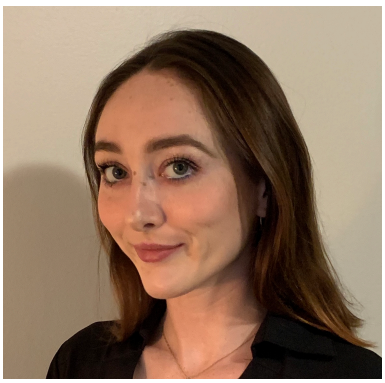
Nancy Casper Hillis and Mark Hillis Undergraduate Research Award

CHARLES KENNEDY
Supervising Professor: Dr. Omar Faruque

Study of Potential Energy Harvesting Opportunity Utilizing Thermoelectric Effect

Charles Kennedy is an undergraduate engineering student at Florida State University. He is studying Computer Engineering & Electrical Engineering (Dual-Degree). His work is in renewable energy and increasing the efficiency of solar systems with thermoelectrics. He is currently an undergraduate research fellow under Dr. Omar Faruque at the Center for Advanced Power Systems.

Abstract: This research is an investigation of how to utilize thermoelectric generators in photovoltaic solar systems to capture excess wasted energy dissipated as heat. In the last few years, the interest regarding heat to electricity conversion with solid-state technology has been rising noticeably and in tandem, material science has followed. The recent advancement in thermoelectric technology combined with its decrease in cost allows for a more in-depth look at an array of implementation opportunities. Many small generation experiments using thermoelectric generators (TEGs) to harvest heat dissipation in the environment with a temperature difference have been done in the past, but the system's overall efficiencies vary. The temperature difference required to induce power generation is based on thermoelectric effects that are present in the p-n junction diodes placed inside two parallel plates. The aim is to create an original design that sustains favorable conditions in which one plate is a vastly different temperature than another, therefore capturing the maximum amount of energy from the environment. Utilizing COMSOL multi-physics software, it is possible to simulate thermoelectric generators coupled with photovoltaic cells while adjusting individual parameters to achieve the maximum system efficiency possible.



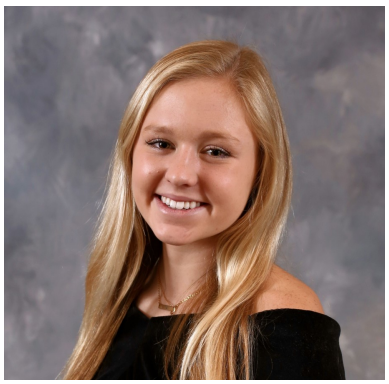
Scott & Ina McNichols Undergraduate Research Award

MAEGHAN KERINS
Supervising Professor: Dr. Nina Efimov

Violence Against Women in the Soviet Prison System

Maeghan is a Senior studying Political Science and Russian Language and Literature. Last summer, she was awarded the Winthrop-King Undergraduate Scholarship for study abroad. When she graduates in Spring 2020, she plans to pursue a Master's in Slavic Studies at Florida State, with the goal of being a translator.

Abstract: My research further investigates the violence against women in the Soviet prison system, the GULAG. The horrific experiences of these individuals have been recorded by historians, Russian dissidents, and authors of 21st century literature. However, many of these accounts fail to touch upon the sexual traumas specific to female prisoners. Literary analysis of Russian dissident authors, allowed me to base my findings on firsthand accounts of Women incarcerated in the GULAG. I found that in the GULAG, women were forced to do the same labor as men, yet the frequency of sexual assault and abuse made the female experience significantly worse. The power prison guards held over incarcerated women made it almost impossible to avoid rape, for they feared execution. I also found that women were assaulted by male prisoners, due to Russian society's view of women. Thus, Soviet women, proclaimed by the Communist ideology equal to men and protected by the Soviet society, were sexually abused in the GULAG.



ANNA LEWIS

Supervising Professor: Dr. Stephanie Pau

Spatiotemporal Relationship of Liana Growth to Gaps/Trails on the Tropical Forest of Barro Colorado Island, Panama: Implications for CO^2 Sequestration

Anna is a third-year Senior, majoring in International Affairs and minoring in Environmental Science and Policy. She previously worked with Dr. Trina Merrick in the Geography Department through UROP on learning how to use GIS software and high-resolution satellite imagery to map tropical forest canopies and distinguish differences in plant species. After graduation, she plans to complete a Master's in International Development and then pursue a career with the UN Environment Programme.

Abstract: The liana, a large woody vine, is a rapid growing plant that can be found in tropical forest canopies around the globe. Many recent studies note the alarming rate at which the liana vine is growing in increasing density and size on the island of Barro Colorado Island, Panama. Liana vines grow in a way that may choke and shade native trees on the island, which reduces their ability to sequester carbon dioxide from the atmosphere. Given the importance of our global tropical forests in sequestering CO^2 emissions and the worldwide abundance of this liana vine, it is crucial that we attempt to document and understand the reasons for their rapid growth. Using high-resolution satellite imagery, this research project aims to study the spatiotemporal relationship of gaps and trails (whether the cause be anthropogenic or natural processes) to the liana species within the tree canopy on Barro Colorado Island to improve our understanding of how these disturbances may affect the structure and function of this tropical forest.

Scott & Ina McNichols Undergraduate Research Award

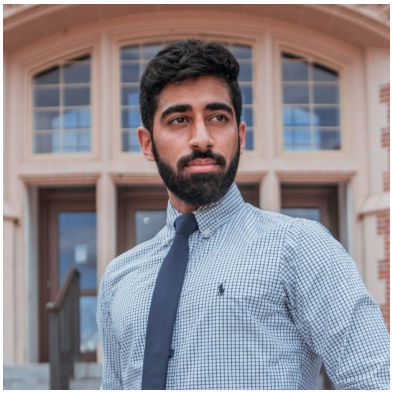
TRYSTAN LOUSTAU

Supervising Professor: Dr. Paul Conway

Not Down with the Sickness: Interpersonal Moral Perceptions in the Time of COVID-19

Trystan Loustau is a third-year Psychology major minoring in Computer Science. She is an active participant in undergraduate research on campus, as a UROP Leader, Assistant Director of SCURC and Editor-in-Chief of The Owl. Her research spans diverse disciplines, from musical theatre studies to psychological science. Trystan has shared her research at professional conferences and her work has been accepted for publication at peer-reviewed journals. Trystan is also a member of the Honors Experience Program and Presidential Scholars Program. After graduation, Trystan plans to pursue a Ph.D. in Social Psychology.

Abstract: Morality involves perceiving others' minds along two dimensions: agency and patiency. Past work shows that mind perception is influenced by the target's social group and perceived pathogenic risk. Therefore, people may perceive outgroups as having more agentive, less patient minds under pandemic conditions. In Study 1, American MTurkers (N = 215) read scenarios describing White and Asian people who violated social distancing and were subsequently diagnosed with COVID-19. We assessed participants' ascription of agency and patiency to each group, perceived vulnerability to COVID-19, and the association between each group and the virus. Participants reported higher perceived agency, but not patiency, for Asian versus White people, and perceived vulnerability to COVID-19 predicted agency, but not patiency, ascription for both groups. In Study 2, a between-subjects replication of Study 1 modified to test perceptions of different age groups (College-age vs. Elderly people) instead of race, findings were replicated and extended, with younger people ascribed higher agency and less patiency than elderly people. These results suggest that people who feel vulnerable to COVID-19 tend to view others as more agentic, especially those whom they associate more closely with the virus, suggesting they seem more threatening. Results are discussed in the context of the behavioral immune system.



OSMAN MAHBOOB
Supervising Professor: Dr. Michael Roper

Measurement of Extracellular ATP Release from Islets of Langerhans Cells Using Bioluminescence

Osman Mahboob is an honors student at Florida State University pursuing a B.Sc. in Interdisciplinary Medical Sciences specializing in Public Health Administration and Policy. Osman aspires to pursue a career as a physician working with underserved populations.

Jack Saltiel Undergraduate Research Award

Abstract: This study will quantitatively investigate the dynamic levels of extracellular adenosine triphosphate (ATP) release from islet cells obtained from murine specimens. Incubating the islets in varying glucose concentrations will allow for a range of extracellular ATP release quantities to be assessed. By using a commercially available assay kit, extracellular supernatant samples of ATP-releasing islets will be treated with a luciferin/luciferase solution, leading to the production of bioluminescence. This emission will be captured and measured using a plate reader. As the resultant bioluminescence is proportional to the amount of ATP, extracellular ATP levels will be estimated. By producing a dynamically measured analysis of ATP release at the extracellular level, we hope to elucidate physiological trends in the production of this vital molecule. Understanding these trends will enable us to make connections regarding the role of extracellular ATP and its influence on hormone release.

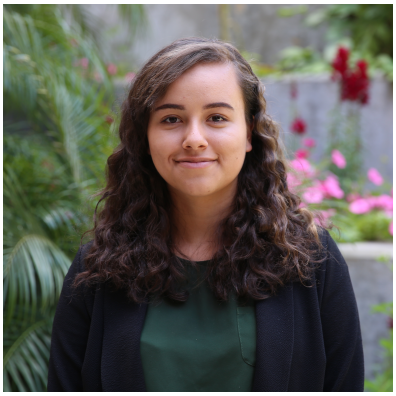
CAMDEN NEESE
Supervising Professor: Dr. Tom Needham

Cracking the Neural Code Underlying Chemosensory Processing

Camdeen is a Senior studying Statistics. His career ambition is to use statistical and data science methods in a variety of scientific and business contexts to unearth new insights.

Scott & Ina McNichols Undergraduate Research Award

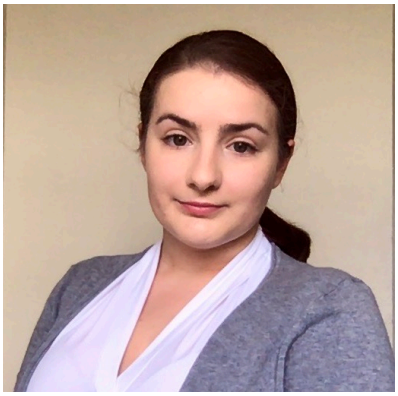
Abstract: The current predominant method for analyzing neural taste processing relies heavily on the firing rate of a neuron in response to different tastes. However, many researchers believe that important information is also encoded in the specific timing of these fires relative to licks, which mark the times when an animal actively experiences the sensation of taste. This project is a collaboration between neuroscientists, mathematicians, and statisticians to understand the contribution of neural firing phase to neurons' abilities to differentiate between tastes. We aim to prove that neural firing phase is an integral part of the neural code by improving classification metrics when this information is incorporated. These insights will deepen the neuroscience community's understanding of the complex patterns that constitute taste processing.



CELINA MEYER AND EMILY CAPOTE
Supervising Professor: Dr. Julia Sheffler

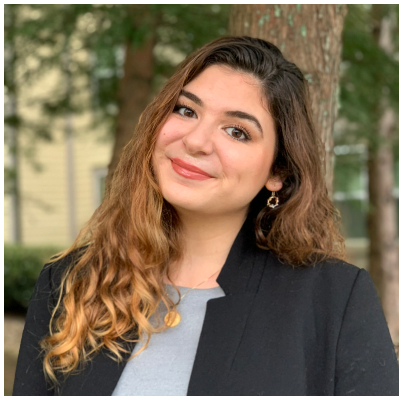
Buffering the Effects of Early Adverse Environments on Executive Function

Celina Meyer is a Senior majoring in Psychology and Statistics. An IDEA Grant recipient from 2019, her past research has examined the effects of early adversity on emotion regulation. Celina is applying to Ph.D. programs in Developmental and Clinical Psychology with hopes to be a research psychologist.



Emily Capote is a Senior Psychology major. She started her research in the UROP program. For three years, she has been a research assistant at the Center for Translational Behavior Science. Under Dr. Julia Sheffler, she investigated the role of childhood experiences of cognitive ability in adults.

Abstract: Researchers have established adverse childhood experiences (ACEs) and household chaos as independent risk factors for executive and emotional dysfunction across the lifespan. However, no studies have examined positive emotion regulation (ER) strategies as a potential buffer against the effects of ACEs and household chaos on adult executive functioning (EF). We predicted that the number of ACEs and a higher level of household chaos would be associated with reduced EF ability in adulthood, and the negative effect of ACEs and household chaos on EF would be buffered by adaptive ER strategies in adulthood. We used a virtual design, including a self-report survey and a behavioral EF battery. Although incomplete, we have collected preliminary data from a young adult sample (N=20; mean age=21.8, SD=4.64) with a good distribution of ACEs (M=2.9, SD=1.37) on the Childhood Trauma Questionnaire. Initial correlations suggest that as household chaos increases, ER strategies like positive refocusing (r=-.573, p=.013), cognitive reappraisal (r=-.436, p=.070), and acceptance (r=-.449, p=.054) are used less often. Notably, household chaos was also associated with greater use of refocusing on planning (r=.580, p=.012). When examining a summed ACE score, there is a trend for decreased use of cognitive reappraisal (r=-.438, p=.070). These preliminary findings support our hypothesis that early household chaos and a greater number of ACEs may be associated with less effective ER strategy use in adulthood. Once data collection is complete, we will examine whether the effects of early adversity influences EF, and the moderating effects of ER strategies.



Scott & Ina McNichols Undergraduate Research Award

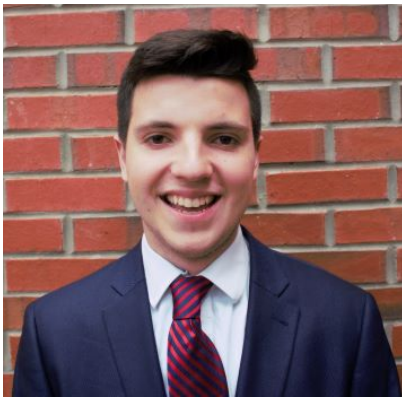
SAMANTHA POLITANO

Supervising Professor: Dr. Ian MacDonald

Sponge Communities in Mesophotic Reefs of the Gulf of Mexico Before and After the Deepwater Horizon Oil Discharge

Samantha is a first-generation Senior majoring in Environmental Science and Policy and English. She has studied sponges in both literary and scientific contexts. She has worked at the Florida Senate as a proofer and is currently working full-time at the Florida Department of Environmental Protection.

Abstract: Mesophotic reefs across the edge of the northern Gulf of Mexico shelf were examined for possible impacts of the Macondo Well's Deepwater Horizon 2010 oil spill. For weeks following the spill, Alabama Alps Reef and Roughtongue Reef were situated 60-88 m under suspended oil, with Alabama Alps closer to the spill and under oil for a longer time period. ROVs surveyed the reefs in 2011, 2014, and from 1997 to 1999. Sponges were present, but they are notoriously difficult to identify. The sponges were quantified using still images captured from ROV video transects and the average number of sponges per photo for each site was calculated. Following the spill, the number of sponges at Alabama Alps Reef notably declined while those at Roughtongue Reef increased. Recovery was clear in 2014 for both sites, though Roughtongue Reef's sponge population increased much more dramatically. Predation and disease, among other mortality factors, possibly influenced the population changes.



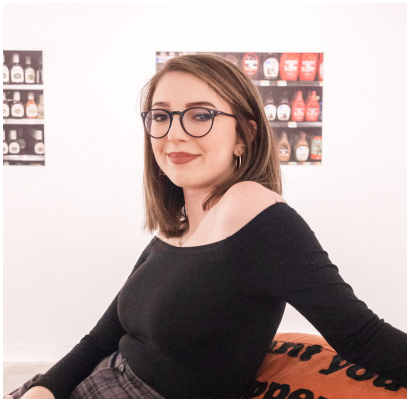
DYLAN PSULKOWSKI

Supervising Professor: Dr. Tarik Dickens

Investigating Data-Fusion in Biomechanics for Patient Specific Meniscal Degradation Prediction

Dylan is a Senior studying Biology, previously involved in research at TMH's Concussion Center. This work will continue towards a thesis in developing intelligently manufactured patient specific knee braces. He is currently undergoing paramedic certification before pursuing medical school.

Abstract: With the advent of The Internet of Things, smart wearables permit in-situ data collection towards custom solutions for individual medical needs. The following work establishes the framework in which patient-specific health monitoring and knee injury prevention occurs. The input parameters of weight, age and locomotive gait are utilized in a custom interface to calculate reaction forces and stress felt on the meniscus to predict the susceptibility of tearing and to inform clinical decision making towards prophylactics. Furthermore, high fidelity anatomic simulations are implemented for validating a developing model and to expand the knowledge pool of knee injury without the variability inherent in human trials. Overall, this investigation showcases how data-fusion can augment the biomechanics field to deliver custom healthcare in the digital age.

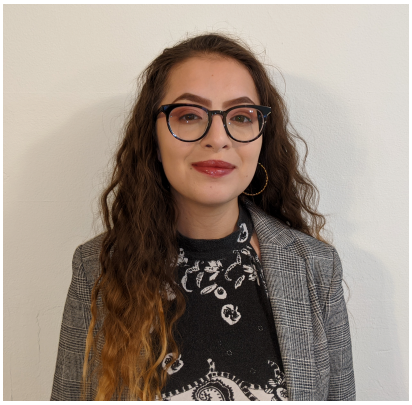


ARIEL RASKIN
Supervising Professor: Prof. Jessica Ingram

Can You Hear Me?

Ariel is a BFA Studio Art major graduating this December. All of her work has been about cultivating vulnerability through the use of text. She has been awarded the BFA award, as well as the Excellence in Visual Arts award. Her future goals are to attend graduate school and receive her MFA in Studio Art..

Abstract: After losing an important person to me last fall, everything I thought of always brought me back to her and the loss that never goes away. I am constantly grieving. Everywhere I go, it follows me, and for a while it felt like I was the only one in the world that could feel this immense loss. After the pandemic began, peoples' loved ones began to die everywhere, in mass amounts and in the public eye. Not only was death becoming a prominent topic, but fear to lose those we love was as well. As I watched this unfold, I realized that no one was talking about what comes after death. Grief was everywhere, and still is, in immeasurable amounts, but is not being talked about. By opening up to the public with my own traumatic experiences dealing with death and loss, I am trying to start a conversation about grief. For those who are left behind, I want them to know that others are also lingering in the space between moving forward and yearning for the past.



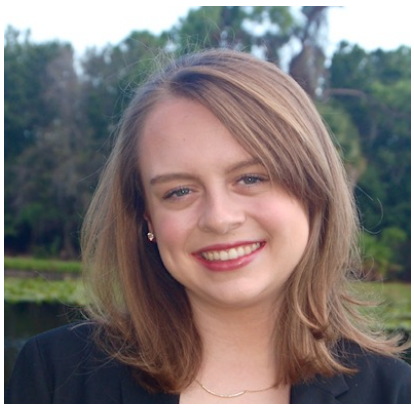
LILLIANA REINOSO
Supervising Professor: Dr. Grant Mandarino

For Your AI's Only: Exposing the Nipple Ban

Lilliana is a Junior Studio Art major simultaneously pursuing studies in Pre-Law. She has previously been engaged in DIS research assisting in studies regarding the Interpersonal Theory of Suicide. Lilliana endeavors to implement the knowledge of her dual academic interests to pursue Cultural Property law.

Phi Eta Sigma Undergraduate Research Award

Abstract: As social media has proliferated, various companies such as Instagram have implemented artificial intelligence to perform high-speed content moderation in real time. This mode of content moderation exacerbates the discriminatory nature of Instagram's community guidelines regarding "female" nipples. The policy and its implementation are problematic in various ways. Firstly, the ban on "female" nipples implies that the female body is inappropriate or harmful. Secondly, the classification of "female" that the platform relies upon is inherently transphobic and Eurocentric. Consequently, Instagram ends up classifying "female" bodies in negative terms while reinforcing regressive ideas of who is and is not "female." Throughout the project, it became apparent that not all nipples were treated equally. The chests of those who appeared white (either naturally or via editing) tended to be removed more quickly than those of their black/brown skinned counterparts. In attempts to evade AI censorship, I experimented with pattern, abstraction, and color. While these attempts were not always successful, it was curious to see how certain means of evasion became ineffective as time progressed, implying artificial learning or the widening of AI search parameters.

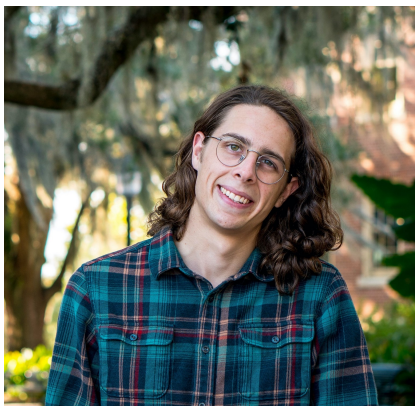


GRACE ROBBINS
Supervising Professor: Dr. Andrea De Giorgi

Excavating and Digitizing Archaeological Practices: A Case Study of Cosa 1970 vs 20202020

Grace is a Junior majoring in Classical Archaeology. She previously conducted research through UROP examining stress among post-disaster volunteers in Florida and Texas. Grace is currently a Digital Cultural Heritage Intern in the Office of Digital Research and Scholarship. She is pursuing a career in museum archival work and in improving accessibility through 3D modeling.

Abstract: Traditionally, accessibility to historic records of archaeological excavations has been limited to and contingent on the individual site's decision to make their excavation records public and, in the 21st century, attainable on a digital platform. As digital scholarship has increased over the past several decades, more excavations are building databases that publish their past and current field journals, photographs, and plans separately from research publications. For the site of Cosa in Ansedonia, Italy, original archaeological journals can only be accessed at the American Academy in Rome. Due to COVID travel and operational limitations, this project now functions as a preliminary assessment of the current challenges and needs of digital historical record accessibility for the archaeological site of Cosa. Additionally, by means of interviews, it analyzes the current attitudes of Cosa Excavations team members towards the historical evolution of documentation and excavation methods.

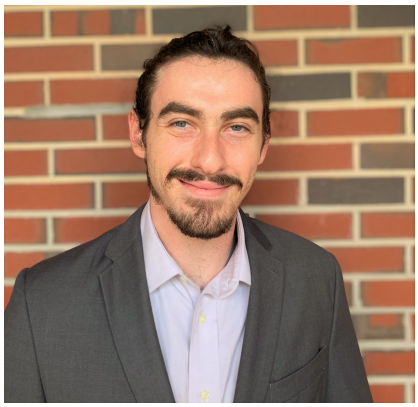


COOPER SHAPIRO
Supervising Professor: Dr. Lisa Tripp

Sustainable Production Practices on Small-Budget Films

Cooper Shapiro is a student in Florida State University's College of Motion Picture Arts, studying Motion Picture Production. Cooper recently finished production on a music video and documentary, directing both projects. In addition to his IDEA Grant Project, Cooper is writing a script that will go into production early next year. After graduating in the Spring of 2022, he plans on moving to New York City to continue making films.

Abstract: This creative project involves the research and collection of ecologically sustainable filmmaking practices. The project includes two phases: 1) researching current practices for environmentally conscious film production and improvements that can be made at the low-budget level; 2) compiling the ecologically friendly techniques I have found into a website to be shared among filmmakers. This project will exemplify how low-budget and student filmmakers can be more conscious of how their art is affecting the environment. The goal of the website is to demonstrate that eco-friendly and quality films are not mutually exclusive and to promote filmmaking practices that are environmentally sustainable.



MICAH SILVERMAN
Supervising Professor: Dr. Daniel Hallinan

Exploring the Soret Effect: Harnessing Polymers for the Future of Renewable Energy

Micah is a Junior Chemical Engineering major. He is currently a research assistant in the Polymers for Advanced Energy Sustainability Lab. The IDEA Grant is his first research award. Micah plans to obtain a Ph.D. in Materials Engineering and use that to develop batteries for renewable energy sources. He also plans to open his own environmentally-focused engineering firm.

Scott & Ina McNichols Undergraduate Research Award

Abstract: The Soret effect states that a temperature gradient applied to a mixture results in a concentration gradient in the mixture. This is significant because a concentration gradient can be used to generate power. In other words, the Soret effect could potentially be used to convert waste heat energy (a major energy problem) to electricity. However, the Soret Effect remains poorly understood, limiting our ability to predict which mixtures will exhibit optimal behavior. This project evaluated the hypothesis that the Soret coefficients of two-component liquid mixtures correlate to the activation energy of diffusion for each component. This was accomplished by analyzing the data available in the literature. Our analysis indicates that there is a trend in behavior as activation energy differences increase.

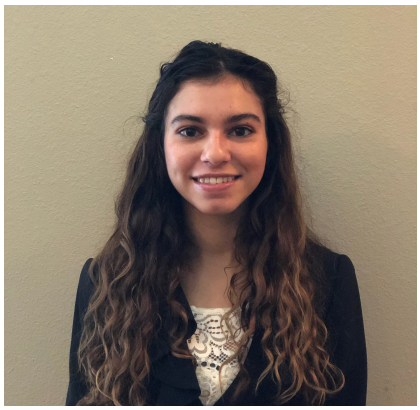
ELIZABETH SLADE
Supervising Professor: Dr. Kris Salata

Theatre Congregation: Breaking Down the Bicameral Relationship Between Actor and Audience

Beth Slade is a Senior pursuing a BA in Theatre and will be graduating with dual honors this spring. Beth has performed in many productions at FSU and looks forward to continuing to perform professionally. She would like to thank Dr. Kris Salata for always supporting her artistic endeavors.

Garnet and Gold Scholar Society IDEA Grant

Abstract: Based on the practitioner, Jerzy Grotowski, I wanted to make a space in which actors and audiences could congregate and engage with one another, what I deemed a “Theatre Congregation.” This is to be accomplished by utilizing the technique of Call and Response. My work began with researching the evolution and history of Call and Response and studying the structure. In my research, I found Dr. Cristal Truscott, who has a methodology entitled SoulWork, in which she describes a theatrical setting built entirely on Call and Response. This includes the performance and the making of the piece, creating a setting in rehearsal rooms where the artists Call and Respond with one another. Through studying the history and evolution of Call and Response along with Dr. Truscott's work, I am able to begin devising a theatrical piece that engages both actor and audience.

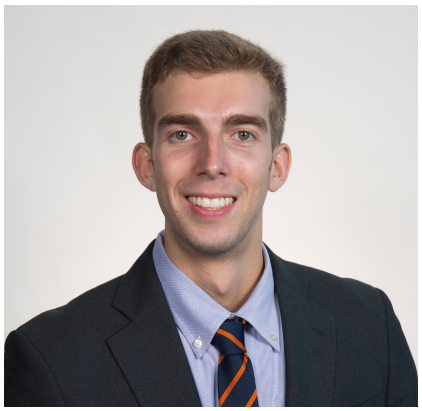


Steve Madden Undergraduate Research Award

AVA DODD, JOHN SUTOR, AND ERIN MURPHY
Supervising Professor: Dr. Jonathan Adams

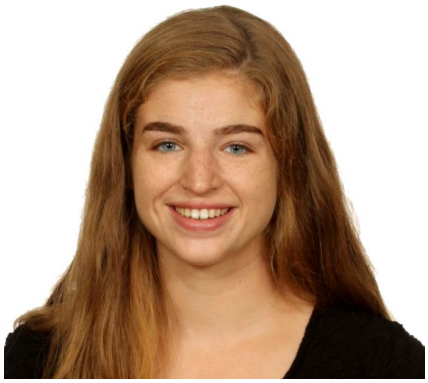
Synthetic Visual Data Generation and Marine Object Detection: A Case Study

Ava Dodd is a Senior Computational Science major. She has been conducting machine learning research with Dr. Adams for a year. Ava is currently working on creating a start up business in techniques to enhance the efficiency artificial intelligence.



Steve Madden Undergraduate Research Award

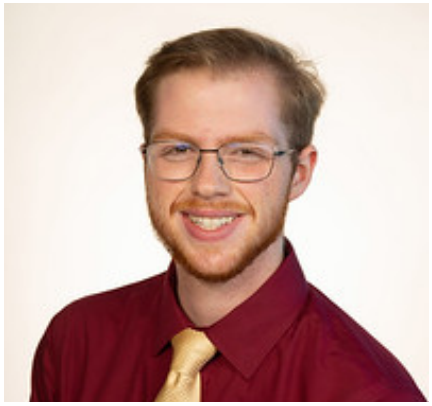
John Sutor is a Junior studying Computational Science and Applied Mathematics. He is interested in pursuing a career in computer research, especially in the field of machine learning. He has worked on computer vision research in the past, particularly for real-time object detection, though he is now researching computer vision focusing on synthetic data.



Steve Madden Undergraduate Research Award

Erin Murphy is a Sophomore majoring in Computer Engineering. She is also a Presidential Scholar and a student-athlete on FSU's NCAA beach volleyball team. Last spring, she, along with the rest of this team, presented at the 2020 SITE Conference. She aspires to have a career in software engineering or higher education.

Abstract: Last spring, our research team successfully trained YOLO machine learning (ML) software to detect marine objects from drone footage with upwards of 90% accuracy. This presentation serves as a continuation of that work and was originally intended to study YOLO's ability to monitor sea turtles at night using infrared footage. Due to COVID-19 travel limitations, the team had to shift focus to an emerging topic within artificial intelligence: synthetic visual data. Synthetic visual data refers to any images or videos generated or modified by computers for the purpose of training ML algorithms for domains without many images. To first strengthen our understanding of the emerging field of synthetic visual data and the best methods for generation, the team conducted a literature review that has been submitted to Columbia University's Machine Learning in Science & Engineering Conference. Next, the team narrowed down data generation options and developed a production process. This process included the use of a three-dimensional digital modeling software called Blender to render synthetic sea turtle images. The presentation explores this summer's journey through ML research and the impact of synthetic visual data YOLO object detection.



Phi Eta Sigma Undergraduate Research Award

EVAN VINSON
Supervising Professor: Dr. Robert Wandell

Optimizing the Creation of Green Fertilizer with an Air, Water, and Plasma System

Evan is a Junior in Chemical Engineering major currently working in Dr. Locke's Lab at the FAMU-FSU College of Engineering. He has been on the President's List for every semester he has taken classes except for his first semester (Dean's List). Evan is looking into internships and grad schools to do research and help the environment.

Abstract: Most nitrogen-based fertilizers are made in large factories and require H (from natural gas) and N2 (from air). These processes are energy intensive and contribute to environmental pollution. Fertilizer is a required component of increasing the world's food supply to sustain the growing human population. Dr. Bruce Locke and Dr. Robert Wandell are involved in a lab at the FAMU-FSU College of Engineering that is researching processes to create nitrogen-based fertilizers using just air, water, and electricity with the use of a plasma reactor. The processes they have designed work to create such fertilizers, but there is still a significant number of intermediate molecules in the gas phase at the end of the process. The goal of this project is to optimize the fertilizer production process by using liquid additives to draw out more gaseous intermediates and get them into the fertilizer. My research focused mainly on two additives, ammonium sulfite and sodium sulfite.

THE FSU iGEM TEAM
Supervising Professor: Dr. Cesar Rodriguez

SPLASH: Sewage Purification Limiting Antibiotic Spread in Habitats

The International Genetically Engineered Machine (iGEM) Competition is the premiere student competition in synthetic biology.

Team Video Presentation

Team Website

The 2020 team is led by Sarah Fuller (Biochemistry) and Associate Team Leader Miguel Sarenas (Neuroscience). The Design team is made up of Dat Vo (Team Lead, Biomaterials and Polymers), Christine Cremeans (Biochemistry), and Andres Ramirez (Neuroscience). The Create team includes Jennifer Rocque (Team Lead, Biological Science), Kelly Bacherman (Biochemistry), and Miguel Brinon (Biomaterials and Polymers). The Human Practices team, who examine the physical and ethical implications of the team's proposed intervention, are Caroline Young (Team Lead, Anthropology), Zane Massengale (Environmental Science), Kim Pedregal (Exercise Physiology), and Hannah Champ (Psychology), with Kelly Bacherman and Kajoyrie Purcell (Computer Science) acting as visual arts and software leads, respectively.

Abstract: Antibiotic resistance is an increasing global emergency. Microorganisms continue to evolve ways to render antibiotic therapies less effective, causing 2.8 million infections in the US and 750,000 deaths worldwide each year. In Florida, dolphins are serving as a sentinel species. A longitudinal study on dolphins in the Indian River Lagoon found that 88.2% of bacterial isolates were resistant to at least one antibiotic. Resistance to *erythromycin* was highest among all the bacteria at 91.6%. Antibiotics are entering our environment via animal husbandry and disposal of antibiotics. We've designed an engineered *E. coli* that expresses EreA and EreB enzymes, which will degrade *erythromycin* in the secondary portion of wastewater treatment plants, and a genetic system that is intended to prevent the engineered cells from escaping. Our project can be implemented in water treatment plants across the world to curb the rapid spread of antibiotic resistance.

The FSU Tech Fellows program exposes students to the everyday work of product development, entrepreneurship, and ecosystem building. As a fellow students spend a dynamic summer embedded with an ecosystem building organization and work alongside startup companies. The Tech Fellows complete a qualitative or policy research project as part of the program.

Adel Bebe is currently a Sophomore majoring in Chemical Engineering. He interned with Tallahassee's Domi Station. Previously, Adel has interned with Orange County's Traffic Engineering Division. Here at FSU, he has participated in the Florida Georgia Louis Stokes Alliance for Minority Participation (FGLSAMP), which seeks to empower minority students in STEM fields to graduate and move onto graduate school. In addition, Adel has joined the National Society of Black Engineers and Progressive Black Men.

Alexander Blanchette is a Senior majoring in Information Technology with a minor in Entrepreneurship. In addition to his internship with Starter Studios, Alexander's research looks into intergenerational wealth and its impact on the success of startups. Outside of the classroom, Alexander leads a team of six students to promote and maintain the College of Communication and Information "Get Involved" website. In addition, he has lead an outreach group providing IT training at the Tallahassee Senior Center providing workshops and ad hoc desk help.

Alex Jeannite is a Junior majoring in Computer Science. In addition to his internship with Tampa Bay WAVE, Alex researched imposter syndrome within the programming community. Outside of the classroom, Alex has previously interned with FSU's Innovation Hub (Spring 2020) as a web developer and FSU Communications conducting marketing analysis.

Chris Lormeus is a Junior majoring in Finance and has ambitions for launching his own e-commerce business. In addition to his internship at Tallahassee's Domi Station, Chris researched the optimization of digital marketing for drop shipping businesses. Chris was previously a part of the CRE's Global Scholars program interning (Summer 2019) as a Financial Analyst at Morocco World News. In addition, he received the Benjamin A Gilman fellowship to support his summer internship in Morocco.

Nohemi Soza-Acevedo is a Junior majoring in Criminology who interned at Orlando's Starter Studio. In addition to her internship, Nohemi researched the perspectives and preparations of small business owners around cybersecurity risk. Outside of the classroom, Nohemi is the Public Relations Chair for the Lamba Theta Alpha Latin Sorority and Outreach Coordinator for the Phi Eta Sigma Honor Society. One of Nohemi's career goals is to become an intelligence analyst for the Department of Homeland Security.

We are so grateful for the generous donors who have sponsored the following IDEA Grants:

Robert and Mary Frappier Undergraduate Research Award:

Robert and Mary Frappier are strong supporters of FSU and undergraduate research. This award is for a student focusing on the environment and sustainability or housing.

Scott and Ina McNichols Undergraduate Research Award:

Scott and Ina McNichols are both FSU alumni who have a deep desire to support research which provides an enriching experience for the student engaged in research who wants to better the community around them. This award is open to all majors.

Nancy Casper Hillis and Mark Hillis Undergraduate Research Award:

Mark and Nan Hillis are vibrant FSU supporters who want to support undergraduate research that embodies the Unconquered Seminole spirit. This award is open to all majors.

Jack Saltiel Undergraduate Research Award:

Dr. Jack Saltiel is a long time Chemistry professor at FSU whose teaching and research has made an impact on many of his students during his more than 50 years at FSU. One such student is Dr. Mark Wrighton, who established this award in Dr. Saltiel's honor. This award is for a student majoring in Chemistry.

Steve Madden Undergraduate Research Award:

Steve is an FSU graduate in Engineering who is supportive of students finding their passion in STEM fields. His award is open to students in any STEM major. (Must be a full-time FSU student in spring)

David B. Ford Undergraduate Research and Creative Activity Award:

David B. Ford of New York, New York is currently the President of DBF Associates, a private investment firm, and Senior Advisor to Gatemore Capital Management, LLC, a private wealth and institutional investment management firm. This award is open to all majors.

Phi Eta Sigma Undergraduate Research Award:

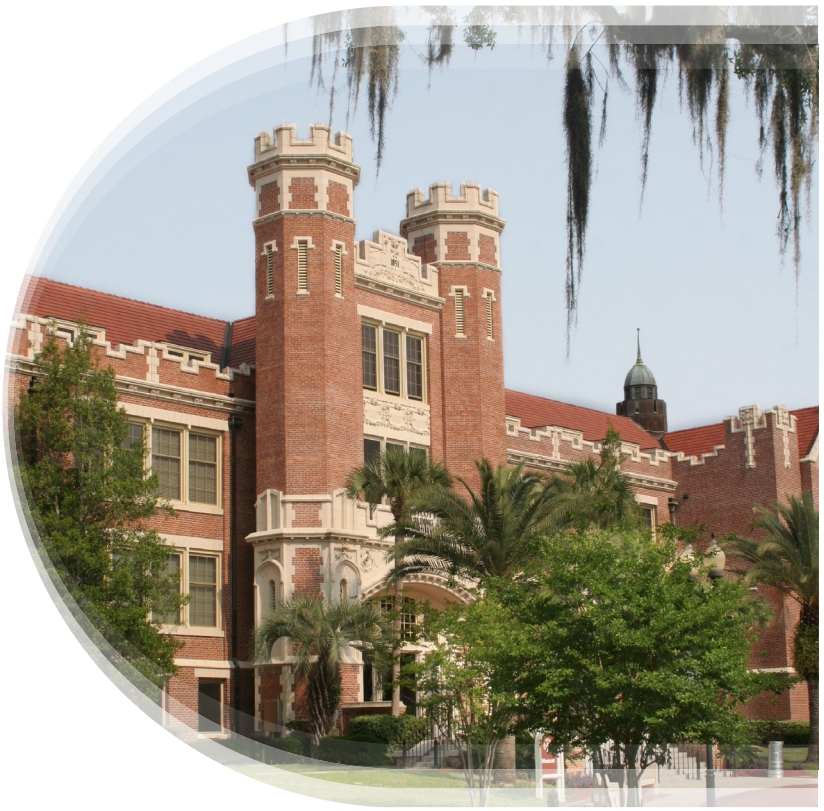
The Phi Eta Sigma Freshman Honor Society established an undergraduate research award to support the research endeavors of students who are members of the honor society. This award is for Phi Eta Sigma members in good standing. (Must be a full-time FSU student in spring)

Garnet and Gold Scholar Society IDEA Grant:

With generous funding from the Garnet and Gold Scholar Society, this award is open to students from any major who have already submitted their Garnet and Gold Scholar Society Intent to Participate with research selected as one of their three engagement areas.

Helen Louise Lee Undergraduate Research Award:

This award was established by Dr. Jim Lee in memory of his mother Helen who was a proponent of higher education and the ways it can help students enhance their lives. This award is for a student majoring in Biology. (Must be a full-time FSU student during the Spring semester)



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