

19TH ANNUAL
SCHOLARLY *E* CREATIVE
research
SYMPOSIUM

VIRTUAL LIVE EVENT VIA ZOOM
Friday, April 2, 2021

Featuring the Robert Lee and Thomas M. Chastain
Honors Symposium Guest Lecture Series

CHARISSE L'PREE CORSBIE-MASSAY, PH.D.,

Associate Professor, Communications

S.I. Newhouse School of Public Communications

Syracuse University



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Welcome to the 19th Annual Wilkes Honors College Scholarly and Creative Research Symposium, in which we celebrate the high-caliber, original scholarship and creativity of our students. Today we have the opportunity to watch the students we have taught, advised, and mentored share their academic research and creative projects with a broad audience of community members and their peers. Their intellectual curiosity combined with many hours spent in laboratories, in field research sites, on data collection, on reviews of literature, and on writing and revising has produced over 100 publications by our students in peer-reviewed academic journals over the past 21 years. Though it goes without saying, the pandemic has turned everything upside down during this academic year. And all year long, we have risen to the occasion. We have made the adjustments in order to hold this year's symposium virtually, and I could not be more pleased with the outcome. We hope that you enjoy this day as much as we do, and we encourage you to ask questions, engage with our students, support your peers, and challenge yourself to cross interdisciplinary boundaries.

– Dean Justin Perry

SYMPOSIUM COMMITTEE:

Annina Ruest (chair)

Monica Maldonado

Warren McGovern

William O'Brien

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CHARISSE L'PREE CORSBIE-MASSAY, PH.D.,

Associate Professor, Communications,
Syracuse University



"The Me in Media and the Media in Me."

Charisse L'Pree Corsbie-Massay's work focuses on how media affects the way we think about others and our perceptions of ourselves. In her current book, she investigates changes to the communication environment over the past 150 years and how these rapid yet pervasive shifts have affected our psychology. A committed teacher, L'Pree has spent the past 20 years encouraging others to think differently about their relationship with all forms of media and mentored dozens of students through research projects across disciplines.

In her lecture, Dr. L'Pree will inspire students to think broadly about research and the processes by which we come to understand the world and our place in it. She will draw on her research in quantitative psychology and experimental studies, as well as qualitative and critical work exploring identity and intersectionality.

As an actively interdisciplinary scholar, L'Pree has collaborated with researchers across a wide variety of disciplines including psychology, communications, anthropology, sociology, political science, medicine and engineering. Her research has been funded through the National Institutes of Health, the California HIV/AIDS Research Program and The Robert Wood Johnson Foundation.

EVENT SCHEDULE: FRIDAY, APRIL 2, 2021

9:00-10:15 AM	Session 1: Oral Presentations
10:15-11:30 AM	Session 2: Oral Presentations
12:00-1:00 PM	Break
1:00-2:00 PM	Chastain Lecture
2:00-4:00 PM	Session 3: Visual Arts Projects and Poster Session

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SESSION 1 & 2: ORAL PRESENTATIONS SCHEDULE

All student abstracts are included in alphabetical order on the pages following the presentation schedule grids.

● Economics/History
 ● Marine Biology/Math
 ● Biology
 ● Neuroscience
 ● Physics

SESSION 1 & 2: ORAL PRESENTATIONS SCHEDULE

All student abstracts are included in alphabetical order on the pages following the presentation schedule grids.

● Chem / Env. Sc. / Anthro
 ○ Literature / Art
 ● Soc. Ent.
 ● Phil / Law / Political Science / Women's Studies

		Breakout 1	Breakout 2	Breakout 3	Breakout 4	Breakout 5
SESSION 1	9:00 AM	Jasmine Quintana	Christelle Alcinor	Reece Humphreys	Tristan Stinchcomb	Gabrielle Byrd
	9:15 AM	Asad Haider	Maggie Boing	Andy Romero	Chelsy Davis	Anastasiya Valevski
	9:30 AM	Ramona Horti	Jillian Hanley	Aryeh Spraggins	Jessica Young	Madison Nissan
	9:45 AM	Kenneth Kalczuk	Alexis Koh	Nikita Jayan	Hailey George	Aaron Chichester
	10:00 AM	Bryan Padilla	Angie Joseph	Maria Smirnova	Gina Marie Gruss	Redmayne Taylor

SESSION 2	10:30 AM	Luis Pollon	Pierce Herrmann	Jessica Young (Env. Sc.)	Jessica Chomik	Raven Mello
	10:45 AM	Karla Hernandez	Manuel Contreras	Annika Tiller	Bianca Rodrigues de Oliveira	Camilla Andrade
	11:00 AM	Thalles DeOliveira Caiado	Ari Aviles	Taylor Sharrard	Luis Pollon (Soc. Ent.)	Rodrigo Sotelo
	11:15 AM	Jorge Hernandez	Amanda Wade			

Discipline in parentheses indicates one of two presentations scheduled for the student.

SESSION 3

	Breakout 1	Breakout 2	Breakout 3	Breakout 4	Breakout 5
2:00 PM	Aden Eagle	Angie Joseph	Sofia Feliciano	Owen Silvera	Gina Gruss (Thoughts and Prayers)
2:20 PM	David Harbaugh	Alec Borislow	Reece Humphreys	Amanda Marker	Jackson Eagan
2:40 PM	Faakhira Diljohn	Daniella Segini	Angelo Ybarra	Meagan Knoll	Gina Gruss (Carve Me Whole)
3:00 PM	Redmayne Taylor	Art Awards	Andrew Ly CANCELLED	Valerie Viluan	Henry Plante
3:20 PM	Pierce Herrmann		Samuel Manoharan	Shanay Thompson	Briana Valenzuela
3:40 PM	Catherine Martinez		Nikita Bansal CANCELLED	Gabrielle Byrd	Erin Farmer

ALCINOR, CHRISTELLE

Advisor(s): Andia Chaves-Fonnegra

Detecting Serotonin (5HT) in Various Species in Marine Sponges (Phylum Porifera)

Serotonin (5HT) is a neurotransmitter and a neurohormone in animals. Both serotonin and dopamine receptors have been reported in marine sponges (Phylum Porifera). Although serotonin has not been detected in sponge transcriptomes, it has been found in chemical extracts and by histochemistry and immunohistochemistry methods on a couple of sponges' species. The objective of this project was to quantify serotonin in sponge cells and possible associate bacteria symbionts. Sponge samples were collected at the Fort-Pierce Marina in the Indian River Lagoon, FL, and sponge cells and bacterial cells were extracted and separated using a Percoll gradient. Cells extracts and controls (DI water, seawater) were tested with an ELISA immunochemistry Serotonin kit and read on a plate reader. Serotonin was found in all species of sponges, bacterial cells and on controls. Adjustment to the method and other protocols are in progress to eliminate possible cross-contamination.

ANDRADE, CAMILLA

Advisor(s): Mark Tunick, Wairimū Njambi

Unequal Justice in the U.S Death Penalty

Several studies reveal a connection between a victim's skin color and the probability that their aggressor will receive the death penalty. Other studies conclude that a defendant's race will be a factor in determining whether or not they are sentenced to capital punishment. Despite the evident racial discrimination that plagues capital cases, Ernest van den Haag contends that "unequal justice

is still justice" and that if someone is guilty of a capital offense they don't deserve any less punishment simply because the death penalty is applied disproportionately based on race. I argue, against van den Haag, that an "unequal" justice system is unjust in and of itself. Even if a defendant is guilty, justice demands a fair system that protects defendants from systemic injustice and treats all victims and defendants equally.

AVILES, ARI

Advisor(s): Johanna Kowalko, Estephany Ferrufino, Itzel Sifuentes-Romero

Rcl1 as a Contributor to Cavefish Eye Loss

Identifying the function(s) of genes underlying evolution of traits is central to evolutionary biology research. *Astyanax mexicanus* is a small freshwater fish with cave-adapted populations that have repeatedly evolved multiple traits, including the regression of eyes. The genetic underpinnings of eyelessness in various *Astyanax* morphs has not been fully examined, and clearer knowledge of the genetic changes underlying its evolution can contribute toward our knowledge on the developmental regulation of ocular organogenesis in humans. To investigate the functions of specific genes related to the development of the cavefish eye, I identified a gene within a region associated with eye size differences in *Astyanax*; the gene *rcl1*. In this study, I employed CRISPR/Cas9 targeted mutagenesis to functionally interrogate the role of *rcl1* in *Astyanax* eye development. This work as the potential to identify novel regulators of eye evolution and expand our understanding of how eye size varies in naturally occurring populations.

BANSAL, NIKITA

Advisor(s): Chitra Chandrasekhar, Catherine Trivigno

Preventative Treatments of Diabetes and Non Alcoholic Fatty Liver Disease

Diabetes mellitus type 2 is a long-term metabolic disease that is currently ranked as the seventh leading cause of mortality in the United States and ninth leading cause worldwide. Recognized as a global health problem, diabetes mellitus is a chronic condition that involves multiple organ systems and can often lead to irreversible damage. Long term complications include neuropathy, retinopathy, nephropathy, cardiovascular disease, and hepatopathy. Diabetes is associated with a wide spectrum of liver diseases; the most common is non-alcoholic fatty liver disease, which can lead to liver failure. Sedentary lifestyles in industrialized countries are often seen as the inadvertent cause of increasing obesity and diabetes despite the thoroughly researched treatment plans available. In this study, I will examine the role of lifestyle and dietary modifications (including plant-based diet) in controlling diabetes and diabetes related complications.

BOING, MAGGIE

Advisor(s): Yaouen Fily, Andia Chaves-Fonnegra, Jon Moore

Automatic Detection of Coral Reef Microhabitats Using Computer Vision Libraries in Python

Coral reefs host a large amount of our ocean's biodiversity, but due to climate change the reefs are rapidly changing and dying. Currently tracking coral reef changes over time largely depends on manual annotation of different benthic coverages, which is very time-consuming. The objective of this project was to utilize Python programming language

to automate the detection of various microhabitats on coral reefs photographs. Photo-transects were obtained from shallow coral reefs in Broward County, FL. Images' colors were corrected, and microhabitats were traced manually in IMAGE J. To automate the detection of microhabitats on images we used color and texture (Gabor) filters in Python. The pre-processing of the images, most notably the color correction, allowed for later analysis that worked with the image's color channels and was more accurate. The texture analysis showed more potential to be able to differentiate between the different types of coverage.

BORISLOW, ALEC

Advisor(s): Rachel Luria, Mark Tunick

Batman Could Be Anybody: Self-Transcendence And Christopher Nolan's The Dark Knight Trilogy

Directed and co-written by Christopher Nolan, The Dark Knight Trilogy examines the origin and evolution of Bruce Wayne, and his hero vigilante alter ego, Batman. The trilogy consists of Batman Begins (2005), The Dark Knight (2008), and The Dark Knight Rises (2012). Wayne's post-traumatic journey for physical and mental excellence results in transformative and personal discovery, leading to self-transcendence. The personality trait of self-transcendence is the apex of psychologist Abraham Maslow's lesser-known and amended hierarchy of needs. It is the highest level of human consciousness and development. Wayne's unwavering morality, intrinsic motivation, and spirituality are characteristic of both humanistic and transpersonal psychology and further illustrate how the motion picture series exemplifies a road map to self-transcendence.

BYRD, GABRIELLE

Advisor(s): Lucia Carvelli, Sirisha Madem

Assessing Transgenerational Impacts of Amphetamine Exposure Provided Selective Ablation of Dopaminergic Neurons via the Fluorescent Protein, Killer Red

Killer Red (KRed) is a fluorescent protein which is capable of the selective ablation of targeted cells via reactive oxygen species (ROS) when exposed to the appropriate wavelengths of visible light. By targeting dopaminergic neurons via the *dat-1* promoter, these neurons may then be ablated with minimal to no damage to external structures. Utilizing this targeted ablation, this study aims to ascertain the transgenerational impacts of amphetamine exposure in the absence of DAT-1, a predominant target of amphetamine. These impacts will be asserted via the collection and analysis of SWIP data for the model organism *C. elegans*, comparing results for control animals to those which have undergone the selective ablation of dopaminergic neurons. This study adds to a body of literature assessing the neurobiological mechanisms of addiction, raising further research questions and possibilities in the realm of treatment, mechanistic action, and transgenerational impacts of drug abuse.

BYRD, GABRIELLE

Advisor(s): Andia Chaves-Fonnegra

Sponge Community Resilience After Consecutive Category-5 Hurricanes

Extreme weather events are becoming more frequent and intense as a result of climate change, and, while studies on the impact on corals are extensive, little is known of the impact and recovery of coral reef sponge communities. The unprecedented occurrence of two category five hurricanes in rapid succession

during the 2017 hurricane season, Irma and Maria, presented a valuable opportunity to analyze sponge community recolonization and recovery. Utilizing a BACI design, data was collected from sites surrounding the island of St. Thomas, U.S. Virgin Islands. Analysis of recolonization via remnant sponges and recruited individuals revealed the latter to be more implicated in the recovery process, with increased rates of recolonization in high-anthropogenic as opposed to low-anthropogenic impact sites, regardless of macroalgal or extant sponge cover. This study holds significant implications for the recovery of sponge communities following extreme climatic events, which bolster efforts to facilitate coral reef recovery.

CHICHESTER, AARON

Advisor(s): Mark Tunick, Nicholas Baima

The Vexed Application of the Social Contract Theory on Black People

The Social Contract details the liberties of members in society; those willing and able to consent to the contract were afforded the luxuries of protection and assistance through the government. I draw on the theory of Charles Mills in *The Racial Contract*, which argues that the black life was never intended to fit into the Social Contract. During the early stages of its inception, black people weren't regarded as valid members who could enter the contract. Disagreement about the validity of frustration felt by the Black community as a result of this exclusion has created a social and political divide. I document multiple instances in which black lives have been disregarded and undervalued. Drawing on John Locke's *Treatise of Two Governments* regarding justified resistance when the government violates the Social Contract, I justify the resistance and outrage of the Black community and argue for a restructuring of another Social Contract, made to consider everyone.

CHOMIK, JESSICA

Advisor(s): Christopher Strain, Timothy Steigenga

FutureMe

Graduate school applications can be extremely daunting. As a result of the time-consuming process of identifying graduate programs and preparing their applications – all while maintaining their academic excellence during the final stages of their current program – students become disorganized, stressed, and frustrated. FutureMe was created to empower students during such a critical stage of their academic career in a sustainable fashion. This project resulted from the Kenan Social Engagement program and is a user-friendly database where students create personalized profiles to find and organize graduate programs relevant to their interests. The application provides a tiered experience so that students can receive additional resources if they choose to do so. Ultimately, FutureMe will be available as an application on both iOS and Android platforms.

CONTRERAS, MANUEL

Advisor(s): Johanna Kowalko, Andia Chaves-Fonnegra,

Neuromast-mediated Craniofacial Differences in *Astyanax mexicanus*

Craniofacial shape is highly variable, and can be highly adaptive, e.g., Darwin's finches. Variability in craniofacial shape is often linked to adaptations in sensory systems, but how sensory evolution impacts evolution in craniofacial structures is not fully understood. *A. mexicanus* has two naturally occurring morphs: surface fish and cavefish, which evolved under different selective pressures. Surface fish rely heavily on vision for behaviors like feeding, while blind cavefish evolved in the dark and thus rely on non-visual sensory systems, including the lateral line. The regression of eyes and changes in number and positioning of

neuromasts, lateral line sensory organs, have been implicated in the formation of craniofacial structures. Seeking to uncover functional or genetic relationships, we examined potential co-variance in eye size, neuromast number and placement, and multiple craniofacial bone features in a cave-surface hybrid F2 population. Furthermore, we examined how genetic reduction of eye size impacts craniofacial traits.

DAVIS, CHELSY

Advisor(s): Rachel Luria, Sondra Washington

The Weight of Wings

This presentation will be an excerpt reading of my thesis, which is a magical realism novel called *The Weight of Wings*. It is primarily set in the fictional Saveria, a dying country. Many of its citizens believe that the famines, the extreme weather, and the demon wars that ravage Saveria are to be blamed on zealots, those who deny God and who refuse to follow the country's leader, The Angel. At the heart of this conflict is the Deljents—a family as dysfunctional as the land they were born unto. This novel explores how religion can either save or destroy, bar or protect, and free or control humanity.

DE OLIVEIRA CAIADO, THALLES

Advisor(s): Kanybek Nur-tegin, Terje Hill

The Implementation of the Brazilian Real Plan in Venezuela

Venezuela is currently experiencing inflation rates that are higher than 50 percent per month, which means the country is officially experiencing hyperinflation. The economic dependency on one natural resource, oil, makes the country's GDP fluctuate as oil prices change. The country has increased its government spending during

times in which oil prices were high. However, now that the price of oil has fallen, the country is facing considerable debt; in order to pay its debt, the country is printing money which has led to hyperinflation. The shortages, constant changes in price, and government debt in Venezuela are similar to the economic situation in Brazil in 1994. Brazil was able to curb its hyperinflation with an economic plan called the Real Plan. Some of the measures of the plan were to cut state expenditures, to stop price freezing, and to partially link the currency to U.S. dollars. I claim that some of the measures carried out in Brazil through the Real Plan could be implemented in Venezuela.

DILJOHN, FAAKHIRA

Advisor(s): Catherine Trivigno, Lucia Carvelli, Randy Blakely, Adele Stewart

Sex-Biased Dopamine Receptor Signaling Determines Drug-Dependent Locomotor Responses in DAT Val559 Mice

The Val559 dopamine (DA) transporter (DAT) variant, identified in patients with attention-deficit/hyperactivity disorder (ADHD), autism and bipolar disorder, drives transporter-dependent DA efflux in mice harboring the mutation. Accumulating evidence indicates that genetic sex influences DA release, reuptake, and signaling. Indeed, while male DAT Val559 mice exhibit a decreased locomotor response to amphetamine (AMPH), females do not. While the DA D2 receptor agonist quinpirole reduced locomotor activity in male and female animals regardless of genotype, D1 receptor responses (SKF83822) were blunted in DAT Val559 mice. Surprisingly, while male DAT Val559 mice showed reduced horizontal locomotion and stereotypy, females showed reduced vertical activity and time in center. While male DAT Val559 mice display intact AMPH-dependent DA elevations, they lack ERK activation following AMPH exposure, a response absent in females. These data indicate that DAT Val559 mice may be useful in determining how sex influences dopamine signaling in the context of neuropsychiatric disease.

EAGAN, JACKSON

Advisor(s): Annina Ruest

Bytie's Web - An Interactive Tour

Bytie's Web is an interactive digital art project, written and programmed by Jackson Eagan. It is the story of an ambitious if inexperienced programmer as they show the viewer around their brand new webpage. However, as is often the case for beginner artists, not everything goes to plan, and they must learn that some ideas are just too big to work on the first try, and that's okay.

EAGLE, ADEN

Advisor(s): Erik Duboué

Neural Networks for Automatic Mexican Cavefish Behavior Classification

The blind Mexican cavefish *Astyanax mexicanus* is a small tetra found as two distinct morphological types: blind and eyed forms. Additionally, myriad behaviors such as stress, sleep, and aggression differ between these evolutionarily divergent morphs. Such intraspecies distinctions make *A. mexicanus* a model organism for evaluating the evolutionary bases of differing responses to stressful stimuli; however, the laborious nature of collecting and classifying behavioral stress response data in forms of *A. mexicanus* is a major limitation of current research. Machine learning algorithms such as neural networks serve as exciting tools for dynamic automation of complex tasks. In this project, neural networks were developed to classify between eight common *A. mexicanus* behaviors using positional and movement data of the body parts of the fish. Here we find that an optimized neural network can achieve accuracies of more than 80% on test datasets across Tinaja, Pachón, Molino, and surface-dwelling conspecifics.

FARMER, ERIN

Advisor(s): Annina Ruest

Elisabeth Scrivener and the Great Library: Translating a Literary Work into a Digital Game

Elisabeth Scrivener and the Great Library is a 2D side-scrolling game adaptation of the bestselling novel "Sorcery of Thorns" by Margaret Rogerson. Like the novel, the game is set in the Great Library of Summershall. This is a place where magical grimoires of varying strength and benevolence or malignance are managed and contained. The player character is Elisabeth, an apprentice librarian and the player follows her as she progresses through the library taking advice from benevolent grimoires and defeating and containing not so benevolent grimoires. The game is the practical part of a thesis with the title: "Elisabeth Scrivener and the Great Library: Translating a Literary Work into a Digital Game Abstract."

FELICIANO, SOFIA

Advisor(s): Chitra Chandrasekhar, Vivian Merk

Mineralized Wood Synthesis to Combat Harmful Environmental Pollutants

Iron oxide mineralization yields new biocomposite materials for the remediation of environmental pollutants. Both ferrihydrite and magnetite minerals were embedded within the cell wall-lumen interface of balsam wood. In addition, iron-containing minerals were found in wood cell walls and rays. Our research suggests that these hybrid biomaterials will prove successful in absorbing harmful pollutants by providing a porous scaffold holding the iron oxides. Our methodology includes a variety of spectroscopic and microscopic methods, such as Raman imaging and Scanning Electron Microscopy. Crude oil degradation and arsenic absorption are two of the pollutant systems tested with the biocomposites.

GEORGE, HAILEY

Advisor(s): Kevin Lanning, Rachel Luria

Eating Elephants

The following novella is a fictional case study of Jethro Jones, a young male who suffers from three pathologies, including Binge Eating Disorder, Major Depressive Disorder, and Panic Disorder. It traces the development of his suffering, from infancy through childhood trauma into adolescent manifestations, such as severe panic attacks, a suicide attempt, and weekly episodes of binge eating. The creative nature of the piece was inspired by works such as *The Bell Jar* (Plath) and *Wasted: A Memoir of Anorexia and Bulimia* (Hornbacher). The character and story were informed by peer-reviewed studies about the aforementioned pathologies, including risk factors, manifestation and course, subtypes, and treatments. While research exists on all three of these topics separately, little of the literature exists on the comorbid presentation of these disorders, despite common occurrence. Thus, this is what the novella attempts to tackle.

GRUSS, GINA MARIE

Advisor(s): Dorothea Lemeh

Thoughts and Prayers

"Thoughts and Prayers" is a haunting acrylic piece on canvas board. It is a twisty, complex work that portrays the artist's disembodied head with curled hair that collapses into flames, then smoke—her eyes are blank, hands joined in prayer, cracked Eucharist in front. Behind her head are glimmers, textured and thick; two other hands drip with straight lines of blood, the palms marked with Stigmata. A white, angular cross reflects dagger-thin shards of light. It is purposefully ambiguous and uneven, rich with Catholic

iconography. "Thoughts and Prayers" symbolizes many things: a disillusion or questioning of a person's relationship with God; the patriarchal edge built into Christianity; the inherent bloodiness and violence of martyrs and Saints and religion itself; or perhaps how "thoughts and prayers" in reaction to horrific acts, like school shootings or the COVID-19 pandemic, is inaction. What do you see through the mist?

GRUSS, GINA MARIE

Advisor(s): Rachel Luria

Wasps and Bees

This Student Writer-in-Residence presentation is a short story titled "Wasps and Bees," which was created in Professor Luria's Fairytale Retellings course. It is an all-new fairytale and a coming-of-age story that pulls inspiration from Mexican mythology and native folk magic. It is a subtly futuristic, dystopic fantasy piece that touches on themes of identity, borders, environmentalism, and reexamines current US-Mexico relations. In this tale, twins must make a dangerous trip, within themselves and across their homeland, to save their farm, and learn who they are along the way.

GRUSS, GINA MARIE

Advisor(s): Annina Ruest

Carve Me Whole

"Carve Me Whole," created in Professor Ruest's Intro to Programming course, is a linear narrative that centers and investigates the history of abuse for female muses and male artists across different artistic fields. You take the role of an aspiring, young female artist who models for a successful male artist, hoping for a foray into the 'art

world'—but instead, faces abuse, blackmail, and loss. She is his muse, at the cost of herself. Follow the story along over 120 hand-drawn pixel-art sprites over the course of over 20 animations. This piece is coded on Processing and is fully playable.

HAIDER, ASAD

Advisor(s): Keith Jakee

Market Disruption by Streaming Services: A Case Study of Netflix

Streaming services have disrupted the entertainment market. The movie and TV industries have been heavily outdated by the technological disruption in content creation and distribution. Netflix utilizes internet-based advancements to modernize content viewing at the expense of the antiquated Hollywood business model. This paper discusses the various market disruptors created by the entrepreneurial innovations formed by streaming services like Netflix and how it can be applied to similar industries.

HANLEY, JILLIAN

Advisor(s): Rachel Harris, Jon Moore

Underutilized Potential of Small-Scale Oyster Reef Restoration Units as Habitat for Invertebrates

Oyster reefs play vital roles in an estuary's health by filtering the water and by serving as nurseries for many aquatic animals. The objective of this research was to investigate habitat use of smaller macroinvertebrates on restored oyster reefs. Small-scale (approx. 10 cm³) cage (bagged shell) and string (hanging shell) oyster cultch units were deployed on two restored oyster reefs in the Loxahatchee River Estuary for one year.

Fauna inhabiting the units were monitored monthly, identified to the lowest practical taxonomic level, and categorized into functional groups based on feeding mode, living position, and mobility. Results showed similar abundance, richness, and diversity of functional groups in cage and string units. These findings suggest that even small-scale oyster reef restorations, such as individual 'vertical oyster gardens' (i.e. string units), add valuable habitat for smaller organisms. This provides additional options for small-scale restoration efforts.

HARBAUGH, DAVID

Advisor(s): Catherine Trivigno, Joseph Kissil

Development of a Kinase Translocation Reporter Assay for High-Throughput Screening of Novel PAK1 Inhibitors

The p21-activated kinase 1 (PAK1) is a member of the PAK protein kinase family that play roles in cell proliferation, motility and survival. Dysregulation of PAK1 stimulates growth of cancer cells. Identified PAK1 inhibitors present challenges related to efficacy, toxicity, and selectivity of the inhibitors. To overcome these issues, we are developing a novel cell-based assay, utilizing a kinase translocation reporter (KTR) approach to identify PAK1-specific inhibitors that are potent and exhibit limited toxicity. This assay tracks the nucleocytoplasmic shuttling of a PAK1-substrate-green fluorescent (GFP) fusion protein. The cellular localization of GFP can ascertain the level of PAK1 activity. Currently, I am determining whether PAK1-mediated phosphorylation results in translocation of the reporter from the nucleus and whether additional modifications to the KTR reporter are required. Development of this assay will allow generation of stable cell lines that express the KTR reporter to identify PAK1 inhibitors via high-throughput screening.

HERNANDEZ, JORGE

Advisor(s): Christopher Ely

The Development of State Shinto

The formulation of narratives-of-rule is essential for governments to justify their authority. This tactic has been used throughout world history, especially in the wake of revolutionary periods when the fundamental order of a society has shifted. One of the most drastic shifts in any society in modern history took place in Japan as a result of the Meiji restoration. At this point, an isolated island nation, long stuck in feudal reaction, was thrust into the heat of the industrial revolution. To maintain stability and control, the Japanese government willingly took upon itself the attitudes of their would-be colonizers from the west. In order to justify the Imperial government's mandate, a loose set of spiritual practices known as Shinto were re-contextualized, and fundamentally changed, so as to create the civil religion of State Shinto. This ideology would serve to justify Japanese exceptionalism and imperialism all across Asia. My presentation will explore the process of how the ideologues of Meiji-era Japan (1862-1912) transformed Shinto in an effort to justify their policies and validate their rule.

HERNANDEZ, KARLA

Advisor(s): Kanybek Nur-tegin

How Brand Image and Brand Identity is Communicated in a Mobile Marketing Environment: A Comparative Analysis of Dunkin' and Starbucks

This thesis focuses on mobile marketing, a marketing communication tactic that businesses have come to recognize as a necessity to communicate and reach current and potential customers. I am planning to accomplish this by examining past literature on mobile marketing, structuring theories around customer buying habits, analyzing past

mobile communication platforms, and investigating practical implications of mobile campaigns on brand identity. To show how mobile marketing has been implemented successfully, I focus on Dunkin' and Starbucks, as they are among the top mobile marketing giants and are well-known by a large audience. By focusing my research on these two corporations, I hope to provide readers with an understanding of how many of the concepts discussed in this paper are crucial to understanding what mobile marketing is in its entirety, as well as how brand image is communicated in a marketing environment.

HERRMANN, PIERCE

Advisor(s): Catherine Trivigno, Courtney Miller

Basolateral Amygdala Mir 598 3p Mediates Susceptibility To Stress Enhanced Remote Fear Memory

Post Traumatic Stress Disorder is a common mental disorder prevalent in combat veterans and individuals who have been exposed to extreme trauma. MicroRNAs (miRNAs) are potent regulators of learning, recent memory and extinction. However, our understanding of miRNAs and their roles in mental disorders remains limited. A stress-enhanced fear learning (SEFL) paradigm was used to examine resilience and/or susceptibility to the development of enhanced fear memories. Mir-598-3p is a miRNA that was identified in the basolateral amygdala (BLA) as differentially regulated by learning and thus was selected for further study in the context of stress-enhanced fear learning.

HORTI, RAMONA

Advisor(s): Keith Jakee, Kanybek Nur-tegin

The Repercussions of the Soviet Occupation on Current Investment Behavior in Hungary

This paper concentrates on the causes of current investment practices

of individuals in Hungary. The Soviet occupation of Hungary between the end of World War II and the fall of the Soviet Union had major impacts on Hungary that continue up to this day. The nationalization of banks and businesses under Soviet control, the limited alternatives for investment, and the sociopolitical climate of the Soviet system led Hungarians to keep a high proportion of their wealth in cash. I evaluate the current household financial wealth of Hungarians and find that this investment behavior is still prevalent not only in Hungary, but all former Soviet Bloc countries. I attribute this investment practice to the norms and savings ethics developed during the Soviet occupation. Through the evaluation of cash's profitability compared to other investment options, I conclude that investing in cash is restricting the individual wealth of Hungarians.

HUMPHREYS, REECE

Advisor(s): Yaouen Fily

Modeling and Simulating the Evolution of Orbital Debris Clouds

Orbital debris are the remnants of orbital collisions, weapons tests, decommissioned satellites, and spent rocket stages that are passing over our heads faster than bullets and containing similar energy to hand grenades. They have quickly become one of the newest sources of pollution as a result of humanity's desire to work in, explore, and utilize space. Unlike most types of pollution that people experience daily, this is pollution that is impossible for the average person to ever encounter, yet poses just as grand of a threat as the other types. This talk explores some of the computer models that space agencies have used to predict the formation of debris clouds from fragmentation events, how orbital mechanics cause the debris cloud to evolve, and the ramifications these clouds pose to the scientific endeavors and critical infrastructure that millions of people depend on.

HUMPHREYS, REECE

Advisor(s): Warren McGovern

Interdisciplinary Applications of Lie Groups and Manifolds

Abstract Algebra is a fundamental division of mathematics that many undergraduate students have difficulties understanding the importance of. More specifically, the notions of symmetries that are paramount in the studies of groups are often not emphasized within an interdisciplinary framing. As such, it is uncommon for people in the applied sciences to have the necessary tools for representing physical symmetries using these powerful algebraic objects. This poster explores the applications of lie groups within the context of control theory, numerical method, and physics. This is accomplished by showing how various problems contained within these fields can be represented by lie groups and the benefits that this yields.

JAYAN, NIKITA

Advisor(s): Johanna Kowalko, Yaouen Fily

Uncovering The Role Of Maternal Effects On Vision In *Astyanax Mexicanus*

The visual system allows for perception of stimuli and subsequent behavioral responses. Different species and populations are subjected to divergent ecological factors, which, in turn, impact the evolution of the visual system. In the Mexican tetra, *Astyanax mexicanus*, ancestral-like surface fish have large eyes and are highly reliant on visual cues, while cavefish, which reside in constant darkness, are blind. Maternal effects, the influence of maternal genotype on an offspring's phenotype, have been shown to affect eye size in this species. However, whether these differences in eye size translate into functional differences in the visual system is unknown.

Here, we generate cave-surface reciprocal hybrids through fertilizing cavefish eggs with surface fish sperm and surface fish eggs with cavefish sperm. We test for visual response using the optomotor response assays in surface fish, cavefish and cave-surface reciprocal hybrids to determine the role of maternal effects in evolution of the visual system.

JOSEPH, ANGIE

Advisor(s): Dorotha Lemeh

Art and Math: A Marriage

A visual marriage between art and mathematics through an anamorphic work.

JOSEPH, ANGIE

Advisor(s): Warren McGovern

The Mathematics Behind Anamorphosis

Anamorphosis is a visual art technique based on perspective of a distorted work. The earliest known depiction of an anamorphic work was done by Leonardo da Vinci in his Codex Atlanticus. In order to achieve this work, various math techniques had to be utilized. Despite the fact that da Vinci's methods of Anamorphosis are no longer used, there are other mathematical ways to achieve Anamorphosis, which I will spend time discussing. I will then go into the mathematical techniques, which will predominantly be Calculus methods, I utilized to create my own anamorphic work to be shown during the visual art portion.

KALCZUK, KENNETH

Advisor(s): Keith Jakee

The Implicit Repressiveness of Governance: Freudian Insights into the Works of Buchanan and Marcuse

This work compares Freudian political theory with that of political philosopher Herbert Marcuse and economist James M. Buchanan. Freud's political theory emphasizes the necessity of coercion in societal institutions, however, Marcuse expanded on Freud to argue that society's repressiveness is only conditional. Buchanan, on the other hand, emphasized the necessity of coercive measures in the foundation of society but is not traditionally considered to be ideologically similar to Freud. Contrary to popular dogma, this paper illustrates how disagreements between Freud and Marcuse demonstrate Freud's similarities with Buchanan. By understanding these differences, Freudian political theory is interpreted through a "classical liberal" framework vastly different from that of the "complimentary" Marcuse. These frameworks, and competing theories, remain important for understanding issues of social organization today as they parallel modern theories in the area.

KNOLL, MEAGAN

Advisor(s): Jon Moore

First Description and Illustration of the Juvenile *Parazen pacificus*

Parazen pacificus is a benthopelagic deep-sea fish found at depths of 146–512 meters in the western Pacific, Indian, Caribbean, and western Atlantic Oceans. This ray-finned fish has a silvery elongate body with magenta coloring along its dorsal side. *Parazen pacificus* has not previously been illustrated or described in its juvenile stage. This project works with two juvenile specimens of *Parazen pacificus* to form the first description and illustration of the juvenile stage of this species.

KOH, ALEXIS

Advisor(s): Jon Moore, Rachel Harris

Impacts of Storm Water Discharge on Seagrass Densities in the Loxahatchee River

The seagrass that are present in the Loxahatchee River are important indicators of the overall health of the environmental system, sustaining life for a vast majority of organisms. In nearly the last decade, the Loxahatchee River District (LRD) has monitored and mapped the decline of seagrass populations throughout the river. One possible explanation for this decline could be due to the influence of discharge from nearby storm drainage sites in the Town of Jupiter and the Village of Tequesta. ArcGIS data was collected from the LRD in order to locate seagrass data collection sites encompassed within a 100m radius of a storm drain. Seagrass data collection points that are identified as potentially impacted sites are compared to collection sites considered to be outside of the designated discharge range. Attribute tables of the collected data points were examined for seagrass densities in order to determine stormwater influence. These results will be important in terms of future seagrass management plans as well as the management of stormwater discharge.

LY, ANDREW

Advisor(s): Chitra Chandrasekhar, Julie Earles

Post-Traumatic Stress Disorder and Cancer Treatment

Unlike many other traumatic events preceding the onset of post-traumatic stress disorder (PTSD), the cancer experience has ongoing stages of diagnosis, treatment, and survivorship that each present their own stressors. The epidemiology of cancer-related PTSD is well-documented, but the effect of front-line cancer treatments on the prevalence and intensity of PTSD has yet to be consolidated. Due to

the multifaceted nature of cancer-related trauma, it is important to understand how each component of the experience plays a role in the onset of mental illness. Thus, I review the existing literature to elucidate how the biochemical changes induced by chemotherapy, immunotherapy, and radiation influence the onset and persistence of cancer-related PTSD. In being informed of the physiological processes underlying treatment and their implications for mental health, patients and clinicians alike can better predict the psychological changes that occur alongside cancer treatment.

MANOHARAN, SAMUEL

Advisor(s): Shailaja Allani

Effect of Sulindac on Senescence in RPE Cells using Senescence β -galactosidase Assay.

Oxidative damage is the progression of age-related diseases such as heart disease, Alzheimer's disease, cancer, and macular degeneration. (Kozlowski, et al., 2012). The proposal is to understand the role of senescence in retinal epithelial cells (RPE) due to oxidative damage. Cell senescence is the state of permanent cellular division arrest and concerns only mitotic cells (Blasiak, et al, 2017). RPE senescence may contribute to or/and precede irreversible pathological events in the retina specific for Age-related Macular Degeneration, such as RPE loss and inflammation. We reported that the anti-inflammatory drug (NSAID), sulindac, can protect both the heart and RPE cells against oxidative damage by initiating a protective response, similar to ischemic preconditioning (IPC), that is independent of its NSAID activity (Sur, et al., 2014). The goal of this project is to test whether sulindac can reverse senescence in RPE cells using the senescence associated β -galactosidase assay.

MARKER, AMANDA

Advisor(s): Andia Chaves-Fonnegra, Ericca Stamper

Evaluating the Presence of the Serotonin Receptor Gene 5-HT7R in Marine Sponges

Sponges (Phylum Porifera) lack a true nervous system, however they present a notch-Delta signaling system and a proneural basic helix loop helix (bHLH) gene that resembles the conserved molecular mechanisms of primary neurogenesis in bilaterians. The serotonin receptor gene, 5-HT7R, was found putatively in the sponge *Amphimedon queenslandica* genome but not on several sponge transcriptomes, which has led to a controversy about the presence, and origin of this neurotransmitter in sponges. The objective of this project was to evaluate the presence of the serotonin receptor gene 5-HT7R in other marine sponges besides *A. queenslandica*. Sequence comparisons were performed in GenBank and alignment and phylogenetic trees in MEGA. Sets of Primers were developed to target the gene on DNA from several species. Through these tools, we expect to explore if this gene is also found in species of sponges in which serotonin (5HT) has been previously found.

MARTINEZ, CATHERINE

Advisor(s): Chitra Chandrasekhar, Mark Sundrud

Characterization of Immune Phenotypes as Predictive Biomarkers for Response to the $\alpha 4\beta 7$ Integrin Blocker Vedolizumab

Chronic inflammation from T cell activation and its subsequent tissue damage is implicated in the pathogenesis of inflammatory bowel disease (IBD). Vedolizumab (VDZ), a monoclonal antibody against $\alpha 4\beta 7$ integrin that prevents T cell homing to intestinal mucosae, has shown efficacy in treating both ulcerative colitis (UC) and Crohn's disease (CD), with

greater efficacy in UC. We aimed at identifying immunophenotypic and gene regulatory characteristics that could predict which IBD patients will benefit from VDZ therapy. Using an agnostic approach to the flow cytometry data, we examined cell clustering by CytofKit. We performed differential gene analysis (DEseq2) of RNA-seq data on T cell populations from the periphery and lamina propria. Unsupervised clustering and RNA signatures in Tregs revealed that intestinal profiling better represents markers of response and immunophenotypic differences than blood. These biomarkers may allow the creation of a model to determine which IBD patients will benefit from VDZ therapy.

MELLO, RAVEN

Advisor(s): Mark Tunick, Laura Vernon, Wairimū Njambi

Funding the Fundamental Right to a Legal Defense

The Sixth Amendment of the Constitution guarantees all United States citizens the right to a fair trial. However, that right has not been made equally accessible to all defendants in the criminal justice system due to the underfunding of Public Defender's offices nationwide. This thesis examines the impact of this underfunding on indigent criminal defendants and analyzes social psychology research to understand the psychological biases that help explain this underfunding, and how they might be overcome. Evidence suggests that the disproportionate government expenditure on the State Attorney and underfunding of the Public Defender has led to a skewed legal system that favors not only the prosecutor, but also the white, abled, and wealthy. I argue that to support a criminal justice system that aligns with the values of equality and justice, the Public Defender must be properly funded to fulfill its adversarial role.

NISSAN, MADISON

Advisor(s): Mark Tunick, Nicholas Baima

Self-Driving Cars and the Value of Human Life

There are several different normative ethical frameworks one can use for measuring the value of a human life, including deontological and utilitarian theories. I intend to evaluate these frameworks and apply them to the problem of self-driving cars, which pose both ethical and legal issues. These cars will have to be programmed to make decisions in emergency situations. Who should be programming these vehicles and how they should be programmed? I argue that utilitarianism is the best framework to use in cases where we must choose between lives, and that self-driving cars should be programmed to do the least damage possible, even if that means sacrificing the life of the passenger. In addition, I will argue for the programming of self-driving cars to be uniform across manufacturers, with standardized guidelines for programmers and car companies.

PADILLA, BRYAN

Advisor(s): Keith Jakee

Challenging the Concept of a 'Resource Curse' in Venezuela: Does the Narrative Explain Venezuela's Collapse?

After the discovery of oil in the 1920s, Venezuela's economy underwent a transformational period of expansion, that took the country from being one of the poorest to one of the richest economies in Latin America. However, Venezuela's rapid growth quickly came to a halt. The rise of the oil industry and its dominating effect on the Venezuelan economy led most scholars to center their attention on the economic and political repercussions associated with oil dependence. Many economists suggest that Venezuela's divergent economic performance and collapse can be explained by the resource curse hypothesis. The 'resource curse'

concept is often used to describe states that experience a paradoxical degradation in economic and political stability following the discovery of natural resources. This chapter analyses the validity of the resource curse theory in the Venezuelan growth experience and discusses how different versions of the resource curse narrative explain or do not explain Venezuela's economic collapse.

PLANTE, HENRY

Advisor(s): Annina Ruest

Sensory

Sensory is a game about sensory issues. Its goal overall is to communicate the stress of such issues without using a word. While it was rather difficult to test because of my own issues, the overall experience should even be jarring to those without sensory issues. Through testing with people who lack the sensory issues that I have, the gameplay mechanics, graphical effects, and sound effects have been fine-tuned to communicate the feelings of distress and futility that one may feel with sensory issues. It aims to be a distressing and uncomfortable experience, to give just a glimpse into the problems with trying to be part of a world that can feel unaware of, or even at times hostile towards one's senses.

POLLON, LUIS

Advisor(s): Keith Jakee, Kanybek Nur-tegin

Uncertainty as an Intrinsic Characteristic of Entrepreneurship: A Case Study of The Rolling Stones

The Rolling Stones have managed to stay relevant for over 50 years, and I would argue they may be one of the most successful "entrepreneurial" musical enterprises over the past century. Their innovations include not

only reinventing their musical style several times, but also pioneering a number of business practices. My analysis is based on the "radical uncertainty" approach to entrepreneurship, meaning agents confront a profoundly unknowable future when innovating. Thus, even entrepreneurs who are deemed successful (from some later vantage in time) must make decisions without knowing how those decisions will unfold. As such, I explore many entrepreneurial decisions made by the Rolling Stones, attempt to articulate why they were innovative, and show why the eventual outcomes—judged from the moment of the decision—were not obvious successes.

POLLON, LUIS

Advisor(s): Timothy Steigenga, Christopher Strain

Unsink, Inc.

Although some students are able to succeed throughout high school and college, some end up falling behind. While there is an expectation for students to excel in school and their adult lives, there is not much focus on teaching them some of the essentials: time management, learning strategies, public speaking, car maintenance, personal finance, taxes, etc. Meanwhile, professors have a set of materials that must be covered in class, so it is hard for them to take the time to teach students the "basic tools" like the ones we mentioned above. For this reason, Unsunk, Inc. creates short digital courses that are as easy to consume as social media content, while maintaining the integrity of educational legitimacy. These courses teach learning techniques, indispensable public speaking knowledge, time management strategies, and many other skills that can set students for success—both in school and out.

QUINTANA, JASMINE

Advisor(s): Keith Jakee, Stephen Jones

**Fisher Body's Vertical Integration with General Motors:
The Debate Between Coase and Klein et al.**

The merger of Fisher Body and General Motors is one of the most well-known examples of vertical integration in modern industrial organization. The universally accepted theory for the merger can be attributed to Klein, Crawford, and Alchian (Klein et al., 1978). These three economists, using Coase's 1937 paper, claim that ex post contractual opportunism, or the "hold up" problem motivated the merger. However, Coase disagrees fundamentally with Klein et al.'s rationale, claiming their view is wholly inaccurate. My presentation introduces this discrepancy between the interpretations of Coase and Klein et al. and analyzes the debate between the two. Further, Coase's (1937) original insights on transaction costs will be expanded upon.

RODRIGUES DE OLIVEIRA, BIANCA

Advisor(s): Timothy Steigenga

Incentives and the Social Impact of Non-Profits: A cost-benefit analysis of the El Sol Neighborhood Resource Center in Jupiter, Florida.

Non-profits are organizations that aim to provide public or social benefit, without the express intention of making profits. Non-profits may also file to become tax-exempt and can accept tax-deductible donations. In contrast, for-profit businesses frequently receive several other types of incentives, such as relocation incentives, start-up development funds, and other specific incentives to open in or relocate to a particular locality. This thesis argues that non-profits may be economically undervalued by state and local authorities relative to for-profit businesses. Therefore, state

and local authorities should also consider offering incentives to non-profit organizations based on the economic and social value they bring to the community. To corroborate this claim, I review the literature on non-profits and incentive policies and conduct a cost-benefit analysis, while utilizing a social accounting model to explain the value of one local area non-profit, El Sol Jupiter's Neighborhood Resource Center.

ROMERO, ANDY

Advisor(s): Yaouen Fily

Identification of Notes and Structures in Music Through Fourier Transforms

Can we use the mathematical rules that govern waves to characterize notes and chords from a sound sample? For this project I designed a python program which uses Fourier transforms, a mathematical technique to extract the frequencies that make up a sound wave, to do just that. I will describe the method and explain how this can be used to identify structures in a piece of music.

SEGNINI, DANIELLA

Advisor(s): Dorothea G. Lemeh, Kanybek Nur-tegin

Exploring Art Patronage in a Family Game Night Package

In my thesis, I delve into the creation process behind my board game, which investigates the topic of art patronage and the exchange that occurs between patron, artist, and community in a historical context. Within the world of tabletop games, players perform specific actions limited by a set of rules. These rules, which are known as the game mechanics, are procedures that guide players as they interact with the game to achieve their goals. In my game, the goal

is to expand one's art collection and share it with the community while fulfilling the role of patron. The aim of designing this game is to develop an interactive story that explores the exchange of art initiated by patrons, ultimately translating my ideas into a game that participants can play.

SHARRARD, TAYLOR

Advisor(s): Rachel Corr

The Death Positive Community and Change in American Mortuary Ritual

American mortuary ritual, including either embalming and burial or cremation, has largely gone unchanged since the Civil War. The growing movement of "death positivity" started by mortician Caitlin Doughty has been educating the American public about funeral alternatives that advocates believe are better for survivors of the deceased as well as the environment. I analyze past criticisms of the funeral industry that have influenced Doughty to craft the death positive movement's ideals and discuss these in terms of capitalistic greed and death denial culture. I describe the downfalls of the current embalming and cremation practices that the death positive movement opposes. Furthermore, I highlight the eco-friendly and family involvement-based funeral rituals that the death positive community promotes and how these are changing the homogeneity of American funeral rituals. I will demonstrate how the death positive movement is providing ritual change to U.S. funerals and promoting ritual freedom over uniformity.

SILVERA, OWEN

Advisor(s): Jon Moore, Rachel Harris

Acute and Chronic Effects of Roundup QuickPro (73.3% Glyphosate Salt) on *Halodule wrightii* and *Halophila johnsonii* Seagrass in Closed Tank Systems

Seagrasses are essential habitats for many species and provide critical ecosystem functions. Globally seagrasses are declining at an alarming rate. Locally, seagrass loss is concerning because of the magnitude of habitat loss as well as the uncertainty surrounding the mechanisms driving seagrass decline. We exposed two prevalent seagrasses in the IRL to the terrestrial herbicide Roundup QuikPRO™ (active ingredient 73% glyphosate) and quantified seagrass response over 53 days. Direct application of 112 mg glyphosate (15mL of 7.5 g/L) onto *Halodule wrightii* and *Halophila johnsonii*, simulating overspray during low tide, yielded persistent concentrations of 2.58 mg/L glyphosate after 13 days. Direct application had acute effects, but survivorship after 53 days was equivalent to control tanks. Indirect application of 125 mg/L glyphosate, with persistent concentrations of 83.4 mg/L glyphosate after 13 days, resulted in complete *H. johnsonii* mortality and nearly complete mortality of *H. wrightii*. Despite high-water solubility, glyphosate poses a measurable threat to seagrasses which warrants further study.

SMIRNOVA, MARIA

Advisor(s): Lucia Carvelli, Ning Quan

Interleukin-1 Receptor 1 Contributes To Synapse Formation In The Dentate Gyrus: Possible Mechanism For Epilepsy

Epilepsy is a chronic neurological disorder that affects 2.3 million adults and 450,000 children within the US. The etiology of epilepsy is unknown; however, increased severity and neuropathology of

epilepsy is associated with inflammatory pathways. Specifically, pro-inflammatory cytokine Interleukin-1 signaling via Interleukin 1 receptor type 1 (IL-1R1) has been shown to decrease sensitivity to kainic acid induced status epilepticus. Our lab hypothesizes that IL-1R1 signaling alters synaptic connectivity in the hippocampus thus conferring increased neuronal excitability. Using WT and IL-1R1 null (IL-1r1r/r) mice, colocalization of immunolabeled pre- and post-synaptic markers (VGLUT-1/HOMER1) were analyzed, indicating synapses. Additionally, using the Golgi-Cox method we visualized synaptic spines and analyzed dendritic spine morphology in WT and IL-1r1r/r mice. Our results indicate that IL-1R1 does significantly alter synaptic structure and that this mechanism possibly contributes to the pro-convulsant effects of IL-1 in epilepsy.

SOTELO, RODRIGO

Advisor(s): Wairimū Njambi

Femicide In A Global Perspective: A Theoretical, Historical, And Preventive Approach

Introduced by Diana Russell in 1976, the term femicide refers to the intentional killing of women and girls because of their gender. From the Americas to Africa to Europe, femicide occurs globally. Bodies are found mutilated and murdered due to this gendered based violence. This thesis will centralize three sections within the topic of femicide: a theoretical approach to why violence against women occurs; an analysis and historical account for the various instances of femicide across the globe; and how we can collectively move forward as a society to prevent femicide from reoccurring.

SPRAGGINS, ARYEH

Advisor(s): Yaouen Fily

Video-Tracking A Group Of Fish: Keeping Track Of Which Fish Is Which

Automatic video tracking has had a major impact on animal behavior studies. One of the challenges of automatic video-tracking to monitor the positions of animals has been keeping the animals distinct. To solve this problem for groups of fish, I will be using python code to track patterns of brightness as a visual identifier to track Mexican cavefish from the labs of Dr. Keene, Dr. Duboue, and Dr. Kowalko, on the Jupiter campus.

STINCHCOMB, TRISTAN

Advisor(s): Michael Harrawood

Bodies in the Works of Harry Crews

This presentation will consider representations of the human body in two late novels by the great Florida author, Harry Crews. In *Body and Scar Lover*, written respectively in 1990 and 1993, Crews delves not only into the experiential qualities of the body – what it feels like to live and die inside a body – but also utilizes his characters' bodies to express broader themes including sacrifice, resilience, mortality, and redemption. I propose that the profane nature of Crews' writing juxtaposes the sacred themes which underlie his works and serves to represent a defining characteristic of the human experience; to this end, I explore the various bodies of Crews' characters in *Body and Scar Lover*, and how they are used to develop these themes.

TAYLOR, REDMAYNE

Advisor(s): Yaouen Fily

Seizure Data Analysis of Mexican Cavefish

Comparisons between closely related populations are a powerful tool to study evolution. River and cave populations of Mexican tetra fish are thought to react differently to stimuli that cause seizures. I will discuss methods of automatically detecting and classifying different types of seizure behaviors across these populations from video recordings of the fish.

TAYLOR, REDMAYNE

Advisor(s): Nicholas Baima

Moral Responsibility in a Deterministic World

Can we be held accountable for our actions in a fully deterministic world? If we cannot, how can we hold others morally responsible? In this talk, I will argue that moral responsibility requires free will and is incompatible with a deterministic world but that we can salvage discussions of morality by changing how we view responsibility.

THOMPSON, SHANAY

Advisor(s): Monica Maldonado, Evelyn Frazier

Behavioral Interaction Among Gopher Tortoises, Iguanas, and Burrowing Owls

The conservation area on the FAU Boca Campus is home to gopher tortoises (*Gopherus polyphemus*) and burrowing owls (*Athene cunicularia*), both native species and listed as threatened in Florida. Both species dig burrows that are sporadically occupied by the green iguana (*Iguana*

iguana), which is an invasive species. It has been shown that burrowing owls eat young green iguanas (McKie et al., 2005), but the overall impact of the green iguana on populations of gopher tortoise and burrowing owls is not well known. This project will analyze the interactions among these species. Two cameras were placed in front of gopher tortoises' burrows and two cameras in front of burrowing owls' burrows that are adjacent to iguana burrows. Three of the cameras captured still images and one collected video for every motion detected.

TILLER, ANNIKA

Advisor(s): Predrag Cudic, Chitra Chandrasekhar

Optimization of Solid-Phase Synthesis of a Biologically Active Cyclic Disulfide-Rich Peptide

Opioids are effective analgesics, but they are highly addictive and overdose can be lethal. The misuse of opioid-based pain medications led to a worldwide opioid crisis. Naloxone, a medication counteracting life-threatening opioid overdose, is inconsistent in overturning overdoses with potent opioids. Thus, discovery of novel treatment options for opioid overdose is needed. Therefore, we designed a novel bicyclic peptide opioid antagonist by incorporation of a somatostatin analogue sequence (CTOP), a potent μ opioid receptor (MOR) antagonist, into the structure of a carrier molecule odorranalectin (OL), a naturally occurring cyclic peptide lectin shown to facilitate intranasal delivery of peptides to the brain. The incorporation of CTOP in OL is challenging, as both peptides are prepared via solid-phase formation of disulfide bonds producing a bicyclic MOR antagonist (OL-CTOP). This poses a synthetic challenge, in which reaction conditions should be carefully optimized to obtain the desired product in high yields.

VALENZUELA, BRIANA

Advisor(s): Annina Ruest

Emotions

This project was inspired by emotions that we experience and utilizes a combination of different skills learned in the past Fall 2020 semester in ART 3657C-01H. We spend our lives constantly coming across and interacting with people. However, not always can we tell how they are actually feeling. Even though people can seem alright or 'neutral' on the outside, sometimes that is not really the case. Similarly, a flower may carry a different significance depending on their species or the circumstance that they are being presented in. However, this is often overlooked, typically only being associated with the idea of being beautiful and sweet.

For this project, different emotions and flowers are associated together. A series of combinations between flowers and expressions represent different emotions and states of being that is deeper in meaning than what just meets the eye.

VALEVSKI, ANASTASIYA

Advisor(s): Mark Tunick, Amy Borman

The Impact of Expanding Protection Against Sex Discrimination in Title VII to Encompass Sexual Orientation and Sexual Identity

Title VII of the Civil Rights Act of 1964 prohibits employers from discriminating against their employees due to "race, color, religion, sex, or national origin." From its creation until 2020, the United States court system did not clarify whether the protected trait "sex" includes sexual identity/ orientation. After a split among Circuit Courts, the U.S. Supreme Court granted certiorari and addressed the question in *Bostock v. Clayton County, Georgia*. The USSC determined that discrimination based on homosexuality or transgender status requires employers to treat individual employees differently because of their sex intentionally. The role of intent

is thus inescapable: Just as sex is necessarily a but-for cause when an employer discriminates against employees' sexual orientation/ identity, an employer who discriminates on these grounds inevitably intends to rely upon sex in its decision-making. In my thesis, I focus on recent cases that are attempting to interpret the reach of the USSC's decision.

VILUAN, VALERIE

Advisor(s): James K. Wetterer, Jon Moore, Rich Jones

Potential Impact of Stinging Ants on Vertebrates in South Florida

Several predatory ant species are known to attack, injure, and even kill vertebrates. Perhaps the most notorious of these are the red imported fire ant, *Solenopsis invicta* and the little fire ant, *Wasmannia auropunctata*. *Solenopsis invicta* are originally from the grasslands of South America and *Wasmannia auropunctata* are native to South and Central America. Both species, however, have spread around the world through human commerce. In areas where they invade, both are most common in disturbed habitats. *Solenopsis invicta* often dominates open, grassy areas, while *Wasmannia auropunctata* more often dominates in forested areas. For my thesis research, I compared the distribution of ant species, including *S. invicta* and *W. auropunctata*, at the burrows of gopher tortoises in South Florida.

WADE, AMANDA

Advisor(s): Johanna Kowalko

Melanocytic Effects of *hipk2* Mutation on *Danio rerio*

A. mexicanus cavefish evolved a collection of traits upon colonization to the cave environment, including a prominent loss of pigmentation. Numerous studies have identified QTL associated with pigment cell number, however many of the genes that may contribute to pigmentation

reduction in cavefish remain unknown. Here, we identified a candidate gene for evolution of pigment reduction in cavefish, *hipk2*, which maps to a region of the genome associated with pigment cell number in an *A. mexicanus* mapping study and plays a known role in pigmentation in other species. We disrupted the function of the *hipk2* gene using CRISPR mutagenesis in another teleost fish, *Danio rerio*, and quantified the effects on pigment cell number. Identification of the genes associated with color loss in cavefish will enhance our understanding of *Astyanax* pigmentation evolution and will provide insight into genetic mechanisms of phenotypic trait loss that have occurred throughout evolutionary history.

YBARRA, ANGELO

Advisor(s): Timothy Steigenga, Jeffrey Morton

International Peacekeeping: A Critique of the United Nations' Operational Procedures

International Peacekeeping has been a polarizing topic since becoming established as a mainstay in United Nations policy. Although international involvement of this sort is bound to be vulnerable to situational complications, the consistency of the UN's failures makes it impossible to ignore the fundamental issues engrained in its standard operating procedures. This thesis analyzes a number of key UN peacekeeping operations that resulted in varying degrees of success as well as the general assessments that have been developed in response to these operations. Based upon an analysis of these cases as well as the literature on the issue of UN Peacekeeping, the thesis identifies the common problems in Peacekeeping operations and traces their evolution to the foundational elements of the UN Peacekeeping program combined with the evolving types of Peacekeeping missions undertaken.

YOUNG, JESSICA

Advisor(s): Rachel Luria, Dorothea Lemeh

Strange Frequencies: Development of a Post-Human Narrative

Posthumanism embodies a wide-ranging scope of philosophies, including works of transhumanism dealing with cybernetics or androids. Few works treat advanced technological developments like A.I. and androids as equal to, or companions to humanity. Despite potentials for future technology to be equally as intelligent as humans, there remains a limited number of stories treating android or A.I. characters as main characters and narrative lenses. This project grapples with questions of humanity, spirituality, and environment through sequential storytelling using an android protagonist. This adds critical reflection to the body of posthumanist works by serving as one of a few stories where the main character is not human, and the world is after the time of humankind. Instead of encapsulating a purely entertaining story of science fiction, this work delves into ideas of rapid environmental degradation and ever-evolving levels and functions of technology in our world and our near future.

YOUNG, JESSICA

Advisor(s): James Wetterer, William O'Brien

Asexual Reproduction of Native and Non-native Species of Milkweed in Variant Soil Conditions

This study collected results about the effects of different soil substrates, milkweed species, and exposure to indole-3-butyric acid on the survival rates of cuttings from progenitor plants. Fifty-four cuttings of each species were transplanted to substrates of an 80:20% v/v mixture of peat moss to perlite, only peat moss, and potting soil. Half of each group of cuttings were exposed to rooting hormone powder. The cuttings were allowed to grow for three weeks, and were watered three times a week. A binomial

logistic regression model was developed to determine the significance of each of the independent variables in the likelihood of survival of any individual cutting. The model specified had an 84.3% accuracy in correctly predicting the survival of the cuttings. This experiment may offer insights on the best environment for the propagation of native species of milkweed, which could be beneficial in the development of more native habitats for monarch butterflies in Florida.

CONGRATULATIONS

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ON APRIL 29, 2021

Medallion Ceremony

10:00 am

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Commencement Ceremony

5:00 pm

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