



Stetson
new world
**Show
case**

STETSON SHOWCASE XXIII: NEW WORLDS

APRIL 13, 2021

A Celebration of Achievement at Stetson University

About the Undergraduate Research and Creative Arts Symposium Showcase:

Welcome to the twenty-third Stetson Showcase. This event, with its debut in 1999 and former names of Undergraduate Scholarship and Performance Day (USAPD) and later Undergraduate Scholarship Day (USD) and Stetson Undergraduate Research and Creative Arts Symposium (SURCAS), has grown to be one of the oldest and most distinctive comprehensive Undergraduate Research Days in the United States. Our theme this year, New Worlds, acknowledges the challenges that undergraduate research has faced in the past year, and the new understandings we have had to accept in conducting that research. However, the theme also celebrates the opportunities our students have created for themselves in learning and research in a world of virtual academe.

One of these challenges has been the translation of our campus event onto a virtual platform. In April 2020 we were unable to do so on short notice, resulting in a marquee of some of our SURE Grant winners. This year, we will have a hybrid Showcase. Some events, such as the senior recital and Hand exhibits will be available both live and online. Some sessions may be live. Many others will be online. You are free to go in and out of sessions all day, attend a music recital, see the art exhibit, and in the evening, attend the awards ceremony. We may have to abridge some of our traditional venues this year, but it will still be exciting.

JUDGING CRITERIA AND PRIZES:

Each group of judges for each specific location will be deciding among themselves appropriate and consistent criteria that will help them decide which presentations were most effective. In general, students are asked to discuss their projects at a level that anyone not knowing the area can understand. Part of an effective presentation is effective communication, and the judges keep this as consistent criteria for choosing the best presentation for all involved. The winners of each of the locations or poster sessions will receive a Maris Prize of \$200 and a certificate of excellence. Eligible pre-selected candidates will also be judged for the Dr. Leonard Nance Award for Excellence in Social Justice Research.

ARTWORK AND PHOTOGRAPHY

This year there are two contributing artists. Gordon Silva ('21) has produced the winning cover art "New World", which encapsulates the challenges of learning online, but also the opportunities for new types of interaction. The second, "Brave New World", from alumnus and graphic designer Michael Johnpoll, highlights our Abstracts section, and offers a slice of virtual learning. In both submissions, we see optimism, community and humor, all elements that have motivated and defined Stetson learning this year.

THE 2021 JUDGING PANEL AND ALTERNATES:

Dr. Rina Arroyo, Assistant Vice President for Development, Parent and Alumni Engagement
Dr. Bruce Bigman, MD
Dr. Martin Blackwell, Adjunct, History
Dr. Elizabeth Boggs, Director of Career and Professional Development
Keith Casto, JD, Cooper, White and Cooper Law

Barbara Costello, Associate Professor/Government Information & Research Librarian
Dr. Christopher De Bodisco, Assistant Professor of Economics
Joe Del Rocco, Assistant Professor of Practice, Computer Science
Dr. Michael Eskenazi, Assistant Professor of Psychology
Dr. Heather Evans-Anderson, Assistant Professor of Health Science
Dr. Melissa Gibbs, Professor of Biology and Director of Aquatic and Marine Biology
Dr. Bert Gordon Chemist, J.R. Reynolds
Terry Grieb, Assoc. Professor Emeritus of Instructional Media
Dr. Lua Hancock, Vice President, Campus Life and Student Success
Dr. Stephanie Hollis, MD, CEO Solar Stik
Dr. John Horn, Vice-President (ret.) for Research & Development, 3M
Matthew Imes, Associate Professor of Finance
Lyda Kiser, Executive Director & Title IX Coordinator, Campus Life and Student Success
Nick Leibee, artist, Nick Leibee Art
Dr. Delphine Pinet, Assistant Professor of Practice, Chemistry live
Dr. Hari Pulapaka, Associate Professor, Math and Computer Science
Dr. Lisa Robison, Visiting Assistant Professor, Psychology
Dr. Matthew Shannon, Assistant Professor of Chemistry
Dr. Jean Smith, Assistant Professor of Biology

Cultural Credit: This year, cultural credit will be awarded by 15 minute participation blocks on Zoom or in person. For every 15 minutes logged into or attending a session, one-third of a cultural credit will be awarded. A maximum of five cultural credits can be earned for the symposium event. At each venue, student ID numbers will have to be used for cultural credit.

PROGRAM

ART AND DIGITAL ARTS PRESENTATIONS AND EXHIBITIONS

Homer and Dolly Hand Art Center

Dr. Dengke Chen, Morning Session Chair

Grace Kaletski, afternoon session chair

Judges: Nick Leibee

On Campus

ART-1 9:50-10:05 **Carly Perales**

ART-2 10:10-10:25 **Anyawu Zahira** Schubert's Mushroom Garden

ART-3 10:30-10:45 **Faith Belflower** Encapsulating Vehemence

10:45-11:10 BREAK

ART-4 11:10- 11:25 **Grace Crandall** A Place You Want to Stay

ART-5 11:30-12:00 **Grace McElroy** LACUNA: An Exploration Into Manipulatives Of Audio Signals For Classroom Use

11:50-1:00 LUNCH

Virtual Session

ART-6 1:00-1:15 **Gordon Silva** Acoustically Treating Collective Church/Dreka Theater

ART-7 1:20- 1:35 **Jacob Woods** Audio Production for Procedural and Linear Environments

ART-9 1:40-1:55 **Connor Bradt** The Chase: Creating an Environment that Tells the Player How to Move throughout a Level

ART-9 2:00-2:15 **Anthony Donofrio and Olivia Donofrio** Perilous Journey

JUNIOR MUSIC RECITALS

On Campus

Lee Chapel, Elizabeth Hall

Judges: Jane Christeson, Dr. Thomas Masse

Repertoires are to be found in Abstracts (long program), or at end of Short Program

M-1 9:00-9:30 **Nicholas Shefstad**, Organ

M-2 10:00-10:30 **Elené Okruashvili**, Piano

M-3 11:00-11:30 **Destiny Malave**, Clarinet

M-4 12:00-12:30 **Nathan Clifford**, Violin

M-5 1:00-1:30 **Jonathan Dills**, Cello

M-6 2:00-2:30 **Annabrett Ruggiero**, Voice (Mezzo-Soprano)

M-7 3:00-3:30 Zaria Graves, Viola

M-8 4:00-4:40 Rachel Nolasco, Flute

ORAL PRESENTATIONS – SESSION A

On Campus

John E. Johns Room 315, Elizabeth Hall

Dr. Emily Mieras, morning session chair

Sidney Johnston, afternoon session chair

Judges: Dr. Martin Blackwell, Dr. Michael Eskenazi, Dr. Lua Hancock

ART AND MUSIC VIRTUAL

A-1 9:00- 9:15 Faith Belflower A Declaration of the Ceramics Status from Craft to Fine Art

A-2 9:20-9:35 Andrew Nadeau Kara Walker: Acclaim, Slavery, and Controversy

9:55-10:05 BREAK

ART AND MUSIC ON CAMPUS

A-3 9:40-9:55 Paul Liu Art, Anthropology, and Liminality in the Arctic: Carlos Casas' Experimental Siberian Documentary

9:55-10:05 BREAK

A-4 10:05-10:20 Jaylen Walton The Importance of Image

A-5 10:25- 10:40 Adam Wallace Stetson University Band Program 1955-1974: Repertoire, Performances, and Personnel Under Richard Feasel

SUSTAINABILITY AND HEALTH

A-6 10:45-11:00 Olivia Lubitz Conservative Environmentalism - a Paradox or the Solution?

A-7 11:05-11:20 Summer Marshall Speciesism: The Unfortunate Reality of Octopus Species in Captivity

A-8 11:25-11:40 Sara Gerken Framing Effects on Mental Health Stigma

A-10 11:45-12:00 Nicanor Vergara Bluu Prototype

12:00-1:00 LUNCH

RACE, ETHNICITY, JUSTICE

A-10 1:00-1:15 Ocean Crawley-Sweeney The Impact of Social Determinants of Health on COVID-19 Health Disparities in Tampa, Florida

A-11 1:20-1:35 Jasmaine Tinsley Juneteenth, Civil Rights, and the Fight for Freedom. A Comparative Study, 1920-1960

A-12 1:40-1:55 Ryan Mason A New Justice: Analyses of criminal justice

A-13 2:-2:15 D. Zevi Altus Estimating Kurdish Population in Turkey: Population modeling with regression and Leslie matrices

2:15-2:25 Break

POLITICAL AND ECONOMIC FORCES

Virtual

A-14 2:25-2:40 Hannah Weary What political policies have best promoted growth in Latin America?

A-15 2:45-3:00 Kennedy Ryder The Early Federal Republic's Forgotten Crisis: How Konrad Adenauer Stabilized West Germany Through Solving the Refugee Question (1945-1953)

A-16 3:05-3:20 Grace Highsmith Nudge Theory Implications on Voter Participation

A-17 3:25-3:40 Katarzyna Kubicz Econometric Analysis of Economic Factors Causing Crime Rate Decline In The US Between The Years 1995-2009: A State Level Analysis

A-18 3:45-4:00 Joseph Williams Awareness of Detrimental Topics in Society

ORAL PRESENTATIONS - SESSION B

On Campus

25 Library Auditorium – Media Center

On Campus Session

Dr. Sean Beckmann, morning session chair

Dr. Terence Farrell, Afternoon Session Chair

Judges: Dr. Heather Evans-Anderson, Dr. Delphine Pinet, Barbara Costello

SCIENCE ACROSS THE SPECTRUM I

B-1, 9:45-10:00 Anna Baj Investigating how a Single Point Mutation in FUS1 Alters Yeast Cell Fusion

B-2, 10:05-10:20 Leah Day An Analysis of *Pterygoplichthys disjunctivus* in Blue Spring Nutrient Composition Compared to Local Fish

B-3 10:25-10:40 Cayla Gonzalez How does diet effect the growth rate of Exotic (*Pomacea insularum*) and Native (*Pomacea paludosa*) Apple Snails?

10:40-10:55 Break

B-4 10:55-11:10 Tabor Filippello Longitudinal change in fish size in a central Florida spring

B-5, 11:15-11:30 Cheyanne Mills Investigating TOR Pathway in *Vanessa cardui* Butterflies Treated with Rapamycin

11:30-1:00 – Lunch

B-6 1:00-1:15 Gerald Reidenbach Abundance and distribution of armored catfish (*Pterygoplichthys disjunctivus*) feces in Volusia Blue Spring

B-7 1:20-1:35 Trevor Storey How does Habitat usage and availability effect genetic diversity?

B-8, 1:40-1:55 Emily Wolcott Acupuncture as an Analgesic: Reduction of Post-Operative Pain in Veterinary Periodontal Surgery

B-9 2:00-2:15 Benjamin Tucker Oxidative Stress on human leukemia cells with *alpinia zerumbet* seed extract

ORAL PRESENTATIONS – SESSION C

Virtual

Dr. Kevin Riggs, morning session chair

Dr. Ken McCoy, afternoon session chair

Judges: Dr. Bruce Bigman, Dr. John Horn, Dr. Matthew Shannon

SCIENCE ACROSS THE SPECTRUM II

C-1, 9:00-9:15 Yizheng Wang Detection and Tracking on Fisheye Videos

C-2, 9:20-9:35 Jennifer Kisow Is There a Positive Relationship Between Style Length and Reproductive Success in The *Chamaecrista fasciculata* Plant?

C-3, 9:40-9:55 Matisyahi Fogel Using Molecular Docking to Study Known SINE XPO1 Inhibitors and to Design Novel SINE XPO1 Inhibitors

C-4, 10:00-10:15 Marie Visone Can *Raillietiella orientalis* spread northward in North America?

10:15-10:25 **BREAK**

C-5 10:25 -10:40 Stephen Korotasz Measuring the Viscosity of Ferrofluids

C-6, 10:45- 11:00 Jada Ho Point Mutation Fus1-F262A In *S. cerevisiae* Caused Improper Localization of Fus1p And Decreased Rate of Fusion

C-7, 11:05-11:20 Jordan Brothers Increased fecal density of loricariid armored catfish, *Pterygoplichthys disjunctivus*, in Volusia Blue Spring

C-8 11:25-11:40 Paxton Wilson Determining the Critical Temperature of YBCO and BSCCO

C-9 11:45-12:00 Emma Hall Prevalence of *Babesia microti* in southeastern rodent species

12:00-1:00 Lunch

C10 1:00-1:15 Shannon Besile Antioxidant Capacity of *Ilex Vomitoria* When Tea Preparation is Altered Compared to Lipton Green tea and Original Yaupon Holly Tea

C-11, 1:20-1:35 Breanna Valderrama The Effect of Multiple Auditory Cues on the Intensity of Mobbing Response by Florida Birds

C-12, 1:40--1:55 Dante Jones Testing the Einstein Equivalence Principle with the Atacama Cosmology Telescope

1:55-2:05 Break

C-13, 2:05-2:20 Marie Domina *Mus musculus* as an Intermediate Host of a Recently Introduced Snake Parasite in Florida, *Raillietiella orientalis*

C-14, 2:25-2:40 Koreigh Gabriel Comparison of Commodity Oils in Biodiesel Production

C-15 2:45-3:00 Laurel Tokar Phenotypic expression of FUS1 point mutation F262A on fusion related processes

C-16 3:05-3:20 Johnisha Wright Comparison of floral fragrance components of *Oncidium* Sharry baby (Orchidaceae) with other chocolate fragrances

C-17 3:25-3:40 Liam Britton Analyzing Crystals through the use of X-Rays

ORAL PRESENTATIONS – SESSION D

Virtual

Dr. John York, Morning Session chair

Dr. Cynthia Bennington, Afternoon Session Chair

Judges: Dr. Bert Gordon, Dr. Stephanie Hollis, Dr. Melissa Gibbs

SCIENCE ACROSS THE SPECTRUM III

D-1 9:00-9:15 Darby Thomas Will excretion rates of Sailfin suckermouth catfish (*Pterygoplichthys disjunctivus*) in Blue Springs State Park continue to raise or eventually even out?

D-2, 9:20-9:35 Jake Simmons ‘Socially Distancing’ Points on an Ellipsoid

D-3, 9:40-9:55 Caitlin Bhagwandeem Identification of Potential Reservoirs of Pathogenic *Bartonella* Species

D-4, 10:00-10:15 Daminie Appavoo Mathematical Optimization Methods: Application in Project Portfolio

D-5, 10:20-10:35 Shmuel Fogel Ethanol-based extracts from *Alpinia zerumbet* induce apoptosis in CLL cells via PAK-1 inhibition

10:35-10:45 BREAK

D-6 10:45-11:00 Tessa Barnard Exotic fish biomass may exceed native fish biomass in Volusia Blue Spring

D-7, 11:05-11:20 Derek Hinton Comparing Efficiency of Ducted vs Un-Ducted Propellers in Aquatic Environment

D-8, 11:25-11:40 Kayla Davis Feces from invasive armored catfish, *Pterygoplichthys Disjunctivus*, alter nutrient dynamics in Florida springs

D-9 11:45-12:00 Jenna Smith Designing an Apparatus to Measure the Elasticity of Human Cells and Tissues Management

12:00-1:00 Lunch

D-10 1:00-1:15 Madison Reeves Linking the antioxidant strength of fruits and vegetables to their phytochemical components

D-11 1:20-1:35 Sarah Hill Optical Microphone with PID Feedback Circuit

D-12, 1:40-1:55 Yasmine Nagah Abdou Optimization of PCR amplification conditions to determine the DNA sequence of *engrailed* in butterfly species *Vanessa cardui*

D-13, 2:00-2:15 Jordan Ogg Amyloid- β -Induced chemotaxis behavior and neuronal morphology in transgenic *Caenorhabditis elegans*

D-14 2:20-2:35 Amber Caton Health Implications of Pentastomes (*Raillietella orientalis*) on Banded Water Snake (*Nerodia fasciata*) Health

D-15 2:40-2:55 Sydney Gragg City of Palm Bay Greenhouse Gas Inventory for Facility's Electrical and City Fleet Usage of 2018

ORAL PRESENTATIONS – SESSION E

Virtual

Dr. Fazal Abbas, morning session chair

Dr. Kirsten Work, Afternoon Session Chair

Judges: Dr. Hari Pulapaka; Dr. Lisa Robison, Dr. Jean Smith

SCIENCE ACROSS THE SPECTRUM IV

E-1 9:00-9:15 Tahira Perry Impact of light availability and the mutualistic relationship with nitrogen-fixing bacterium, Rhizobium, on above ground growth of *Chamaecrista fasciculata*

E-2, 9:20-9:35 Wade Hart Imaging Graphene Quantum Dots Using Atomic Force Microscopy

E-3, 9:40-9:55 Matthew Miller Do roaches Serve as an Intermediate Host for an Invasive Pentastome Parasite

E-4, 10:00-10:15 Megan McLean Inhibitors Influence on Hedgehog Signaling Pathway in *Vanessa cardui* Butterflies

E-5, 10:20-10:35 Markala Roland The influence of light intensity on the mutualism between nitrogen-fixing rhizobium bacteria and the partridge pea plant, *Chamaecrista fasciculata*

10:35-10:45 BREAK

E-6 10:45-11:00 Ashley Herrera The prevalence of *Borrelia* spp. DNA in rodent reservoirs in Deland, FL

E-7, 11:05-11:20 Bradley Alexander Omega-3 Fatty Acid Diets Cause Significant Physical Changes to the Heart and Induce Various Levels of Activated Neurons in the Paraventricular Nucleus and the Nuclear Solitary Tract

E-8, 11:25-11:40 Carol Minott Analyzing the Structural Properties of Cosmetic Formulations

E-9 11:45-12:00 Abdul Muneeb Relationship between heterospecific pollen receipt and reproductive success in partridge pea (*Chamaecrista fasciculata*)

12:00-1:00 Lunch

E-10 1:00-1:15 Kathryn Moran Identifying Health Impacts of *Railietiella orientalis* Infection in Banded Water Snakes

E-11 1:20-1:35 Cordelia Meixsel Optical Tweezers: The Manipulation of Small Organisms Using Light

E-12 1:40-1:55 Jeffrey Lu Short Term Omega-3 Modulated Neural Activity in the CA-3 and Dentate Gyrus Regions of the Hippocampus in Wistar Rats

E-13 2:00-2:15 Alison Martin Effects of Ibuprofen on Development of Axolotl Embryos

ORAL PRESENTATIONS - SESSION F

Virtual

Dr. Randall Croom, Morning Session Chair

Nicole King, Afternoon Session Chair

Judges: Keith Casto, Joe del Rocco, Lyda Kiser

MARKET FORCES

F-1 8:45-9:00 **Kelly Liu (SOBA)** Critical Analysis of the 2015 Patreon Data Breach

F-2 9:05-9:20 **Jessica Hurtado** Understanding Self-Control and Impulsive Buying Decisions: The Role of Ego Depletion

F-3 9:25- 9:40 **Cameron Dias (SOBA)** Mental Health Effects on Workaholics

F-4 9:45 -10:00 **Timothy Gyenis** Economic Impact of Covid-19 on America's Restaurant Industry

F-5 10:05-10:20 **Dylan Slattery (SOBA)** Working in the Pandemic Era of Work

10:20-10:30 BREAK

F-6 10:30-10:45 **Jessica Matilzski** Selling Secondhand Concert Tickets: What is your Best Bet?

F-7 10:50-11:05 **Hannah Russo** Republican Theory of Labor and Caring Labor

F-8 11:05 – 11:20 **Colin Ibison (SOBA)** The Red Tide and Tourism

F-9 11:25-11:40 **Caitlyn Bhagwadeen** Art Value in the Art Market: A Case Study on Yayoi Kusama

F-10 11:45-12:00 **Campbell Cole** Working Hours and its Impact on Productivity and Suicide

12:00-1:00 LUNCH

EDUCATION AND STUDENTS

F-11 1:00-1:15 **Anna Hamilton** A model for maximization of Stetson student learning through community impact

F-12 1:20-1:35 **Vienna Sarno** College Students' Interpretations of Stickers on Their Peers' Belongings in Social Settings: Expressing Identity, Ideologies, Unity, and Division Through Stickers

F-13 1:40-1:55 Jack Harris (SOBA) Bully Prevention Study

F-14 2:00-2:15 Andrew Butler (SOBA) High-Poverty Schools

2:15-2:25 BREAK

PHYSICAL AND MENTAL HEALTH

F-15 2:25-2:40 Samuel Friedman (SOBA) Exploring mean reversion in relation to quality of life, before, during, and after covid

F-16 2:45-3:00 Kristen Fellion (SOBA) Timing Measures Growth

F-17 3:05-3:20 Bradley Alexander The War on Disease. WWI as a Catalyst for Preventative Medicine, 1919-412

F-18 3:25-3:40 Anthony Rivardo Studying the correlation of sleep/rest & wellness to academic achievement amongst college students

ORAL PRESENTATIONS – SESSION G

Virtual

Jean Wald, Morning session chair

Dr. Lou Sabina, Afternoon Session Chair

Judges: Dr. Elizabeth Boggs, Matthew Imes, Terry Grieb

DIVERSITY, EQUITY, INCLUSION

G-1 8:20-8:35 Daminie Appavoo Understanding the racial gap within the housing market

G-2 8:40-8:55 Victoria Crawford Renovating a space to revitalize a place: Cultural heritage, social well-being, community health and Deland's African American community well-being

G-3 9:00-9:15 Julia Bassett Victimized and Privatized: How Medical Interests Weaponized and Racialized Cocaine (1880s-1920s)

G-4, 9:20-9:45 Steven Kalicharan and Kiara Santiago The Toxicity of Gender in Shakespeare and Its Performance in The Past is Prologue

G-5 9:50-10:05 Mason Kempf (SOBA) The Cultural Importance of Sports

10:05-10:15 BREAK

G-6 10:15-10:30 James Parman The Paradox of Nostalgia for the “American Indian”: How the heroic image of Native Americans emerged from a century of relocation, cultural Warfare, and extermination, 1840-1913

G-7 10:35-10:50 Alyssa Louk *The Knight’s Tale*: 16th and 21st Century Perspectives

G-8, 10:55-11:10 Nelson Quezada-Herrera Dismantling the Myth of Racial Progress in the United States Through Colson Whitehead’s *The Underground Railroad*

G-9 11:15-11:30 Nathaniel Dent (SOBA) The Inequality of Women

G-10 11:35-12:00 Aliya Cruise and Caleb Roberts (ACT)ion: Combating Social Justice Issues Through Devised Theatre

12:00-1:00 LUNCH

School of Business Administration: MANAGING STUDENT STRESS, SELF-IDENTITY AND SADNESS IN UNUSUAL TIMES

G-11 1:00-1:15 Sidney Bailey (SOBA) Negative Reactions to Specific Music Genres

G-12 1:20-1:35 Guilherme Pinheiro (SOBA) Understanding Distrust and Its Effects

G-13 1:40-1:55 Hailey Carter (SOBA) Do Blondes Have More Fun?

G-14 2:00-2:15 Emily Saccone (SOBA) Cat People Vs. Dog People: What’s the Difference?

2:15-2:25 Break

G-15 2:25-2:40 Gabriela Casado (SOBA) Procrastination among college students and how it can be tied to mental health

G-16 2:45-3:00 Mohamed Annabi (SOBA) The relationship between social types, depression, and anxiety

G-17 3:05-3:20 Marcella Oliver (SOBA) Is it social media or is it just me?

G-18 3:25-3:40 Anthony Totaro (SOBA) Social Media and Information Privacy

SESSION H

HONORS 102 SERVICE LEARNING AS SCHOLARSHIP

322 Elizabeth Hall

Kevin Winchell, Session Chair

Students in Honors 102 identify a meaningful need in the community, then create and implement a project to address that need. The students have recorded presentations to share their research, plans, results, and learning reflections; these presentations are viewable at [insert link here to forthcoming Honors Program YouTube Channel]. Below is a list of student teams and their project titles.

Plants with a Purpose **Audrey Berlie, Faith Hannah Lea, Jacob Robinson, Sadie Jensen**

Baby Steps to Maternal Support **Miranda Bihler, Laura Cheshire, Janie Wang, Christian Gomez**

Cat Friendly Campus: TNR at Stetson **Coral Kehm, K Mauser, Tiffany Cloo**

Student Activists Teaching (SAT) **Christian Berberich, Alexander Garofalo, Jackson Gray, Wyatt Sise**

For the Boys and Girls Club **Madeline Strojje, Steele Norton, Colton Myers, Dylan Anderson**

Expanding the Reach of West Volusia Audubon **Carlye Mahler, Jace Rowley, Phong D Vo**

Seeds of Solidarity **Cas Bradley, Alexa McDonough, Juliet Tonkin**

Preventing Addiction in DeLand **Avery Korp, Gabby Carlson, Hunter Azme**

Rediscovering DeLand: Restorative Archival Research **Catherine Kraft, Joseph Parr, Grace Herzog**

BFB Accessories LLC **Kimberly Calero, Evans Asuboah, Kaitlyn Stroud, Kara Mammola**

Spring Hill Community Garden Rejuvenation Project **Erin Newman, Fred Van Ness, Casey Brown, Andrew Glennon**

COVID-19 Vaccine Education and Empowerment **Madeleine Boyd, Kaci Kruglewicz, Eve Nascimento, Nicole Garcia Milan, Hannah Swartz**

6:15: Award Announcements

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ABSTRACTS

Arts

Faith Belflower (Dr. Katie Baczeski and Dr. Luca Molnar)
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“Encapsulating Vehemence”

Art is a platonic lover of mine. It allows me to be the highly empathetic person that I am while a range of emotions consume me beyond my control. Interactions, events, and thoughts affect how I perceive and handle these emotions. I encapsulate these strong feelings on the surface of forms through the use of texture and color. In this body of work, “Encapsulating Vehemence”, I focus on the interplay of a triangular sculptural piece, oil painted shapes, and ceramic eggs. The goopy blob triangle is the home

environment for the different feelings to thrive. This home base is a result of experimental techniques using materials like pourable foam and pearlescent car pigments. The colored shapes and egg forms are the bodies to these emotions. They are birthed from impasto oil painting and ceramic pieces which provide the textural varieties that mimics the different emotions I feel. Experience my mindscape all at once or take a closer look. Pick up an egg or two and allow yourself to see what attitudes it has to offer. Each one is longing to be felt physically and emotionally. I promise you, they won't bite.

Connor Bradt (Dr. Dengke Chen)
cbradt@stetson.edu

The Chase: Creating an Environment that Tells the Player How to Move throughout a Level

For my updated project, wanted to try to make a game that will allow me to focus on level design, and how enemy AI reacts to the player's actions. Originally I wanted to focus on making levels that would focus movement and use motion capture to easily make the needed animations. However, given the situation the world is currently in my new focus is to make a level where the player would have to make decisions on where to move based on the level environment. I tried in making a video game level that would try to guide the player throughout the level without directly showing, or telling, them where to go. Using Unreal Engine 3 and other resources provided to me from FIEA I think I was able to make a level that succinctly tells the player how to move throughout the level.

Makeda Charles (Dr. Matthew Roberts)
mjcharles@stetson.edu

I Know Those Eyes

I Know Those Eyes is a fictional short story narrative that has three supporting illustrations printed out on canvas, with illustrated covers and an illustrated front page. It's a story that follows the eternal romance of a Kitsune, Abdu, and an Oni, Mokoto, as they are reincarnated, a story that aims to bring about more representation for underrepresented groups within conventional, modern media. With this story, I aim to represent Inuit people, black asians and a women love women, interracial relationship that isn't entirely centered around LGBTQ+ or racially charged traumas. The story will be displayed in the Hand Arts Center during the end of the year Stetson Showcase, with the book on a small pedestal and the three canvases hanging above it.

Grace Crandall (Dr. Luca Molnar)
gcrandall@stetson.edu

A Place You Want to Stay

My work is about the figure in the in-between moments of rest and pause, battling between the contemporary and the traditional, the personal and the impersonal. With this series, I chose to create

something personal – depicting those closest to me and the interplay between the way I view them through my relationships, as well as the spectator’s perspective as the figures drift within and out of the flat pattern work. I construct large scale, figure and pattern-based paintings depicting the figures in oil, but the patterns and flatness with both acrylic and house paint. All aspects of the paintings are hand-drawn, allowing for the looseness of line, drawing, and shape, the individual imperfections that both define art and life.

Anthony Donofrio and Olivia Donofrio (Dr. Charles Underriner)
adonofrio@stetson.edu; lila.cleo2011@gmail.com

Perilous Journey

Music is a medium in which I have grown to love and appreciate for its complexity in its ability to invoke emotion and create stories. With this appreciation for what music can achieve, I set out to create an orchestral symphony of three movements that would tell a story through the music alone, also known as programmatic music. Programmatic music was created by a number of composers, but the main composer that defined programmatic music for what it is, was Hector Berlioz and the symphony he created in 1830, *Symphonie Fantastique*. Berlioz became my main source of inspiration as I saw what this type of composition can achieve. Usually, I would write music to go along with some kind of visual media and apply it to that, much in the way that film and video game music is applied. Stepping out of my comfort zone in composing, I focused on writing music that would tell the story of the Hero’s Journey. The Hero’s Journey is a writing format, coined by Joseph Campbell, for all storytelling, but mostly used in the adventure genre. Each movement in the symphony focuses on the main three parts of the Hero’s Journey: The Ordinary World, The Special World, and The Return. To go along with the music, I commissioned my sister, Olivia Donofrio, who is a Stetson Digital Art graduate, to create digital paintings to go along with the music that I created, helping emphasize the story that it is telling. With funding received by the Dean’s Fund from the School of Art and Science, the digital paintings will be printed onto canvases and displayed in the Hand Art Center for the Senior Art Showcase.

Grace McEllroy* (Dr. Nathan Wolek)
gmcclroy@stetson.edu

LACUNA: An Exploration Into Manipulatives Of Audio Signals For Classroom Use

LACUNA means ‘an unfilled space or interval; a gap; a missing portion.’

I have been presented with a small gap in the education of students of audio: the lack of physical representative manipulatives of actual audio signals. A manipulative—or model—is defined as an object that can be manipulated to enhance a students’ learning. An example is number blocks for math. It’s standard for teachers to show audio in terms of graphed points, and students in classrooms who have visual impairments (or more tactile learners) may find it hard to fully grasp the contexts of 2D pictures, or overcome the obstacle of a poor projector. This project is aiming to create physical models of sounds

using a 3D printer to aid in the education of those interested in audio. My work includes recording sounds, creating pictures of the sound, developing precise procedures to turn the picture into a digital model, and printing the model.

*SURE Grant recipient

Gordon Silva* (Dr. Nathan Wolek)

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Acoustically Treating Collective Church/Dreka Theater

The study of acoustics as a field of research began with Walter Clement Sabine and his work with Boston's Symphony Hall, making specific architectural plans with the highest priority given to how to hall sounds. This field is highly applicable to all sounds that exist in any room, and is a necessary consideration for all studios, performance venues, home theaters, concert halls and the like. My project was to apply these acoustic principles to a space: Collective Church housed in the historic Dreka theater. Over the summer I measured the space's dimensions and considered the acoustic properties of all the surfaces in the room, as well as taking audio measurements of the space. Using these data, I was able to recommend the optimal amount of sound treatment for the space.

*SURE Grant recipient

Jacob Woods (Dr. Nathan Wolek)

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Audio Production for Procedural and Linear Environments

Audio serves as a crucial element in telling a visual story, whether that story is interactive or only meant for observing. The process for incorporating audio can change drastically depending on if the sound is represented procedurally (out of order or based on events) or linearly (from start to finish). To place sound into fully functioning, interactive video games, audio must be integrated into the software using middleware or by directly using the game development engine. This method, known as procedural audio, results in a dynamic and unpredictable experience for the user. Using FMOD Studio, Matt Makes Games' Celeste, and a variety of audio recording and sound editing tools, I developed my own music and sound design and placed them into various sections of Celeste (namely the title screen, menu, prologue, and level 1). In the development of my senior project, I created two demo reels focused solely on sound design: one for video games and the other for animation. Using the same recording and creation techniques used for Celeste – including new ones that I discovered throughout my research experience, I again applied audio to a visual media except without the aid of middleware and advanced automation. The goal is to showcase my process of creating sound design and to highlight the differences and similarities between audio for procedural and linear environments.

Anyawu Zahira (Dr. Luca Molnar)

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Schubert's Mushroom Garden

Mushrooms are kind of magical, their mycelium spreading far and wide and more ancient than you know. Seemingly appearing overnight, but instead lying in wait for the perfect moment to fruit and spread their spores, increasing their fungal network. It's a fleeting but wonderful moment, to catch one. A snapshot in time and I want to show you just that. An impossible moment of beautiful bodies that would never exist in the same environment, standing tall at the height of their growth. They're so diverse and amazing and it's mindboggling to think that they're all within the same family. What makes a mushroom a mushroom, like what categorizes it as a mushroom and not just a fungus? They decompose things the same as mold, spread spores the same, and some can kill you the same, but mold isn't a mushroom. They're nature's funky little decomposers and they bring me a sense of wonder and joy. There's something delightful about imitating things that don't last. Mushrooms sprout and wither, but ceramic will last as long as you'd like. I want to share the sense of the wonder, suspended in this moment.

ORAL PRESENTATIONS

Music

Music

Nicholas Schefstad (Boyd Jones) Organ

nschefstad@stetson.edu

Praeludium in C Major, BuxWV 136 Dieterich Buxtehude (1637-1707)

Allein Gott in der Höh sei Ehr, BWV 662 Johann Sebastian Bach (1685-1750)

Organ Sonata No. 11, Op. 148 Josef Rheinberger (1839-1901)

II. Cantilène

Les Corps Glorieux Olivier Messiaen (1908-1992)

VI. Joie et claret des Corps Glorieux

Elené Okruashvili (Dr. Sean Kennard), Piano

eokruashvili@stetson.edu

Adagio in B Minor Wolfgang Amadeus Mozart (1756-1791)

Prelude, Op. 23 No. 6 Sergei Rachmaninoff (1873-1943)

Prelude, Op. 32 No 12

Romance in F Minor Pyotr Tchaikovsky (1840-1893)

Fairy Tale, Op. 51 No. 3 Nikolai Medtner (1880- 1879)

Destiny Malave (Dr. Lynn Musco) Clarinet

dmalave@stetson.edu

Hannah Sun, piano

Trois Caprices für Klarinette und Klavier Rudolf Jettel (1903-1981)

Three Pieces for Solo Clarinet Igor Stravinsky (1882-1971)

I. (Preferably in A)

II. (Preferably in A)

III. (Preferably in Bb)

Andante et Allegro Ernest Chausson (1855-1889)

Nathan Clifford (Routa Kroumovitch-Gomez) Violin

nclifford@stetson.edu

Jacob LyteHaven, piano

Concerto No. 1 in D Major Sergei Prokofiev (1891 - 1953)

Partita No. 2 in D Minor, BWV 1004 Johann Sebastian Bach (1685-1750)

Chaconne

Jonathan Dills (Dr. Jamie Clark) Cello

jdills@stetson.edu

Suite no. 5 in C Minor, BWV 1011 Johann Sebastian Bach (1685-1750)

II. Allemande

Concerto No. 2 Op. 77 Dimitri Kabalevsky (1904-1987)

I. Molto sostenuto

Jacob LyteHaven, piano

Seven Tunes Heard in China (1995) Bright Sheng

I. Seasons

VII. Tibetan Dance

Annabrett Ruggiero (Dr. Craig Maddox) Soprano

aruggiero@stetson.edu

Jacqueline Compton, piano

Les Berceaux Gabriel Fauré (1845-1924)

Fleur Jetée

Nacht und Träume Franz Schubert (1797-1828)

Gretchen am Spinnrade, Op. 2, D 118

“Una voce poco fa” (Il barbiere di Siviglia) Gioachino Rossini (1792-1868)

Four Songs, Op. 13 Samuel Barber (1910-1981)

I. A Nun Takes the Veil

II. The Secrets of the Old

III. Sure on this Shining Night

City Called Heaven Hall Johnson (1888-1970)

Zaria Graves (Dr. Jesus Alfonzo) Viola

zgraves@stetson.edu

Kristie Born, piano

Élégie in F Minor, Op. 30 Henri Vieuxtemps (1820-1881)

Le Grand Tango Astor Piazzolla (1921-1992)

Der Schwanendreher Paul Hindemith (1895-1963)

I. Zwischen Berg und tiefem Tal

Rachel Nolasco (Dr. Tammara Phillips) Flute

rpulasco@stetson.edu

Concerto in E Minor Saverio Mercadante (1795-1870)

I. Allegro Maestoso

Sonatine Pierre Sancan (1916-2008)

Au-Delà Du Temps (2002) Yuko Uebayashi

IV. La lumière tournante dans le rêve

Rachel Nolasco, flute

Pedro Mujica, flute

Oral Presentations

Yasmin Nagah Abdou (Dr. Lynn Kee)

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Optimization of PCR amplification conditions to determine the DNA sequence of *engrailed* in butterfly species *Vanessa cardui*

The function of *Engrailed* in butterfly species *Vanessa cardui* is unknown to this day. Based on experiments conducted on other species, it is likely that its presence affects wing patterning. In my research, I sequenced a section of the gene *engrailed*, which codes for the protein Engrailed, to kickstart the journey of figuring out what the role of Engrailed is in *V. cardui*. I found the gene *engrailed* in *V. cardui* by looking for a known sequence of it in a species that closely resembles it, *V. tameamea*, and matching that sequence to an almost identical one in *V. cardui*. I then sequenced Exon 1 in *V. cardui* and discovered that the optimal conditions to PCR amplify the sequence involves 30 cycles. Having found the matching sequence for the gene in *V. cardui* and having successfully sequenced the first part of the gene, now we are one step closer to figuring out the role of protein *Engrailed* in *Vanessa cardui*. Using CRISPR/Cas9 technology—and the whole sequence of the gene is known—engrailed can be mutated in *V. cardui* and its role can be explored in future studies.

Bradley Alexander (Dr. Eric Kurlander)

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The War on Disease. WWI as a Catalyst for Preventative Medicine, 1919-41

Previous to World War 2 (WWII), disease often ravaged the battlefield more effectively than any military unit ever could. During the Civil War, 62.0% of deaths during the war on the Union side were caused by diseases like pneumonia, typhoid, diarrhea/dysentery, and malaria; none of which had no proper treatment or prevention. When broken down, this means that about 435,600 soldiers had died from disease alone (not including civilian casualties).¹ Compared to today, the hygiene and medical conditions where soldiers were treated was atrocious. The Civil War fostered a common mistrust of the medical field throughout the military and the civilian population. When comparing the death by disease statistics from the Civil War to WWI, only 0.6% of soldiers had died to disease. When asking why this drastic change happened, I would say it is due to the tragic coincidence of a world war and an influenza pandemic occurring at the same time. Thus, unlike in the previous wars, the reliance on medicine and vaccine usage spiked.

D. Zevi Altus* (Dr. Lisa Coulter)

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Estimating Kurdish Population in Turkey: Population modeling with regression and Leslie matrices

Kurds are a major ethnic group in Turkey, comprising somewhere between 10% and 35% of the country's population. Estimates vary wildly as there is no official data – Turkey has not recorded Kurdish population in a census since 1965. Issues of human rights, sectarian violence, and geopolitics revolve around this population, so estimating accurately is important for policymakers and activists. This project uses several mathematical approaches to model Kurdish population change in Turkey over the past 30 years. Population data are analyzed using growth functions, regression analysis, and Leslie matrices. Finally, this paper estimates current and near-future population of Kurds in Turkey and evaluates the mathematical techniques and their utility in demography. Initial results indicate a Kurdish growth rate that is decreasing but still higher than for the rest of Turkey and a Kurdish population that is roughly the same proportion of Turkey's population as in past decades.

Mohamed Annabi (Dr. Randall Croom)

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The relationship between social types, depression, and anxiety

The purpose of my investigation is to determine if there is a correlation between certain social behavioral types when observing anxiety and depression. The behavioral types I am testing are extraversion and introversion. Extraverted individuals tend to be more outgoing and sociable; introverts tend to be quiet and reserved. According to Anxiety Outside's findings, introverts are more vulnerable to depression because they tend to have a lower self-esteem and minimal social support. Severe mental health conditions thrive on loneliness. Although depression and anxiety are seen in both social types, I want to determine whether there is a correlation between these two conditions and the different social behavior types or if there is no correlation at all. I hypothesize that the findings will show a stronger correlation towards introverts when looking at both depression and anxiety.

Daminie Appavoo* (Dr Fazal Abbas and Dr Lisa Coulter)

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Mathematical Optimization Methods: Application in Project Portfolio Management

In this project, we solved a modification of the Black-Scholes Equation using the Crank- Nicolson method by incorporating more real-life assumptions variables concerning the current day trading to the equation. The main focus of the research is to derive a fair price for the American option. The Black-Scholes theory of option pricing, developed by Black, Scholes and Merton is one of the most influential theories in finance. The Black Scholes Model is a mathematical equation used to determine the fair price for a call or a put option based on six variables: volatility, type of option, underlying stock price, time, strike price and risk-free rate. According to the idea of Black- Scholes, the option price can be modeled as

a terminal boundary problem for a partial differential equation. The Crank-Nicolson method is a finite difference method used to numerically solve Partial Differential Equations such as the Heat Equation. Our primary goal has been to consider the continuous effect of time on the price of an option.

*SURE Grant recipient

Daminie Appavoo (Dr. Christopher de Bodisco)
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Understanding the racial gap within the housing market

Over the past few months, there has been an awakening in the United States vis-à-vis the many daily and sometimes subtle discriminations the Black community suffers from. This research aims at better understanding the discrimination Black people faced within the US housing market. Our goal is to find out whether the race of a person decreases the market value of their house, taking into account various variables. To answer this question, we use an econometric analysis to evaluate the price of Black people houses compared to other ethnic groups. The main objective of this project is to try to show that historical housing segregation laws still affect the Black community today in the US.

Sydney Bailey (Dr. Randall Croom)
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Through my survey, I am studying if there are more negative feelings around different genres of music. More specifically, if certain genres of music can cause people to feel mysophobia, a disorder where people have abnormally strong and negative reactions to the ordinary sounds human make, such as chewing or breathing. I am measuring if certain music genres can cause this same “fight or flight” response that leads to feelings of anxiety, anger, or stress. I am hoping to discover correlations between individuals that feel similarly about music types. I believe that country and heavy metal will show high levels of anger, anxiety, or stress. My initial prediction was that opera would be included; however, I now believe people may not be the biggest fan of this genre, but it does not cause intense discomfort. Rap I believe, in people over 30, may cause levels of discomfort. Because EDM is a new type of music, I believe people over 30 will not have negative nor positive feelings towards it. EDM is quite popular in the modern generation, so I believe it will not receive negative results in individuals under 30. I have included in my survey questions about feelings about different genres of music, judgement/open-mindedness, adaptability, risk-avoidance, age, upbringing, and questions that pertain to mysophobia. It is critical in my research to see how people feel about the different genres of music on the scale of “I hate it” to “I love it”. I think people who answer negative responses for country, rap, and heavy metal will have high judgement and low open-mindedness, low adaptability, and high risk-avoidance. I am interested to see if there are similarities in age or upbringing.

Anna Baj (Dr. Jean Smith)
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Investigating how a Single Point Mutation in *FUSI* Alters Yeast Cell Fusion

Cell fusion is an important process in a wide range of living organisms. However, limited information is known about this mechanical process. One mechanism that involves cell fusion is mating of the yeast *Saccharomyces cerevisiae* by having two haploid yeast cells fuse to become one diploid cell. The cell walls of the two opposing yeast cells come into contact and slowly start degrading at the specific contact area so that the two plasma membranes can fuse. If the cell wall starts to degrade in an improper area, it can cause significant harm to the cells, but without any degradation, the cells will never fuse. Cell fusion is therefore regulated by genes that promote fusion properly to avoid causing harm to the cell. One gene that has a direct impact on yeast cell fusion is FUS1. Fus1 is a transmembrane protein that regulates cell fusion by degrading the cell walls between mating pairs. Fus1 is thought to localize mating-specific vesicles that contain hydrolases to break down the cell wall. Thus, a complete deletion of FUS1 blocks fusion before cell wall degradation. There are two known protein domains in Fus1, a transmembrane domain and a SH3 domain. SH3 domains are known to mediate protein-protein interactions, however how this domain specifically functions in Fus1 is unknown. I therefore created a single point mutation using site-directed mutagenesis in a highly conserved residue of the SH3 domain in Fus1. This single point mutation changes residue 469, a Histidine, into an Alanine. Using a Quantitative mating assay, I found that fusion in cells containing fus1-H469A was significantly blocked, shown by a lack of plasma membrane fusion between mating pairs. Preliminary data visualizing Fus1 protein localization in mating-induced haploid cells hints that the H469A mutation may affect the efficiency and location of Fus1 during fusion.

Tessa Barnard (Dr. Kirsten Work)
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Exotic fish biomass may exceed native fish biomass in Volusia Blue Spring

Florida spring systems have seen an introduction of exotic fish species throughout the years, with the number of them increasing steadily. In particular, Volusia Blue Spring, which is a smaller spring system compared to others throughout Florida, has seen an introduction of several of these species, including blue tilapia and sailfin catfish. To determine if the exotic fish have outweighed that of the native species, we counted and measured in two locations on the spring-run; up towards the head of the stream, and downstream near where the St. Johns connects. For larger fish species we video recorded the fish via GoPro and gathered length via laser pointers that were a set distance apart. For smaller fish, we seined in four quadrants in the two set locations and hand measured them. Length weight regressions from previous literature was used to calculate the weigh of the fish species. Overall biomass was then added together and a two-way ANOVA with replication was used to determine if the exotic fish biomass outweighed the native fish biomass. Ultimately, no significant difference between total native biomass and exotic mass was seen, however we did find that the native fish species significantly outweigh the exotic upstream and the opposite occurs downstream.

Jules Bassett (Dr. Nicole Mottier)
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Victimized and Privatized: How Medical Interests Weaponized and Racialized Cocaine (1880s-1920s)

When it comes to the illicit drug, cocaine, its early history in the United States is little known and overshadowed by more contemporary drug history and modern political discourse. The United States entanglement with cocaine and other narcotics originated long before President Nixon declared the war on drugs in 1971. What occurred between the late nineteenth century and into the 1930s is what many historians have characterized as a love affair that informed policy and society in lasting ways whose legacies can be seen today. Those such as David Musto suggest demand for the drug was curbed through unregulated public experience that exposed the underbelly of addiction to its users in ways that were not properly passed onto future generations. However, as Jeffery Clayton Foster points out, the swift downward curve in demand observed from America's first encounter with cocaine was quite distinct from the broader anti-drug and anti-alcohol sentiments that condemned opiates and whiskey in this time. What then, converted cocaine from a drug of such high esteem, to one of the most feared of all illicit narcotics? This paper will demonstrate how medical and pharmaceutical interests, though not always aligned, had significant roles in crafting the narrative of racialized anti-cocaine sentiments. Medical professionals sought to remain the sole gatekeepers and profiteers of the substance and formed powerful alliances with media outlets and local authorities to facilitate restrictive legislation that led to the permanent legal demise of cocaine by the end of the 1920s.

Faith Belflower (Dr. Katya Kudryavtseva)
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A Declaration of the Ceramics Status from Craft to Fine Art

My research project explores a contested status of ceramics within the art history canon. Throughout history, ceramics has been considered as a craft rather than fine art. Furthermore, ceramics was often described in terms of fragility, femininity, functionality, and decoration. While other mediums, for example, painting and sculpture, received sustained art historical and critical attention, ceramics was largely excluded from the art history canon. However, the existing status quo was challenged in the 1960s, as ceramicists made a tremendous breakthrough in being accepted as fine artists. This research project will analyze the myriad of factors that contributed to this shift by focusing on the American artist Peter Voulkos, whose artistic innovations and influential teachings methods provided the necessary boost for a new mindset, which resulted in a proclamation of ceramics as a fine art.

Shannon Besile (Dr. Roslyn Crowder)
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Antioxidant Capacity of *Ilex Vomitoria* When Tea Preparation is Altered Compared to Lipton Green tea and Original Yaupon Holly Tea

Antioxidants are so important for every living being. They are compounds that help inhibit oxidation in our cells and are found in many things that we consume. Because antioxidants are so important, it's also

important to note the concentration of antioxidants in things like tea. Tea is an excellent way to obtain antioxidants and realizing the concentration of antioxidants in different teas could be very beneficial when looking at the medical field. Higher levels of antioxidants can help patients fighting heart disease or cancer, allowing their cells to be stronger and fight against the disease. I tested antioxidant concentrations in 4 teas (Bagged Lipton Green Tea, Yaupon Brothers Matcha Tea, Yaupon Brothers Matcha Green Tea, and Yaupon Brothers loose Yaupon Holly tea leaves) and compared them to see not only which tea has higher antioxidants but also to see if the way that tea is prepared can have an effect on antioxidant concentrations. This paper explains the experiment that was implemented, and the techniques used to test for concentration and dives deeper in comparing antioxidant concentrations and realizing the benefits of such information. More research could help benefit the medical field in finding an organic and safe way for helping patients with certain diseases.

Caitlin Bhagwandeem (Dr. Katya Kudryavtseva)
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Art Value in the Art Market: A Case Study on Yayoi Kusama

My research project focuses on artistic career of Yayoi Kusama, the most prominent Japanese female contemporary artist. Kusama is a trailblazer, known for innovation and originality of her polka-dot art pieces, infinity rooms, infinity nets, and a daring fashion sense. Her artistic career, however, was not a continuous triumphant march towards success, in fact, it was full of ups and downs. In the 1960s, Kusama was struggling to achieve recognition, while in the 2000s, she successfully re-entered the art world becoming nothing less than a superstar. This research project offers an analysis of factors that propelled her to fame. Situating Kusama's artistic project within broader historical and political contexts, this study explores the reasons for an upsurge of her visibility and popularity, examining such factors as symbolic and monetary value of her works, her purposeful marketing strategies, and the relevance of her art for broader audience.

Caitlin Bhagwandeem (Dr. Sean Beckmann)
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Identification of Potential Reservoirs of Pathogenic *Bartonella* Species

Bartonella is an emerging pathogen found commonly in tropical regions such as Florida and is known to cause many diseases such as endocarditis, trench fever, and cat-scratch disease in humans. This bacterium can be transmitted through reservoirs, such as rodents, allowing for infection to spread to other organisms. This study sought to identify potential reservoirs of *Bartonella* in central Florida, with the hypothesis that *Bartonella* would be present in rodents because infection is common due to habitual and behavioral factors in rodent communities. Rodents were sampled throughout Lake Woodruff Wildlife Refuge and tested for *Bartonella* via PCR, DNA gene sequencing, and statistical tests. Results showed that of the 84 rodents sampled (*N. floridana*, *P. gossypinus*, *S. hispidus*, *P. floridanus*), 23 were infected with strains of *Bartonella* (*B. clarridgeiae*, *B. grahamii*, *B. vinsonii*). Three of the four species (*N. floridana*, *P. gossypinus*, *P. floridanus*) showed similar prevalence (47-50%), indicating that prevalence was similar amongst rodent species. A chi-squared test showed a p-value of 0.557 ($p > 0.05$). Non-significance may be due to sample size, or because there was a similar *Bartonella* prevalence between rodent species. Future experimentation could include continued research of *Bartonella* presence since

small sample size did not provide conclusive answers. Maintaining frequent studies and analysis increase knowledge on reservoirs in the region and further educate the public on common pathogen species and how to prevent and protect against infection.

Liam Britton (Dr. Kevin Riggs)

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Analyzing Crystals through the use of X-Rays

In order to analyze and research crystal samples, scientists have created techniques that involve x-rays. For my research, I will be using X-ray Diffraction and X-ray Powder Diffraction to analyze and determine some of the internal properties of a number of samples. X-rays diffraction is a technique that is used for measuring the atomic spacing between atoms in single crystalline structures. X-ray powder diffraction is used for observing both polycrystalline and amorphous structures. The reason we must use different techniques for different sample types is due to the properties of Bragg's Law. After conducting my experiments, I am now able to show the distance between atoms in single crystalline structures. Unfortunately, I was not able to gain results from samples with the use of x-ray powder diffraction due to difficulties with the apparatus that was used.

Jordan Brothers (Dr. Melissa Gibbs)

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Increased fecal density of loricariid armored catfish, *Pterygoplichthys disjunctivus*, in Volusia Blue Spring

Pterygoplichthys disjunctivus, a species of loricariid armored catfish, has invaded Volusia Blue Spring for many years. This species is known to produce copious amounts of feces that contribute to nutrient loading in the spring. Excess nutrient loading can lead to eutrophication, severely damaging an ecosystem. The purpose of this study was to see if there has been a change in *Pterygoplichthys disjunctivus* fecal density within Volusia Blue Spring. We hypothesized that the average fecal density would be higher in the 2020 data set compared to previous collections. Fecal abundance was measured using photographs of quadrats that were randomly distributed throughout the run. We found that the overall fecal density in the spring was significantly higher during the 2020 data collection, compared to previous collections. Both sets of data depicted a general trend toward a decrease in the density of fecal matter as one moved from the spring head to the river. This trend was significant in the 2020 data but not in previous years. The data collected in this study show that *P. disjunctivus* fecal matter had increased over time and was more abundant in certain sections of the spring run. It is important to recognize this increase in fecal density, as excess nutrient loading is harmful to aquatic habitats.

Andrew Butler (Dr. Randall Croom)

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High-Poverty Schools

Across the United States, there are many struggling communities and cities. There are many days that go by where we do not think or process what is happening in these struggling communities and cities. However, even when these thoughts about these poverty-stricken communities and cities come across our mind we rarely think about the schools around these communities and cities and how they are impacted on where they are located. Since these schools are in these badly off areas, it causes them to be classified as High-Poverty Schools. Many young students struggle to find a path to success, being they have limited resources and tools to their access. I feel as if our communities, cities, and nation need to do a better job of finding a way to decrease the number of High-Poverty Schools located across various cities in our country.

Hailey Carter (Dr. Randall Croom)

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Do Blondes Have More Fun?

The purpose of my investigation is to determine if people believe their personality or perceptions of themselves shift with their coloring or dyeing their hair color. A person's hair is a major part of a people's identity and it is often how others judge a person before knowing them. This investigation is asking people why they dye their hair, how many times they dye their hair (if they do), discovering how confident people are with their natural hair, and asking how other people react to their hair color. Many people have heard the saying that "blondes have more fun," so I am investigating to see if hair color has a positive correlation to extroversion, adventurousness, fun-seeking (risk taking), and how happy a person is (satisfaction with life). I will also be looking to see if age or gender affects the correlation. My hypothesis is that women will have a positive correlation between coloring their hair multiple times and adventurousness and extroversion. However, they will have a negative correlation between coloring their hair multiple times and satisfaction with life, possibly because they are constantly changing their hair color. My hypothesis for men is that they will have a negative correlation with coloring their hair and extroversion, but a positive correlation with adventurousness.

Gabriela Casado (Dr. Randall Croom)

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Procrastination among college students and how it can be tied to mental health

Procrastination has been shown to often have a negative effect on college student's quality of work, performance, but no one really seems to talk about the impact it can have on mental health. Procrastination is more often than not, a form of social esteem protection. A lot of the time, our self-worth is very much tangled up with our successes/failures at a given task. The correlation between procrastination and mental health lies when you strategically think about why so many college students put assignments off and avoid them till the last minute. Why students do this is because, if the task has never actually been started, there is a 0% chance of failure. Procrastination has little to do with productivity vs. laziness and more to do with emotional regulation, causing the person to be the avoider.

This research focuses on finding positive/negative relationships between physiological variables, different types of procrastination, and how we can unlearn these behaviors.

Amber Caton (Dr. Terence Farrell)

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Health Implications of Pentastomes (*Raillietella orientalis*) on Banded Water Snake (*Nerodia fasciata*) Health

Understanding symbiotic relationships is an important aspect of ecology. Parasitism is a very significant symbiotic relationship as parasites often significantly impact the health of their host. The pentastome (*Raillietella orientalis*) is a parasite that lives in the respiratory tract of snakes and has recently invaded Florida from Asia. We studied the health implications of pentastome infection on banded water snakes (*Nerodia fasciata*). We compared naturally infected snakes to non-infected snakes all captured at Lake Woodruff National Wildlife Refuge in Deland, Florida. We kept the snakes in a laboratory environment for 4 months and fed them several times a week. We examined the growth rate (g/day) and survivorship between the pentastome-infected and uninfected snakes. We hypothesized that infected snakes would have a lower growth rate than uninfected snakes. We found naturally infected snakes had a significantly higher average growth rate (0.276 g/day) than the uninfected snakes (0.143 g/day; p-value=0.037; df=7). The infected snakes were on average larger than the uninfected snakes at capture and this initial size difference appeared to impact growth rates. Analysis of covariance with initial body length found that mean size-adjusted growth rates did not differ among the infected and uninfected snakes (p-value=0.21). We hypothesized that survivorship would be lower in the infected snakes but there was no significant difference in survival (Fisher exact test statistic, p-value=1). Although our results do not support the hypothesis that pentastomes cause health implications in banded water snakes as other research describes, this could be a result of the fact we did observational work rather than an experiment. It is important to understand the potential dangers that invasive pentastomes could inflict on individual snakes and their wild populations so that we can intervene and preserve our functioning ecosystems.

Campbell Cole (Dr. Christopher de Bodisco)

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Working Hours and its Impact on Productivity and Suicide

Working hours have been rising or stagnating in many developed nations, despite advancements in technology supposedly requiring less work. This increase in labor seems to stem from cultural tendencies, especially in nations such as Japan and America. However, while working hours have gone up, economic growth has slowed in many developed nations, and suicide rates have climbed. This shows that there could be diminishing returns on these working hours, and with suicide being a major socioeconomic drag on a society these working hours could be a serious drag on the economy. Many articles have dealt with

how working hours can increase suicide and some have dealt with how working hours can lower productivity, but few have merged the two concepts. Working Hours may have a compounding effect on economic productivity through suicide. This paper explores how the time we spend working can increase our risk of suicide, as well as lower our overall productivity, showing that there may be more socioeconomic value to working fewer hours.

Victoria Crawford* (Dr. Asal Johnson)

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Renovating a space to revitalize a place: Cultural heritage, social well-being, community health and Deland's African American community well-being

The historic Wright Building was constructed in DeLand, Florida during the 1920s. It once served as the economic and cultural district for DeLand's African American community during the time of segregation. The building hosted a variety of functions; a cafe, a barbershop, a grocery store, and residential apartments. It also housed the dental office of Deland's first black dentist. It has been vacant for more than two decades and was recently bought by a black non-for-profit organization to be renovated. The purpose of this project is to: 1) identify the current state of social well-being and community health of DeLand's African American community; 2) identify the significance of the building in providing the community with social, health and economic resources in the past; 3) assess if restoration can build community capacity and revitalize economic development back into DeLand's historic black district. Archival research and semi-structured interviews were conducted to collect the written and oral history of the Wright Building. Based on qualitative data collected 2018-2019, a questionnaire was developed to capture different dimensions of social well-being (access to public space, quality of sidewalks and street lights, trust in local organizations, etc.), community health (food environment, access to healthcare, violence, etc.) and the role of the Wright building in the community's past and present (questions regarding what it used to provide for the community in the past and how important it is now regarding the collective heritage in Deland). Investigators are currently in the process of collecting data through the distribution of questionnaires to local churches. Data collection will be completed by March 2020 and analysis will be conducted using chi2 and t-tests. The findings of this study will provide important insight into the interconnectedness between cultural heritage and community well-being mediated by the power of place.

*SURE Grant recipient

Ocean Crawley-Sweeney* (Dr. Dejan Magoc)

Co-contributors: Advent Health Tampa: Kimberly Williams, Romanus Joseph, Amber Windsor-Hardy
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The Impact of Social Determinants of Health on COVID-19 Health Disparities in Tampa, Florida

The Coronavirus has been linked to numerous inadequacies in multiple areas, and it triggered the needs for improvement. The population most impacted by the pandemic is the one at the intersection of minority and low-income sectors. As cases of COVID rise, the disparities between populations grow.

Unfortunately, many minority and urban neighborhoods are poorly designed and lack the necessary resources for a healthy lifestyle. There is a strong correlation between the built environment and chronic disease, with one of the main risk factors for COVID-19 being underlying health conditions, such as chronic illnesses. The purpose of this research is to look at the relationship between COVID-19 and the structural inequalities that occur within the built environment. Participants will complete a survey, distributed at clinics and hospitals around the Tampa area, consisting of questions related to COVID-19 and built environment. The results will be used to determine what factors of the built environment are affecting the community negatively and impacting the cases of COVID-19. Finally, the results will be used to help resolve the issues of structural inequalities in the most affected areas.

*SURE Grant recipient

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(ACT)ion: Combating Social Justice Issues Through Devised Theatre

In 2020, the entertainment industry began to struggle economically as a result of the COVID-19 pandemic. 2020 also brought many systemic issues to light, including but not limited to racism and xenophobia. This furthered the desire for collective action and ways to engage in activism. The purpose of this study was to reflect on the sharing of history and fight for social justice through devised theatre — a collaborative process of theatre making where the ensemble works collectively to create a performance piece — with a focus in the DeLand community. This research examined the topics of racial segregation/the era of Jim Crow Laws in the city, as well as the aftermath of police brutality and the continued push for civil rights on both a local and national level through the Stetson Theatre Arts productions of *The Way Things Were* and *The Past Is Prologue: Confronting the Classics on Race, Gender and Identity*. In addition, there is a reflection of the creative processes the students took to get there as they utilize the performing arts to not only retell the past, but present ideas on how we can work towards the future.

Kayla Davis (Dr. Elizabeth Tristano)

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Feces from invasive armored catfish, *Pterygoplichthys Disjunctivus*, alter nutrient dynamics in Florida springs

Invasive species can sometimes alter the concentration of specific nutrients in the springs they invade. Armored catfish, an invasive species in Volusia Blue Spring, frequently feed on algae and then egest in the springs. Their feces is known to have a high phosphorus and nitrogen content. I studied if the addition of armored catfish feces in Volusia Blue Spring altered the phosphorus and nitrogen content in overlying spring water over a 24-hour period. We added catfish feces to different sites of the spring and compared the phosphorus and nitrogen concentration before catfish feces was added to the concentration 1 hour and 24 hours after catfish feces was added. We found that there was not a difference in nitrogen and phosphorus content in spring water taken from Volusia Blue springs over a 24-hour period after depositing armored catfish feces. One possible explanation for our results is that the feces were not

deposited long enough to leach a significant amount of nutrients as leaching time usually exceeds 24 hours. Another reason could be that we only deposited the feces in low flow areas of the spring. Future studies may find leaching is more prominent in other areas of the spring. There are still multiple studies that can be done probing the role invasive species play in altering nutrient concentration in environments they invade and how these potential alterations effect primary production and ultimately native species stoichiometry and resource availability.

Leah Day (Dr. Melissa Gibbs)

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An Analysis of *Pterygoplichthys disjunctivus* in Blue Spring Nutrient Composition Compared to Local Fish

Pterygoplichthys disjunctivus is a South American armored catfish that is invasive in Blue Spring. These catfish are a phosphorus dependent species meaning they need a high amount of phosphorus to support their body structure. It was predicted that because of the catfish's armored plates that they have that their skin would have the most phosphorus and have more overall than local stream fish. Catfish, Bluegills, and Mosquitofish were caught from Blue Spring and processed for nutrients. The catfish were separated by tissue type before they were prepared for processing. The ANOVA test ran on the different catfish tissue showed that the nutrients were significantly different between all three tissue types (skin, bone, and muscle). Catfish were also found to have a lower N:P ratio than both the local fish and have the most phosphorus in their skin. The data supports that the armored scales of the catfish increases their phosphorus need. With the amount of phosphorus the catfish need they have the potential to affect the Blue Spring run.

Nathaniel Dent (Dr. Randall Croom)

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The Inequality of Women

In this project presented to you I have researched the difference of pay gap between male and female in the athletic world of basketball such as the NBA and WNBA. The pay gap between male and female are drastically different, and research proves it. It is many different workplaces where women are not paid equally compared to men, but the WNBA and NBA stood out to me most. The pay difference between the two is outrageous and should be fixed, women should be paid equally for the same amount of efforts. With this being said the purpose of my project is to show support and evidence to the inequality of pay difference not just in the NBA and WNBA, but in the world.

Cameron Dias (Dr. Randall Croom)

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Mental Health Effects on Workaholics

I decided to begin my research in potential correlations between workaholism and mental health. A typical stereotype that most agree with is that someone who is a workaholic is typically not a happy person and quite miserable. Although this may be true, I'm mostly interested in beginning to uncover some underlying reasons why workaholics are associated with miserableness. Two of the main mental health concerns that I want to dive into would be anxiety and depression. The reason why I am choosing to explore these theories is because we can agree that the American dream is to work, earn, and prosper. I don't think that at first glance, some won't understand that they even may be considered to be a workaholic. In my opinion, lots of Americans generally don't always look forward to going to work Monday thru Friday and working at least 40 hours per week. Others enjoy and obsess over their work, but this doesn't always mean that they're happy with their current lifestyle. My overall goal is to understand why some people obsess over their work and continue to move forward despite their risk for experiencing anxiety and depression, whether it's acute or chronic.

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Mus musculus* as an Intermediate Host of a Recently Introduced Snake Parasite in Florida, *Raillietiella orientalis

The introduction of non-native species into the United States poses a threat to ecosystems in many ways, including the spread of exotic parasites. With the introduction of the Burmese python into Southern Florida, the pentastome parasite, *Raillietiella orientalis*, has also been introduced. Native snakes may be particularly vulnerable to *R. orientalis* because they have evolved no defenses against it. Gaining a better understanding of the life cycle of this parasite will enable conservation biologists to gauge the prevalence and potential geographical range to which this parasite is currently spreading. Because this parasite is known to pass through intermediate hosts before infecting a definite host (snakes), we looked at the possibility of *R. orientalis* infection of the house mouse, *Mus musculus*, and whether they can transmit the parasites, given that mice are often prey to snakes. Additionally, mice are present all over the United States. We hypothesized that *M. musculus* can act as an intermediate host and that the *R. orientalis* larvae would develop into infective stages in the mice. We exposed mice to these pentastomes in two different ways: through egg exposure in food, and through the consumption of pentastome-infected roaches. In dissection, none of the egg-exposed mice showed signs of infection. Three of the four roach-exposed mice showed signs of infection. However, two of those three infected mice had dead pentastomes within calcified cysts. The house mice, which are not native to North America, may not be suitable intermediate hosts as an inflammation response encysted and appeared to have killed the *R. orientalis* larvae 150 days after infection. The roaches were successful vectors of the pentastome larvae. Future research should investigate native rodents and insectivores as potential intermediate host species and should use larvae-exposure instead of egg-exposure in rodents.

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Timing Measures Growth

In today's society, we often assume what our bodies do and don't necessarily need after strenuous physical exercise. We value the push we give during the activity itself, but often times individuals tend to forget that it is the nutrients that we put into our body after the fact that matter just as much, if not more than the workout or activity being done. The purpose of this study is to go into detail for the controversial matter of if protein intake timing is meaningful for strength and the effect on muscle growth post physical activity. Within this research it will exhibit four different point of views from individuals such as practitioners, stakeholders, organizations and scientific literature. With evidence from their own research, these sources exhibit the way the body breaks down its protein intake, anabolism, muscular hypertrophy, glycogen levels and ending with protein synthesis to configure the results of muscular growth given the time protein was ingested. Their views will further provide evidence and examples to explain the breakdown of protein and how the body processes protein within a time limit after high or low intensity activity.

Tabor Filipello (Dr. Kirsten Work)

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Longitudinal change in fish size in a central Florida spring

Dissolved oxygen and predation are two structuring factors for fish communities. For some Florida springs, the underground aquifer, which is source of the spring's water, is nearly anoxic and the water that emits from the spring has dissolved oxygen concentrations consistently close to zero. As the water travels down the spring run, it can accumulate oxygen, producing longitudinal oxygen zonation. This gradient has been shown to structure fish assemblages in some Florida springs, such that larger potential predators only occur downstream. The purpose of this study was to evaluate whether spring longitudinal zonation also may affect the distribution of fish sizes for three species: *Lepomis macrochirus* (bluegill sunfish), *Lepomis microlophus* (redeer sunfish), and *Gambusia holbrooki* (eastern mosquitofish). We hypothesized that sunfish and mosquitofish would segregate longitudinally by size, such that smaller sunfish and larger mosquitofish would be closer to the headspring. We surveyed fish at two sites, one near the headspring and one downstream, using video and snorkel surveys, and seine samples. As predicted, downstream sunfish of both species were larger, possibly to exceed to the gape width of potential predators, and mosquitofish were small enough to be difficult to see by predators downstream.

Matisyahi Fogel (Dr. Paul Sibbald)

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Using Molecular Docking to Study Known SINE XPO1 Inhibitors and to Design Novel SINE XPO1 Inhibitors

Exportin 1 (XPO1) is a nuclear export protein that mediates the transport of virtually all major tumor-suppressor proteins (TSPs), which are crucial in inducing the apoptosis of cancer cells. Selective inhibitor of nuclear export (SINE) drugs inhibit XPO1, which allows TSPs to remain localized to the nucleus and induce apoptosis of tumor cells. The nature of the interactions between the SINE compound and the XPO1 active site determines the effectiveness of the drug. Computational molecular docking studies were used to design novel SINE ligands and predict their effectiveness in binding to the XPO1 active site. We

are currently working on synthesizing some of the targets that our docking studies predicted to have high efficacies so they can be tested.

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Ethanol-based extracts from *Alpinia zerumbet* induce apoptosis in CLL cells via PAK-1 inhibition.

Chronic Lymphocytic Leukemia (CLL) is the most common form of leukemia in western countries, and it occurs due to a lack of apoptosis - regulated cell death. Tyrosine Kinase Inhibitors (TKIs) have recently been an effective treatment, but their success has been short-lived due to cancer cells developing resistance, and P21 activated kinase (PAK) inhibitors could work synergistically with TKIs to combat this resistance. The essential oils from *Alpinia zerumbet*, a plant used in folk medicine in Japan, have been shown to induce apoptosis in CLL cells, and we sought to confirm that extracts from *Alpinia zerumbet* induce apoptosis in CLL cells via PAK-1 inhibition by performing an ELISA experiment that assessed the PAK1 and P-PAK1 concentrations in cells treated with *Alpinia zerumbet*. Our results were inconclusive with our first trial supporting our hypothesis and demonstrating a significant reduction in P-PAK1 for cells receiving the *Alpinia zerumbet* extract. When we ran a larger experiment, however, there was no significant result, and we suspect this was due to experimental error. Overall, our experiment demonstrates that PAK1 inhibition is the likely mechanism by which *Alpinia zerumbet* causes apoptosis in CLL cells, making it a good candidate to be tested with TKIs.

Samuel Friedman (Dr. Randall Croom)

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Exploring mean reversion in relation to quality of life, before, during, and after covid.

Mean reversion is a concept most commonly used in a financial setting, its used to describe the assumption that an asset's price volatility and returns will tend to move back towards a long-standing average based on the data set. The goal of my research is to understand if such an effect has a role in human psychology, determining whether or not positive or negative changes that have occurred over the past year, have impacted ones quality of life, or potential future quality of life. This study hopes to shed light on optimism, self-esteem, and mental health in a challenging time, allowing for a deeper understanding of how we view the Covid-19 Pandemic in relationship to ourselves and our success.

Koreigh Gabriel (Dr. Kirsten Work)

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Comparison of Commodity Oils in Biodiesel Production

Fossil fuel usage, depletion, and its impact on our planet is a distressing concern of the future, but the use of commodity oils as a source of biodiesel is a promising solution. In this study, we tested eight different commodity oils for biodiesel yield and quality. We hypothesized that pure olive oil would lead in both of these categories due to its high oleic acid content. The feedstocks were put through a transesterification process that involved the use of a methanol/sodium hydroxide catalyst in order to separate the fatty acid

methyl esters from the glycerol, then the fatty acid methyl esters were purified via water-washing. Clarity and quality were measured using a spectrometer, fatty acid titrations, and pH_{Lip} tests. The statistical analysis used to interpret the data was a Principal Component Analysis. The statistical analysis revealed that safflower oil yielded the most biodiesel with the highest amount of fatty acids, which did not support our hypothesis. This analysis also revealed that pure olive oil had the highest clarity, which did support our hypothesis. Further studies should explore safflower oil as a source of biodiesel in higher quantities in order to determine its true potential.

Sara Gerken (Dr. Christopher Ferguson)

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Framing Effects on Mental Health Stigma

Stigmatization of mental health disorders has become an increasing dilemma over the past few years. Recent research has analyzed specific aspects of stigmatization with specific populations. In order to truly understand the cause and effect of stigmatization, research has utilized various framing strategies to test how mental health messages increase or decrease stigmatization towards those conditions. This paper seeks to understand the relationship between gain-loss frames and their effects on mental health stigmatization. By using instrumentation to study social media usage and pre-existing mental health condition, results will indicate how messages portrayed in the media affect both those with and without mental health conditions.

Cayla Gonzalez (Dr. Kirsten Work)

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How does diet effect the growth rate of Exotic (*Pomacea insularum*) and Native (*Pomacea paludosa*) Apple Snails?

Invasive species are a major threat to freshwater ecosystems; they alter the food webs in their new environments often by creating different trophic interactions or changing resource availability. Apple snails are critical to Florida's aquatic food web because predatory species of fish, birds—including the endangered snail kite—and various other animals rely upon them as a food source. Although *P. paludosa* is native to Florida ecosystems, it does not occur in Volusia Blue spring. However, the exotic *P. insularum* has been seen recently within Blue Spring. The preferred diet of the apple snails is macrophytes, but Blue Spring lacks macrophytes, so we hypothesized that the exotic snails were feeding on another food source found within the spring. To test this hypothesis, we harvested exotic and native apple snail eggs, hatched juvenile snails, and fed them three diets consisting of either spinach (control) or algae (*Vaucheria*) or detritus collected from Blue Spring. Both species grew fastest when feeding on spinach and slowest when feeding on detritus ($p < 0.05$) and exotic apple snails grew proportionally faster when feeding on detritus ($P < 0.002$). We concluded that exotic apple snails not only grow faster than native apple snails, but that they grow faster on a more varied diet than native apple snails. It is likely that this habitat breadth has played a role in the expansion of the range of *P. insularum* and that this species can make use of resources that *P. paludosa* cannot.

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City of Palm Bay Greenhouse Gas Inventory for Facility's Electrical and City Fleet Usage of 2018

Around the world people have been starting to take notice of climate change and the effects it has, which lead to an increase in demand for ways to fight climate change. The main contributor to climate change is the emission of greenhouse gases, which can be tracked using a greenhouse gas inventory. The City of Palm Bay, Florida conducted a greenhouse gas inventory in 2009, but hasn't conducted one since. Therefore, a new inventory was conducted to see if Palm Bay was reaching their goals laid out in their 2009 Master Sustainability Plan. The results of this partial inventory indicated that there was a decrease in emissions from the facility's electrical usage. The reasons as to why there was a decrease as well as how Palm Bay's emissions have decreased and the contribution to attaining their sustainability goals are then discussed.

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Economic Impact of Covid-19 on America's Restaurant Industry

The Covid-19 pandemic has changed the way Americans spend their money. According to the Bureau of Labor Statistics, the average American household spends about \$3,000 a year dining out. Restaurant industry sales equal roughly 4% of the U.S. gross domestic product. Deemed a high-risk environment by the CDC, the restaurant industry has been hit especially hard during the pandemic, causing over 110,000 eating and drinking establishments to go out of business, as well as nearly 2.5 million jobs erased from pre-pandemic levels. Using econometric analysis through STATA software, this study looks at key states to examine the effects of the pandemic on the restaurant industry as a whole. This study can be used to extrapolate evidence for policy actions in regards to restaurant closures as well as economic stimulus in the restaurant sector.

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Prevalence of *Babesia microti* in southeastern rodent species

Babesia microti is the causative agent of human babesiosis and has been found primarily in the northeastern region of the United States. However, potential reservoirs of *B. microti* have been located in central Florida, creating the potential for babesiosis to spread. We predicted that there would be a low prevalence of *B. microti* in central Florida rodent species due to previous research finding the pathogen in the area. To conduct the study, we trapped and sampled several rodent species DNA to test for *B. microti* using a Polymerase Chain Reaction. After confirming the positives, we calculated the prevalence rates of *B. microti* in each species and ran a logistic regression analysis to determine the likelihood of each species being infected with the pathogen. While small, we did find *B. microti* prevalence in three of our five

samples species, which has lined up with previous research stating that babesiosis is not a major health concern in the state of Florida.

Anna Hamilton* (Dr. Will Miles)
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A model for maximization of Stetson student learning through community impact

As a SURE grant recipient, I worked with Dr. Will Miles to develop a mathematical model that will help Stetson's Center for Community Engagement (CCE) adjust their programs and efforts towards maximizing their mission, to create opportunities for student learning that have community impact. We utilized AAC&U's VALUE rubrics to measure student learning outcomes and worked with CCE staff and their supervisors to identify the outcomes the CCE is best situated to work toward. We then used regression models to analyze how various resources were being distributed to develop and sustain programs. This allowed us to identify how the CCE is currently structured, what resources they utilize most, and the specific resources most used in achieving particular goals. This information will be used in program creation to assure the achievement of the VALUE rubric identified outcomes and to inform the reallocation of resources to better achieve stated goals.

*SURE Grant recipient

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Bully Prevention Study

In my study I am researching bullying in America. My objective in this study is to find out how many people get bullied, why they get bullied, why people bully, and what are some ways to prevent bullying. I plan on finding the evidence to these questions by using research methods like surveys that I have created and internet articles. This study is used to find effective way on how to stop bullying from happening across our schools in America.

Wade Hart (Dr. Kevin Riggs)
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Imaging Graphene Quantum Dots Using Atomic Force Microscopy

Quantum dots are nanoparticles ranging from 2nm to 10nm in size and when given energy will emit light. The emission of light is due to the principle of quantum confinement and the emitted light, or photons, varies based on the size of the particle. Since their conception in 1981 their applications have grown quite rapidly and have found a home in many fields, such as electronics, computing, photonics, and in vivo imaging. This research uses an Atomic Force Microscope to image quantum dots synthesized from graphene, the single layer form of graphite, to image these nanoparticles of varying sizes and comparing the measured sizes to the energy of the emitted photons.

Ashley Herrera (Dr. Sean Beckmann)
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The prevalence of *Borrelia* spp. DNA in rodent reservoirs in Deland, FL

The most common arthropod-borne disease in the United States is Lyme disease, caused by multiple species of bacteria in the *Borrelia burgdorferi* genogroup (Clark 2004). These bacteria are transmitted to humans most commonly by ticks and are harbored in nature primarily by small rodents that act as reservoirs (Clark et al. 2013). The habitat preference of ticks consists of mostly dry, wooded areas with sandy soils. Based on this, I hypothesized that rodents who specialize in habitats with characteristically dry, sandy terrain will have a higher prevalence of *Borrelia* spp. DNA compared to rodents who are habitat generalists, found in both wet and dry habitats. To test this hypothesis, I collected rodent tissue samples in the summers of 2019 and 2020 from natural areas around Deland and utilized PCR to identify *Borrelia* spp. DNA. The *Borrelia* spp. DNA prevalence rates were significantly different between samples collected in 2019 and 2020. The two rodent species specializing in drier, wooded habitats did not have significantly larger prevalence rates than the two rodent species that were habitat generalists. Having more data that specified which habitat types the samples were collected in would assist in identifying the more active reservoirs of Lyme disease in Central Florida.

Grace Highsmith (Dr. Christopher de Bodisco and Dr. Ranjini Thaver)
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Nudge Theory Implications on Voter Participation

The purpose of this research is to evaluate the influence of election policies and behavioral nudges on the voter registration and voter turnout rates during national elections within the United States. Conceived by Richard Thaler (2008), Nudge Theory expounds on the decision-making mechanisms of humans and illustrates how elastic people are to “nudges” or subtle suggestions. This paper intersects the field of behavioral economics with political science in order to assess the variables that drive voter behavior. Data is collected for every county in the United States for the 2014, 2016, 2018, and 2020 elections. The variables expected to influence voter participation include automatic voter registration, access to information and education levels, and the ease at which people can register and cast ballots. By creating a difference-in-difference model, this paper intends to provide empirical support for a suspected correlation between voter behavior and the implementation of different voter policies. A combination of theoretical interpretation and econometric analysis aims to cohesively reveal the significance of choice architecture in the election setting in order to demonstrate the effectivity of nudges in increasing voter registration and turnout.

Sarah Hill (Dr. Kevin Riggs)
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Optical Microphone with PID Feedback Circuit

The purpose of this project was to record different audio signals using an optical microphone with a PID controller. The optical microphone was constructed by a previous student as part of their senior research,

and this project involved optimizing the PID feedback circuit to make recordings and then processing those recordings. This project has two main components: the optical microphone and a PID controller. The optical microphone is a laser interferometer, and the PID controller is connected to the piezo mirror of the interferometer in order to compensate for the vibrations of the mirror that is driven by a speaker. This project is based on a similar project conducted by students at Princeton in 2006. Construction of the laser interferometer portion of this project began last academic year, as it was the senior research project of a student in the Stetson Physics department.

Derek Hinton (Dr. Kevin Riggs)

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Comparing Efficiency of Ducted vs Un-Ducted Propellers in Aquatic Environment

This presentation consists of Derek Hinton's senior research as an undergraduate physics major with a concentration in physics. The project was advised by Dr. Kevin Riggs. Propellers are the primary method of driving vessels through aquatic environments and efficiency is important in all applications. From the largest cargo ship to the smallest remote-controlled boat, propellers are used to push the craft through the water. In small craft relying on an onboard battery or motor with a finite energy level, increasing the efficiency of the propeller is one of the best methods for increasing operational lifespan between refueling/recharging. Ducting a propeller allows us to modify certain variables such as the pressure differential (ΔP) and the formation of vortices. This project involved comparing force generation between ducted and un-ducted propellers to determine which system was more efficient. I hypothesized that the ducted system would generate a greater force with a given energy input.

Jada Ho (Dr. Jean Smith)

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Point Mutation Fus1-F262A In *S. cerevisiae* Caused Improper Localization of Fus1p And Decreased Rate of Fusion

Cell-cell fusion is an essential mechanism in sexually reproducing organisms, involved in processes such as muscle formation, bone formation, the building of organs, and more (Aguilar et al., 2013). It is also involved in important processes such as eukaryotic fertilization and cell development. Because yeast mate in a well understood fungal cell pathway with similar morphological properties to somatic cells, studying fusion in yeast can lead to a greater understanding of broader cell fusion mechanisms (Merlini, Dudin, & Martin, 2013). In addition to this, yeast offer an accessible genetic system for studying the properties of fusion (Grote, 2008). Thus, being able to research and understand yeast cell fusion will increase understanding of universal cell-cell fusion mechanisms such as membrane fusion, cell polarization, and cell signaling (Ydenberg & Rose, 2008). Fus1 is a protein within yeast that is important to the fusion process. A highly conserved but unknown genetic domain is present in yeast *S. cerevisiae* that is worth exploring due to the high level of conservation within Fus1. A novel F262A point mutation made in this region was found to cause a mis localization of Fus1 protein and a decreased rate of fusion when compared to wildtype cells, which is a finding that supports previously conducted research about the role of Fus1 in fusion.

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Understanding Self-Control and Impulsive Buying Decisions: The Role of Ego Depletion

Self-control has been defined as an individual's ability to resist impulses by regulating both emotions and behaviors for decision-making that aligns with long-term goals. The strength model of self-control claims it is a limited resource that can be depleted, similar to a muscle, resulting in self-control failure during later use. Previous studies have applied the strength model concept to consumer behavior research to better understand what motivates rational versus impulsive purchases. This study will use an online survey to measure participants' traits of self-control and impulsive buying tendencies, deplete their self-control through cognitive exercises, and give participants imagined purchase scenarios. By allowing for the comparison between each participant's purchase scenario outcomes, before and after self-control depletion, its impact on their buying decisions can be measured through regression analysis.

Colin Ibison (Dr. Randall Croom)

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The Red Tide and Tourism

The purpose of my project and the work I have done so far is to determine the effects on the tourism industry after a vicious red tide bloom in the coastal cities and river front towns along the coast of Florida. Red Tide is an algae bloom that happens almost annually on coastal towns from the east coast of Florida as far north as Volusia County all the way around to coastal cities in Texas. The goal of my work is to be able to measure the impact that this phenomenon has on local economies and even state economies that rely heavily on the tourism industry for their revenue.

Dante Jones (Dr. Kevin Riggs)

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Testing the Einstein Equivalence Principle with the Atacama Cosmology Telescope

This project utilizes data from the Atacama Cosmology Telescope (ACT) to test the Einstein Equivalence Principle (EEP). The EEP can be tested by comparing the arrival time of different frequency photons that were emitted from the same source at the same time. We did this by developing and employing two different methods of data analysis. The first method is entirely coded; raw data is input, and then a data frame of peak times is output. The second method utilizes curve fitting to analyze an entire signal, rather than a few points at a time. Although we were able to detect and calculate time differences between both peaks and signals, and despite the data not being consistent with the EEP, at this time the data is not conclusive enough to refute the EEP.

Steven Kalicharan and Kiara Santiago (Dr. Ken McCoy)

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The Toxicity of Gender in Shakespeare and Its Performance in The Past is Prologue

Toxic gender roles are something that have existed within our society for many years and are ever-present. As to when it became normalized for some women to seek a meeker demeanor for the sake of a man, or a man to talk down to another man to assert their alleged dominance, it is unclear, but undeniable, that humanity alludes to these tropes across a wide span of our history. In our project, we immersed ourselves in the words of Shakespeare's classics, *Taming of the Shrew* and *Othello*, to better understand the negative connotations that the characters Kate and Brabantio embody, and in turn, produced contemporary monologues that pulled from our own life experiences to respond and exploit the shortcomings that gender toxicity suggests.

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The Cultural Importance of Sports

Sports are an essential and important aspect of American society; they are indispensable when it comes to their impact on a surplus of arenas and stadiums, including economics and the mass media. Sports coincide with community values and political agencies, as it attempts to define the morals and ethics attributed not only to athletes, but the totality of society. I personally became curious about the link between watching and playing sports. Specifically, if sports fans like watching and playing the same sports. Additionally, if factors such as race, gender, age, and family heritage play a role in this link. To begin conducting my research, I chose an article that talked about the ten most popular, well-known sports in the United States. Then, I created a survey using Qualtrics, in which I asked various questions regarding how much everyone enjoys watching and playing each of these ten sports. Additionally, I asked them basic questions regarding their ethnicity and gender. I firmly believe that there is a direct link between factors such as race, gender, age, and ethnicity in the sports people enjoy both watching and playing. My goal is to find these various links and patterns within the data I collect.

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Is There a Positive Relationship Between Style Length and Reproductive Success in The *Chamaecrista fasciculata* Plant?

The number of seeds that produced a fruit in the *Chamaecrista fasciculata* flower could be dependent on the relationship between the length of the style and sperm competition. I hypothesized that there would be a positive relationship between the number of seeds produced and style length. This hypothesis was assessed by tagging 120 *Chamaecrista fasciculata* flowers at Volusia Sandhill and measuring the styles of each on a computer. The measurements of styles were conducted 24 hours after the flowers had bloomed so that the pollen could land on the stigma and germinate. Germination triggered the tube cells to grow the pollen tube from the stigma to the ovules, and all fit sperm cells had the chance to reach the ovules to reproduce. After all of the styles were measured, a t-test determined that there was no significant

relationship between the length of the style and whether a fruit had been produced or not ($p=0.59$). The styles of only 89 flowers of the total 120 flowers tagged were able to be measured due to misplaced or damaged flowers from tornados and too much rain. The data recorded from this experiment did not support my hypothesis that if the style length is longer than the more seeds are produced because there's potentially higher fitness in pollen grains in the longer style plants. However, the results from this experiment still gave significant data to represent that the length of the style does not determine whether that ovary will receive fit or non-fit pollen.

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Measuring the Viscosity of Ferrofluids

We measured the viscosity of ferrofluids to understand the behavior and specific values of viscosity for ferrofluids at varying magnetic field values. Measuring the viscosity of ferrofluids is important because ferrofluids have applications in bio-medical science, electronics in the form of audio loudspeakers and sensors, switches, and solenoids, as well as mechanical applications in magnetorheological dampers (ferrofluid shock absorbers) which are used in high class vehicles as well as spacecrafts and aircrafts. We measured the viscosity of ferrofluids by using a commercial style viscometer with a pulley system and mass attached to it which when released would pass through a photogate to capture the terminal velocity of the mass. We then would induce a magnetic field using an electromagnet at varying amperages. We measured the viscosity of these ferrofluids from 0 to 6 amperes and found that the viscosity of ferrofluids with an induced magnetic field would increase similar to a sigmoid function (s-shaped curve) as the magnetic field increased.

Katarzyna Kubicz (Dr. de Bodisco)
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Econometric Analysis of Economic Factors Causing Crime Rate Decline In The US Between The Years 1995-2009: A State Level Analysis

Crime is something that is present in every country in the world. Some countries have more crime than others and there are different economic factors that have been speculated as the reason why that is. Since 1995 there has been a big decrease in crime rates in the US, however there is a lack of studies that examine this phenomenon. This study will examine the impacts of different economic factors and policy changes on property crime rates, as well as violent crime rates throughout the years 1995-2009. It aims to recognize if there is a difference between the two distinctive types of crime and which factors and policies can be attributed to the decreasing crime rates. Since some of the states in the US have different laws than others do, this study is done at the state level to account for those differences. To conduct my research I will be using the STATA software to run a variety of econometric regressions.

Kelly Liu (Dr. Valrie Chambers)

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Critical Analysis of the 2015 Patreon Data Breach

In September of 2015, Patreon, a crowdfunding website for artists, was breached. The September 2015 Patreon Breach resulted from lax security oversight: a debug version of the site was left open to the public. Fifteen gigabytes of data—names, emails, addresses, PayPal credentials, Amazon Web Service keys, and source code—were leaked onto the dark web. No credit cards were compromised and sensitive information like passwords, social security numbers, and tax form information were encrypted with a 2048-bit RSA key. This key, or bcrypt, is computationally taxing and should slow down decryption. A Twitter user associated with the controversial GamerGate movement claimed to be behind the attack. In the end, few Patreon users reported stolen identities, although many were subject to phishing. Had Patreon's development team been more vigilant in restricting public access to their debug site, the breach could have been prevented.

Paul Liu (Dr Katya Kudryavtseva)

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Art, Anthropology, and Liminality in the Arctic: Carlos Casas' Experimental Siberian Documentary

In exploring Spanish filmmaker Carlos Casas' End Trilogy (2004-2008) and specifically his feature film *Hunters Since the Beginning of Time* (2008) I wish to convey its value as a work of documentary as well as a certain linkage to the mystic domain as perceived through the artist's lens. Drawn to the harsh and remote environment of the Russian Arctic, Casas' artistic vision oscillates between the romantic primitivistic of Arctic explorers and the reflexive postmodernist approach of a contemporary artist. His means of achieving this vision in his films lay principally in his distinct cyclic narrative structure, his juxtaposing usage of still and panning long shots with handheld closeups, his usage of compositional music and ambient sounds, and the exclusion of sociological information and animal death on screen. These constituent components of Casas' artistic process resulted in a singularly unique work that fuses documentary, ethnography, and fiction.

Alyssa Louk (Dr. Thomas Farrell)

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The Knight's Tale: 16th and 21st Century Perspectives

"*The Knight's Tale: 16th and 21st Century Perspectives*" is a presentation on the methodology and results of my recent study concerning the marginal annotations found in a fifteenth-century manuscript copy of Geoffrey Chaucer's *The Knight's Tale*. After transcribing over a thousand lines of the poem into Extensible Markup Language (XML), a format that increases digital accessibility to the manuscript, my focus revolved around interpreting the marginal annotations frequently found throughout the manuscript, which were written by a sixteenth century reader. Using textual and historical analysis, I compared the content of the marginal annotations with contemporary scholarly discussions of *The Knight's Tale* and

found many similarities that reflected a continuity in the reception of Chaucer's work. This research was conducted over the summer of 2020 as part of my Stetson Undergraduate Research Experience (S.U.R.E.) project under the supervision of Dr. Thomas J. Farrell.

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Short Term Omega-3 Modulated Neural Activity in the CA-3 and Dentate Gyrus Regions of the Hippocampus in Wistar Rats

To study the preventative effects Omega-3 fatty acids have on neurodegenerative disorders, an experiment was devised to study diet modulated neural activity within the hippocampus. A group of young adult male Wistar rats (N=4) was provided with a short-term diet rich in Omega-3 fatty acids (1400 mg). Control rats received normal food with no Omega-3 supplementation. After 58 days of exposure to the specific diet, specimens were subjected to the Morris Water Maze. The number of neurons within the hippocampus activated by the Morris Water Maze was counted using Fos-immunohistochemistry and maze trials were timed and recorded. Within one hour of completing the Water Maze task, subjects were sacrificed and perfused for preservation. Brains were dissected and cut into 75 um sections using a vibratome. Sections were treated with Fos-immunohistochemistry antibodies, mounted on slides, and observed under a microscope. The number of Fos-immunoreactive neurons was counted in three sections throughout the CA-3 and Dentate Gyrus (dorsal and ventral) regions of the hippocampus. Paired t-tests showed that short-term Omega-3 diet supplementation only significantly affected the number of Fos-immunoreactive neurons in the CA-3 region of the hippocampus. There was an increase in neural activity within the CA-3 region of the hippocampus which suggests higher cognitive functioning in memory consolidation and less susceptibility to neurodegenerative disorders.

Olivia Lubitz (Dr. Tara Schuwerk)
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Conservative Environmentalism - a Paradox or the Solution?

In a polarized world, understanding all perspectives surrounding an issue is a pivotal part of finding a middle ground. In my research, I aimed to explore how young, registered Republicans within the American Conservation Coalition (ACC) organization communicate about their identity in relation to nature as well as how conservative membership within the ACC leads their discourse surrounding climate change issues. Some people have a greater connection to the natural world than others; this connection is known as Environmental Identity. Environmental Identity (2003) is a concept created by Susan Clayton, which put simply, is the idea that "I am important to nature and nature is an important part of who I am." I employed thematic analysis as a means to answer my research questions and discovered that participants did not communicate about their identity in relation to nature at all but rather in terms of their conservative identity instead. Conservative membership in the ACC environmentalism guided discourse among participants regarding how climate change should be addressed politically, the value of nature, and lastly who is going to solve climate change and how are they going to do it. This research has the

potential to shed light on different approaches to solving the crisis as well as deepen our understanding of what makes people care about protecting the natural world.

Summer Marshall (Dr. Melinda Hall and Dr. Benjamin Tanner)

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Speciesism: The Unfortunate Reality of Octopus Species in Captivity

The area in which I have focused my research efforts is the philosophy of animal rights specifically, the unethical life of captivity. It is important when considering the implications of captivity that there are certain aspects of speciesism present. I would argue that my work shows why captivity is wrong by looking at an underappreciated species, Octopuses. Octopus species are among the most intelligent creatures on the planet but have little to no legal protection in the United States. This allows for these creatures with extensive cognitive abilities to be subjected to an unstimulating life in captivity specifically at Seaworld Orlando. It is against my own moral beliefs to purchase a ticket to such an institution but funds were provided by the Stetson Dean's Fund and Environmental Studies department for the purpose of my research. I am certain that through further research and analysis the overall question of: Is it really ethical to keep one of the most intelligent creatures on the planet in captivity with little to no brain stimulation, will be answered.

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Effects of Ibuprofen on Development of Axolotl Embryos

The purpose of this study was to quantify the dosage of ibuprofen that could be dangerous to a developing human embryo and record the types of effects at different dosages. A model organism, the axolotl, was used to mirror the early aspects of pregnancy to prevent endangerment of a human embryo. Axolotl embryos were exposed to a solution of ibuprofen and spring water at dosages of 400 mg/L, 200 mg/L, 100 mg/L, 50 mg/L, and a control of 0 mg/L. After one week, embryos were transferred to petri dishes containing fresh spring water where they remained until the control embryos began to hatch. All hatchlings were euthanized with an overdose of the anesthetic MS222 and preserved before being analyzed. I measured head width, head length, and body length using Nikon imaging software. An ANOVA test was run to see if there was a dose dependent effect of ibuprofen on body dimensions followed by a Tukey test to look for a threshold concentration. It was discovered that exposure to ibuprofen causes a significant decrease in size for all three characteristics at all concentrations. A chi-squared test was also run to show the likelihood of malformations, which showed a significant increase.

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A New Justice: Analyses of criminal justice

Analysis of the American criminal justice system can be done along many lines, including the root goals, the methods by which the system is enacted, the way it intersects with other societal institutions, and how it is currently evolving. Through critique of the underlying philosophical goals as well as the practical application of the criminal justice system, as well as comparison with other examples of applied criminal justice systems (in particular, Norway's), the American criminal justice system can be most clearly labeled as a primarily retributive one, with the practical application trending towards punitive measures that serve no societal purpose beyond punishing imprisoned people. With trends in the criminal justice system changing from incarceration to probation, now is a good time to consider a philosophical shift from the current retributive justice system towards a restorative one, as the latter lies on generally sounder philosophical goals, and is more effective in practical application.

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Selling Secondhand Concert Tickets: What is your Best Bet?

How much is your concert ticket actually worth? This research determines the factors of demand for concert tickets by modeling the average mark-up on second-hand concert tickets. Demand for concert tickets are dependent on the perceived costs of going. This includes economic costs, time costs, and perceived utility of the experience. These factors may potentially be seen in the prices and demand for secondary market tickets. The analysis of this market can be divided into three sections: Model A, the initial linear model of the average percent markup on tickets, Model B, the linear regression of average resale ticket price, and Model C, the logarithmic model of average resale ticket price. Research results suggest that the popularity of the artist, size of the market, and face value of tickets are the most influential in predicting the resale price of concert tickets.

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Inhibitors Influence on Hedgehog Signaling Pathway in *Vanessa cardui* Butterflies

Abstract

Hedgehog signaling plays an important role in the developmental stages of growth, and when disrupted in different organisms leads to phenotypic changes. Experiments with *J. coenia* show that wing size and eyespot deformation occur with down regulation of the hedgehog gene in butterflies (Tong et al., 2012). Thus in my study, I hypothesized that *Vanessa cardui* butterflies either ingested or became injected with cyclopamine, a hedgehog inhibitor, would result in decreased wing size and deformed eyespots in butterflies, and a short and spiked hair phenotype in caterpillars. Cyclopamine was diluted at different concentrations in artificial caterpillar food or injected into the body during the larval stage of development. Phenotypic changes were observed and recorded through measuring weight, length and microscopy. The weight and length of the caterpillars receiving the cyclopamine were statistically smaller during

the first week of growth but the same during the second week. Microscopy did not show phenotypic differences between the cycloamine experimental groups and control groups. By examining the phenotypic changes of the painted lady throughout their life cycle when given cycloamine to downregulate the hedgehog gene, more insight on the cell signaling pathway can be found and open the door for future studies to be conducted.

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Optical Tweezers: The Manipulation of Small Organisms Using Light

Optical tweezers are a Nobel Prize winning invention in which light is used to manipulate small particles, often living cells, in such a way that they do not get damaged. Photons pass through a particle and are reflected as it enters and exits due to Snell's law, meaning it may leave at a different angle than it entered. This change in direction causes the photon to transfer momentum to the particle as it exits and if a stream of photons goes through a particle, the overall momentum transferred will push the particle to the center of the beam, thus trapping it. A trapped particle can then be gently moved, stretched, or otherwise manipulated without damage. Our research is to create Stetson University's first Optical Tweezer apparatus to be used in the study of cells. We have used various equipment lying around the department with few purchases to make a cheap, recycled tweezer apparatus. We test its effectiveness by evaluating images taken before and after the laser is applied to the sample and comparing the distances between the test particle and a reference particle to determine if the tweezers had successfully captured the test particle. Though it is not operational, our optical tweezers are at the cusp of functioning.

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Do roaches Serve as an Intermediate Host for an Invasive Pentastome Parasite

Many invasive species have spread throughout the world and within Florida, and with this spread brings spillover of nonnative species' parasites to the native species of an ecosystem. The pentastome, *Raillietiella orientalis*, is a parasite that has travelled to Florida in this way, and if it is like other pentastome parasites, it uses intermediate hosts to get to its definitive hosts, which are snakes. In this experiment, we looked at the viability of roaches as intermediate hosts. We exposed one group of roaches to the parasite and then measured the growth of that group against another control group. Their weights, maturation, and survivorship were recorded over six months. We found that the roaches exposed to the pentastomes did not have a change in any aspect of growth or survivorship. This experiment showed that the pentastomes didn't affect the roaches in any significant way, but it also does not show that the roaches can serve as an intermediate host. To show whether they can serve as an intermediate host, another experiment will need to be done in which roaches are fed to another intermediate host like lizard or frog and see if the pentastome eggs are passed on. This experiment was unable to be done in this experiment due to time constraints.

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Investigating TOR Pathway in *Vanessa cardui* Butterflies Treated with Rapamycin

Target of rapamycin (TOR) is a pathway that regulates important functions such as development in response to upstream signaling. Studies have shown downregulation of TOR with a TOR inhibitor called rapamycin can increase the lifespan of *Drosophila melanogaster* flies. Similar research has shown that mice homozygous for mTOR deletion died during the embryonic stage. The presence and role of TOR in butterflies has not been studied and, therefore, I sought out to investigate the TOR pathway in *Vanessa cardui* butterflies and its role in their development. Sixty caterpillars were separated into three treatment groups that were fed one of: DMSO, 0.1mg of rapamycin per 5g of food (Rapamycin+), or 0.2mg of rapamycin per 5g of food (Rapamycin++). Rapamycin+ and Rapamycin++ caterpillars showed a decrease in their size and weight compared to DMSO-control, suggesting an inhibition, and therefore presence, of TOR. Moreover, treatment with rapamycin resulted in an increase in the lifespan of the *V. cardui* caterpillars by about eleven days. However, caterpillars treated with rapamycin failed to complete metamorphosis and hatch into butterflies after chrysalis-transformation.

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Analyzing the Structural Properties of Cosmetic Formulations

This project sought to seek correlation, if any, between viscosity, surface tension, and a cosmetic fluid's ability to do what it claims. Viscosity is the measure of a fluid's thickness. It determines at what rate a fluid can be spread. Surface tension describes the amount of force that can be applied to a fluid's surface before the microscopic connections between molecules are broken. The viscosity was measured using a viscometer consisting of concentric rotating cylinders. The surface tension was measured using the capillary tube method. The results show negligible correlation between surface tension and viscosity. The foundations tested demonstrate the ability to show lower viscosity with more force applied, causing them to be non-Newtonian fluids, a beneficial characteristic for foundation. The results also showed no correlation between the formulations and their main non water ingredient. This could be due to additives in the formula.

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Identifying Health Impacts of *Railietiella orientalis* Infection in Banded Water Snakes

The presence of the invasive Burmese Python (*P. bivittatus*) in Florida has caused the spread of Asian pentastome parasite, *Railietiella orientalis*, to native Florida snakes. The geographic spread of the parasite is likely to continue as one of its intermediate hosts, the brown anole, is continually spreading north due to transportation of ornamental vegetation (Miller et al, 2017; Farrell et al., 2019). As of now, there is very little information on the health impacts of pentastome infection on snakes as no experimental studies have been performed comparing infected snakes to control snakes. The objective of this study was to

improve understanding of these health impacts by analyzing the survival and growth rates of both infected and control snakes. The two hypotheses for this experiment were that brown anoles are competent intermediate hosts of *R. orientalis*, and that *R. orientalis* is a deleterious parasite in snakes. 14 banded water snakes were divided randomly into control and experimental treatments, and the experimental group was exposed to *R. orientalis* larvae hosted by brown anoles. Results indicated that brown anoles do serve as competent hosts of the parasite. Results also showed no significant difference in survival rate, growth rate, or infection rate between snakes exposed to *R. orientalis* larvae and control snakes. Conclusions of this experiment are that *R. orientalis* may not be a deleterious parasite, and brown anoles are competent hosts.

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Relationship between heterospecific pollen receipt and reproductive success in partridge pea (*Chamaecrista fasciculata*)

As people move toward urban cities, more land and resources are needed to satisfy the growing population. This development, in turn, causes the habitats of plants and animals to be destroyed. In this study we looked at partridge pea flowers (*Chamaecrista Fasciculata*) which require buzz pollination by the bumblebee to properly transfer pollen. Competition arises between the bumblebee (*Bombus*) and the honeybee (*Apis*) which causes the pea plant to be pollinated by generalist bees. The generalist bee deposits heterospecific pollen on the plant which might inhibit seed set by producing a blockage in the stigma due to the incorrect size of the pollen grain. Partridge pea styles were collected from Volusia Sandhill from flowers that had already been pollinated and examined under a light microscope. There was no significant difference between heterospecific pollen deposits and fruit formation. Style and petal lengths were also measured to determine if there was a relationship between the total number of pollen grains and length of the style and petal. There was no significant relationship between them. More research needs to be done with a larger sample to determine if heterospecific pollen deposition truly impacts fruit formation.

Andrew Nadeau (Dr Katya Kudryavtseva)

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Kara Walker: Acclaim, Slavery, and Controversy

This research paper is based on African American contemporary artist Kara Walker, and the from black critical reception of Walker's works focused on 1994. Which was critiqued by Betye Sarr and Howardena Pindell for white privilege, incitement of racism, and depictions of grotesque scenes regarding sex. Identity, sex, and race are primary focuses of Walker through which antebellum era depictions of African Americans and slavers are used. Through analysis of acclaim and criticism that followed walker after her debut of "Gone: An Historical Romance of a Civil War as It Occurred b'tween the Dusky Thighs of One Young Negress and Her Heart" in 1994. Through analysis of interviews and personal writings to examine Walker's creative process and vision. Alongside Walker for comparison of reception of negative

stereotypes depicted within the 1990's through Carrie Mae Weems' "at the kitchen table" and Fred Wilson's "Mining the museum".

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Amyloid- β -Induced chemotaxis behavior and neuronal morphology in transgenic *Caenorhabditis elegans*

Alzheimer's Disease is a progressive neurodegenerative disorder that remains the leading cause of dementia in the aging population in the United States. Accumulation of the protein, amyloid-beta ($A\beta$), has been attributed to some of the neurodegeneration seen in AD patients. While this has been widely accepted as a primary causative agent, there are still gaps in the literature examining the mechanistic, biological, and genetic basis for this protein build-up in humans. The present study utilized two transgenic strains of *C. elegans* (CL2355 and CL2006) to investigate the role of $A\beta$ on behavior and neuronal morphology. For each strain, worms were tested with chemotaxis protocols to evaluate chemosensation in the presence of the odorant, diacetyl. Worms were given test and control plates, and were analyzed by the calculation of a Chemotaxis Index (CI) for each strain. A fluorescent dye-staining assay (DiI) was performed to examine neuronal morphology. After being incubated with fluorescent dye, each strain was counted for proportion that expressed properly dye-filled neurons. Transgenic strains CL2355 and CL2006 showed statistically significant impairments in chemotaxis behaviors, indicating $A\beta$ -induced disruption in chemosensation. Only strain CL2355 demonstrated improperly dyed neurons (Dyf), with strains N2 and CL2006 exhibiting normal dye-uptake. Strain CL2355 failed to have dye-filled neurons in adult but not larval stages, indicating age-dependent changes in neuronal morphology when $A\beta$ is found in chemosensory neurons and not musculature.

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Is it social media or is it just me?

It is no surprise that in this day and age with all of the new and improved technology, people are starting to realize the negative effects it can have on an individuals' mental health. After scrolling on social media all day, people tend to get this feeling called fear of missing out or FOMO because they see such high standards of living and people presenting such picture-perfect images on their pages. The target of this presentation is to explore the positive and negative correlations that the given variables have on mental health and FOMO. From going through this information, I hypothesize that for some people social media can be a life motivator and platform to express themselves but also that some individuals will get the negative effects of feeling left out and envy those who have and present the perfect life.

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The Paradox of Nostalgia for the "American Indian": How the heroic image of Native Americans emerged from a century of relocation, cultural Warfare, and extermination, 1840-1913

This project researches how popular portrayals of Native Americans across popular American media (newspapers, shows, popular support) evolved from the implementation of Jackson's relocation to the end of the Indian Wars in the West. This project also considers how key events in United States – Native relations affected these depictions and popular opinion. But most of all, this project asks how Native American culture captured the attention of certain demographics of the United States, whilst simultaneously, the U. S. Army chased the Native tribes towards their annihilation.

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Impact of light availability and the mutualistic relationship with nitrogen-fixing bacterium, *Rhizobium*, on above ground growth of *Chamaecrista fasciculata*

Mutualistic relationships between rhizobium bacteria and leguminous plants, such as *Chamaecrista fasciculata*, may reflect a positive net impact of the developmental factors of leguminous plants. These interactions may allow plants to overcome environmental stressors and increase the overall growth of plants. In this greenhouse study, we examined how varied sunlight treatments influence the growth of *C. fasciculata* plants by studying their resulting above-ground characteristics, which included plant height, number of leaves, number of flowers and total biomass. Plants were harvested at the end of a 21-week period. *Chamaecrista fasciculata* plants that were inoculated produced a higher leaf count and total biomass. Inoculation did not play a detectable role in plant height, but light affected growth; plants that were in the 50% shaded treatment were taller in height. Under the conditions of the study, the rhizobial interaction incurred a net cost to their hosts' early in growth. These costs may have occurred due to an over allocation of carbon to nodules rather than to above-ground growth. However, the costs may have been facilitated by possible contamination of seeds throughout scarification and transplantation processes. If this study were to be repeated in the future, I would advise that there be an increase in the number of replicates to ensure that more *C. fasciculata* germinate and develop following transplantation. Also, in the future, there should be more attention to avoid possible contamination of samples as well.

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Understanding Distrust and Its Effects

Distrust is, indeed, an extremely powerful feeling. It triggers other sentiments, shaping our behavior and relationships. For this reason, a study was designed to investigate distrust and its effects. In details, the survey "Trust" was developed to assess responses related to lack of trust, forgiveness, anger, and anxiety. The purpose was to understand the correlation between the selected variables and identify patterns that might indicate whether the respondent have trust issues or not, and the consequence of this behavior. As a result, even though the study is still in progress, evidence that lack of trust do impact various aspects of the human behavior has been noticed. In conclusion, through detailed research, the study "Understanding Distrust and Its Effects" aims to assess a hypothetical tendency of reluctance to forgive and demonstration of anger and anxiety issues by those who present symptoms of common distrust.

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Dismantling the Myth of Racial Progress in the United States Through Colson Whitehead's *The Underground Railroad*

In this essay, I will examine Colson Whitehead's *The Underground Railroad* as a historicized critique of the racial violence Black people have continually faced in the United States. In the novel, Whitehead chronicles the journey of Cora, an enslaved woman in an antebellum America who makes her escape to the North through the Underground Railroad. This essay is focused on demonstrating how Whitehead's intertwining use of historical fact and speculative fiction work to dismantle the myth of racial progress in the United States. My argument acts as a response to past criticism the novel has faced as a result of Whitehead's use of history and fiction.

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Linking the antioxidant strength of fruits and vegetables to their phytochemical components

Fruits and vegetables are generally high in antioxidants, a type of molecule that is believed to work in the human body to prevent the onset of cancer. Many naturally-occurring plant-based compounds, or phytochemicals, can act as antioxidants. The phytochemical components of high antioxidant-capacity fruits and vegetables were investigated in order to establish a phytochemical link to a plant's antioxidant strength. Phenolic compounds were selected due to their growing popularity in the field of nutrition. A meta-analysis was conducted on all available pre-existing literature on the antioxidant capacity and total phenolic content of six species of fruits and vegetables. Kale had the highest phenolic content and antioxidant capacity of all fruits and vegetables tested. Comparatively, both raspberries and strawberries had higher phenolic content and higher antioxidant capacity than spinach, while green grapes and carrots had the overall lowest values in both categories. A correlation analysis revealed that $r = 0.8784$, indicating a highly positive correlation between a plant's phenolic content and antioxidant capacity. Therefore, a strong link between phenolic compounds and antioxidant strength was supported.

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Abundance and distribution of armored catfish (*Pterygoplichthys disjunctivus*) feces in Volusia Blue Spring

Exotic species can alter their invaded environment through predation, ecosystem engineering, and the release of nutrients. Because egestion releases nitrogen and phosphorus, it is important to investigate the density and distribution of fecal matter to better understand how it might impact the ecosystem's nutrient dynamics. Our study is a follow up to Rubio et al.'s (2016) investigation of *Pterygoplichthys disjunctivus*

feces in Volusia Blue Spring (VBS). We hypothesized that not only would the fecal density have increased since Rubio et al. (2016), but that fecal distribution would also have changed. We surveyed the spring by dividing it into grid squares, took pictures of quadrats in each grid square, identified and measured the length of feces in each picture, and calculated the average fecal density of the grids. Our average fecal density and fecal distribution for Spring 2020 was compared to the Spring and Summer 2008 – 2011 data used by Rubio et al. (2016). Our hypothesis was supported by our findings: the fecal density significantly increased since the Summer and Spring 2008-2011 data, and the fecal distribution changed both laterally and longitudinally, becoming more concentrated towards the center of the run and uniform along the length of the spring run.

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Studying the correlation of sleep/rest & wellness to academic achievement amongst college students

Today's college students are tasked with a load of responsibilities in a busy world, being overwhelmed with constant new deadlines and evolving technology amidst a world pandemic. It is a stressful time to be a college student. Many students are thriving and finding success during this difficult time, despite all of the challenges they have been tasked with overcoming. But many others are struggling to find success and struggling to balance their coursework with their social life and personal time. College students often find themselves "pulling all-nighters," staying up through the night to complete school assignments before the corresponding deadlines. Sometimes these students stay up, work better at night, and achieve great academic success. But the drawbacks to staying up late at night are a lack of energy during the day and an inconsistent sleep schedule. Does that lack of energy affect college students' performance in the classrooms? I hypothesize that students that get more sleep and rest earn greater academic achievement. To test this hypothesis, I created a Qualtrics survey, questioning students on their sleep schedules, the amount of sleep they get, and the amount of rest they get. The survey also asks them about their college GPA to study the correlation between sleep and academic achievement. I hypothesize that students that say they sleep more hours than other students will have higher GPA's than the students that get minimal hours of sleep.

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The influence of light intensity on the mutualism between nitrogen-fixing rhizobium bacteria and the partridge pea plant, *Chamaecrista fasciculata*

Mutualisms are widespread, symbiotic relationships that occur when different species gain an ecological benefit from an interaction. As per the focus of this research, such symbioses can form within or around plant roots and can aid plants in overcoming environmental barriers and increasing their geographic presence. Some plants can also gain a useable form of nitrogen while giving up organic carbon from photosynthesis to rhizobia microbes. Such mutualisms occur between mature, leguminous partridge pea plants and the root symbioses of nitrogen-fixing rhizobia bacterium. However, should limiting resources

develop it could alter once beneficial mutualisms into parasitic ones. The experiment that we retrofitted to serve our hypothesis: that rhizobia could be a detriment to seedlings during earlier growth stages. We basically altered light intensity among inoculated and not-inoculated *C. fasciculata* plants but were disproved as inoculated plants in the sun outperformed the control in each treatment. This revelation can prove to be useful as rhizobia could eventually be used as an environmentally friendly alternative to hazardous artificial fertilizers in agriculture.

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Republican Theory of Labor and Caring Labor

The neo-republican school of thought posits that freedom is defined as the absence of domination and arbitrary interference from outside forces, and thus that freedom is gained by the abolition of domination. Proposed approaches to achieving this abolition vary across the neo-republican field of study—from instituting a universal basic income to co-operative ownership of the means of production—but nearly all are united on one front; they are largely informed by the forms of domination present in traditional employee-employer relationships. The field of caring labor, both paid and unpaid, serves a case study for the inadequacies present in the concept of domination, as defined by neo-republicanism. This research uses the unique qualities of the caring labor field, as well as an examination of how infringement upon freedom demonstrates itself within the field, to demonstrate the ways in which domination can be redefined and, thus, alleviated.

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The Early Federal Republic's Forgotten Crisis: How Konrad Adenauer Stabilized West Germany Through Solving the Refugee Question (1945-1953)

A persistent problem that would face the Allied forces and the German leadership for years to come after the end of World War II was that of the German refugee and expellee problem. Individuals of German ethnicity and German citizenship were forcibly expelled from a number of countries such as Poland, Czechoslovakia, Hungary, to the post-war boundaries of West Germany beginning in 1945. The extreme hardship faced by refugees in resettlement, food shortages, and poor economic conditions during 1945-1948 motivated some refugees to join nationalist political parties that claim to be advocating on behalf of refugees for an economic equalization of burdens such as the Block of Expellees and Disenfranchised (BHE). The social and political organization of the refugees through forming parties like the BHE exemplified to Chancellor Konrad Adenauer and his party (CDU) that they were serious about their demands and were prepared to use their political power to achieve their goals. The election results in a number of German states all showed impressive electoral gains for the BHE in the immediate years preceding the passage of the Equalization of Burdens Law in 1952. This furthered Adenauer's incentive to equalize the war burden so he could maintain his slim lead in the Bundestag and co-opt refugee voters into the CDU. As refugee leaders continued to demand an Equalization of Burdens and exemplified their electoral power, Adenauer eventually implemented the *Lastenausgleich*, or Equalization of Burdens Law, in 1952. By working to resolve this crisis, Adenauer ultimately began to alleviate the post-war challenges Germany felt in terms of the economy, occupation, infrastructure, and public health.

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Cat People Vs. Dog People: What's the Difference?

This study seeks to identify the personality traits of self-identifying cat people and dog people, and finding the differences between the two, if any. According to several sources, personality traits such as independence, introversion, and creativity are associated with self-identified cat-people, and traits like, extraversion, compassion, dominance, and competitiveness with dog-people. The results of the Qualtrics study should reflect a correlation between self-identification as a cat person or a dog person and their score on the respective scales. For example, those who self-identify as cat-people should also score highly in introversion and creativity. The purpose of this research is to identify how closely our personalities are related to our pet choice and or aversion to one animal over another.

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College Students' Interpretations of Stickers on Their Peers' Belongings I\in Social Settings: Expressing Identity, Ideologies, Unity, and Division Through Stickers

Stickers are influenced by popular culture, trends, ideologies, and aesthetics, but do college students share the same interpretation? This qualitative project aims to study the use of stickers placed on the belongings of college students' peers which are visible in social settings because I want reveal if these stickers hold any type of impression on college students in order to help my reader understand the significance of visual communication created by stickers. Having greater insight into visual communication, social identity theory, symbolic interactionism theory, perception, encoded messages, and icons, this study yields useful information about college students and their interpretations of their peers' stickers as a medium. Given the strong association between college students and their use of stickers, I conducted 10 interviews on college students who witness and examine their peers' stickers in social settings on campus such as the classroom. Through the use of the Constant-Comparative Method by Glasser and Straus, I developed sound reasonings and relations of stickers from my interviews for the purpose of understanding one's peers, expressing identity through stickers, noticing conscious and unconscious decisions of stickers and their placement, influencing political ideologies, motivating messages, and contributing to popular social movements. These factors influence college students as they recognize, through peers' stickers, connections and barriers, misinterpretations of abstract or directive meanings through image and text-based stickers.

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‘Socially Distancing’ Points on an Ellipsoid

Mathematical and computational software has allowed the STEM research field to drastically improve over the past 30 years. My professor mentor, Dr. Tandy Grubbs and I, utilized Mathematica, a software which allowed us to program easy to use ‘notebooks’ that could utilize chemical and mathematical equations to illustrate the minimization of electrostatic repulsion between particles or ‘electron groups’ that are positioned around the center of an atom. In other words, Mathematica was programmed to ‘optimize’ distances between each particle according to Coulomb’s Law. Additionally, the bond angles resulting from the constraints given in the programming were illustrated accordingly.

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Working in the Pandemic Era of Work

Before the COVID-19 pandemic plagued our country, millions of U.S. workers got up every morning, got dressed, and headed out the door to their typical nine-to-five job. Everything seemed so simple and routinely, until things began to change. For the US, the pandemic began around mid-March to early April of 2020. Since it was no longer safe for a large group of people to breathe the same air for eight hours a day, many of those nine-to-fivers were sent home to complete their work remotely. Though some may claim working from home is the only way to work efficiently, I would argue that that is not the case for most of the US population. My goal throughout all of this is to show as many people as possible the detriment that working from home has had on a typical nine-to-five worker. Through articles, studies, polls, and other forms of data collection, I will try to convince people that working from home is not the solution for an ordinary nine-to-five job.

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Designing an Apparatus to Measure the Elasticity of Human Cells and Tissues

In this study we were able to design a mechanism that allowed us to take the measurements needed to find the stiffness and elasticity of an organic visco-elastic sample. The elasticity of tissue can allude to abnormalities in its biological function, and can aid in predicting injury and disease. Our design will be able to characterize the deformation and elasticity of a material using Young’s Modulus and Poisson’s Ratio of an elastic sample. We used the mechanical properties of our device to design and print a smaller version with micro springs that could characterize the elasticity of an organic sample about 1 mm in length.

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How does Habitat usage and availability effect genetic diversity?

In many animals that are vulnerable or endangered, there is very little genetic diversity within species compared to species that are less vulnerable. I hypothesized that animals with low habitat availability that were specialists to a habitat would be much less genetically diverse compared to species that were of high habitat availability. To test this, I trapped *Peromyscus gossypinus*, *P. floridanus*, and *N. floridana*, and analyzed the d-loop of their mitochondria to determine statistics for genetic relation. It was found that habitat generalists are more diverse than habitat specialists, and that rodents with higher availability of habitat tend to be more genetically diverse. There is evidence to support the claim that diversity is due to use and availability of habitat type, but it is worth noting the litter size may affect diversity as well.

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Will excretion rates of Sailfin suckermouth catfish (*Pterygoplichthys disjunctivus*) in Blue Springs State Park continue to raise or eventually even out?

Sailfin suckermouth catfish (*Pterygoplichthys disjunctivus*) is a certain invasive species of armored catfish that has been taking over the waters at Blue Springs State Park. The main point of this study is to get a better understanding the amount of changes this species can have on the springs ecosystem. Since they are invasive we decided to study the excretion rates and compare them to pervious years to see if anything has changed or if the ecosystem has finally leveled out. We hypothesized that the data which was collected this year, and when it was compared to previous studies it would show no difference. We can determine from the data that it does in fact show no difference when compare to pervious years. We can also assume that since the data showed no significance due to the p-value being more than 0.5 we can determine that the surrounding ecosystem has been able to develop with the armored catfish being an invasive species.

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Juneteenth, Civil Rights, and the Fight for Freedom. A Comparative Study, 1920-1960.

My senior research last semester was titled Juneteenth, Civil Rights, and the Fight for Freedom. A Comparative Study, 1920-1960. I looked at why Juneteenth celebrations declined between 1920-1960. I hypothesized that Juneteenth celebrations declined due to social factors such as Jim Crow laws, Civil Rights Movement and white supremacists groups. In order to effectively conduct my research, I focused on three states: Texas, Illinois and Georgia. I argue that the decline of Juneteenth celebrations during this forty to fifty year period can be attributed to the Civil Rights Movement and the on-going racial issues. The 1920s-40s celebrations declined due to economic hardships. During the 20s, there was the Great Depression and if you were African American, you were already paid a lot less than your caucasian counterpart. From the 50s to the 60s, we saw a rise in these celebrations again due to the Civil Rights

Movement emerging. Leaders such as Martin Luther King Jr., Ralph D. Abernathy, Rosa Parks, Coretta Scott King, John Lewis, etc., led various marches and held protests and speeches that sparked national attention. With marches such as the The March on Washington symbolized not only a fight for jobs and freedom, but it was a reflection back to Juneteenth celebrations and remembering where it all started. Through a selection of primary and secondary sources, I will be able to examine the decline of Juneteenth celebrations in relation to the Civil Rights movement.

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Phenotypic expression of FUS1 point mutation F262A on fusion related processes

Fusion is a ubiquitous process occurring in cells across a range of all living organisms. It is equally the cause for both essential and detrimental growth. Take into example the formation of a zygote when a sperm and egg cell fuse, but also the unregulated growth for cancerous uncontrolled cells such as tumors. Although this process is seen in a multitude of examples within living organisms, very little is known about the molecular mechanism in which fusion of cells occurs. To study this molecular mechanism, *S. cerevisiae* was observed to further investigate how this process transpires. What is known is that if either domain FUS1 or FUS2 is deleted within this yeast, fusion does not occur. To study this, I chose to phenotypically characterize different traits of FUS1 after a point mutation of F262A. Assays performed included observing Green Fluorescent Protein localization, as well as quantifying wild type yeast cells for the formation of “shmoo” against both the mutated cell and empty vector. This strain of yeast was picked due to its conserved nature within multiple species domains, implying that it may have scientific significance throughout evolution. Assays concluded that formation of diploid cells was significantly reduced, as well as a less localized GFP concentration. Further studies could expand into the significance of this point mutation within higher level eukaryotic organisms, and continue to alter the fusion process in medical-related fields to our advantage in inhibiting tumor growth.

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Social Media and Information Privacy

Information privacy with a constantly growing social media platform is booming and is the future of communication. Although how useful and fun these platforms are, there are many things unknown to each individual user about how their information is protected. The average person would think that their information is protected, little did they know it was sold to the highest bidder. This project will explain how companies collect the data from its users and is constantly selling it to other large companies, this will also bring people to attention on how their information is shared. Although, it will not specifically make anyone out to be the “bad people” here. There is a reason for this, and that is so this project has no bias on information/ questions asked when collecting data for this project, this is crucial to the way data is collected for this and for the project itself. It will highlight how user’s data is used and how this is done.

Benjamin Tucker (Dr. Roslyn Crowder)

Oxidative Stress on human leukemia cells with *alpinia zerumbet* seed extract

Cancer is one of the world's most prevalent and dangerous diseases. While some forms are more easily prevented than others, Leukemia is one form that is not as well understood in preventable methods. Treatment for cancer varies depending on many variables however, most treatments are harmful to the body and have negative side effects. *Alpinia Zerumbet* is a shell ginger most commonly found in East Asia and has shown potential for being a natural and less harmful option for cancer treatment. The seed extract, seed covering extract, and the flower extract are all being measured in many different regards to see how they perform with treating the cancer. This research focuses on the seed extract, human Leukemia cells and oxidative stress. This was done by measuring the amount of Nitrogen given off when a cell dies using a nitric oxide test kit. The results were then measured against a standard curve as well as the amount of cell death between each of the three samples and the control. The results showed the most significance at a quantity of 7µl. However, the 5µl sample as well as the 10 µl showed promise and could still be used in future areas of study.

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The Effect of Multiple Auditory Cues on the Intensity of Mobbing Response by Florida Birds

Many bird species that are vulnerable to predation engage in mobbing behaviors to ward off predators. If a bird feels threatened, the bird will call out to alert others to the predators' location. I studied how the number and diversity of mobbing vocalizations affected mobbing behavior. Using playback of an audio file with owl vocalizations and mobbing calls, I recorded the number of species and individuals calling after 1, 3, and 5 minutes in three different treatment groups: screech owl whinnies + yellow warbler chip notes (SCOW + YEWA);, screech owl whinnies + multiple alarm calls with blue jays, tufted titmice, Carolina wrens, yellow warblers (SCOW + multiple; and screech owl whinnies only (SCOW only). I expected there to be a strong mobbing response to all of the treatment groups, but to see a higher response in the SCOW + Multiple treatment and similar species responding to the playback in the SCOW only and SCOW + YEWA treatments. The bird's attraction to the treatment groups seemed to be similar. They mobbed more towards the SCOW + Multiple and SCOW only than towards the SCOW + YEWA in all samples except the individuals at post playback after 1 minute. The SCOW + YEWA treatment response may have been smaller than the SCOW only treatment because those birds could not understand the yellow warbler chip notes like they understood the screech owl whinnies. When there is diversity in mobbing calls, more species can communicate and receive the alarm messages.

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Bluu Prototype

The use of e-cigarettes and vape devices by teenagers and young adults is a concern to many people. Juul is the most notable manufacturer of these kinds of devices. They market their product as a solution to the smoking pandemic. Juul has implemented a proprietary Bluetooth-capable device, the Juul C1, outside of the United States but it utilizes that technology to merely lock the device or locate it. At one point, the Juul C1 had a functionality to monitor the nicotine consumption of users to go along with their initial advertisements of their e-cigarettes being a means to quit smoking. However, they removed this functionality without providing any reasons. In this project, we plan to revitalize this function to help consumers reach their objective of using these devices. Consumers will be able to use a Juul device for the purpose of rehabilitating from their smoking habits. In this project we present a modified Juul device, called Bluu, that connects with an app on one's phone to track nicotine consumption. This could lead to more responsible vaping by the youth.

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Can *Raillietiella orientalis* spread northward in North America?

Several species of *Raillietiella* have been found in snakes and other reptiles in East Asia, Africa and Philippines, and have been introduced into Australia and southern Florida snakes. This invasive lung parasite has traveled with invasions of Burmese pythons from Asia and can have detrimental effects on native snake populations. The parasite spillover is becoming a major snake conservation issue, and the goal of this research was to assess whether the parasite *Raillietiella orientalis* could spread and expand its range further north in North America. We evaluated the hatching behavior of pentastome eggs of parasite *R. orientalis* in three different treatments of water: well water, fish water and low pH water. However, none of the treatments influenced the hatching behavior of the eggs. The pentastome eggs hatch in the digestive tract of its intermediate host, so we also simulated stomach conditions that should cause the egg to hatch. A sample with trypsin and neutralizer and fecal samples was made to observe the eggs hatching behavior over time. When incubated at a temperature of 28°C with trypsin and neutralizer, more eggs hatched into larvae after 6 hours. Therefore, *R. orientalis* eggs seem to effectively hatch in a stomach-like environment where the temperature is warm. These results suggested that the parasite *R. orientalis* will be unlikely to spread further north in North America since the temperature of the environment will not be ideal for them to hatch.

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Stetson University Band Program 1955-1974: Repertoire, Performances, and Personnel Under Richard Feasel

The scope of this document is to catalog concert performances of the Stetson University band program from 1955-1974 using available documentation from the DuPont-Ball library

along with other sources used to complete needed information. Emphasis is placed on cataloging each performance's time, location, available program notes, personnel (including ensemble musicians, conductors, and soloists), and repertoire (arranged by composition, composer, arranger/transcriber if applicable, date of completion). All repertoire is cataloged by composer, by title, and as a rendering of the actual concert programs; guest conductors, featured soloists and guest artists, and personnel are cataloged in separate appendixes. This research provides a source for analyzing performance programs from the earlier years of the Stetson band program, recording the names of former members of the band, and reflecting on the evolution of both the Stetson band program and the concert band medium in general within that timeline. This research also provides an enlightening picture of the Stetson band during this time period along with the practices and programming decisions of its director

Richard Feasel.

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The Importance of Image

The Salsa music industry has been dominated by men for most of its existence, with artists such as Ruben Blades, Willie Colon, and Hector Lavoe making huge contributions to the beloved music. However, it would be incorrect to assume that women played no part in Salsa's development. Celia Cruz, La Lupe, and La India are three remarkable women who pushed through gender norms and stereotypes and went on to build highly successful careers in Salsa music. Despite their shared occupation, they were not received the same by public audiences. Each woman had a unique personality and style, and therefore used different strategies to break into the industry. They were judged accordingly. Each of these women faced various degrees of scrutiny depending on how far they pushed the social boundaries. In some cases, these women were pitted against each other in a competition for the spotlight. Time and again, it would be proven that image was everything. Their images and reputations would continue to influence their careers for the rest of their lives.

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Detection and Tracking on Fisheye Videos

In order to survey wide areas in traffic intersections, multiple closed-circuit television (CCTV) cameras are needed. Traditional pinhole camera models use rectilinear lenses and yield a smaller field of view. Usually, the field of view (FOV) of a pinhole camera is fixed. Fisheye lenses can provide a larger FOV of over 180° and provide a surveillance without blind spots. Our project is about the detection and tracking on fisheye videos. We cropped and converted fisheye videos into perspective views, then built a tracking tool based on a model trained from Facebook's Detectron2 framework to collect path data of vehicles in

the intersections. The project will be open sourced and we hope this project would inspire anyone who is interested in computer vision techniques.

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What political policies have best promoted growth in Latin America?

To determine what political policies have best promoted growth in Latin America, I will examine if human capital, regime-type, land rights, inequality rates, unbundled-institutions, and revolts have created any variation in Latin American countries over the past 100 years. Land rights will be defined as land titling. Human capital will be operationalized as government spending on education, R&D, and primary and secondary graduation rates. Un-bundled institutions will include variables for crime, law, trust in army, trust in local representation, corruption of representation, and police corruption. I predict that that strong institutions, human capital investment, land rights, and democratic regimes will increase economic growth. Whereas, revolts and IMF loans will decrease economic growth.

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Awareness of Detrimental Topics in Society

Concerns about whether our society can have a profound effect on the beliefs held around power structure, effects of nature, and impacts of societal living for individuals has been debated for several decades. In the 1970s, researchers were led to have the general assumption that a deliberate mainstream society is detrimental to the morality of human beings. More recently, further investigations of theories and research suggest that correlations between societal living and belief in false concepts creates an unconscious decrease in the natural state of human beings. This also takes humans away from natural living processes. Fortunately, it is assumed that millennials are more aware about the negative effects of a mainstream society than the elderly are. However, it is also appropriate to note that humans might not be aware of the long-term psychological effects that a deliberately controlled mainstream society has, and most would even oppose its effects due to years of conditioning. GMO foods are widely used, regardless of the health impacts that they cause, as opposed to a more natural way of growing crops (Popek, 2020). Societal power that is distributed is maintained by a false notion that they were God given instead of deliberately allocated between powers that share the intention to maintain majority control (Han, 2017). Nature, showing intricate designs and nutrients meant for humans, has been proven to increase mental and emotional health, which we are less apart or aware of by participating in a mainstream society (Mayer, 2004).

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Determining the Critical Temperature of YBCO and BSCCO

YBCO and BSCCO are known as superconductors, materials that exhibit zero resistance and expel magnetic fields below a certain temperature known as the critical temperature. The critical temperature, TC, of each superconductor was measured using two different methods. Each one took advantage of one of the characteristics of superconductors. The first was using a Resistance v Temperature graph (zero resistance) and the second was using the Meissner Effect (expulsion of magnetic fields). YBCO and BSCCO both are a certain kind of superconductor known as a high-temperature superconductor, meaning their critical temperature is above 77K (-196.15 °C). So, we were able to cool them to their TC using liquid nitrogen instead of liquid helium (4K). For method 1 (R v T graph) we got a TC of (-184.2°C) with a 2.2% error for YBCO and a TC of (-155.3°C) with a 4.8% error for BSCCO. While for method 2 (Meissner Effect) we got a TC of (-183.9°C) with a 2.1% error for YBCO and a TC of (-159.3°C) with a 2.4% error for BSCCO.

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Acupuncture as an Analgesic: Reduction of Post-Operative Pain in Veterinary Periodontal Surgery

Acupuncture is an established pain relieving modality borrowed from Eastern medicine. However the application in veterinary periodontal surgery is not widely studied, and its role in complementary medicine is not fully understood within Western medicine. The use of acupuncture in veterinary medicine is becoming more common for generalized pain, but the application in periodontal surgery is relatively untapped. Sixteen patients underwent periodontal surgery with a minimum of one extraction or gingivectomy. They were then blindly assigned to either the experimental or control group. The experimental group received acupuncture at specific pain relieving acupuncture points in addition to oral analgesics sent home. The control group did not receive acupuncture and was only given oral analgesics. These patients were monitored by their owners for the first 48 hours post-operative to determine if acupuncture had any effect on reported post-operative pain. Overall, there was no significant difference between the patients who received acupuncture versus those who did not. Additional research with a larger sample size is necessary to elucidate the validity of acupuncture for intraoperative treatment of pain.

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Comparison of floral fragrance components of *Oncidium Sharry baby* (Orchidaceae) with other chocolate fragrances

Orchids show a variety in their floral morphologies and methods of pollinator attraction. Floral fragrance and volatile compounds play vital roles in pollinator attraction and interaction in the environment. The First Orchid Nursery in Apopka, Florida has many orchid species, including *Oncidium Sharry Baby*, the chocolate fragrant orchid. In this paper, we document the presence of fragrance compounds from *Oncidium Sharry Baby*, a chocolate mint plant and a chocolate Hershey bar by using gas chromatography

mass spectrometry (GC/MS) analysis of headspace volatile collection. We compare the results of the volatiles collected from each sample. The orchids, mint plant, and chocolate bar sampled were found to be producing six volatiles that are common in floral fragrances, including those of previous orchid species studied. By knowing the chemical compounds that are produced within these samples, we can better understand how the orchid gives off a chocolate scent.

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- Dr. Kimberly Reiter, Associate Professor of History – Committee Chair
- Dr. Elizabeth Skomp, Dean, College of Arts & Sciences
- Dr. Chadley Ballantyne, Assistant Professor of Music
- Dr. Randall Croom, Assistant Professor of Management
- Dr. Michael Eskenazi, Assistant Professor of Psychology
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- Grace Kaletski, Assistant Professor, Information and Literacy Librarian
- Dr. Ken McCoy, Professor of Theater
- Dr. Khushbu Mishra, Assistant Professor of Economics
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