

THE
FOURTEENTH
ANNUAL
GREAT DAY

GENESEO

THE earth
IS THE
ONE
THING
we
all
have
IN
COMMON

GENESEO RECOGNIZING
EXCELLENT, ACHIEVEMENT,
AND TALENT

WEDNESDAY
APRIL 22ND
2020

Welcome to SUNY Geneseo's Fourteenth Annual GREAT Day!

Geneseo Recognizing Excellence, Achievement & Talent Day is a college-wide symposium celebrating the creative and scholarly endeavors of our students. In addition to recognizing the achievements of our students, the purpose of GREAT Day is to help foster academic excellence, encourage professional development, and build connections within the community.

http://www.geneseo.edu/great_day



This program lists all submissions for GREAT Day 2020. Due to COVID-19, GREAT Day 2020 is happening virtually. Scholarly and creative projects that lend themselves to a virtual format will be available for viewing beginning April 22nd – check the GREAT Day webpage at:

http://www.geneseo.edu/great_day to view projects that have been uploaded.

Please note that not all projects listed in this program will be in Virtual GREAT Day.

GREAT Day 2020 coincides with 50th Anniversary of Earth Day – Virtual GREAT Day is surely the most environmentally friendly GREAT Day on record. Also, look for the Leaf – student have self-identified presentations that include topics that promote sustainability and are designated by .



Throughout the day, when you post about GREAT Day on social media use #WeAreGREAT to be featured on GREAT Day social media!

GreatDayGeneseo



@GeneseoGREATDay



geneseo.edu/great_day



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GREAT Day graphics by Joanna Walters '13

ABOUT THE VIRTUAL GREAT DAY PROGRAM:

- Access at: http://www.geneseo.edu/great_day
- Is searchable by student, faculty member, department, etc.
- Numbers preceding submission titles are “submission ID” – you can use this number to search the project as well.
- Will be available online through September 30, 2020



Ten-Year Sponsors

GREAT Day would not be possible without the dedicated faculty and staff who work with students throughout the year on the projects that are presented annually. As we observe the 14th Annual GREAT Day, we would like to acknowledge the following faculty and staff who, as of this year, have served as a sponsor for 10 GREAT Days:

ANTHROPOLOGY

Barbara Welker

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Ruel McKnight

COMMUNICATION

Andrew Herman

ENGLISH

Beth McCoy

GEOGRAPHY

Jennifer Rogalsky

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Kathleen Mapes

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INTERNATIONAL RELATIONS

Jeffrey Koch

PSYCHOLOGY

Jeffrey Mounts

SOCIOLOGY

Steve Derne

SPONSORED RESEARCH

Patty Hamilton-Rodgers

First-time Sponsors

This is the first year the following faculty and staff have served as a sponsor for GREAT Day – Welcome!

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William Anyan
Mackenzie Gerringer
Varuni Jamburuthugoda

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Nicole Manapol

DIVERSITY AND EQUITY

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LGBTQ PROGRAMMING AND SERVICES

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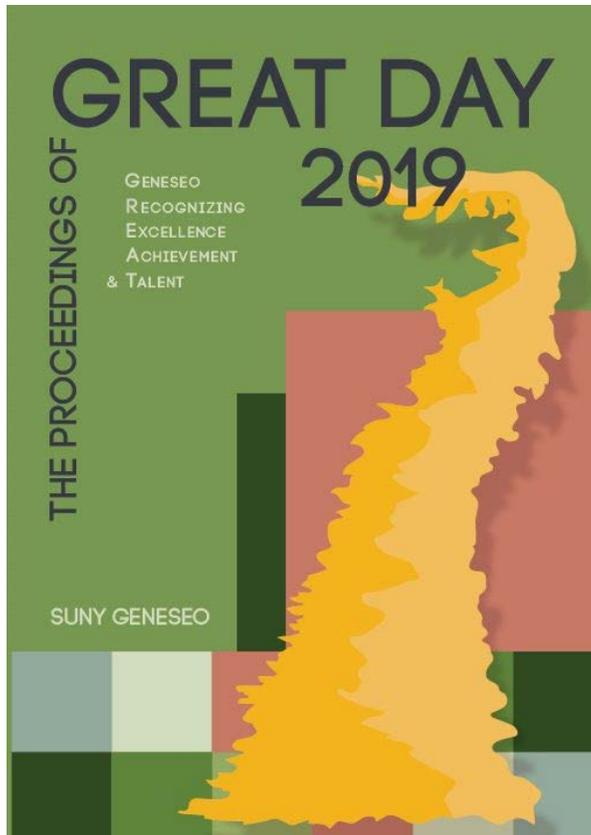
MUSIC

Monica Hershberger
Leah McGray

PHYSICS & ASTRONOMY

Thomas Osburn

Students and Faculty Mentors Published in the Proceedings of GREAT Day 2019



Established in 2009, *Proceedings of GREAT Day* compiles and publishes promising student work presented at SUNY Geneseo's GREAT Day symposium. The projects, presentations, and research included here represent the academic rigor, multidisciplinary study, and creativity of the students taking part in the SUNY Geneseo GREAT Day symposium.

The proceedings of GREAT Day 2019 is now available!
go.geneseo.edu/greatjournal

Featuring:

- Interview with Stephanie Singer, GREAT Day keynote speaker
- Interview with Joseph Cope, Associate Provost for Academic Success
- Interview with Lytton Smith, Director of the Center of Integrative Learning
- Interview with Dmitri Wing-Paul, student editor for *Proceedings of GREAT Day 2018*

STAFF: JONATHAN GRUNERT, ALLISON BROWN
 INTERNS: NICOLE CALLAHAN, JAIME DEVITA

UNMASKING THE SOUTHERN BELLE AND THE BLACK MAMMY: THE INTERTWINED AND VIOLENT NATURE OF SOUTHERN ANTEBELLUM WOMANHOODS
KRISTA BORST
 JUSTIN BEHREND

EFFECTS OF A KETOGENIC DIET ON STEREOTYPIC BEHAVIOR IN MICE
MOLLY BRADY
 ALLISON BECHARD

LAND RIGHTS AND REGIME CHANGE: TRENDS IN MAPUCHE TERRITORIAL CONFLICT FROM 1970 TO PRESENT IN SOUTH-CENTRAL CHILE
CECILIA BREY
 KARLEEN WEST

CLASS AND SOCIAL MOBILITY IN ENLIGHTENMENT LITERATURE
EMILY CECALA
 KATHRYN FREDERICKS

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MADISON HARDING
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 CESAR AGUILAR

VEE IS FOR VOICELESS
ABBY RITZ
 MARIA LIMA

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SAMANTHA SCHMEER
 JONETTE LANCOS

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GREG VINAL
 AARON HEAP

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 JONETTE LANCOS

SESSION PRESENTATION ABSTRACTS

ACADEMIC PLANNING AND ADVISING ENTIRE SESSION

402 DIVERSITY AND DISRUPTION – KNOWLEDGE, THEORY, AND SOCIAL JUSTICE THROUGH THEATRE

SESSION CHAIR AND PRESENTER: YARO BAUTISTA MARTINEZ

JESSICA BROCKWAY, NICOLA BRUNO, RACHEL ARAUZ, SARAH BURKE, CRAIG CAMPBELL, NAMAN CHHATPAR, VICTORIA COOKE, JULIA DEACON, THOMAS FIERRO, VICTOR MOLINA, NICHOLAS STRONG, SARAH VERWIJ, OLIVIA WILLIAMS

FACULTY SPONSORS: CELIA EASTON AND HEATHER WILHELM, ACADEMIC PLANNING & ADVISING, ROBBIE ROUTENBERG, DIVERSITY AND EQUITY

"Leadership, Values, and Inclusion" is a course, a process, performance, analysis, theory, and practice. Starting from readings on diversity ranging from the Harvard Business Review to Ibram Kendi's "How to Be an Antiracist" and Crystal Fleming's "How to Be Less Stupid About Race," the spring 2020 INTD 251 class has used various forms of social justice theatre to learn and critique campus perspectives on diversity and equity. This session is a culmination not only of the class members' theatre projects but also visible and invisible social justice theatre moments that bystanders in public spaces across Geneseo's campus may experience by interacting with class members throughout GREAT Day. During this session, class members will share an overview of what it means to disrupt what we think about diversity along with demonstrations of how theatre can bring that disruption about. With some creative efforts, we will try to involve "spect-actors" (active spectators!) in this social justice theatre presentation.

ANTHROPOLOGY INDIVIDUAL SESSIONS

112 There's More Than One Way to Skin a Hominin: An Analysis of Plio-Pleistocene East and South African Hominins as Prey

CARRIE DAIGNAULT

FACULTY SPONSOR: BARBARA WELKER, ANTHROPOLOGY

This presentation will detail the perilous world in which our ancestors evolved as a prey target for a significant number of carnivores. The first part of the presentation will detail the predators that would have co-existed with ancient hominins in the highlighted geographic region and time and notable specimens that bear marks of having been the victims of carnivores. The second section will show how being hunted affected

hominin behavioral and cognitive evolution. The final section will discuss to what extent hominins may have been preferred prey for certain carnivores.

305 Assessment of Population Densities of Vulnerable Species in the Tamshiyacu-Tahuayo Reserve, Peru

LYDIA FREGOSI, DANIEL BORG

FACULTY SPONSOR: BARBARA WELKER, ANTHROPOLOGY

The Amazon rainforest faces numerous threats to the high biodiversity found there. Human changes to the forest structure include (1) overhunting of keystone species, and (2) habitat loss and fragmentation due to deforestation. While those problems affect much of the South American rainforest, such is not the case at the Tamshiyacu-Tahuayo Reserve. The reserve experiences very little human influence, and it thus allows for an estimation of biodiversity in the absence of the harmful effects of humans. The focus of our study is to evaluate the biodiversity of the area with a focus on the population densities of vulnerable species. We used camera trap data to estimate species density. The cameras are positioned throughout five different forest types in a 1 sq. km grid system, with cameras positioned to film both terrestrial and forest canopy animals. Our data show a high degree of biodiversity in the area, along with a relatively high population density of many vulnerable or endangered species. We will present camera and video footage of jaguars, tapirs, white-lipped peccaries, night monkeys and many more.

388 College Students & Anxiety

VIMBAYI MANDIZHA

FACULTY SPONSOR: JAMES AIMERS, ANTHROPOLOGY

This course is an exploration of anxiety among contemporary American college students. How is anxiety defined socially and medically, and are diagnoses (by students or medical professionals) of anxiety increasing over time in the college environment? How are colleges and universities responding to this issue? Are best practices emerging for students, faculty, and institutions, and if so what are they?

425 The Role of Privilege in the Anti-Vaccine Movement

EMMA SMITH

FACULTY SPONSOR: MELANIE MEDEIROS, ANTHROPOLOGY

EDGAR FELLOWS CAPSTONE PROJECT
The discovery of vaccines was groundbreaking; diseases that plagued the world for centuries have the potential to be eradicated. However, anti-vaccination sentiments have been culminating over the latter part of the 20th century. One of the prominent sources for vaccine hesitancy and refusal is that of the

Measles-Mumps-Rubella (MMR) vaccine. The hesitancy and refusal falls under the purview of the anti-vaccine movement and is governed by two worlds; affluence governs one world and poverty governs the other. The main question that I want to propose is: why isn't science enough? Through a wide view of anti-vaccine research, I believe that the duality of privilege and poverty is where the focus of the political and social discussions should focus on. The research and science cannot persuade those to vaccinate because the role of privilege stands in the way.

445 Linguistic Purism and Anglicisms in France

BRIANNA RIGGIO

FACULTY SPONSOR: JENNIFER GUZMAN, ANTHROPOLOGY

EDGAR FELLOWS CAPSTONE PROJECT

France is known for its attitudes of linguistic purism; not only are there institutional and legal measures in place to protect the language, but many travelers report experiencing cold treatment if they do not speak French. All of this has been compounded by the sharp increase of anglicisms that accompanies the spread of American music, TV, and pop culture via the internet. As it becomes "trendy" to include English words or phrases in their media and advertisements, and as certain concepts originating in English do not always receive a French translation of equally popular usage, French preservation institutions such as the Académie Française attempt to prevent the influx of English use from encroaching upon French language and culture. As a French major studying abroad in Montpellier, I was interested to see how I would encounter these purist attitudes and whether or not the average person considers the French language to be compromised by the use of anglicisms. I conducted a series of interviews with students and professors from my university examining their views on anglicisms and protecting the French language. I was also interested in observing whether or not there was a marked generational divide on the issue.

458 Eating Disorders: A Cross-Cultural Comparison

MARISSA MARINI

FACULTY SPONSOR: BARBARA WELKER, ANTHROPOLOGY

This project examines disordered eating practices in relation to food and necessary nutrients, an epidemic that manifests differently in developing countries versus those that are westernized. The specific focus of the research is to compare eating practices, issues, and concerns of students at SUNY Geneseo, with those in developing countries. Disordered eating and nutrition deficiencies share a multitude of similarities that impact one's health. Malnutrition in westernized societies is sometimes a choice, for example, to underfeed oneself to maintain a

thin ideal, whereas, dietary deficiencies elsewhere are often due to lack of resources and/or injustices. Poor dietary intake often involves underconsumption of calories, necessary vitamins and minerals, and other substances that the body needs to sustain itself. Malnutrition can result from a low intake of food, low food availability, mental health problems, social and mobility problems, digestive disorders and stomach conditions, alcoholism, etc. (Brazier, 2017). Data on SUNY Geneseo students were collected electronically and anonymously. Questions focused on how respondents feel about their relationship to and consumption of food. Results are compared with literature from developing countries, where women may lack equal rights and ample resources.

ART HISTORY ENTIRE SESSION

ART HISTORICAL TIMELINE OF JORDAN & AN ANALYSIS OF SANTERIA IN HORROR AND ART

SESSION CHAIR AND PRESENTER: LELIANA MCDERMOTT

FACULTY SPONSOR: LYNETTE BOSCH-BURROUGHS, ART HISTORY

32 An Art Historical Timeline of Jordan

This presentation will provide a visual analysis of Jordanian artworks ranging from prehistory to current day. The presenter, Leliana McDermott, studied abroad in Jordan in the summer of 2019 and will use the information she pulled from her studies on the political climate of the Middle East and Jordan to aid her visual analysis. She will examine the themes and motifs that stay constant throughout Jordanian art and how subject matter and styles shift as time progresses.

33 An Analysis of Santeria in Horror and Art

Santeria is a Haitian and Cuban form of West African Voodoo and is often depicted in American pop culture. This presentation will provide a history of Santeria itself, a visual analysis of Santeria in art, and an analysis of Santeria in horror. The presenter, Leliana McDermott, will debut a short horror film she filmed this semester that uses Santeria as its main element of horror.

BIOLOGY INDIVIDUAL SESSIONS

236 Characterization of the Expression of Female Sexual Development-1 (*fsd-1*) in the Fungus *Neurospora crassa*

KATHERINE COTTEN

FACULTY SPONSOR: ELIZABETH HUTCHISON, BIOLOGY

Neurospora crassa is a filamentous fungus that can undergo asexual and sexual development. However, little is known about the signaling mechanisms that control the sexual reproductive cycle of *N. crassa*. It has been shown that a predicted transcription factor in *N. crassa*, female sexual development-1 (*fsd-1*), plays an important role in the sexual reproductive cycle. Deletion strains of *fsd-1* are delayed in the development of female reproductive structures and are sterile. However, we have been unable to continue characterizing the function of *fsd-1* at the protein level due to the overall low abundance of the protein. There are three different variants of the *fsd-1* gene, which differ by the position of the transcriptional start codon and their 5' untranslated regions. In order to obtain more protein, we created strains that overexpress *fsd-1* at the native location for each of the three transcripts. The overexpression strains are tagged with GFP, and we have characterized the overexpression strains via fluorescence microscopy. In addition, we have characterized the sexual development phenotype of these overexpression strains, and will analyze protein expression by western blot.

274 The Deepwater Horizon Oil Spill's Effect on Deep-Sea Coral Health and Impacts With Varying Community Density

OMAR SURI

FACULTY SPONSOR: MACKENZIE GERRINGER, BIOLOGY

On April 20th, 2010, the Deepwater Horizon wellhead broke releasing an estimated 210 million US gallons of oil into the Gulf of Mexico. The Gulf is home to many species of deep-sea corals, slow-growing and long-lived creatures that develop for thousands of years. Being sedentary, they maximize access to the current to filter out plankton. The magnitude of this accident and its effect on coral health is under investigation. Girard et al. (2018) quantified the percentage of observed damage on deep-sea coral colonies, 1000 m below sea level and anywhere from 6 km to 182 km away from the wellhead. Using their published photo data, I investigate the effect a coral colony will have on protecting its community from oil damage. Using distance to estimate a colony's chance to be affected, I compare communities of high and low density using a network model. I hypothesize that a coral colony can act as a barrier from oil flow, and therefore high density communities will, on average, see less percent damage per colony. Understanding the relationship between density and resilience will aid in preparation for future disasters. Protecting coral communities is critical because they are vulnerable and they house many associate organisms.

415 Using CRISPR/Cas 9 on *Teleopsis dalmanni*

NICHOLAS SIDOU

FACULTY SPONSOR: JOSEPHINE REINHARDT, BIOLOGY

CRISPR/Cas 9 is a novel procedure that can be used to edit the genome of an organism and

ultimately cause mutations. *Teleopsis dalmanni*, otherwise known as stalk-eyed flies, are an interesting organism to perform research on due to their long eye stalks as well as the presence of X-linked meiotic drive in certain populations. Meiotic drive is the uneven transmission of X and Y chromosomes due to one or more alleles on the X chromosome. Instead of being 50/50 it favors the transmission of the X chromosome. Part of my research is using CRISPR/CAS 9 on the Black gene within *Teleopsis dalmanni*. This serves as a control for the experiment since, if done correctly, a noticeable phenotype change will occur. It is also to confirm that CRISPR/CAS 9 can be done on *Teleopsis dalmanni* since it has never been done before. Currently I'm collecting *Teleopsis* eggs using different procedures hoping to get embryos on which to perform CRISPR/Cas9. While carrying this out I am also looking for candidate genes that are linked with meiotic drive to knock out with CRISPR/Cas 9 in the future. This involves getting information such where the genes are expressed and the different domains of the proteins.

420 HL-60 Cells Alternative Response to an Ionomycin PMA Cocktail

LAUREN STERNBERG

FACULTY SPONSOR: ROBERT O'DONNELL, BIOLOGY

EDGAR FELLOWS CAPSTONE PROJECT

The combination of Ionomycin and phorbol 12-myristate 13-acetate (PMA) cocktail has been used to increase the proliferation of normal mouse and human T cells and PMA alone has been used to cause the differentiation of the myeloid leukaemia HL-60 cells in culture to a macrophage-like adherent population. Contrariwise, the cocktail was linked to apoptosis in acute HL-60 cells. This distinction has also been noted in the literature by Wang, et al. (2014), who concluded that Jurkat T cells were inhibited at S-phase and G2/M-phase by the cocktail. When we cultured the HL-60 cells for 48 hours in the presence of the cocktail, we also saw no growth and significant death. Originally, we suspected this distinction was due to the biological differences between normal cells and tumor cells; however, further investigation revealed a discrepancy within the literature. While HL-60, Jurkat, and Glioma cells (Han 2013) are inhibited by the cocktail, breast cancer cell lines were MDA-MB-435 and MDA-MB-231 had enhanced invasion (Yiu 2006). Future experiments including a cell cycle analysis and apoptosis assay will be used to test other cancerous and non-cancerous cell lines in hopes of elucidating a pattern for the effects of the ionomycin PMA cocktail.

437 Forensic Applications of the Soil Microbiome Associated with Mouse Decomposition

MARGAUX HALES

FACULTY SPONSOR: ELIZABETH HUTCHISON, BIOLOGY

EDGAR FELLOWS CAPSTONE PROJECT

Determining the post mortem interval (PMI) is important in the field of forensic science to set a minimum and maximum time since death. There is a need for more reliable methods of PMI estimation, of which forensic microbiology is a potential solution. Through analysis of the microbial soil composition associated with a decaying organism at different time points, a pattern emerges that can create a “microbial clock.” This clock would be a useful tool in determining a PMI. My research explores whether this directional microbial timeline can be detected using quantitative PCR. During putrefaction, microbes decompose the tissues of the corpse. The microbial communities associated with a decaying corpse can be characterized along the decomposition timeline. We set up a field experiment using eight containers of soil. Four of these containers served as controls while four contained deceased mice. The containers were covered, buried, and allowed to decompose for three months. Soil samples were taken periodically and container temperature was monitored at each timepoint. We observed a complete timeline of decomposition ending in partial skeletonization. We extracted DNA from the soil samples and plan to assess bacterial and fungal community changes using a quantitative PCR approach.

444 Development of a Phytoremediation Plan at Jones Chemical Inc. Superfund Site

ARIANA WALCZYK

FACULTY SPONSOR: REGINA CLINTON, BIOLOGY

EDGAR FELLOWS CAPSTONE PROJECT

Jones Chemicals Inc. of Caledonia, NY is a chemical manufacturing company that has been declared a Superfund site by the EPA. This project analyzed the effectiveness of phytoremediation as a possible cleanup method at this site as a greener and more cost-effective alternative to groundwater extraction and treatment. Phytoremediation is the process by which plants break down, extract, or transform chemicals into less harmful substances. Rhizodegradation is a form of phytoremediation in which the microbial community of the associated plant rhizosphere is stimulated by the root exudates. The rhizosphere bacteria and fungi break down the contaminants into organic compounds that can be utilized by the microbes. Rhizodegradation has been shown to be successful in both *Medicago sativa* and *Lolium perenne*. This research focuses on determining the effectiveness of two common agricultural species in breaking down benzene, toluene, ethylbenzene, and xylene (BTEX) in the soil, using headspace analysis and GCMS. BTEX is a common method of measuring volatile organic compounds in water and soil and is representative of the petroleum hydrocarbons present at the Jones Chemical Superfund site. This experiment also determined the importance of the rhizosphere effect on chemical breakdown by comparing experimentally inoculated soils to a control group.

448 Bacterial Expression of Chimeric *Escherichia coli* and

Trypanosoma brucei DNA Methyltransferases

CASSANDRA TABER

FACULTY SPONSOR: KEVIN MILITELLO, BIOLOGY

EDGAR FELLOWS CAPSTONE PROJECT

Little is known about epigenetic information such as DNA methylation in microorganisms. One methyltransferase being studied at this time is a putative DNA methyltransferase (TbDmt) from *Trypanosoma brucei*. TbDmt strongly resembles bacterial DNA methyltransferases like DNA cytosine methyltransferase (EcDcm) from *E. coli*. To test our hypothesis that TbDmt is a DNA methyltransferase, we expressed TbDmt in bacteria and created chimeric protein sequences switching the DNA binding domain and enzymatic domain of EcDcm and TbDmt. Exchanging the domains of TbDmt with a known methyltransferase may help us discover the function of the enzyme and its target sequence. Plasmids containing sequences for each protein were introduced into *E. coli*. EcDcm and the chimeric protein with the EcDcm DNA binding site and TbDmt enzymatic domain were successfully purified under partially denaturing conditions. The plasmids were then re-isolated from cultures and digested with various restriction enzymes blocked by methylation. EcDcm methylated at its expected site, 5'CCWGG3', but TbDmt showed no signs of methylation at any of the sites tested. It appears that the chimeric protein with the EcDcm DNA binding site and TbDmt enzymatic domain is methylating at 5'CCWGG3'. This suggests TbDmt is a DNA methyltransferase, but the sequence it methylates is unique.

457 An Analysis of Bacteria Biofilm Formation and Structure

CLAIRE PRUNIER

FACULTY SPONSOR: GREGG HARTVIGSEN, BIOLOGY

EDGAR FELLOWS CAPSTONE PROJECT

A bacteria biofilm is a collection of bacteria cells that grows over time. These bacteria secrete quorum sensing compounds that attract other bacteria toward the growing biofilm. A common example of this type of structure is dental plaque. Understanding how these formations develop can contribute to helping us find ways to slow the formation and possibly remove biofilms. In this study, a model of bacteria forming a biofilm by following a chemical gradient was created using the programming environment R. The results of this study indicate that bacteria cells aggregate faster in the presence of a steeper chemical gradient. The steepness of that chemical gradient, however, does not affect the shape of the resulting biofilm. As a biofilm forms, the fractal dimension, or complexity, of the structure increases over time. The regular clearing of these chemicals and bacteria by brushing your teeth can hinder the quorum sensing activities of these bacteria, slowing the formation of dental plaque. As a biofilm grows and its structure becomes more complex, it is more difficult to break and remove.

459 Plastics in Marine Environments

GUS FORMATO

FACULTY SPONSOR: ISIDRO BOSCH, BIOLOGY
EDGAR FELLOWS CAPSTONE PROJECT

Plastic and microplastic pollution in the marine environment is one of the most significant environmental challenges faced by the world today. Each year more than a billion pounds of plastic waste are added to the hundreds of billions already in the ocean. A large portion of this plastic consists of pieces smaller than 5 mm, and thus characterized as microplastics. Through entanglement, ingestion, and the transfer of toxic chemicals, plastic presents threats to marine ecosystems at every level of life. A drastic reduction in the production of plastic waste is a necessity in addressing this issue, but removal of existent waste is also important. Bucoo Hispania Barcelona and Cascais Dive take this proactive approach, diving to remove debris from underwater ecosystems. By quantifying microplastic particles in sediment, this study aimed to see if the persistent removal of macroplastic debris is reflected in the microplastic concentration of local sand. A null result was encountered, lending insight into the current methods for microplastic analysis.

383 Assessing the *Drosophila suzukii* Invasion in a Secondary Successional Forest Using DNA Barcoding

LAUREN ELLIS

FACULTY SPONSORS: JOSEPHINE REINHARDT AND SUANN YANG, BIOLOGY

Pre-dispersal seed predators can have a severe impact on the reproductive output of their hosts, ultimately resulting in negative impacts on the population dynamics of plant species in an ecosystem. While invasive plant species may initially be able to expand rapidly in population size, the introduction of their coevolved enemies can disrupt this population dynamic. We hypothesized that as an invasive plant species become well-established in an ecosystem, they may attract more invasive pre-dispersal seed predators such as *Drosophila suzukii*. We looked to quantify the occurrence of *D. suzukii* in a secondary successional forest. We used DNA barcoding with universal insect primers that target the mitochondrial COI gene to identify species of larvae dissected from native and invasive plant fruits during the 2018 fruiting seasons. We found that 85.3% of the total interactions classified were between *D. suzukii* and various invasive plant species also originating from Asia so we also analyzed evidence for population structure within our *D. suzukii* collection. The remaining 15% of the total interactions showed taxon diversity. We also quantified the correlation between fruit relative abundance and the rate of *D. suzukii* predation.

**BIOLOGY AND MATHEMATICS
INDIVIDUAL SESSIONS**

453 Investigating the Dynamics of Competition between Two Varieties of *Brassica rapa* Using a Spatially-explicit Model

KATY TOT

FACULTY SPONSORS: GREGG HARTVIGSEN, BIOLOGY, CHRISTOPHER LEARY, MATHEMATICS

Competition is often studied in both experimental systems and computer models. However, my work combines these two approaches by parameterizing a spatially-explicit, lattice model using results from an experimental test of competition between tall and short varieties of *Brassica rapa* plants. The model includes parameters for both interspecific and intraspecific competition of the *B. rapa* varieties. Within the model, individuals compete for space with four neighbors based on their identity. The results of the model show relatively equal populations of each variety for many time steps as the two varieties of *B. rapa* compete for space. Although these varieties may coexist for many time steps, eventually the dominant species will out-compete the less dominant species. This spatial model, parameterized using experimental data, can provide greater insight into how species interact over time than more commonly used non-spatial models.

461 Comparing the Effectiveness of Treatment Plans on Limiting the Spread of Emerald Ash Borer in New York State

RACHEL MCLAUCHLIN, WALTER HENNINGS, BEA DIPZINSKI

FACULTY SPONSORS: GREGG HARTVIGSEN, BIOLOGY, CHRISTOPHER LEARY, MATHEMATICS
The emerald ash borer (EAB) is an invasive species in North America currently causing extreme damage to forests throughout the Northern Midwest and Southern Canada. Several insecticide methods are being used to combat EAB spread and damage, but treatment for a single tree is expensive. We set out to find the most efficient distribution of insecticide treatment for an impacted forest. To do so, we have built an SIRD model that simulates the population proportions of trees in a forest as they become infested with EAB, undergo treatment, and recover. We created a network model simulating the rate of infestation spread in a forest environment and to introduce the spatial element of treatment. Based on where in the forest the treatment is applied, we determine the most efficient plan for immunizing trees to prevent EAB spread. Results show that the number of infestations of the emerald ash borer increases exponentially. Beyond a certain density of infestations, treatment becomes ineffective, indicating that treatment is most cost efficient at the beginning of an infestation. Additionally, the proportion of non-ash trees within the forest also decreases transmission rates, indicating that treatment may be most impactful on forests with less diversity.

467 Ecosystem Dynamics in Hare and Lynx Populations

DAVID CONGDEN, BENJAMIN ARONOW

FACULTY SPONSORS: GREGG HARTVIGSEN, BIOLOGY, CHRISTOPHER LEARY, MATHEMATICS
The interactions between organisms in an environment shape how its ecosystem will function and how these organisms survive within it. We modeled how factors including introducing predators, removing predators, adding competition, and adding density dependent regulation influence a population of hare (*Lepus americanus*) and lynx (*Lynx canadensis*) data. We used the Lotka-Volterra predator prey model and adjusted it for the calculated parameters. We found the exponential growth of the hare population and found its growth rate parameter by assuming that the population was growing exponentially when the lynx population was at its lowest point, and thus not influencing the hare population significantly. With this parameter we were able to find parameters for the death rate of the hares and the growth and death rates of the lynxes. We used these parameters in the differential equations used for the model. We found that hares are dominant in the population for 9.6 years, the lynx population range is larger than the hare range, and the hare cycle is behind the lynx cycle. These results conclude that the populations depend on each other and need each other for population equilibrium. We observed that adjustments to one population severely altered the other.

472 Modeling the Spread and Sex Dependency of *Chlamydia pecorum* in Koala Populations

KENNETH COLE, JENNA CACCIATORE, ALEXIA STETTINIUS

FACULTY SPONSORS: GREGG HARTVIGSEN, BIOLOGY, CHRISTOPHER LEARY, MATHEMATICS
Chlamydia pecorum (*C. pecorum*), a species of the family Chlamydiaceae, is a bacterium that affects only mammals, predominantly koalas. Chlamydia is the most infectious disease among koala populations and has been known to cause infertility and conjunctivitis in its hosts. Using mathematical modeling, we are able to visualize the spread of *C. pecorum* among theoretical populations of koalas. We have developed a difference equation that allows us to manipulate parameters like population size, birth rate, and sex dependent transmission rates and see the effects on the spread of the disease through the population. Additionally, we developed a second model using a bipartite graph to test the sex dependency of the disease. We can inoculate either male or female koalas in a small population and model the spread of *C. pecorum* among the small population. Using our model, we have found better strategies of reducing the impact of *C. pecorum* in koala populations.

476 Modeling Environmental Effects on Wildfires in California

TANYA KORICHKOVA, LAUREN TIGUE

FACULTY SPONSORS: GREGG HARTVIGSEN, BIOLOGY, CHRISTOPHER LEARY, MATHEMATICS

Having insight as to how different environmental factors affect the spread of wildfire is very important when deciding how to implement preventative measures. California is environmentally more prone to wildfires than many other states. There are a great number of factors that contribute to fire spread, such as: the type and density of vegetation, wind speed, drought, and elevation. By implementing a spatial model, it allows us to represent these real life parameters in a more visual way and determine which factors most influence the behaviors of fire spread. This is modeled in a lattice spread that represents the trees on different scales. Using the simplest model, the fire area is represented on a lattice where each square is occupied by a type of vegetation or barren. The probability p defines the probability that a plant is present in the square. From there, an ignition point is set or randomly chosen to model the randomness of a natural fire. Thus we visualize the effects of the attributes through our spatial model, supporting the prediction of long term spread.

460 Modeling the Spread of Malaria in Ethiopia

ALLIE AIRD, RACHEL SMITH

FACULTY SPONSORS: CHRISTOPHER LEARY, MATHEMATICS, GREGG HARTVIGSEN, BIOLOGY
EDGAR FELLOWS CAPSTONE PROJECT

Malaria is a parasitic disease caused by the protozoan *Plasmodium* and is transmitted to humans via female *Anopheles* mosquitoes. The disease is most widespread in Sub-Saharan Africa, where more than 90% of malaria deaths occur each year. In 2017 there were 1,530,739 indigenous cases in Ethiopia alone. Uninfected mosquitoes can become infected by biting infected humans. It is more difficult to predict the spread of malaria in regions where there are larger variations in precipitation, characteristic of Ethiopia's position close to the Indian Ocean and equator. We developed a mathematical model to simulate the spread of malaria between mosquitoes and humans over time, using an SIR compartment model and system of differential equations. By incorporating current data of cases in Ethiopia, we also varied the birth rate of mosquitoes and initial conditions of the model to better capture Ethiopia's climate conditions and saw that the maximum level of infected individuals is similar to that in years of higher precipitation than average. Obtaining a model for the disease can help us note how infection rates will fluctuate depending on the climate based on the years between 2010-2017.

480 Modeling Population Selection of Deleterious Mutations in Hemoglobin Subunit Beta (Sickle Cell)

EMILY WHITNEY, AVERY DEMILLE

FACULTY SPONSORS: CHRISTOPHER LEARY, MATHEMATICS, GREGG HARTVIGSEN, BIOLOGY
Sickle cell anemia is a disease caused by mutations in hemoglobin that result in abnormally shaped (sickled) red blood cells (RBC) and result in tissue oxygen deprivation.

Homozygotes have 100% chance of developing chronic hemolytic anemia, die early, and less likely to reproduce. Despite this selective disadvantage, there are world regions with high frequencies of these mutations. These regions have high rates of malaria. These mutations confer protection against malaria. A graph-based model is used to represent this system. Methods: 1) Create a lattice, randomly assign each vector a genotype (AA, Aa, aa). 2) Iterate over 100 time steps, vectors are killed based on a death rate given to each genotype. 3) Scan for dead vectors, replace with new vectors with genotypes determined by two nearby vectors. 4) Store vectors in an array. Results: The average lattice is filled with genotype Aa after approximately 45 steps. The equilibrium of the system is found with a full lattice of Aa types. We will continue to refine these models by adding more traits and varying death and/or birth rates for given genotypes. These results will help us gain a better understanding of how fitness influences gene spread through a population.

510 Comparative Modeling of the COVID-19 Pandemic in Wuhan, China and New York State

SCOTT BOOTH, ALEC ATKINSON, JOHN CODY
FACULTY SPONSORS: GREGG HARTVIGSEN,
BIOLOGY AND CHRISTOPHER LEARY,
MATHEMATICS,

COVID-19 is an extremely infectious disease recently classified as a pandemic by the World Health Organization. The virus is now spreading globally, and the process by which it is spread from person to person is the subject of intense study. In order to understand this process an SEIR disease model was constructed, utilizing the most recent population and outbreak data, to represent the dynamics of the disease. The model results accurately represent the current outbreak in Wuhan and considers the impact of social and governmental action taken to limit the spread of the disease. A proper modeling of the Wuhan outbreak allows us to more accurately predict the future spread throughout other outbreak stricken nations and to predict the impact of prematurely returning to normalcy.

BLACK STUDIES ENTIRE SESSION

BLACK HUMANITIES: THE 1619 PROJECT

SESSION CHAIR: EMMA MANDELLA
FACULTY SPONSOR: MARIA LIMA, BLACK STUDIES

360 Introducing Black History with the Stolen Sounds of American Popular Music

MARGAUX CARMEL

The goal of The New York Times's The 1619 Project is to restructure education around American history to include and focus on the experiences of black people in American history and society, specifically the impact of slavery and structural racism. This presentation creates the

argument to include societal education of the importance of black musicians, artists, and musical traditions in the formation of what is now American popular music in genres such as country and rock and roll. It also analyzes the successful retention of black music culture through the contemporary rap genre. Overall, this presentation sets the foundation of the use of American music culture in the education of the black influence on American history and culture.

361 Slamming the Stigma

SAMANTHA AYA

Linda Villarosa argues that past beliefs about Black people's physiological differences from white people were used to justify slavery. The problem is that present day physicians still use these myths to influence how they treat Black people in the healthcare system. To this day it is still believed that Black people are more immune to pain and have thicker skin than white people and that takes a toll on the mental health in the Black community. When doctors do not take the pain of Black people seriously, Black people will not take it seriously either. Not only Black people should be aware of the many ways to overcome the community's stigma towards mental health issues. The foundation of the stigma can be found in the past, but that does not mean the culture cannot change going into the future. This stigma may have a strong foundation, but it has been proven day after day that Black people can overcome anything.

362 The Ills of American Capitalism and the Question of Reparations

EMMA MANDELLA

Chattel slavery was the foundation for capitalism in America, and the extreme impact it has had on economic development of the nation has made American capitalism into a system uniquely cruel to its working class. This uniquely American preference of profit over worker security began with the seemingly endless profit from slavery, and can still be identified in worker exploitation today. A close reading of Matthew Desmond's "In order to understand the brutality of American capitalism, you have to start on the plantation" brings forth the realization that an oppressive capitalist system continues to work against black Americans. From the Reconstruction period until today, structural inequality permeates the lives of African Americans; housing discrimination, unfair lending practices, and social discrimination culminate in the perpetual subjugations of black citizens under American capitalism. Based on this, I will argue that to achieve any lasting solution to such inequities, optimal reparations must attack structural injustice, and (perhaps most importantly) work outside of American capitalism itself.

494 From Plantation to Prison: Examining the Creation of the United States Prison System

KELSEY DUX

The goal of this presentation is to analyze the history of the United States prison system to reveal how it reproduced slavery after the 13th Amendment. My intention is to separate its history into three eras: the first prison boom of

the mid-1800s, the second prison boom of the mid-1900s, and the modern-day private prison industrial complex. The connection of chattel slavery to the prison system is then shown through three parts: how the government used its power to institutionalize this new form of slavery, how culture and public opinion have been influenced to accept this new caste system, and finally how brutal inhumane treatment against Black Individuals have been continued through the prison system. The rhetoric promoted by governmental leaders and policies, as well as the created connection between Black Americans and criminality is among the few themes examined. Pulling from various sources, including The New York Times's The 1619 Project, this presentation reveals how the three parts work interdependently to normalize a system that continues the deprivation of human lives.

BUSINESS ENTIRE SESSION

31 VENTUREWORKS INVESTOR PRESENTATIONS

SESSION CHAIR: STEVEN BROOKSTEIN,
BUSINESS

Students in Geneseo's VentureWorks entrepreneurship program will be competing again this year in the annual New York Business Plan Competition (NYBPC). The competition begins with regional semi-final rounds in each of New York's 10 Regional Economic Development Council zones: Capital Region, Central New York, North Country, Mohawk Valley, Finger Lakes, Western New York, Southern Tier, Mid-Hudson, NYC, and Long Island. The top teams from each of the 10 regions will then advance to the final round of the statewide competition, where they will go head-to-head for monetary prizes in Albany. SUNY Geneseo is in the Finger Lakes region and our student teams plan to compete in the semi-final rounds. GREAT Day is an opportunity for our Student Teams to deliver their Investor Presentations that were selected for presentation at New York Business Plan Competition, Rochester and Albany, NY.

511 Green Dplan Redemption

GIANNI CASTELLANO, JAKE HASENBALG, NICK GARTNER, ADAM TENNEY

512 SecretSOS

LEAH SHERMAN, SARAH HASHMI, EMMA LENZ

513 Shadow App

ALEXANDER CASTILLO, NOELLE STASO,
BRENDEN NAVARRO

514 EZ Meals Meals

LOGAN STRONG, BRENDAN LYON, MASON MEZZIO, JESSICA BUFFAMONTI

515 CyberVision

SALVADOR GALARZA PEDRAZA, JACK TRUCKENMILLER, MATTHEW FICARRA

516 GenGamCon

CARTER BENTON, TREVOR GRECO, CALEB WILDER

517 Geneseo Ice Rink

**MICHAEL HUGHES, MAXIMILIAAN TORRES,
SEAN MOHAN, THOMAS RIGGERS**

**BUSINESS
INDIVIDUAL SESSIONS**

**13 Impact of a Toxic
Workplace/Work Environment on
Employee Stress/Health**

MICHAEL WEISS, LAURA RICHARDS

FACULTY SPONSOR: AVAN JASSAWALLA,
BUSINESS

Employee stress/health is important to workplace productivity. For our research, we sought to examine the correlation between a toxic workplace/work environment and employee stress/health within the workplace. We used the following questions as a basis for our research: 1. What aspects of employee health/stress are most severely affected by a toxic workplace environment and how do these aspects limit productivity? 2. What are the economic differences between healthy and toxic workplace environments? 3. What management styles create more of a toxic environment and what can be done to promote healthy environments? Based on our analysis of scholarly articles, our findings include the following: 1. Toxic or stressful work environments directly impact employee and organizational health, performance and productivity. 2. Companies that promote healthy workplace environments save a great deal more money than companies with toxic workplace environments. 3. Narcissistic, egomaniac, overly competitive, and micromanagement styles create a toxic work environment with an atmosphere of insecurity, demoralization, vulnerability, unworthiness, and low motivation among the employees. Based on our findings, what do we recommend? Let's find out!

**208 The Impact of Redesigning
Workspaces on Employee
Productivity ☞**

**JACK KAISER, JACK KAISER, JULIA FLOCCO,
JULIA FLOCCO, IAN FARRELL, IAN FARRELL**

FACULTY SPONSOR: AVAN JASSAWALLA,
BUSINESS

Our research focuses on whether improving workspace on the job will improve or decline employee productivity. This includes physical layout, employee interactions, and employees effectiveness towards workplace sustainability.

**438 Skilled Delivery and Child
Health: Case Study of Odisha**

ALLIE AIRD

FACULTY SPONSOR: PALLAVI PANDA, BUSINESS
Although the entire country of India had an extremely high infant mortality rate (IMR) at the turn of the century, the state of Odisha stood out at 97 deaths per 1000 births in 2001. Consequently, the IMR mission was developed to treat pregnant mothers and infants in Odisha in attempt to decrease Odisha's IMR relative to

other Indian states. The IMR mission provided expectant mothers with cash assistance for transport to health facilities, prophylactic chloroquine tablets to prevent malaria, and information targeted at dispelling traditional beliefs. The policy has the potential to reduce infant mortality, yet the most vulnerable infants who are saved through IMR services may in turn become malnourished children as there are no services offered beyond infancy. By applying econometric techniques to nationwide survey data, I evaluated whether the malnutrition rate increased as a result of the policy by using height-for-age z-scores and weight-for-age z-scores as indicators. If an increase in malnutrition has occurred, it may indicate a waste of resources and imply an optimal policy would incorporate measures to assist children beyond infancy as well.

489 Mexico City Policy Impacts

LUCIEN SIGAL

FACULTY SPONSOR: PALLAVI PANDA, BUSINESS
EDGAR FELLOWS CAPSTONE PROJECT

This project examines the impact of Mexico City Policy on Health Behaviors and Health Outcomes in sub-Saharan Africa. The Mexico City policy "prohibited non-U.S.-based non-governmental organizations (NGOs) from receiving U.S. family planning (FP) funding if they advocated, provided, counseled, or referred clients for abortions, even with non-U.S. funds." I conducted an extensive review of the implementation of the policy as well as any economic studies that have been carried out to assess its impact on the economy over time. Finally, using econometrics, I analyzed the policy and its impact on a woman's fertility, infant mortality, and other health behavior outcomes.

**518 Closing the Gap: A Look at
Productivity In Advanced
Economies**

JULIAN PONIRAKIS

FACULTY SPONSOR: MANSOKKU LEE,
ECONOMICS

This presentation is a look into the productivity of some of the world's most developed economies over the last 30 years. We go into depth using the Solow Growth Model in each country studied and in the end see how they compare to emerging economies.

**CENTER FOR INTEGRATIVE
LEARNING
ENTIRE SESSIONS**

**53 NEUWRITE/EDU: PAIRING
SCIENTISTS AND CREATIVE
WRITERS**

SESSION CHAIR AND FACULTY SPONSOR:
LYTTON SMITH, CENTER FOR INTEGRATIVE
LEARNING

**DONG WON OH, JENNA CONGDON-LOEFFLER,
LAUREN ELLIS, CLAIRE PRUNIER, CAITLIN
MORAZZINI, JENNA COBURN**

FACULTY SPONSOR: OLYMPIA NICODEMI,
MATHEMATICS

NeuWrite/Edu pairs Geneseo undergraduate creative writers and scientists who collaboratively produce rigorously-informed creative nonfiction essays about cutting-edge science research at Geneseo. This presentation explains the process behind NeuWrite/Edu, discusses the need for creative science writing, and shares parts of the essays produced by the students.

**214 INTEGRATIVE LEARNING IN
ACTION: WHAT MY ADOPT-A-
BUSINESS MEANS TO ME ☞**

SESSION CHAIR AND FACULTY SPONSOR:

NICOLE MANAPOL, CENTER FOR INTEGRATIVE
LEARNING

**GABRIELLA DIGNITTI, ABIGAIL SICKLES,
MADELEINE METCALF, CECILIA KULA, MICHAEL
HUGHES, JULIA MCGAUGH**

Join the Adopt-a-Business student team for a panel presentation while we reflect on our year-long experience of interning. The Adopt-a-Business program provides students with a unique internship experience to consult with business owners in the surrounding communities on digital marketing and online visibility. During this panel, we will dive into the learning outcomes we established at the start of the year, reflect on our experiences throughout the program, and offer some final thoughts on the impacts of interning during our college experience.

**CENTER FOR INTEGRATIVE
LEARNING
INDIVIDUAL SESSIONS**

**146 Considering the US Gender
Gap: Lessons from Iceland; Frank
Vafier '74 Ambassadorship in
Leadership**

JILLIAN TODD

FACULTY SPONSOR: LYTTON SMITH, CENTER
FOR INTEGRATIVE LEARNING

Through the ambassadorship program and the funds provided by the Frank Vafier '74 Ambassadorship in Leadership, I was able to travel to Iceland for two weeks over the 2019-2020 winter intersession where I conducted a research project focused on gender in early education. I spent time observing and interviewing in one traditional Icelandic early school and two schools which follow the Hjalli pedagogical model. The Hjalli Model seeks to liberate children from typical gender roles through curriculum meticulously designed to subvert the development of masculinity and femininity in young boys and girls respectively. My presentation will highlight key points from my research, discuss its impact on the Geneseo community, and describe how the project continues to inform my plans for the future. This project was funded by the Frank Vafier '74 Ambassadorship in Leadership.

291 Interactive Shakespeare Experience: Digital Humanities and the Future of Studying the Bard

NICOLE CALLAHAN

FACULTY SPONSOR: LYTTON SMITH, CENTER FOR INTEGRATIVE LEARNING

Through the ambassadorship program and the funds provided by the Frank Vafier '74 Ambassadorship in Leadership, I created a website devoted to a digital edition of Shakespeare's Othello. I developed my own website with in-line annotations and was able to view a live performance of Othello at the Stratford Festival in Canada. The viewing of the performance included a behind the scenes tour of the theater that provided a way to frame the performance element of the play for the website. This edition is an experiment in a digital approach to the works of Shakespeare. It tries to engage students who are just being introduced to early modern drama in a new way. This project funded by the Frank Vafier '74 Ambassadorship in Leadership.

401 Culture Shock from (the) Seoul

DENIS MAZARIEGOS

FACULTY SPONSOR: LYTTON SMITH, CENTER FOR INTEGRATIVE LEARNING

Through the ambassadorship program and the funds provided by the Eddie Lee '76 Ambassadorship for First Generation Students I sought to further empathize with my Guatemalan immigrant parents by going to South Korea to self-administer culture shock. Due to my initial lack of direct connection to South Korea, it was the perfect country to experience the challenges of a language barrier and the effects of being a stranger in foreign location. While in Korea, I photographed my whole experience with the intention to inform students of the nuanced emotions that arise when being abroad. These photographs collected are to encourage students to apply to unique study abroad programs, while explaining my culture shock challenges through visualization. This presentation will focus on specific pictures along with personal stories that are relevant to the theme of culture shock and how it has affected my goals to continue pursuing cross-cultural research. This project funded by the Eddie Lee '76 Ambassadorship for First Generation Students.

CHEMISTRY INDIVIDUAL SESSIONS

351 Nano-scale Networking of Amyloidogenic Peptides

DAVID AKANONU, SAKURA HAMAZAKI

FACULTY SPONSOR: KAZUSHIGE YOKOYAMA, CHEMISTRY

A structural condition between adjacent gold colloids were considered to be "entangled" and enclosed in an interfacial distance that was found to be approximately 2 nm. The complex nano-size dependence was explained by available spacing between adjacent peptides. This difference was explained by the difference in partial charge distribution over a monomer. Both $A\beta_{1-40}$ and

$B2M$ are considered to have a partial charge (especially partially +) distribution centering around the prolate axis.

433 Oxidation of Primary and Secondary Alcohols into Aldehydes and Ketones using Ammonium Dichromate in Sand

JOHN LEPORE

FACULTY SPONSOR: ROBERT TORREGROSA, CHEMISTRY

The oxidation of alcohols is a long-established class of reaction in synthesis. Classical oxidation reactions have used pyridinium chlorochromate, Jones reagent, sodium dichromate, and Swern conditions as effective oxidation reagents. In recent years, there has been growing interest in the use of supported reagents in tandem with these reactions, particularly with silica gel towards chromium-based oxidizing agents. Although there are plenty of reactions carried out in silica gel reported in the literature, the use of sand in reactions remains limited. Comparing between sand and silica gel, both are SiO_2 , crystalline, and porous, yet silica gel is ordinarily used. Herein, we report some of our results regarding the oxidation of primary and secondary alcohols to aldehydes and ketones using ammonium dichromate in the presence of washed sand. Using acetonitrile or toluene for primary and secondary alcohols respectively, the clean oxidation of these alcohols into aldehyde and ketone forms in sand is observed based on TLC, 1H and ^{13}C -NMR of the crude material. Furthermore, comparison between the preparation of aldehydes and ketones using the developed reaction versus sand-free conditions demonstrates the supporting role and enhanced reaction efficiency sand provides.

COMMUNICATION INDIVIDUAL SESSIONS

434 Citizen Journalism: A Vehicle Adding New Framework to What Traditional Journalism Provides

JULIA SKEVAL

FACULTY SPONSOR: ATSUSHI TAJIMA, COMMUNICATION

EDGAR FELLOWS CAPSTONE PROJECT

Everyday citizens are utilizing the power and reach of social media to "report" on the news unfolding in front of them, whether that be physically in front of them or in the media they are consuming. These citizens are known as citizen journalists; people with no journalistic credentials who post about breaking news and recent tragedies, often without confirming or fact-checking the content before it is published. Through the lens of framing theory, the traditional print and citizen coverage of three mass tragedies are analyzed in order to determine the relationship between the two mediums as well as how each medium impacts one another and their audiences. Traditional print journalism frames tragedy in ways that differ significantly from citizen journalism, creating different versions of realities for their readers.

496 The Psychology of Food: Food Marketing, Packaging, and Appearance Impact Consumer Purchases

MICHAELA PULVER

FACULTY SPONSORS: ATSUSHI TAJIMA AND ANDREW HERMAN, COMMUNICATION

This document observes, discusses, and studies the world of food psychology, particularly food presentation and packaging, and how it is used to manipulate and influence consumer thoughts, beliefs, and choices. Food companies manipulate consumers primarily through color and color schemes within company product or packaging, as color subconsciously can evoke emotion and create association. Past studies have been formulated to test the power of color persuasion. The author of this study conducted research to further support past data regarding food beliefs, preferences, and to test color scheme favorability. Results produced further evidence that particular colors are more favorable and desirable and elicit particular thoughts.

EDUCATION INDIVIDUAL SESSIONS

91 The Importance of Inquiry-Based Learning in Education

LAYLA KAISER

FACULTY SPONSOR: DENNIS SHOWERS, EDUCATION

As education evolves, there is becoming a greater need for a shift from teacher-centered instruction, to student-centered instruction. Inquiry-Based Learning is an approach to instruction that emphasizes the role of the student as part of the learning process. Students are given a real-world question or problem to solve, then conduct research/experiments in order to arrive at a solution. Students can present their solution in a variety of ways using multimedia resources, and reflect upon with their peers post presentation. The benefit of using this method of learning is that it allows students to demonstrate their individual strengths, it does not use a "one size fits all" approach. Studies have found however that this method can be difficult for teachers to implement because it can be time consuming when there are strict curriculum guidelines to follow. However, when teachers are properly coached to implement Inquiry-Based Learning into their classrooms, there has been found to be significantly positive impact on student learning and an increased amount of engagement across content areas.

108 Teaching Internationally and the Effects that it has on American Educators and their Teaching Practices in U.S. Schools

KELLY TEEL, HEATHER MCELLIGOTT

FACULTY SPONSOR: CHERYL KREUTTER, EDUCATION

Our presentation will focus on research that we have gathered from educators who have taught or student taught abroad in a wide variety of countries/continents. Each subject revealed

differences in the experience that they had teaching abroad. However, the takeaways and the impact that the experience resulted in was similar in all cases, no matter the country or school. All subjects felt that their time teaching abroad strengthened their teaching abilities and cultural awareness. We will also focus on our own experience student teaching in Ghana and how it changed our outlook on foreign school policies.

301 Students with IDD Displaying their Campus Experience to the Geneseo Community: A Newsletter Writing Intervention

NOELLE BARRAGATO, KRISTEN ADAMS
FACULTY SPONSOR: BRIAN MORGAN, EDUCATION

Students with intellectual and developmental disabilities have been historically underrepresented in media and texts as authors and creators. This project will look into the impact a newsletter written by students with intellectual and developmental disabilities has on the Geneseo community and the student authors. Also, this newsletter will be designed to help students with disabilities improve their writing through targeting individual student needs through differentiation of instruction. The student writers will be fourteen students with intellectual and developmental disabilities from the L.I.V.E.S. Program. We will be completing three student-written newsletters by GREAT Day for our presentation. Student writing improvements will be examined for data collection along with a pre-writing and post-writing survey that will examine the students attitudes towards writing. We plan to publish this newsletter be online via Google Sites so students, professors and Geneseo community members may access it. Finally, we plan to leave a survey for readers of our newsletter to gain their perspective after reading. All of these measures will give us insight in order to see if the newsletter writing intervention is successful in improving individual student writing and bring awareness to the Geneseo campus and community.

442 The Effects of Process Differentiation in an Eighth-Grade Mathematics Classroom

ABBY GRIFFIN
FACULTY SPONSOR: GEORGE REUTER, EDUCATION

EDGAR FELLOWS CAPSTONE PROJECT
Research indicates that teachers should implement strategies that target individual student's needs, while also instructing in a heterogeneous classroom. In the present study, I designed a sequence of activities to observe the effects of differentiation on a cohort of students in their eighth-grade mathematics class. Students were given a pretest to examine their knowledge before any differentiation was implemented. Throughout the next unit, I collected data about my students' responses to the activities, designed new differentiation activities, and quantitatively analyzed their responses. To conclude the study, the students took a post-test. As the literature suggests, all three activities focused on student choice, productive struggle, and open-questioning. Students were given

options and the freedom to write their own problems, or choose their own way to approach a problem. The students were surprised by the appearance of choice in these activities and struggled to confront the more challenging problems that they were given. The conclusions of this study suggest that in order for differentiation to be significantly productive, it is necessary to adopt a culture of differentiation early-on in the classroom and continue to support this culture throughout the school year.

419 Teacher Candidates Reflection and Application of Multicultural Education

EMMY LUNDQUIST, AMY FORREST, LESLIE MAST, RYLAND FROST

FACULTY SPONSORS: THEA YURKEWECZ AND CRYSTAL SIMMONS, EDUCATION
Teacher candidates from the elementary and adolescent education programs in the School of Education will reflect on the importance of multicultural education and share pedagogical strategies in this presentation. This session will feature a narrated PowerPoint where teacher candidates demonstrate how they have implemented multicultural materials into their planning and teaching. Audience members will be provided with current research strategies and resources for how to address diversity and inclusion in classroom spaces.

ENGLISH ENTIRE SESSIONS

CRITICAL APPROACHES TO READING WEST AFRICAN WOMEN'S LITERATURE I

SESSION CHAIR AND FACULTY SPONSOR:
OLA OCHA NWABARA, ENGLISH

122 The Contextual Ability of Literature to Represent the Impact of Colonialism on West Africa and Individual Women Identity in West Africa

BRIAN VARGAS

It is imperative, in the consideration of the societal practices and history of a culture, that text be acknowledged as a cultural contextualizer; literature contextualizes historical movements that impact the people of a society. This paper discusses the contextual implications of early African Literature and its correspondence to the West African Women's disposition by looking at modern narratives that provide context for their disposition in relation to colonialism. This paper examines the works of Yaa Gyasi and Buchi Emecheta, *Homegoing* and *The Joys of Motherhood*, which offer perspectives into the disposition of West African women through a generational narrative of colonialism. The paper uses primary and secondary resources to highlight each narrative's historical accuracy. The literature presents fictional characters real historical context, revealing issues that continue

to affect West Africa to this day. There is a lack of voice and awareness regarding the position of West Africa as a result of several generations of imposition by European colonialism; there is even less representation and acknowledgement for the women of West Africa. This paper offers an analysis of the untold insight into the serious issues, restraints, and limitations women in West Africa have had to deal with and overcome.

Selected for presentation at National Conference for Undergraduate Research, Bozeman, MT

123 Women's Decolonial Perspectives and Chimamanda Ngozi Adichie's *Purple Hibiscus*

EMMA MANDELLA

As a consequence of Afrocentrism, the academic method Africology extends the importance of Black perspectives by creating an identifiably African or Pan-African method to analyze knowledge and culture. Just as interdisciplinary studies incorporate multiple fields, this approach to utilizing African origins must address all perspectives. Considering gender, if one perspective dominates discussion, academics risk repeating the injustice of a hegemonic narrative. African women's literature as artistic and political work recognizes their contribution to a complete picture of African experiences. In contemplating cultural issues, their literature contributes to completing the narrative framework in Africology. This paper covers decolonial theories, focusing on distinctly African frameworks for examining the diasporic culture. Chimamanda Adichie's *Purple Hibiscus* particularly will demonstrate how authors investigate continued complexities of colonialism's presence, paralleled through the protagonist's growth in patriarchal familial structure. The novel's narrator and author emphasize a young Nigerian woman's narrative, and offer a unique contribution to Africological theory by incorporating the value of cultural roots alongside feminist ideals. By tackling subjects from a perspective often neglected, the literature shows knowledge available only when such perspectives are elevated, inevitably creating a complete picture of culture and solutions as these theories evolve.

Selected for presentation at National Conference for Undergraduate Research, Bozeman, MT

124 Sula and Homegoing: African Traditionalism through Taboo and Ogbanje-Abiku

ROSALINDA MESBAHI

In this research paper I engage with the primary texts *Homegoing*, by Yaa Gyasi, and *Sula*, by Toni Morrison. *Homegoing* and *Sula* are admittedly different, but they share a multitude of thematic and cultural qualities. I explore death, madness, and intentionality. In order to explore death and madness I use a piece authored by Augustine H. Asaah which discusses taboos in African culture, namely death, madness, sex, and incest. A 2004 publication by Christopher N. Okonkwo allows me to explore death and intentionality in *Sula*. An essay by Ruth Simms Hamilton makes contributions to my analysis of intentionality in

Sula and *Homegoing*. These pieces are central to my analysis of *Sula* as a traditional African text. In using analytical pieces which frame *Sula* as fundamentally African, I allow myself room to explore other texts which are more heavily located in the West African literary canon, namely *Homegoing* by Yaa Gyasi.

Selected for presentation at National Conference for Undergraduate Research, Bozeman, MT

125 Enslavement in Womanhood

DEVIN GORDON

In this paper I use Buchi Emecheta's novel *The Joys of Motherhood* to analyze the ways in which African women's enslavement becomes an underlying element throughout the novel. I discuss how the prevailing trope of enslavement is developed through three major points: marriage and the expectations for the wife; the limitations poverty and illiteracy create for African women and how poverty and illiteracy deprives them of independence and autonomy; finally, the societal expectations of motherhood and childrearing and how they limit women's freedom and become a defining factor of her womanhood. I will discuss these topics through a scholar-backed analysis and outside research to support my claim and further develop my analysis. Furthermore, I will display how the element of enslavement becomes evident within other texts from African women's literature and the importance of acknowledging the stories and experiences depicted.

CRITICAL APPROACHES TO READING WEST AFRICAN WOMEN'S LITERATURE II

SESSION CHAIR AND FACULTY SPONSOR:
OLA OCHA NWABARA, ENGLISH

126 Telling and Remembering: The Role of Folktales in Yaa Gyasi's

Homegoing

CECELIA DRAKE

Stories are often the way in which older generations pass down cultural identity to younger generations. However, in the case of African people who were forcibly taken from their land of origin, and family lines became indistinct and their stories could be lost or forgotten. Many of the characters in Yaa Gyasi's novel *Homegoing* have a profound emotional longing to know more about themselves. Stories are often used to help people reconnect with their origins and their culture. Folktales and family stories are passed down through family generations of Gyasi's main characters Esi and Effia; those stories helped in times of extreme hardship. Stories, such as folktales and myths are a cement that hold people together through the ages. Gyasi explores the nature of African folktales and the important part women play in their transmission.

127 Reflect to Understand to Move Forward

MACKENZIE GRIFFIN

There is a continuous struggle for African women to invoke their agency within African spaces. By

highlighting the struggles of African womanhood to find fulfillment and happiness in Buchi Emecheta's *The Joys of Motherhood*, the goal of this paper is to reveal colonialism's negative influence on Nigerian women. Women must remain authentic in their existence while juggling the expectations to "conserve, reproduce, and sustain life". A close reading of *The Joys of Motherhood* focusing on the character relationships paired with readings on African womanism will reveal how colonialism has simultaneously tainted the parent-child and husband-wife relationships and prevented African women from finding happiness. When Emecheta's protagonist, Nnu Ego, marries a prominent man to fulfill traditional expectations and appease her father, she is a failure because she cannot bear children. Nnu Ego's second marriage brought her to Lagos, an environment influenced by modernity. Although she bears many children, she still fails to find happiness. Nnu Ego remarks, "The men make it look as if we must aspire for children or die" emphasizes the colonial influence. While African women have gained some space to reflect on their agency, it is not enough just to recognize the oppressive forces.

128 Imported Sexism: An Exploration of the Impacts of Colonialism on West African Women

EMILY POMAINVILLE

On the surface, *The Joys of Motherhood* can be read as a critique of traditional values and reproductive injustices. In this paper, I argue that, while this is true, Buchi Emecheta offers an even harsher critique of the influence of colonialism on the lives of West African women. She argues that the emphasis on motherhood in traditional Igbo society was limiting to women, but that the devaluing of motherhood does more harm. I argue this by discussing the ways women benefited from traditional practices like valuing mothers and collective action, and how contact with the West stripped women of these positive customs, as seen with the failure of Adaku's strike and Nnu Ego's children's neglect of her. Exposing problems such as these through literature is an important part of bettering the lives of women in these situations. Emecheta suggests that the root of these problems is a lack of education and job access for women which contributes to the erasure of their experiences. Through this paper, I hope to join the conversation surrounding the negative impacts of Western gender ideology on African women and make visible how an unnatural order of sexual difference has contributed to their oppression.

163 POEMS FROM EVERYDAY SOURCES

SESSION CHAIR AND PRESENTER: HANNAH FAHY

NICHOLAS VANAMEE, JESSICA BANSBACH

FACULTY SPONSOR: LYTTON SMITH, ENGLISH

Far from being lofty and exalted, poems often come from surprising and even mundane sources: Dickinson hearing a fly buzz, Williams

eating plums from an icebox. The everyday experience has much to offer every type of poet from the casual to the highly acclaimed. In this interactive presentation/demonstration, we'll show you how to be crafty in crafting poems from old magazines, from social media, and even from things in the classroom around you. We'll explore poems as shaped by chance, perception, and collage in order to reflect on what stands out to each of us as poets and observers of the everyday. Come ready to create!

237 POEMS: FROM SENSES, SENSATIONS, AND ETYMOLOGIES

SESSION CHAIR AND PRESENTER: LIDABEL

GUZMAN AVILA

KYLE NAVRATIL, JENNA MURRAY

FACULTY SPONSOR: LYTTON SMITH, ENGLISH

Where do we source our poetry? Where do we find the words we craft with? Throughout this interactive workshop, we will explore the connections between the human senses and the language we use. Spanning from orange peels to pendulums, we will ask you to find source within even the most obscure objects and the feelings they evoke. What are words? Combinations of letters? Combine them all together to formulate sentences and paragraphs that create meaning through stimulus. In this workshop we will explore not only the ways in which we physically interact with the world, but the ways in which we mentally create our world, through meta-language. Through stimulating conversation, we will both write and revise poetry in the course of this workshop. We will take them through the quiriness of language and how to mine for words within words derived from what they feel, smell, taste, hear, and see as a source of poetic and literary expression.

RETHINKING MACBETH: GENDER, GENRE, CHARACTER

SESSION CHAIR AND FACULTY SPONSOR:

SAMUEL FALLON, ENGLISH

275 Maternal Horror: Women's Bodies as Monstrosity in *Macbeth*

RACHEL MCLAUCHLIN

Most scholarship on the horror of *Macbeth* centers around reading the terrifying elements of the play as reflections of misogynistic or patriarchal fears of women and mothers. However, I argue that the horror of *Macbeth* can also be read through the lens of maternal fears of pregnancy and childbirth. By combining modern approaches to horror media with early modern medical and legal discourses, I present the very real bodily terror experienced by women during this period and demonstrate the ways in which *Macbeth* grapples with these fears and ultimately fails to provide a fully reassuring resolution. Contemporary medical theories especially reveal these categorical collapses within the play, indicating that attempts to differentiate good mothers from monstrous antimothers, both witches and pathologized hysterics, in this cultural framework always fail, since the horror exists within their very bodies, normative and non-normative.

276 A Caution Against Ambition: Macbeth and the Instruction of Moral Knowledge

CLAIRE CORBEAUX

According to Sigmund Freud, "Shakespeare often splits a character up into two personages, which, taken separately, are not completely understandable and do not become so until they are brought together into a unity" (323). In *Macbeth*, Shakespeare not only splits what typically constitutes a complete character into disparate roles, those of Macbeth and Lady Macbeth, but does so through a complex chiasmus that occurs across the play's narrative framework. This paper argues that Shakespeare employs this unique, dispersed mode of characterization in order to educate his audiences on the consequences of ambition. Indeed, the exchange of emotional extremes, that is, the chiasmus of character continuously committed by Macbeth and Lady Macbeth, instructs Shakespeare's audience with the moral knowledge necessary to visualize and understand ambition's diverse symptoms and repercussions. Though Macbeth and Lady Macbeth do not necessarily represent ontologically complete characters that mirror the members of their human audiences, their lack of ontological completeness primes them for their roles of instruction. Thus, Shakespeare's complex, unconventional characterization of *Macbeth's* titular characters provides the perfect vehicle for instructing moral knowledge, particularly, concerning the toxic trait of ambition.

KNIGHTS AND MAGICIANS: MALORY'S LE MORTE D'ARTHUR (AND ITS DESCENDANTS)

SESSION CHAIR: NATHAN STIVERS

FACULTY SPONSOR: GRAHAM DRAKE, ENGLISH

407 Lancelot's Downward Spiral or, The Ways in which Malory Tries to Warn Us About What is to Happen to Arthur's Most Beloved Knight

HEMINGWAY LOVULLO

This essay examines Sir Lancelot's role in *Le Morte d'Arthur*, his fame and eventual downfall and death. In particular, it calls attention to the subtle conventions of language Thomas Malory uses to foreshadow the fall of one of Arthur's most heroic and holy knights.

408 Morgan and Merlin: The Evolving Contrast of Magic in Modern Arthuriana

TAYLOR MANES

Two of the most recognizable names from Arthurian mythos are Morgan le Fay and Merlin, a witch and wizard who at first seem more different than they are alike: one a wise magical mentor to the young once and future king of England, and one his half-sister, a vengeful sorceress who uses her magical abilities to thwart

him at every opportunity. Modern films and literature have given us many varied interpretations of these somewhat archetypal characters, some of which stick closely to their portrayals in Thomas Malory's *Le Morte d'Arthur*, and some of which take vast liberties with their characterization to serve the author's various purposes for writing at all. This paper will first discuss their characterization in Malory, before going on to compare it to Merlin's portrayal in Mark Twain's *A Connecticut Yankee in King Arthur's Court*, Morgan's in Marion Zimmer Bradley's *The Mists of Avalon*, and both characters' in John Boorman's 1981 film *Excalibur*.

CANADIAN LITERATURE: MARGARET ATWOOD GETS TO THE HEART OF THINGS

SESSION CHAIR: KYLE NAVRATIL

418 How Margaret Atwood's "The Woman Who Could Not Live with Her Faulty Heart" Explores the Heart's Literal and Figurative Effect on Life

MARIA PAWLAK

FACULTY SPONSOR: GRAHAM DRAKE, ENGLISH
Margaret Atwood's collection *Two-Headed Poems* is fascinating for its deep exploration into the many layers of human existence and experience. Nowhere is this more exemplified than in her poem "The Woman Who Could Not Live with Her Faulty Heart." Through literary techniques discussed throughout the essay, Atwood paints the picture of an unstable and untrustworthy heart that is perhaps more realistic to the real inner workings of people than the romanticized hearts of poetry and literature. Though afflicted with real-life issues, the heart is also a metaphor for the issues in the speaker's life, as many things stem from its untrustworthiness. Atwood's use of figurative and literal language is part of what makes this poem so compelling, especially through the lens of literary analysis.

A SENIOR READING

SESSION CHAIR: DANIEL FLEISCHMAN

FACULTY SPONSOR: RACHEL HALL, ENGLISH

473 Metropolis

DANIEL FLEISCHMAN

This is an essay that looks at the relationship between the city and the suburbs as well as the relationships within a family.

474 Context Is Everything

DONG WON OH

This is a personal essay about the end of college, the future, and timing. It makes use of the technique of speculation to make sense of endings and change.

475 Halfway Gone

TROY SEEFRIED

FACULTY SPONSOR: RACHEL HALL, ENGLISH

This is a short story about the end of a relationship, though the couple is forced to continue rooming together.

ENGLISH INDIVIDUAL SESSIONS

230 A Poetic Time Loop

TANYA KORICHKOVA

FACULTY SPONSOR: LYTTON SMITH, ENGLISH

Poetic sources differ for everyone; this mixed media presentation aims to allow viewers a chance to experience the sources of my poetry. Images played on a loop through a projector will be combined with photographs to allow for the viewers an in-depth look into my poetic sources. The media will range in topics from my birth in Bulgaria and my upbringing in California to my high school years and my present college experience. They will be accompanied by poems to give the viewers samples of the sources. It will also include explanations of how I've used these poetic sources in crafting the poems. A trigger warning: some poems explore the topic of sexual assault.

241 The Perception of Color in Poetry

ZACHARY VILA

FACULTY SPONSOR: LYTTON SMITH, ENGLISH

This interactive presentation uses the reading and writing of poetry to explore how people perceive color very differently. Attendees/participants will learn about the ways color is subjective, learning from the experiences of people who are colorblind (me). The participants will learn how to write about color in poetry, without using color. They will be then asked to do so in a mini-workshop.

243 Blueprints: An Exploration of Poetic Source

KAYLA EYLER

FACULTY SPONSOR: LYTTON SMITH, ENGLISH

In forming a tour of my poetic sources, I was immediately drawn to the idea of presenting a gallery. I think it's important for my audience to be able to move through my sources and interpret them for themselves. I'm planning to integrate maps and blueprints from my childhood home as well as familiar Geneseo landmarks such as Wegmans, Wadsworth St, Orchard St, and Welles Hall. Visitors will be able to walk through a gallery of poetic sources - drawn from photographs, maps and blueprints, and mixed media - and the poems they've inspired. Maps and blueprints from my childhood home as well as familiar Geneseo landmarks such as Wegmans, Wadsworth St, Orchard St, and Welles Hall; photographs of my friends captioned with phrases from poems they've appeared in; mixed media documentations of the places that have inspired me: all these appear as a way to allow attendees to confront poetic openness and understand poetic source by meandering through a physical map of a poet's poetic consciousness.

249 Turning Note-Taking into Poetry

LYNDSAY TUDMAN

FACULTY SPONSOR: LYTTON SMITH, ENGLISH
Taking class notes is something SUNY Geneseo students do every day; this presentation helps make the ordinary, everyday task of note-taking a source of poetry. We will explore sensory details like the feel of paper, the glide of a pen, and the sound of pages flipping as attendees get to make use of assorted notebooks, ripped pieces of paper, pictures, sticky notes, and index cards, along with pens, pencils, markers, sharpies, and highlighters that they can use to write with. With these items, attendees will be asked to share single words or short phrases that they will randomly arrange to become one poem written by the students and faculty of SUNY Geneseo.

436 Coping Quantumly: Finding Quantum Physics, Identity, and Empathy in the Works of Percival Everett

CLAIRE CORBEAUX

FACULTY SPONSOR: BETH MCCOY, ENGLISH
EDGAR FELLOWS CAPSTONE PROJECT

This essay investigates the presence of quantum mechanics within two novels by author, Percival Everett: *The Water Cure* and *I am Not Sidney Poitier*. Quantum mechanics is a branch of physics that is characterized by the ideas of wave-particle duality, the development of uncertainty principles, and the concepts of indeterminacy and complementarity. Quantum mechanics spawns several interesting thought experiments and theories such as Schrodinger's cat, the many-worlds theory, and quantum immortality theory. Moreover, this essay argues that quantum mechanics functions as a kind of literary device in both novels. Specifically, quantum mechanics provides a coping mechanism for both the novels' respective characters with particular respect to the establishment and maintenance of identity, as well as for the novels' readers, who must grapple with upsetting, even disturbing instances, images, and ideas. Furthermore, the latter effect produced by the inclusion of quantum mechanics presents a useful vehicle through which Everett is able to inspire consideration, care, and hopefully change in his readers. Indeed, a quantum mechanical interpretation presents readers with a choice in how to view Everett's work and allows them to practice and expand their senses of empathy.

441 Ecology of Beauty: A Creative, Multidisciplinary Essay

DANIEL FLEISCHMAN

FACULTY SPONSOR: LYTTON SMITH, ENGLISH
Beauty, unlike butterflies, is difficult to pin down. Capturing beauty or generally pleasing aesthetics has been a motivation for nearly every field of study ranging from romantic art to philosophy to evolutionary theory. This essay concerns itself with how the concept of beauty has come to shape and influence several disparate fields from biology to works of art to my own memoiristic experiences of beauty. For instance, the beauty of natural landscape, the life that inhabits it, how

☞ Promotes sustainability

landscape artists recreate landscape, science, and the broader arts are all used to observe and explore, rather than judge, subjective estimations or expressions of the beauty found in nature. Over the course of geological, evolutionary, and historical time, beauty has come to color the geography and perception of the humans it has enraptured, creating its own ecology of thought in academia and our everyday lives. From sturgeon to the Hudson River School to Alaskan glaciers, this essay attempts to unravel that ecology of beauty as a means to comprehend the world of influences and perception that govern our truly beautiful, interconnected existence.

449 Speculative Fiction and Social Justice

HELEN WARFLE

FACULTY SPONSOR: BETH MCCOY, ENGLISH
EDGAR FELLOWS CAPSTONE PROJECT

This presentation, as part of the Edgar Fellows capstone experience, will focus on the Broken Earth trilogy by NK Jemisin and the Xenogenesis trilogy by Octavia Butler, each of which are works of speculative fiction. Both of these authors talk about issues of social justice in these works by constructing an other; in the case of Butler, an alien species, and for Jemisin, a people that have abilities related to the ability to manipulate the heat energy put out by the Earth. These works use the perspective of those outside the systems of power, as they are found in the novels, to look at alternative ways of being that clearly send a message about our own society. Through the lens of Foucault's conception of biopower, an analysis of the ways that various systems of power are put into play in the novels, and the worldbuilding done by the authors in order to create these systems, this presentation will discuss the ways that speculative fiction, because of its space for imagination, is a type of fiction uniquely suited to discussing issues of social justice.

490 From Plantation to Prison: Examining the creation of the United States Prison System

KELSEY DUX

FACULTY SPONSOR: MARIA LIMA, ENGLISH

The goal of this presentation is to analyze the history of the United States prison system to reveal how it recommenced the existence of slavery after the 13th Amendment. My intention is to separate its history into three eras: the first prison boom of the mid-1800s, the second prison boom of the mid-1900s, and the modern-day private prison industrial complex. The connection of chattel slavery to the prison system is then shown through three parts: how the government used its power to institutionalize this new form of slavery, how culture and public opinion have been influenced to accept this new caste system, and finally how brutal inhumane treatment against Black individuals have been continued through the prison system. The rhetoric promoted by governmental leaders and policies, as well as the created connection between Black Americans and criminality is among the few themes examined. Pulling from various sources, including The New York Times's The 1619 Project,

this presentation reveals how the three parts work interdependently to normalize a system that continues the deprivation of human lives.

GEOGRAPHY INDIVIDUAL SESSION

423 Management of the Genesee Valley Conservancy's Mill Creek Nature Preserve ☞

CHRISTINA MORROW

FACULTY SPONSOR: DAVID ROBERTSON,
GEOGRAPHY

EDGAR FELLOWS CAPSTONE PROJECT

The Mill Creek Nature Preserve was acquired by the Genesee Valley Conservancy in December 2018. Located in Wayland, New York, the property is 50 acres (0.2 square kilometers) and contains notable trout spawning grounds. This presentation will discuss the work conducted by the conservancy and a student intern to create baseline assessments of the property and prepare for future management. In addition to protecting the trout, management includes vegetation monitoring and preparing for the effects of the invasive emerald ash borer. In this talk, I will discuss the importance of land conservation and how this relates to Mill Creek specifically.

508 Does Banning Hijab Empower Women?

THASFIA CHOWDHURY

FACULTY SPONSOR: DARRELL NORRIS,
GEOGRAPHY

In answering the research question, does banning Hijab actually empower women, my data revealed that countries with mandated Hijab laws scored better on women's empowerment than every single Muslim country that restricted it. This allows me to conclude that banning Hijab does NOT increase women's empowerment. With this being said, it is still important to note that Muslim countries with strict Hijab laws are scoring between a 33-44, with only a ten-point difference. Noting once more, the best possible score for women's empowerment in this index is 11 and the worst is 55. Muslim countries like Kazakhstan and Bahrain do especially well in protecting women against organized violence, given that those countries are relatively peaceful. Kazakhstan performs best in education, notably so given that educational attainment is greater for women than for men. Perhaps, it is most suitable to conclude from my data that any country which limits women's expression can not do well in women's empowerment. That includes both sides of the coin, including countries that ban Hijab and those that enforce it.

GEOLOGICAL SCIENCES INDIVIDUAL SESSIONS

334 Flow Bands and Microlite Textures in Obsidian, Minyon Falls Rhyolite, Australia

ZENJA SEITZINGER

FACULTY SPONSOR: NICHOLAS WARNER,
GEOLOGICAL SCIENCES

To investigate the timing and location of band formation during effusive emplacement of rhyolite, micro-analytical techniques were applied in flow-banded obsidian from the Minyon Falls lava dome in eastern Australia. The size, orientation, and number density of clinopyroxene microlites in varying bands were determined by focusing into rectangular volumes of thin sections of obsidian using a petrographic microscope. Textural measurements were made from 47 separate collection sites for samples collected from flow-front and near-vent locations. Bands with higher microlite number densities (MND) have smaller average crystal sizes and steeper negative slopes on crystal size distribution (CSD) plots relative to bands with lower MNDs. Band thickness, glass color, MND, or degree of microlite preferred orientation do not correlate with stratigraphic position within the basal shear zone, indicating that microlites and microlite-defined flow bands primarily form during magma ascent. The micro-textural variability observed in bands is interpreted to be the result of varying degrees of undercooling. Given that number densities and size distributions of microlites vary widely on the scale of a thin section, individual flow bands provide a record of spatially complex variations in water exsolution rate and degree of undercooling experienced during transport.

Selected for presentation Geological Society of America, Montreal, QC

373 Crater Morphometry on the Dark-toned Mafic Floor Unit at Jezero Crater, Mars: Comparisons to a known Basaltic Lava Plain at the InSight Landing Site

ANDREW SCHUYLER

FACULTY SPONSOR: NICHOLAS WARNER,
GEOLOGICAL SCIENCES

Jezero crater is a 45-kilometer-diameter impact crater located along the western edge of Mars's Isidis basin. Jezero is notable due to the presence of two Late Noachian–Early Hesperian fluvial-lacustrine deltas on the western crater floor and a sizable exit river valley in the east. Also present on the crater floor is a dark-toned mafic unit of proposed volcanic origin, the subject of this study. Jezero crater was selected as the landing site for NASA's Perseverance rover, scheduled to land in February 2021. This study provides results from an analysis of the morphometry of small, simple impact craters on the mafic floor unit and a comparison to a type example of a known regolith-covered basaltic lava plain, the InSight landing site. Our results indicate that Jezero differs from InSight in that it lacks a regolith, a fine-dominated granular material several meters deep covering the surface. This is supported by the presence of rocky ejecta in small craters at Jezero and their ability to hold higher rim slopes than InSight craters. This disparity may be explained by regolith stripping via more vigorous surface processes (relative to InSight) or by a less-resistant lithology.

378 Characterization of Terrestrial Carbonates from the Catskill Magnafacies of New York State

SCOTT BOOTH

FACULTY SPONSOR: D JEFF OVER, GEOLOGICAL SCIENCES

The Catskill Mountains are comprised of terrestrial strata that is sourced from the weathering of the Acadian highlands during the Late Devonian, coarsening upwards from fine sands to predominantly quartz conglomerates. Carbonates are extremely rare in the region despite being common in other similar fluvial settings, and only a few have been described and detailed. Thin section analysis of seven selected carbonate beds and interpretation of their associated strata indicate distal meandering or anastomosing floodplain deposition within an isolated lacustrine setting. Reduced siliciclastic input into the system and a carbonate source rock enabled distal lakes to rapidly produce carbonate beds.

GOLD ENTIRE SESSION

478 CIVIC ENGAGEMENT IN A PANDEMIC AND BEYOND

SESSION CHAIR AND PRESENTER: RACHEL WALLISKY

FACULTY SPONSOR: NICHOLAS PALUMBO,
GOLD

SARA WENDELL, JULIA MULLER, JOHN MAGNAN, LARA MANGINO, EMILY MATURA, ROBBIE ECONOMOU

The COVID-19 pandemic has changed many things about our daily lives, including the way that we engage in our democracy. Join the Geneseo Votes Coalition for a panel discussion on how COVID-19 has impacted voting, and the 2020 Election.

HISTORY ENTIRE SESSION

RETHINKING HISTORY DURING THE RECONSTRUCTION ERA: THE FEDERAL GOVERNMENT, CHINESE AND IRISH IMMIGRATION, AND THE FEMINISM OF VICTORIA WOODHULL

SESSION CHAIR AND FACULTY SPONSOR:
JUSTIN BEHREND, HISTORY

132 Progressive Change: Historiography of the Federal Government's Role in Reconstruction

JENNY BARTHOLOMAY

This paper examines multiple historical arguments regarding the federal government's role in Reconstruction. While some of the first

interpretations to emerge in the twentieth century suggested that Reconstruction was destined to fail, subsequent arguments offered different perspectives as they followed a trend towards the study of social, cultural, and global history. Focusing on these historical subfields drove many scholars to recognize the shortcomings of the federal government during Reconstruction as well as the way the relationship between citizen and state changed. Additional questions investigated by different historiographical arguments include what caused the role of the federal government to expand or contract, whether or not this expansion and contraction was notable, and how different groups were affected by the changes experienced during Reconstruction. Ultimately, assessing these arguments has significant implications for how we understand the federal government during Reconstruction today, as well as how we evaluate the power of the government in the broader context of American history.

133 Irish and Chinese Immigration During Reconstruction

EILEEN REINHARDT

This paper discusses the experiences of Chinese and Irish immigrants during Reconstruction, particularly focusing on the historiography of these topics. While there is not much literature on immigration within the context of Reconstruction, this paper aims to incorporate and relate their experiences to the events and themes during this time period. Irish immigrants' relationship to religion, role in domestic servitude, and pauperism all spark debates in the historical community. Chinese immigrants' relationship to opium, style of labor, and level of passiveness are also sources of debate. By examining these topics, Reconstruction is expanded to showcase the increase in federal power and the experiences of new people in America.

134 Mrs. Satan: A Feminist Hero?

KATHERINE PETER

Victoria Claflin Woodhull was a radical feminist most known for her presidential campaign in 1872. She held extreme views about marriage, free love, and women's rights that attracted the ire of many of her contemporaries. Throughout most of her adult life, she was villainized by the public and other feminist leaders, and even dubbed Mrs. Satan in the press. However, she was an impressive and accomplished woman who is now looked at somewhat fondly by historians. In my research, I analyze how scholarship on Woodhull has changed over time, and how this is reflective of a greater cultural evolution of views on women in politics.

HISTORY INDIVIDUAL SESSIONS

15 A Woman's Place is in Hate: Female Identity and Culture in American White Supremacy from the Ku Klux Klan to the Alt-Right.

SAMUEL RUBACKA

FACULTY SPONSOR: KATHLEEN MAPES,
HISTORY

This presentation examines a visual history of women as political agents of white supremacy in the United States from the 1890s to present while challenging the stereotype that only men are capable of political extremism. By examining both organizations and individuals, this presentation demonstrates that white women have frequently engaged in acts of hate against minority communities in the United States. To support this argument, I will draw on historic examples to explain why this topic matters today.

51 Choosing Among the Evidence: The Variety of Portrayals of Joan of Arc in Films

JULIANA THOMPSON

FACULTY SPONSOR: YVONNE SEALE, HISTORY
Joan of Arc's life is unusually well documented for someone who lived in the 1400s. Because her story was such an amazing one, she has been the topic of many films throughout the years, and they each portray her personality in a very different way. However, this is not due to historical inaccuracy, but rather choosing different parts of Joan's historical documents to highlight. My paper looks at four films about Joan of Arc spanning from the 1940s to the 2010s, and each one was historically accurate in its own way. The main evidence we have of Joan's personality is her trial records, which include both stories about her life from those who knew her, and transcripts with quoted conversations she had. Each film creates a personality for Joan based on the message the directors wanted to send with their film, which is often related to what was happening in history at the time the film was made. The films each draw from different parts of her trial records to create their own unique version of Joan. My paper looks at how each film successfully did this.

Selected for presentation at Phi Alpha Theta, San Antonio, TX

52 The Stories in the Scraps: Geneseo Student Life from 1900- 1920

JULIANA THOMPSON

FACULTY SPONSOR: CATHERINE ADAMS,
HISTORY

In 1900-1920, SUNY Geneseo (at the time Geneseo Normal School) was very different than it was today. It was a small school designed only for training teachers. My paper focuses on student life during this time frame, and the most successful way of discovering it was looking at students' personal scrapbooks full of memories, photos, and even small objects, as well as boxes full of old programs and letters that people would never have predicted, would be preserved. These scraps of evidence work together to tell us the story of Geneseo and how these students lived. Despite the time difference, these students had lives similar to ours in some ways, with organizations, events, and connections to the town, and evidence of their traditions is still seen in Geneseo today. These

students were affected by events such as World War 1, and in many cases, their struggles for resources in this time, especially at a small school, led to a high level of creativity and resourcefulness among students that enhanced their student life. This paper looks at the daily life of Geneseo Normal School students during this period.

207 Education Segregation in Syracuse, NY: How Institutionalized Racism has Impacted a Generation

ANNIBELL COOLICAN

FACULTY SPONSOR: JOVANA BABOVIC,
HISTORY

Institutionalized racism is a subtle process that cannot be reduced to one act of individual racism, but when attitudes and practices leading to racist outcomes stem from unquestioned bureaucratic procedures. In Syracuse, New York institutionalized racism is ever-present and there have historically been specific mechanisms in place for creating these racial hierarchies. The African American population is severely limited by the inequality that has been created in the city. High school education is one of the largest indicators in how racism has been institutionalized, as education is highly impacted by unequal socioeconomic factors. The construction of I-81 in Syracuse ultimately destroyed a thriving African American community known as the 15th Ward in an attempt to promote urban development, a decision made by the government without input from people the construction would directly impact. Urban development became detrimental for the minority communities in Syracuse due to its focus on the white population and their improvement. Urban development initiatives negatively impacted the opportunity for minority growth in Syracuse, which has directly impacted the Syracuse City School District.

409 Albert Pistilli: Extraordinary Men in World War II

EMMY LUNDQUIST

FACULTY SPONSOR: JOVANA BABOVIC,
HISTORY

Many people feel as though the war stories from their parent's and grandparents' generations are extraordinary. However, Albert J. Pistilli truly is extraordinary. His experience as an Italian-American soldier, prisoner of war, and spy on the Italian front made his experience stand out from any other war stories I had heard before. This story has only ever been told twice before, though he deserves much more recognition.

421 South African Water History

ELISABETH BABLIN

FACULTY SPONSOR: AMANDA LEWIS-NANG'EA,
HISTORY

EDGAR FELLOWS CAPSTONE PROJECT

Water is a scarce resource in South Africa, a country dependent on water for agriculture, yet plagued by droughts. This is an examination of the developing understanding and control of water in South Africa, as well as the societal impacts that control had on a conflicted society.

It examines the responses to water in the early twentieth century, being a foundation period that sets up later water concerns in the following decades, and the period from the 1990's to the present, as a time of change in water use.

431 Tourism in Post-Conflict Bosnia; James Houston '80 Ambassador in Innovation

SHANNON CURLEY

FACULTY SPONSOR: JOVANA BABOVIC,
HISTORY

EDGAR FELLOWS CAPSTONE PROJECT

This presentation will highlight key aspects of my history thesis about tourism, history, and space in Bosnia and Herzegovina. Through the Center for Integrative Learning Ambassadorship program, I was able to travel to Bosnia in June 2019 to conduct primary source research on this topic. My paper utilizes interviews, maps, and photographs from Bosnia to analyze the presentation of history in tourist experiences across different parts of the country. Bosnia's tourism industry is growing and represents an important venue through which history and identity are conveyed to foreign travelers. The first part of this presentation will focus on the content and key arguments of my thesis paper. In addition to sharing my research findings, I will explain where this project is situated in the wider scholarship on Bosnian history and tourism. For the other part of the presentation, I will talk about the web portion of my thesis and the research process itself.

435 American Spirituality and Contemporary Religious Art

STEPH ADAMS

FACULTY SPONSOR: LYNETTE BOSCH-
BURROUGHS, HISTORY

EDGAR FELLOWS CAPSTONE PROJECT

Despite the separation of church and state, Puritan iconoclast sentiment is inseparable from American ideals. This association combined with American art historians' refusal to engage in the critical study of religion due to secularization theory has left Americans unable to read religious art that is meant to have meanings on multiple levels, while simultaneously leaving art world insiders without the knowledge of religious jargon to properly explain controversial contemporary religious art. This paper will look back to Catholic Renaissance art such as the *Isenheim Altarpiece* to show how in the past, audiences who were not art-world insiders could read multiple levels of meaning into religious work. Then it will provide a concise timeline of American religious art showing the association with Puritan iconoclast sentiment to create a context within which to view the controversies over Andres Serrano's *Piss Christ* and Chris Ofili's *The Holy Virgin Mary* in the late 20th century. Through this close reading of American religious art history, I will create a more understanding context to view controversies over contemporary art.

**LANGUAGES AND LITERATURES
ENTIRE SESSION**

ON TRANSLATION

SESSION CHAIR AND FACULTY SPONSOR:
SUSANA CASTILLO-RODRIGUEZ, LANGUAGES
AND LITERATURES

247 Don Quixote

LAURA WILLIAMS

The art of translation is one that is capable of opening doors to other cultures and providing access and knowledge to those who were previously unable. Cervantes himself had a dynamic understanding of the fine line upon which translators must operate, and even compared the art to a tapestry, stating (through Edith Grossman), "Translation from one language to another... is like looking at Flemish tapestries from the wrong side, for although the figures are visible, they are covered by threads that obscure them, and cannot be seen with the smoothness and color of the right side," (Cervantes). Grossman is quoted here because she is largely credited for having created the best translation of *Don Quixote*, originally written by the translation-doubting Cervantes in 1605 and 1615 (Parts I and II, respectively). Grossman's technique, which focuses largely on limiting the use of footnotes, modernizing the language, and creating smaller paragraphs served to create a compelling product that allowed modern readers to interact with the valuable text. Cervantes's subject matter and critiques were timeless and thus deserving of a modern audience. Grossman's crafted translational techniques expose modern readers to the true tone and message that Cervantes sought to convey centuries ago.

248 Spanish-English Idiomatic Expressions

MEGAN MAZIKAS, KATIE POULSEN

In this panel, we will be discussing several of the techniques used when translating from one language to another. More specifically, we will be looking at the translation of idiomatic expressions from Argentinian Spanish to English and vice versa. This presentation will be based on examples and data collected from a blog conducted by students at SUNY Geneseo and at the Universidad Nacional de Córdoba. Through this blog, students shared idiomatic expressions from their native languages and discussed the meanings in order to find equivalent expressions in the target languages. By doing so, students were able to see how idiomatic expressions vary between the two languages and how to approach translating something so deeply rooted in culture. This panel will explore the process of these translations and the outcomes of the project. Furthermore, it will discuss the various techniques used in translation from one language to the other. These techniques allow that the translation is both natural and applicable to the target culture. In this panel, we may cover any number of the fourteen translation techniques that we have learned, such as modulation and compensation.

**LANGUAGES AND LITERATURES
INDIVIDUAL SESSIONS****180 Rules of Classical Theater: Representations from Antiquity to Seventeenth-Century France**

EMILY KERL

FACULTY SPONSOR: KATHRYN FREDERICKS,
LANGUAGES AND LITERATURES

In *l'Art poétique* (1674), Nicolas Boileau, a well-known 17th-century French poet, and critic, gives the "rules" of classical French theater. Organized into different "chants," the text addresses the following: the three unities: *l'unité de temps*; *l'unité d'action*; and *l'unité de lieu*; and the notions of *bienséance* and *vraisemblance*. The three unities describe the consistency of one time period (24 hours), one main action or plot, and one central location, while *bienséance* refers to the polite, acceptable behavior represented on stage. *La vraisemblance* indicates that what is performed must be believable or true. These requirements for classical theater were created during Antiquity and represented in both Greek and Roman plays. Boileau's purpose in *l'Art poétique* under the reign of Louis XIV was to revisit these directives of ancient theater and revive them for French audiences of seventeenth-century Paris. My presentation will be divided into two parts: First, I will show how Boileau outlines these rules of classical theater by citing passages from Chant III. Second, I will relate each rule to two different French plays – one tragedy: *Phèdre* (1677) by Jean Racine – and one comedy: *Les Femmes Savantes* (1672) by Molière.

238 Diglossia Among Younger Speakers in Equatorial**Guinea/Diglossia Entre Jóvenes****Hablantes en Guinea Ecuatorial**

SHARON BECERRA PACHON, ANA SALAZAR

FACULTY SPONSOR: SUSANA CASTILLO-RODRIGUEZ, LANGUAGES AND LITERATURES

Equatorial Guinea has 3 official languages and 6 national languages that are respected as "traditional" under the 2012 National Constitution. Spanish, the colonial language, is the language of instruction and the lingua franca among ethnic groups. Despite cases of traditional language loss, it is unknown to what extent this occurs across age or ethnicity groups, if languages have particular functions in society or if traditional languages are used only in specific domains. Based on a sample of 200 entries from a survey composed of 1,746 questionnaires collected in Malabo and Rio Muni in 2019, we will focus on 6 questions regarding who speaks what with whom and in which domain. We will analyze the use of Spanish versus the use of vernacular languages and depending on their self-reported ethnic identity. Outcomes expected: if the participants maintain their vernacular language in the domestic domain this could exhibit an endurance of the language even though it is not the language of instruction. If the vernacular language is not spoken in the domestic domain with their siblings or parents, then this would

demonstrate a loss in the vernacular language across generations that could be explained by a top-down language policy and planning.

43 Planting the Seeds of Inclusion and Education in our Community-TOGETHER

ELENA PHILLIPS, SUSANNA DOLAN, FRANCO MELITO, SHANNON CURLEY, CATHERINE GONZALEZ

FACULTY SPONSORS: ROCIO VALLEJO-ALEGRE, ELIZABETH ADAMS AND KODJO ADABRA, LANGUAGES AND LITERATURES

Whether we realize it or not, because of the many ways in which countries and people are now interconnected, our human species have become part of an emerging world community. Using the teachings of Mahatma Gandhi to "be the change that we want to see in the world," we started TOGETHER in 2017 on our campus, a community-oriented program to foster the learning, experiencing, and understanding of other cultures by bringing into a dedicated university space, college students and surrounding migrants families to learn our mutual languages. In an article on the dilemma of inclusivity in the globalization of academia, Professor Carolina Castano Rodriguez argued that universities are failing to ask the right questions to create a learning community that is inclusive of diverse views and multicultural perspectives. In our presentation, we will demonstrate, from our first-hand experience, how programs like TOGETHER are aiding college students in their understanding of communities different from their own. Labeled as a win-win program, we will then present the twofold tangible approaches and results that we have recorded this year working on our campus with non-English speakers' families of farm-workers residing in Livingston County in New York.

Selected for presentation at New York State Association of Foreign Language Teachers, Rochester, NY

**MATHEMATICS
ENTIRE SESSIONS****TOPICS IN THE HISTORY OF MATH**

SESSION CHAIR AND FACULTY SPONSOR: GARY TOWSLEY, MATHEMATICS

404 Want to be a Famous Mathematician?

JIMMY JASINSKI

Everyday, hundreds of thousands of people volunteer their computers in the hopes of finding the next Mersenne prime, which is a prime number of the form $2^p - 1$ where p is prime. This collaborative project is known as the Great Internet Mersenne Prime Search, or GIMPS for short. At this point, the largest Mersenne prime is $2^{82,589,933} - 1$, a number that is almost 25 million digits long. Want to experience the thrill of possibly discovering a record-setting, rare, and historic new Mersenne prime? Want to earn fame and fortune? Come and learn about perfect numbers, prime numbers and GIMPS.

405 Mathematical Applications in Music

ANDREA BEDARD

In this talk, we will explore the correlation between mathematics and its applications in music. More specifically, we will investigate how ancient algebraic and geometric discoveries have laid the foundation for not only a better understanding of music, but also aiding in the many musical advancements throughout history. Through the use of mathematical concepts, such as simple ratios to the harmonic series to the Fibonacci sequence to the study of geometrical spaces, a composer can use these tools to delve deeper into musical keys or even come across new musical chords that have yet to be discovered. And throughout this presentation, we will see the mathematics behind how that is accomplished.

406 Prominent Women in Mathematics and Why They're Often Overlooked

KELLY MCLAUGHLIN

Women have never been the focus of math historians and are often completely left out of mathematics history as a whole. My research includes important women such as Maria Gaetana Agnesi, Sophie Germain, Sofia Kovalevskaya, Emmy Noether, and Katherine Johnson. The purpose is to highlight important women in mathematics throughout history and the important work that they accomplished during that time as well as to discuss some of the reasons that women are often overlooked in the field and how to combat this issue.

TOPICS IN THE HISTORY OF MATHEMATICS 2

SESSION CHAIR AND FACULTY SPONSOR: GARY TOWSLEY, MATHEMATICS

312 The Sulvasutras and Modern Construction Methods

JORDAN UPSON

This presentation will relate the construction methods found in the Sulvasutras with modern methods of construction.

313 The History of Pythagoreanism

ROBERT DOSCH

The key mathematical findings of the Pythagoreans and their relation to their philosophy.

314 The Origin of Zero

LUKE O'BRIEN

Zero is arguably the most distinguished number. Its definition is the cause of both mathematical paradoxes and misunderstandings in human thought. The number alone is necessary for the binary system, essential computational coding, and place-holding the value of none. For this reason, it is perhaps the most important mathematical invention. The origin of its invention, however, is debated. Many ancient civilizations debated over its philosophical existence and never met an accepted conclusion, while in other locations, such as Ancient India,

☞ Promotes sustainability

Babylon, and Mexico, its use as a distinct number was commonplace. Although the earliest records of zero's beginnings are in Ancient India, reports question whether this could have had any impact on later discoveries. Additionally, its translation from nonexistence, uncertain ambiguity, to the wide acceptance and spread of its use is unclear. Nevertheless, the concept of zero is pivotal in the history of Mathematics as its use still retains a profound impact on the modern world.

TOPICS IN THE HISTORY OF MATHEMATICS 3

SESSION CHAIR AND FACULTY SPONSOR: GARY TOWSLEY, MATHEMATICS

321 Abu Kamil Shuja' ibn Aslam

WILSON TAN

Aslam lived during the "Islamic Golden Age" and was known as the Egyptian Calculator. Aslam introduced irrational numbers as solutions to equations and methods for the numerical approximation to the sides of a regular polygon. He was most famous for his work on the "Method of False Position."

322 The History of Algebra

DANICA SERVO

We will take a look into when and how algebra was developed by ancient Babylonians. Algebra was first used to solve geometric equations, that were found in one of Euclid's famous works, Euclid's *Elements*. Also, Diophantus was most known for his development of algebraic notations that were used for unknowns such as x , x^2 , x^3 , etc. In 1637, algebra was further developed when Rene Descartes published his work of *La Geometrie*, where he introduced a new style of algebraic methods. This is when the development of cubic and quartic equations began to be used more often and started this new modern technique of algebra. Today, elementary algebra seems to be the most basic form of algebra taught in schools. It includes the use of unknowns that we call variables and teaches students how to solve for those unknowns using basic arithmetic. The most common use of elementary algebra seems to be for solving polynomials, which includes one variable and solving for that unknown. Over time, algebra has seemed to evolve since it was used by ancient Greeks and Egyptians, but it is still very relevant to today's mathematical world.

323 The Extended Euclidean Algorithm for Polynomials

JOSEPH LEVA

The purpose of this project is to create a program which solves the extended Euclidean algorithm for polynomials. The extended Euclidean algorithm is meant to find all solutions to the equation $ax+by = d$, for polynomials a and b and integers x, y where d is the greatest common divisor of a and b . The program, written in python, is meant to take polynomial arguments as lists of coefficients, and use the extended euclidean algorithm to find all solutions. The program will give the user the option of computing the algorithm in the rationals or integers mod n for $n \in$ the natural numbers.

363 Curve Fitting Techniques for Predicting Corona Virus Cases ☞

SESSION CHAIR AND FACULTY SPONSOR:

AHMAD ALMOMANI, MATHEMATICS

FRANK ADDEO

With coronavirus becoming an increasing global concern each day, it is obvious that we must understand what is truly happening. Using curve fitting techniques such as Fourier series, cubic splines and least squares approximation, an accurate model can be made to fit the data. Analyzing and comparing the three approaches, the best method to fit these data can be seen. We will also compare the fitting curve methods with the solution of the logistic model solution.

488 Balancing Chemical Equations Through Linear Algebra

SESSION CHAIR AND FACULTY SPONSOR:

SEDAR NGOMA, MATHEMATICS

ALYSSA HENDERSON

In chemistry, we learn to balance chemical equations by looking at the number of atoms on each side of the equation and adjusting numbers accordingly. For example, a chemist would be able to look at the chemical equation $CH_4+O_2CO_2+H_2O$ and be able to determine that the balanced equation would be $1CH_4+2O_21CO_2+2H_2O$. We want to show that the true math behind why this works is linear algebra. In high school chemistry, students guess and check to balance chemical equations. However, approaching the manner through linear algebra will always guarantee a correct answer each time. This is especially helpful once chemical equations become increasingly difficult and the guess and check method is not an efficient approach. We will consider several examples to illustrate the efficiency of the linear algebra approach in balancing chemical equations.

MATHEMATICS INDIVIDUAL SESSIONS

93 The Rendezvous Problem

LOGAN BYE

FACULTY SPONSOR: ANTHONY MACULA, MATHEMATICS

Originally considered by Steve Alpern in 1976, the rendezvous problem entails two or more parties randomly scattered in a given area, attempting to locate one another in a finite amount of time without communication. The "how long?" depends on what strategy they use to search these n locations, and if X is the time that they meet, we will calculate the expected value $E(X)$. We will explore various situations and examine the limitations or advantages that they provide the parties, and how this impacts the amount of time it takes for them to rendezvous. In addition we will address the practical implications of this problem in the real world.

150 Tikhonov's Regularization Method

HARRISON HIPOLITO

FACULTY SPONSOR: ANDRZEJ KEDZIERAWSKI,
MATHEMATICS

Many mathematical problems in science, modern technology, and medicine are expressed by partial differential equations. In particular, we discuss the backward heat conduction problem of calculating the initial temperature from the measurement of the final temperature. The backward heat conduction problem is difficult to solve since it is severally ill-posed. We solve this problem using Tikhonov's regularization method. We illustrate our theoretical method with numerical examples.

152 The Monty Hall Problem

MATTHEW ABRONS

FACULTY SPONSOR: ANTHONY MACULA,
MATHEMATICS

In this presentation we will discuss the Monty Hall problem and some variations of it. This problem is based on the game show "Let's Make a Deal" where the host, Monty, asks the contestant to select one of three doors. Behind one door is the prize, a car, and behind the other two are goats. After we select a door, Monty opens one of the other two and reveals a goat. He then looks at you and asks if you would like to stay with your choice or switch. What would you do? We will discuss how conditional probability can give us an optimal strategy as well as use tree diagrams to observe how this changes if Monty forgets which door the car is behind. Lastly, we will look at generalizations of these problems to determine the best strategy for winning in each scenario.

157 The Game of Nim and Combinatorial Game Theory

COLIN DUNLAP

FACULTY SPONSOR: ANTHONY MACULA,
MATHEMATICS

Though the name has been coined relatively recently, the game of Nim has been played for centuries and is one of the oldest games known to mankind. Nim is played by players taking alternate turns and removing discrete objects from distinct piles until all the objects are removed. In traditional Nim, the player who takes the last of the objects is declared the winner. We will deconstruct the underlying mathematics inherent in this simple game as an introduction to combinatorial game theory and see how the understanding of this game can lead to a deeper understanding of games in general.

175 Modeling Traffic Patterns on Main Street in Geneseo

NATALIE KOT, NATE WALKER

FACULTY SPONSOR: CHI-MING TANG,
MATHEMATICS

Between students, SUNY Geneseo employees, and people who drive through town, Main Street in Geneseo experiences a lot of traffic buildup, especially at certain times of the day. In this study, we noted traffic patterns going both north and south on Main St. at the intersection of Main St. and Center St., with the intention of gaining more information about when and how many cars, trucks, tractor trailers, and buses travel down Main St. in the given one hour period. We

will attempt to match our survey data to different probability models such as the exponential and Poisson distributions. As a continuation of our findings, we will discuss the implications of our findings on possibilities for accidents, while also discussing opportunities to further our study.

182 Mathematics and Art

HEATHER FORD

FACULTY SPONSOR: ANTHONY MACULA,
MATHEMATICS

There is a strong influence of mathematics in the world of art. Many different concepts in art can be described using mathematical language, and certain mathematical concepts can be used to create art. We will explore how mathematical topics such as the golden ratio, wavelengths, and projective geometry appear in art and describe artistic techniques including linear perspective, aesthetic, and color theory.

211 Statistical Analysis of New York and National Universities'

Admissions

SARAH CIRILLO, ALYSON HARDICK

FACULTY SPONSOR: CHI-MING TANG,
MATHEMATICS

Choosing which university to attend is usually one of the most stressful decisions for American students. There are several important factors to consider: offered programs and fields of study, cost of living, environment, probability of acceptance, etc. In this research, we will explore some of those factors and compare schools across New York State and the rest of the country. We will examine differences in data between schools but also compare schools with their own data over the past few years. This will allow us to further investigate what outside factors may have contributed to those changes, such as shifts in crime rates or large storms such as hurricanes. Additionally, we will explore differences in the ethnic and racial diversity of schools to discover if there is any correlation between levels of diversity in the student body and the location of the university. This research will aid us in understanding why choosing a college to attend can be so difficult and will also demonstrate how colleges across the nation can be similar but also unique.

223 Organizing a Solar Panel Array to achieve Maximum Solar Energy

Generation ☒

ERIKA SKINNER

FACULTY SPONSOR: ANTHONY MACULA,
MATHEMATICS

Renewable energy is the future of our world's energy generation and solar power is a leading field. Solar panel systems generate power without emitting pollutants and their only input comes from the sun's rays. In order to achieve the greatest energy generation from these systems, they must be appropriately angled and oriented towards the sun. We will explore what factors affect the efficiency of a solar panel such as the latitude of the location, environmental conditions, and time of year. The solar geometry between the sun and a location on Earth will be

defined and depicted for Geneseo, New York. Finally, an optimization problem will be analyzed to evaluate the maximum solar output for the placement of solar panels on a roof.

227 How to Beat the Dealer, A Mathematical Analysis of

Blackjack

CALEB LUCAS

FACULTY SPONSOR: ANTHONY MACULA,
MATHEMATICS

Blackjack is one of the most popular casino games in the world. As it is a casino game, it is designed to give the house an advantage over the other players. However, it was later discovered that using certain strategies, Blackjack is a beatable game. The idea of counting cards was later introduced to further improve a player's odds of beating the house. We will discuss the differences in expected values and variances of a poor player vs. a strategic player vs. a card counter. We will then explore the importance of deviations from traditional strategy based on the count, as well as different betting strategies to attempt to maximize expected value and minimize standard deviation.

235 Using Lyapunov Function to Analyze the Stability of Methicillin-Resistant *Staphylococcus Aureus* in Hospitals.

ALLIE EPSTEIN

FACULTY SPONSOR: AHMAD ALMOMANI,
MATHEMATICS

In this talk we will discuss the rates at which patients are colonized with the traditional hospital-acquired methicillin-resistant *Staphylococcus aureus* (HA-MRSA) strain versus the rate at which patients are colonized with the community-acquired methicillin-resistant *Staphylococcus aureus* (CA-MRSA) strain. HA-MRSA has traditionally been a problem within hospitals for elderly, and sick patients, while CA-MRSA can affect healthy, young people as well. I will use Lyapunov functions to analyze the stability of this model.

246 The Probability You Win a Game of Connect Four

CHRISTOPHER NIELSEN

FACULTY SPONSOR: CHI-MING TANG,
MATHEMATICS

Connect Four is a sequential strategy game played on a seven column by six row board, where the objective is to be the first to connect four discs in a sequence. We will discuss the strategies involved in winning a game of Connect Four. With Connect Four being a solved game, a player can employ up to eight strategic moves in attempts to gain control of zugzwang, the idea of forcing your opponent to make a move they'd rather not. We will delve into the advantages of making certain moves given a particular situation, in hopes of gaining an understanding of the theory behind each strategic move and relate these outcomes to different scenarios.

292 Reducing Food Waste Across Geneseo's Campus ☞

JENNA CACCIATORE, KATARINA NICHOLS
FACULTY SPONSOR: AHMAD ALMOMANI,
MATHEMATICS

Roughly eight percent of global emissions is due to food waste. Uneaten food exhausts resources and generates greenhouse gases. Using numerical approximation methods and the composting data collected from SUNY Geneseo's campus, we have generated a natural cubic spline curve and a least squares regression to figure out the total compost approximated. We compared this to the exact total compost given by the collected data. With this we can predict the total composting in future years using the same rates of compost and discuss ways to move forward to make our campus more efficient and reduce food waste.

342 Expected Utility

Theory/Uncertainty in Economics
NICHOLAS TURTURRO, ZACHARY SOUTHCOTT
FACULTY SPONSOR: KATELYNN KOCHALSKI,
MATHEMATICS

There is a lot of uncertainty in economics; this uncertainty is modeled through probability theory. Utility theory joins economics and mathematics to model how an individual's feeling towards risk impacts their investment strategy. Some people will be more satisfied with a very risky portfolio, and some will be happier with a safer, more risk averse portfolio. In this presentation, we will show how portfolios that are built on different preferences will perform compared to each other.

376 Numerical Approximation for Designing a Solar collector ☞

EMILY MCNEIL
FACULTY SPONSOR: AHMAD ALMOMANI,
MATHEMATICS

Designing a solar collector is expressed as a model of a first-order nonlinear differential equation. The solar collector will concentrate the sun's rays at a point and through using symmetry, we can obtain a curve about an axis. We will discuss the comparison between different approximation solutions from numerical analysis.

426 Technology in Teaching Geometry

CRISTINA GULLI
FACULTY SPONSOR: MELISSA SUTHERLAND,
MATHEMATICS

This talk centers around research-supported ways of implementing dynamic geometry software into mathematics courses, specifically into high school geometry. The Next Generation standards suggest "for scaffolding purposes, the use of a variety of tools and methods for construction is encouraged. These scaffolds include compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc. Dynamic geometry environments provide students with experimental and modeling tools that allow them to investigate geometric phenomena using visualization, reasoning, and geometric modeling to solve problems, in much the same way as

computer algebra systems allow them to experiment with algebraic phenomena. Students can create geometric models and ideas to solve not only problems in mathematics, but in other disciplines or everyday situations." I will discuss the research that supports the implementation of such mathematical technology to further student learning and achievement as well as criteria for effective implementation of such technological activities. The obstacles educators face when implementing technology, as well as suggestions to overcome said obstacles, will also be addressed. Finally, I will share a sample lesson plan using Desmos, created according to the research criteria that engages high school geometry students in exploration of transformations using dynamic geometry software.

439 Knot Mosaics: Algorithms and Interface

JAMES CANNING
FACULTY SPONSOR: AARON HEAP,
MATHEMATICS
EDGAR FELLOWS CAPSTONE PROJECT

In mathematics, a knot is a closed loop with a certain number of crossings, the simplest being a ring (with zero crossings). A knot mosaic is a representation of a knot on a rectangular grid. The knot is drawn into the squares of the grid using a set of nine unique tiles. Although all knots with up to 16 crossings are known, how most of these knots fit into mosaics is still undetermined. Previously all knots with crossing number 8 or less have been shown to fit on a space-efficient 6x6 mosaic. Using an exhaustive algorithmic approach, we show that all knots with crossing number 10 and less can be found on a space-efficient 7x7 mosaic. Furthermore, we developed an online tool that allows researchers to draw and identify knot mosaics, as well as search for a space-efficient representation of any knot.

443 Introduction to Moore Graphs

ERIC PIATO
FACULTY SPONSOR: CESAR AGUILAR,
MATHEMATICS
EDGAR FELLOWS CAPSTONE PROJECT

What do network engineering, biological systems, knots, and chemical bonding have in common? All four fall in the breadth of disciplines modeled using graph theory. We begin this talk by exploring the intuition, and some of the formality, underlying key components of graph theory. We then discuss our capstone research involving a particular class of graphs, called the Moore graphs.

450 Exploring the Relationship Between Music and Mathematics

GRANT GRIEBLE
FACULTY SPONSOR: CAROLINE HADDAD,
MATHEMATICS
EDGAR FELLOWS CAPSTONE PROJECT

The focus of this project is to use mathematical and physical methods to formally describe and explain the phenomena of harmony and dissonance in music and sound. The project will presuppose and set out to prove the notion that musical harmony has a universal and objective basis, which can be elucidated through the tools

of mathematics. The central inquiry will therefore be to explain, in a variety of mathematical perspectives, why certain frequencies of sound, when overlaid, sound pleasant to the ears and why others sound unpleasant or cacophonous. Gaining a deeper sense and appreciation of harmony and dissonance viewed through a mathematical lens can shed light upon the mechanisms that give rise to these phenomena built into music theory. Likewise, the description of musical concepts using the tools of mathematics can shed an intuitive light upon otherwise difficult mathematical concepts, suggesting pedagogical implications for how mathematics is taught in the classroom. The final aim of the project is to study whether the mathematical description of harmony and dissonance transcends the realms of music to see if the equations which describe these phenomena find applicability in the physical setting, everyday life, and beyond.

468 Disease Modeling Through The SEIR Model ☞

LUZ MELO
FACULTY SPONSOR: SEDAR NGOMA,
MATHEMATICS

In the midst of the COVID-19 outbreak, the use of mathematical models is indispensable to understand the mechanisms by which the coronavirus spreads and potentially predict its future trajectory. More generally, mathematical models are powerful tools that serve as a guide for selecting and implementing effective intervention methods for a particular disease. In this project, we will consider the SEIR (susceptible-exposed-infected-recovered) epidemic model. The model consists of a system of differential equations that takes into consideration the natural death and the death caused by the disease. Our objective is to use analytical and numerical methods to model the behavior of the disease and its effect on the population.

471 History of Mathematics in Music: Research on Sound Waves in Music

KENNETH COLE
FACULTY SPONSOR: AHMAD ALMOMANI,
MATHEMATICS

Sound waves are the essence of any auditory stimulation, and they are responsible for how we perceive what humans have defined as music-ordered tones and sounds that are pleasing to the human ear. Many popular and historic mathematicians have published their research on the theory of sound waves in music, and the goal of this project is to compile that research into a presentation on sound waves in modern music. I will research the theories that mathematicians like Euler and d'Alembert have published, compile them using layman's terms, and attempt to update their theories to include sound waves in modern music.

MUSIC INDIVIDUAL SESSIONS

82 Music After Violence- Reclaiming the Black Narrative through *Apeshit* and *Homecoming* REGINA DZIERGAS

FACULTY SPONSOR: MONICA HERSHBERGER,
MUSIC

The Carters, Beyoncé and Jay-Z, have been successful public figures for more than two decades, creating work that has received both critical and public acclaim. Their most recent projects have placed a dual emphasis on uplifting the Black community and addressing issues in their personal lives. Projects like the “Apeshit” music video and Beyoncé’s Netflix film *Homecoming* communicate their viewpoints on personal affairs while asserting the Carters’ unapologetic success to the general public. By creating room for Black excellence in traditionally white spaces, Beyoncé and Jay-Z metaphorically address their own meteoric rise to success and physically place both themselves and their work in exclusionary, prestigious spaces within a society that criticizes their decisions heavily. In this paper and presentation, I examine how Beyoncé and Jay-Z’s celebration of success in “Apeshit” and *Homecoming* responds directly to media commentary on their personal lives and is symbolic of the oppression of the Black community. I argue that these performances not only answer questions surrounding their lives and marriage but express their reclamation of stability and success as Black individuals achieving at the highest level while creating space for their culture and voices in a broader narrative.

268 Musical Reactions to the Bombings of Hiroshima and Nagasaki. Nuclear Anxiety Inspired Musical Works from Japan, America, and the USSR from 1945 to 1960

JOSH DEBELL

FACULTY SPONSOR: MONICA HERSHBERGER,
MUSIC

After the atomic bombs detonated over Hiroshima and Nagasaki in 1945, Japan surrendered, thus ending World War Two. The amount of physical and biological damage these bombs inflicted created a worldwide panic about atomic weaponry. Nuclear anxiety, however, manifested differently among Japan, the United States, and the U.S.S.R. Music produced between 1945 and 1960 illuminates these differences in nuclear anxiety, whether through a song’s lyrics or musical style imitating parts of the bombing. During those fifteen years, all three countries created music influenced by nuclear anxiety that ranged across multiple genres. For Japan, orchestral music about nuclear anxiety emphasized the physical damages and its emotional impact on the country, thus advocating for an end to atomic weapons. Even though America first used atomic weapons, many

US citizens were afraid of these weapons being used on themselves. American popular songs from 1945-1960 contained lyrical references to nuclear fallout. Music in the U.S.S.R about nuclear anxiety was created to persuade nations of the merits of Communism by portraying the bombings as a sign of the United States’ aggression. Thus, all of these nations expressed nuclear anxiety in different ways while having the same fear.

422 Tchaikovsky: Repertoire Study and Analysis of the Later Symphonies

DANIEL BRUSH

FACULTY SPONSOR: LEAH MCGRAY, MUSIC

EDGAR FELLOWS CAPSTONE PROJECT

Pyotr Ilyich Tchaikovsky was one of the most influential composers of the Romantic Era, and one of the best known Russian composers in history. While known for a wide range of musical genres, his later symphonies are perhaps the best indicator of his compositional skills. Through an analysis of his fourth and sixth symphonies, we will explore the revolutionary way in which Tchaikovsky was able to reconcile Russian style with traditional ideas of the Western symphony, as well as pioneer a completely new concept of symphonic form. A small chamber performance of segments from each symphony will also be included.

PHILOSOPHY ENTIRE SESSION

338 Race, Philosophy, and Social Justice

SESSION CHAIR AND FACULTY SPONSOR:

AMANDA ROTH, PHILOSOPHY

YARO BAUTISTA MARTINEZ, KARILYN NIEVES,
LAMINA REJA, BETINA POPNIKOLOVA

Students will talk about their experiences in two social justice-related philosophy courses: Race, Racism, & Philosophy and a seminar: Philosophy, Ethics, & Social Justice. By drawing on coursework and material developed for final projects, they will present a panel of perspectives about the value and challenges of attempting to do philosophy about social justice and for the purposes of achieving social justice.

PHILOSOPHY INDIVIDUAL SESSIONS

440 An Epistemological Account of the Logic of Propaganda

MICHAEL BADALAMENTI

FACULTY SPONSOR: DAVID LEVY, PHILOSOPHY

EDGAR FELLOWS CAPSTONE PROJECT

Propaganda is an unavoidable feature of modern society. It has been identified with multiple global conflicts, oppressive totalitarianisms, and misinformation campaigns that threaten democracy. Despite the word’s popularization in discourse, it remains somewhat ambiguous,

begetting many attempts to define and analyze the concept of propaganda. This project contributes to this effort by examining how propaganda involves itself in logical forms of reasoning and judging its value from an epistemological perspective. Propaganda can be interpreted through logically argumentative forms. These arguments are always improper, involving an invalid form or false proposition; therefore, propaganda cannot directly provide real knowledge. Nevertheless, it succeeds in leading its audience to adopt belief or action through nonlogical means and manipulating available information. An individual may avoid propagandas that rely solely on nonlogical techniques by working to identify their apparent logical flaws. Unfortunately, propagandas that manipulate available information are far more difficult for an individual to avoid, due to their leveraging of epistemic inequalities that exist between the propagandist and the propagandee. The only way to effectively limit the negative epistemic influence of these propagandas may lie at the societal level. Although still imperfect, an open and equal society may be best suited for this end.

456 Out of Body Experiences and Their Implications for the Phenomena of Consciousness

VICTORIA RIVERA

FACULTY SPONSOR: CARLO FILICE,

PHILOSOPHY

EDGAR FELLOWS CAPSTONE PROJECT

Countless reports exist of strange experiences of people having the feeling of being outside their body and undergoing elaborate sensations, or of interacting directly with a different consciousness. The reports range from near-death experiences resulting from accidents, and people who believe to be reincarnations of previous persons, to people who can reportedly separate from their bodies to view things that they otherwise couldn’t. The typical response to these reports, particularly now in the age of the scientific method, is to write them off as frauds, and insist that the mind is fundamentally material. As a result, not much inquiry has been rigorously made into these claims. Generally, differing opinions are not allowed in the mind-body argument and there is a narrow margin of what is considered an acceptable worldview for those who wish to be taken seriously. But it’s possible that the current view is in error. A nonlocal mind explains these phenomena and has some background in quantum mechanics, a realm of physics that is relatively new and unfinished. With proper investigation and an open mindset, the mystery of consciousness is perhaps within our grasp and can lead to new understandings of the human condition.

PHYSICS & ASTRONOMY INDIVIDUAL SESSIONS

429 Designing Sustainability Education Initiatives for Secondary Education ☞

SCOTT WILLIAMS

FACULTY SPONSOR: STEPHEN PADALINO,
PHYSICS & ASTRONOMY

EDGAR FELLOWS CAPSTONE PROJECT

Sustainable Energy Education through Demonstration (SEED) is a ten-week program that educates students on the mechanics of renewable energy production and the value of these energies in combating climate change. This program was designed by undergraduate students at State University of New York at Geneseo who are passionate about sustainability and was successfully administered by these students at the nearby Geneseo Central School. SEED attracts students from a multitude of backgrounds, especially those interested in the natural sciences. High school students involved in the program garner a better understanding of the issues of anthropogenic climate change and environmental degradation, how different forms of renewable energy function, and what sustainability initiatives look like in their own community. Through this program, students became more engaged in issues relating to sustainability, all the while creating a greater connection between the local college and the central school. This presentation will include an overview of the SEED program, highlighting the challenges and benefits of designing the program.

430 Development of a Time of Flight Spectrometer for Low Energy Rutherford Backscattering Studies

ETHAN SMITH

FACULTY SPONSOR: KURTIS FLETCHER,
PHYSICS & ASTRONOMY

EDGAR FELLOWS CAPSTONE PROJECT

The solid-state silicon surface barrier detectors used in conventional Rutherford backscattering spectroscopy necessitate the use of MeV ion beams, as lower energy ions are stopped in the detectors' dead layer. However, the accelerators needed to reach such energies are expensive and often have long startup times. A time of flight spectrometer has been developed at SUNY Geneseo's Low Energy Ion Facility to perform Rutherford backscattering studies using ions with energies in the 10-50 keV range. It has been demonstrated that this spectrometer can accurately measure the kinetic energies of ions scattered off of targets. The spectrometer can also be used to measure the composition and thicknesses of thin targets. Initial results show good agreement between the results obtained with low energy ions from Geneseo's Duoplasmatron ion source and those obtained via conventional RBS with MeV ions from Geneseo's pelletron tandem accelerator.

446 SEED: Sustainable Energy Education through Demonstration ☞

CATHERINE FEDOR

FACULTY SPONSOR: STEPHEN PADALINO,
PHYSICS & ASTRONOMY

EDGAR FELLOWS CAPSTONE PROJECT

Sustainable Energy Education through Demonstration (SEED) is a ten-week program that educates students on the mechanics of renewable energy production and the value of these energies in combating climate change. This program was successfully administered at Geneseo Central School. SEED attracts students from a multitude of backgrounds, especially those interested in the natural sciences. High school students involved in the program garner a better understanding of the issues of anthropogenic climate change and environmental degradation, how different forms of renewable energy function, and what sustainability initiatives look like in their own community. Through this program, students became more engaged in issues relating to sustainability, all the while creating a greater connection between the local college and the central school.

Selected for presentation 2019 at both COPLAC (Council of Public Liberal Arts Colleges) and AASHE (Association for the Advancement of Sustainability in Higher Education).

451 Helium-3 Gas Cell

LAURA HUFF

FACULTY SPONSOR: STEPHEN PADALINO,
PHYSICS & ASTRONOMY

EDGAR FELLOWS CAPSTONE PROJECT

The ${}^3\text{He}(d,p)\alpha$ reaction can produce protons with energies in excess of 20 MeV at deuteron bombarding energies of 3 MeV. This makes it a useful accelerator based reaction for energy calibrations of charged particles and CR-39 plastic track detectors. Helium targets are most frequently made via ion implantation in thin self-supporting foils. Instead, this method uses a gas cell with Kapton windows that is able to contain Helium at pressures upwards of 3 atmospheres. This cell was filled using ${}^4\text{He}$ as a test gas. Measurements were performed to determine the ${}^4\text{He}(d,p){}^3\text{He}$ elastic scattering rates at various bombarding energies. This information can then be used to estimate ${}^3\text{He}(d,p)\alpha$ target-beam runtimes without depleting our limited and expensive supply of ${}^3\text{He}$ gas.

POLITICAL SCIENCE & INTERNATIONAL RELATIONS ENTIRE SESSIONS

MISCELLANEOUS POLITICAL SCIENCE & SOCIOLOGY PRESENTATIONS

SESSION CHAIR AND FACULTY SPONSOR:
JOANNA KIRK, POLITICAL SCIENCE &
INTERNATIONAL RELATIONS

1 Gender Discrepancy in Law Enforcement ☞

NATALIE DISALVO

This presentation will cover the issue of gender inequality in law enforcement, particularly in rural Livingston County. It will expose the reasons behind the discrepancy, the importance of having females in law enforcement, and how to increase female representation and decision-making power in this field.

2 Congressional Hispanic Caucus Institute Internship Experience ☞

KARLA LORA

This presentation will report on experiences as an intern in a Congressional office (U.S. House of Representatives) in Washington, D.C. In addition to describing work, leadership development and community service activities, it will report on research into access to drivers' licenses for undocumented immigrants conducted as part of the internship.

4 Cuban-American Views of Cuba-US Relations ☞

SARAH SHEFFIELD

This presentation will explore Cuban-American views on relations between the United States and Cuba. Although Cuban-Americans are typically Republican in most of their ideologies, that is not the case when it comes to US-Cuba relations. It will also provide insight into the Cuban-American experience in the United States, as well as a broader perspective of the immigrant experience within the political culture of the US.

Selected for presentation at XIV International Congress on Foreign Languages, Communication and Culture, Holguin, Cuba

17 Mock Trial: The State Of Midlands V. Jordan Ryder

SESSION CHAIR: JOANNA KIRK, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

MATTHEW BROWN, MADELINE RIVERA, ALEXANDER MACCALLINI, AUDREY HOLLICK, DANIEL REGAN, DANIELLE CROWLEY, MADELINE MILLER, TIMOTHY IBRAHIM, SAVANA CONRADE, ALEA TIBERI, JOSEPH SALVATORE, KIERA HORAN, LAURA BENJAMIN, LAUREN TRAUTWEIN, HALEY SAUNDERS, JACOB GOLDBERG, EVAN STOUBER, ADRIENNE BRAICO, DELLA KNAPP

Jordan Ryder was indicted for aggravated murder for causing the death of Jordan's minor daughter, Parker Paige, during a hiking trip at Calkins Campground. Jordan Ryder has entered a plea of "not guilty" and the matter is scheduled for a jury trial in the Midlands Center District Court.

POLITICAL SCIENCE AND INTERNATIONAL RELATIONS HONORS THESES

SESSION CHAIR: KARLEEN WEST, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

308 A Detriment to Development: The Global Phenomena of Factory Farming ✂

SARAH BALL

FACULTY SPONSOR: KARLEEN WEST, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

During the 1950s, the United States government began subsidizing the evolution of standard animal farming into meat production facilities that are formally known as large confined animal feeding operations (CAFOs). While meat trade has been in the spotlight of economic scholars since the 90s, the policy on protection of the environment or developing economies has remained unchanged. As a result, the meat production industry in the U.S. has affected the economic and environmental integrity of the world. Developing countries that grow dependent on meat exports from some of the world's largest methane producers is detrimental to the sustainability of their development. This essay will focus on the effects the meat production industry has had on developing countries in Latin America. Ecuador will function as a specific case study in which the technological transfer across international borders of meat production processes threatens Ecuador's local and more sustainable meat production industry as well as its constitutional commitments to environmental protection and preservation. In conclusion, this essay will serve to emphasize the importance of rapid policy changes in meat trade and production in order to protect and improve what has already been a slow development process.

309 Working Class Movements and Nationalist Politics: Conflict Over Natural Resource Control in Bolivia 2000-2020 ✂

ALEXANDER FINDEIS

FACULTY SPONSOR: KARLEEN WEST, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

The first six years of the century saw turmoil in Bolivia as it suffered through mass protests over water privatization and natural gas export plans. What have come to be known as the water and gas wars are often considered separate events. However, I argue that they are better conceived as continuous chapters in a protracted battle over the ownership of natural resources. These conflicts saw the rise and fall of political movements and leaders—including recently deposed president Evo Morales—that ultimately failed to effectively address the fundamental issues behind the conflicts. The water and energy wars are a lesson in how the mass mobilization of the working class and peasantry can create powerful political movements. However, if the leaderships of these movements are unable to resolve the fundamental political conflicts over property ownership, both international and intranational, then they will fail to uphold the aspirations of their supporters. This paper argues for a broader understanding of the resource wars as a conflict over property rights and offers a lesson in how nationalistic movements fail to resolve the core issues that often bring them into power.

310 Far-Right Populists in Western States of the European Union: Who They Are and What They Want ✂

MICHAEL BADALAMENTI

FACULTY SPONSOR: ROBERT GOECKEL, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

The past decade has been a tumultuous period in European politics. Despite the unique economies, histories, and cultures of Western member-states of the European Union, many of these countries are alike in seeing the rise of far-right populist political parties that have challenged the status quo. This project seeks to describe the general character of these parties. They are defined by their far-right positions on social issues – namely their calls to restrict immigration and reestablish the nation-state as the basis for sovereignty – and their populist themes, wherein they deride the mainstream as a corrupt establishment that has forsaken the common people. Outside of these definitional parameters, however, these parties are a fairly diverse set. Their electoral success is varied. They have different origins and structural characteristics. It is difficult to establish a common profile of their supporters. Their positions on numerous issues, like European integration, economics, and matters concerning traditional values, contain various nuances. These factors might challenge the ability to draw accurate generalizations about them. Nevertheless, they may in fact be united in their reason for being: they could be just one symptom of a larger, albeit diffuse, social movement seeking to affect issues of European identity and culture.

311 The Effects of Counterculture on Political Protest: A Look at Domestic Terrorism in the 1970's ✂

SYDNEY JULIEN

FACULTY SPONSOR: ANAND RAO, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

The politically turbulent 1970s saw a lot of domestic terrorism. Opposition to the war in Vietnam and the popularity of other left-wing causes created a surge of left-wing domestic terrorism. While domestic terrorism has almost always been a part of American political life, the 1970s was a uniquely active time especially for left-wing domestic terrorism. Since then, domestic terrorism has not occurred as frequently, and when it has, right-wing terrorism has dominated. The 1970s was a uniquely turbulent time for much of the westernized world, with domestic terrorist organizations forming most notably in Italy and Japan as well. Much of this societal upheaval has to do with the strong counterculture of the late 1960s. If one compares the response to other comparable periods of unpopular United States imperialism, such as the invasions of Afghanistan and Iraq, the popular response was not nearly as extreme. The formation of one, unified counterculture movement led to increased political dissonance in the 1970s.

POLITICAL SCIENCE & INTERNATIONAL RELATIONS HONORS THESES

SESSION CHAIR AND FACULTY SPONSOR: RASLAN IBRAHIM, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

315 Climate Change and Human Rights ✂

SCOTT WILLIAMS

This research project aims to examine the impact of climate change on human rights and to provide a human rights-based approach to mitigate these impacts. I argue that a human right-based approach is the most effective to mitigating climate change's negative impacts and guaranteeing human rights for all those at risk of climate related hazards. The thesis is divided into three parts. The first part discusses the negative impact of climate change on human rights and includes case studies from developing countries. In the second part I conduct an in-depth examination of human rights in the Paris Climate Accords. The third part introduces the human rights-based approach to climate change and discusses its main elements.

316 The Fluid Nature of the Relationship Between Human Rights and Sovereignty ✂

ALEXANDRA BUTLER

This research paper examines the relationship between the norms of sovereignty and human rights within the international community. The relationship between the norms of human rights and sovereignty have recently risen as an important topic within the international community. While the dominant view appears to be that human rights erode state sovereignty, this perspective is largely based off of a misunderstanding of both norms as well as the histories of human rights and sovereignty. This paper aims to reveal the true relationship between the norms of sovereignty and human rights. It will do so by looking at the independent history and evolution of each norm over time before delving into how they have interacted with each other on the international stage. I will emphasize how these interactions have helped shape and redefine both human rights and sovereignty, and how we can use these past interactions to look at how human rights and sovereignty will interact in the future.

317 The United Nations Peace Operations: Why do they fail? How can they succeed? ✂

JONATHAN CHAO

FACULTY SPONSOR: RASLAN IBRAHIM, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

The international community utilizes a number of tools to address issues of war and peace. One of these tools is the United Nations peace operations but it is viewed as problematic because it risks worsening the situation or

destabilizing the region. The concerns are real given that the history of intervention is full of failures and includes few success stories. This paper's overall objective is to answer the following two main questions: 1) why do peace operations fail? and 2) how can they succeed? I identify three reasons as to why they fail: the obstruction from the political bureaucracy of the United Nations; the constant use of one size fits all models; the disconnect of the elements of peace operations (peacekeeping, peace enforcement, peacemaking, and peacebuilding) that are fundamentally interconnected. I will then provide a framework to international peace operations that addresses these problems and is more centered around human rights and sustainable peace.

318 Aspiration and Implementation: County-Level Domestic Violence Programs in a Human Rights Context

MADELINE REILLY

FACULTY SPONSOR: JOANNA KIRK, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

This presentation will analyze and compare domestic violence policy and outcomes in municipalities in Western New York, specifically in two that have adopted resolutions recognizing freedom from domestic violence as a human right (Erie and Tompkins counties), and two that have not (Monroe and Livingston counties).

POLITICAL SCIENCE & INTERNATIONAL RELATIONS INDIVIDUAL SESSIONS

149 Israeli Government as a Refutation of Democratic Peace Theory

ADAM HOSSAIN

FACULTY SPONSOR: ANAND RAO, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

It is generally accepted that Israel is the United States' strongest ally in the Middle East. The rationale being that Israel is the only democracy in the Middle East, and thus, consistent with the principles of democratic peace theory, this would naturally lead to an alliance between Israel and other democracies of the world. To an extent this is indeed what we observe in contemporary politics and the foreign policies of the US and other European democracies. However, as Western support for the state of Israel remains steadfast, the actions of the Knesset, as well as the Prime Minister, have exhibited that the democratic nature of the state is deteriorating, in favor of becoming a more theocratic, Jewish state instead. Policy preferences suggest that democracy and democratic institutions are of marginal concern. One of the things most indicative of dilapidating democracy in Israel is the Nation-State Law, passed in 2018. This law, in essence, confirms the preeminent role of the Jewish identity and makes no mention of any democratic principles. This presentation will focus on Israeli law, as well as the norms and

cultures, to illustrate how the US alliance with Israel runs contrary to democratic peace theory.

300 Explaining the Failure of Western Intervention in Syria

MARC GULL

FACULTY SPONSOR: ROBERT GOECKEL, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

In 2011, the Arab Spring attempted to democratize Syria inciting a massive revolution of ideas that would eventually break out into a complex civil war. The western world attempted a delayed intervention that inadvertently created a power vacuum of proxy wars and terror cells. This half-hearted intervention misperceived the geopolitics and ethnoreligious differences, and contributed to the failure of US policy in Syria.

495 Voter Participation Across America in Presidential Elections

CAMERON RUSSELL

FACULTY SPONSOR: JEFFREY KOCH, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

What can political science conclude about voter turnout from the past few presidential elections and how electorate regulations and laws relate to the voter participation across America? An in depth analysis of the history of voter participation in presidential elections will help show the reasons why participation has been low.

509 The Politicization of Epidemics, Disasters, and Emergency-- The Electoral Impact of Credit Claiming and Position Taking in Times of Crisis

JOSEPH BLASIOLI

FACULTY SPONSOR: JEFFREY KOCH, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

It did not take long for COVID-19 to be politicized. Democrats stress the severity of the crisis while Republicans signal "Keep Calm and Carry On". I examine the politicization of past epidemics, disasters, and emergencies. Situations such as Hurricane Katrina, H1N1, September 11th, Ebola, HIV/AIDS, and The Spanish Flu have long lasting consequences. Whether it be a renewed sense of obligation to donate blood or the creation of new departments within the national security apparatus, major emergencies cause lifestyle changes. I aim to display the intricacies of the Politicians choice to claim credit for the positive changes and responses to emergencies as well as her choice to take positions against the negative changes and responses to these situations. Finally, based on past disasters, I predict the political consequences that the federal handling of COVID-19 will have on the Trump Administration.

PSYCHOLOGY INDIVIDUAL SESSIONS

424 Neural Correlates of Psychopathy and the Likelihood of

Adolescence as a Critical Period in its Development

JEREMY SAWYER

FACULTY SPONSOR: BRADLEY TABER-THOMAS, PSYCHOLOGY

The purpose of this project is to argue that adolescence is a critical period in the development of psychopathy. Using the evidence, adolescence could be an important moment in whether an individual will continue to have psychopathic traits or is possible to gain those traits. Adolescence is a time of upheaval for individuals: hormone levels drastically change, and the brain becomes more plastic. During this developmental period, individuals become more tuned towards social stimuli. Since psychopathy is marked by a lack of response to social stimuli (social standards, regards towards others, empathy), it is possible that individuals who are prone to possessing psychopathic tendencies/characteristics could be less sensitive during adolescence to social stimuli. If the individual receives an intervention during this time period, it may reduce the risk for the development of psychopathic traits and behaviors.

428 Effects of Semantic and Associative Priming on the Processing of Abstract and Concrete Word Pairs

JENNA COBURN

EDGAR FELLOWS CAPSTONE PROJECT

FACULTY SPONSOR: JEFFREY MOUNTS, PSYCHOLOGY

Previous research has found that the processing of abstract and concrete words is different when these words are primed by either a semantically or associatively related word. Namely, an abstract word is processed more efficiently when its prime is associatively rather than semantically related, and vice versa for a concrete word. However, in previous studies using an attentional blink (AB) paradigm, only concrete words were studied. The present study aims to expand these findings to previous evidence demonstrating the qualitative processing differences between abstract and concrete words. This experiment employs an AB paradigm to investigate the processing of abstract and concrete words that are paired with either a semantic or associative prime.

447 Amoxicillin and the Rewarding Properties of Cocaine

BRENDAN HINES

FACULTY SPONSOR: ALLISON BECHARD, PSYCHOLOGY

EDGAR FELLOWS CAPSTONE PROJECT

Research using the cocaine self-administration and reinstatement animal model of relapse finds that the beta-lactam antibiotic, amoxicillin (AMX), displays a trend of reducing cocaine seeking in rats. We tested amoxicillin for its ability to reduce cue-primed and cocaine-primed cocaine seeking in mice using a 3-chambered conditioned place preference (CPP) paradigm. We trained mice to associate one side of the chamber with cocaine (CS+), by giving them intraperitoneal injections of cocaine and placing

them in this chamber for 30 min. In the other chamber, mice were given injections of saline (CS-). After 3 days of conditioning, mice were assessed in a cue-primed 15-minute test of free-exploration for their side preference. Immediately after, mice were administered a cocaine-prime and assessed for another 15-minutes. Daily oral administration of AMX was given to half of the mice, after which an identical relapse test was performed. Though no differences were found between groups in the cue-primed phase, the cocaine-primed phase AMX-treated mice were found to spend significantly more time in the side of the chamber they associated with cocaine. These results contradict previous research that shows that AMX may attenuate cocaine seeking, so the study needs to be replicated with a larger sample size.

492 Why We Might Jump

OTTO JUNIOR

FACULTY SPONSOR: JAMES ALLEN,
PSYCHOLOGY

EDGAR FELLOWS CAPSTONE PROJECT

Sensation seeking is a psychological phenomenon which researchers have been looking at to help explain why people might take greater risks than others. Sensation seeking has often been looked at as a trait behavior in individuals, but often we can see examples all around us of people that would not typically take the risks that they do in a given scenario. This research project looked to understand these anomalies. Why would someone take a risk in a given moment that they wouldn't normally do? This is the kind of question this research looks to explain by observing how a frame, or the surrounding information could influence a person to take greater risks. This research is of particular interest to study because of the potential implications that this study could provide for further explaining peer pressure and other phenomena that we know lead high school and college students to participate in risky behaviors. Participants are undergraduate students from SUNY Geneseo who took an online survey. Data collected looked to measure state level sensation seeking along with other potential predictor variables which could potentially explain why some people would perform a risky behavior.

SOCIOLOGY ENTIRE SESSIONS

SOCIOLOGY OF WONDER AND EMOTIONS

SESSION CHAIR AND FACULTY SPONSOR: STEVE DERNE, SOCIOLOGY

63 Wonder is in the Eye of the Beholder, Rather than the Event

MEAGAN ODETTE

This study wishes to discuss how people interpret the mysteries of wonder in reference to themselves. Nussbaum states that wonder is elusive, which Vasalou expands by claiming that people will attribute wonder to an object or an

experience separate from themselves. However, new research may disprove that. During the fall 2019 semester, thirty open-ended interviews were conducted on participants' experiences of wonder. Surprisingly, one third of these participants claimed that they processed events of wonder internally rather than distancing themselves from the emotion. Many used I-statements describing their experiences, such as stating "I felt wonder." Some participants proved further agency by claiming they seek out wonder daily. This paper outlines the data and suggests further studies that could be conducted for this thesis.

Selected for presentation at SUNY Undergraduate Research Conference, Syracuse, NY

65 Everlasting Memories: Wonder as a Vivid Experience

SAMANTHA DORN

People navigate through life and experience moments of extraordinary circumstances. These moments likely stand out in one's life, and when reflecting back the individual can recall the exact moment vividly. In his discussion of wonder inducing experiences, Georg Simmel examines how these experiences disrupt one's routine. He believes these experiences are so out of the ordinary that when recalling the experience, it often feels like a dream. However, there is evidence to refute this claim. It is because these experiences are so out of the ordinary, when looking back on the experience the mind will recall it vividly, unlike a dream which often dissipates over time. Thirty interviews were conducted as a class, asking participants to share their experiences of wonder. An analysis of the interviews was done with particular attention to words or phrases. The most useful data was found when participants answered the question "Do you reflect on the experience?" This is likely due to them interpreting how they remember the experience and by recalling if it brought about any emotions. This is instrumental in supporting the thesis. Memories found and analyzed in the interviews reject Simmel's claim as they were real and vivid, not dreamlike.

Selected for presentation at SUNY Undergraduate Research Conference, Syracuse, NY

67 Mystic Emotions of Nature and Unity in Antarctica

EMILY STRAYHORN

Research conducted by Mukerjee described how mystic experiences all contain certain consistent emotions, such as wonder, tranquility, and joy. One specific variant of mysticism he described is cosmic – or nature – mysticism. This is characterized by a sense of unity and satisfaction with surrounding environment. However, little research has been conducted on nature mysticism as a whole and what types of experiences in nature are likely to invoke mystic experiences. The current research sought to answer whether a variant of nature mysticism – traveling to unknown places and immersing oneself with the sights and senses surrounding them – could bring about the same feelings of connection and wonder. To answer this, documentary evidence in the form of journal

entries were analyzed from my own travels throughout the Antarctic continent and the surrounding Antarctic islands. My findings clearly illustrated that I was able to obtain such mystic experiences, and they suggest that others may be able to find this sense of unity as well.

69 Religious Celebrations: Emotions Through the Eyes of Another

SAMANTHA ROSENBERG

In "Religion as a Source of Variation in the Experience of Positive and Negative Emotions" Kim-Prieto and Diener claim that religions shape the emotions adherents feel by deeming some emotions desirable and others undesirable. Kim-Prieto and Diener describe how not just texts but also rituals prompt desirable emotions. But would a member of one religion, such as Judaism, experience emotions that a member of a different religion, such as Christianity, is "supposed to" feel if that person was exposed to the other religion's rituals? Through sociological introspection, I found that being exposed to religious rituals outside of one's own religious tradition affects emotional experiences. This finding highlights the importance of ritual in shaping emotion, independent of religious belief or identity.

SOCIOLOGY OF WONDER

SESSION CHAIR AND FACULTY SPONSOR: STEVE DERNE, SOCIOLOGY

78 The World is Enchanted and Full of Wonder

CHLOE WNUK

Max Weber discussed how the world is disenchanted. He says that technology, rational knowledge, and economics have heavily affected society and resulted in the modern world lacking any wonder or enchantment. Although technology, rational knowledge, and economics are large factors involved with individuals of modern society, there may still be wonder and enchantment in the world. A fall 2019 senior seminar of fifteen students conducted a total of thirty interviews in which participants were asked whether they experienced wonder in their lives. Analysis of the interviews provided insight to the intended goal of learning more on wonder. The interviews suggest wonder and enchantment do indeed still exist in today's society even though Weber believed otherwise.

79 Is There Significance in Wonder?

BROOKE REICH

Caroline Walker Bynum discussed the significance associated with wonder. Bynum's discourse about wonder is that for medieval thinkers to achieve an experience of wonder certain conditions need to occur, such as significance. Bynum misses looking at common people as she based her study on theologians and historians in the Middle Ages. In a fall 2019 senior seminar, 30 interviews were conducted about wonder by 15 students. The interviews were conducted to find out if people are still experiencing wonder or if they believe the world

is disenchanted. People were interviewed to find out about their experiences of wonder. The interviews did not explicitly question whether the experience of wonder the person felt was connected to the significance of the event. While looking at the data almost all of the people interviewed did not mention the significance of their experience of wonder. Bynum argued that an experience of wonder needed to have significance, however, the research conducted in the senior seminar suggested this to no longer be true.

80 Within the Known: Wonder that Comes from Understanding

AMANDA VICK

Peter Marchand claims that understanding is contradictory to wonder, describing only two sub-rasas of the Adbhuta rasa (the rasa of wonder). The first sub-rasa includes wonder that occurs when there is a lack of understanding of an experience that could be understood. The second sub-rasa comes from not understanding experiences that cannot be understood. Marchand fails to discuss the possibility of understanding leading to or supporting experiences of wonder. He even suggests that when understanding is obtained, previously experienced wonder is greatly diminished. To explore the concept of wonder, thirty interviews were conducted by fifteen students in the SUNY Geneseo SOCL 476. Each subject was interviewed about their experiences with wonder, enchantment, and surprise, and asked about how those experiences affected them. The findings from this study confirm that people experience wonder from a lack of understanding, but that they can experience wonder from understanding as well.

81 Three Phases of Wonder: Possible Within Your Own Home?

RUBEN MERCADO

When discussing the idea of wonder, scholars such as Servais and Halloy mention the idea of three distinct phases of wonder which include openness of imagination, experience of wonder, and social assessment. While these phases are apparent among large communities, it is neglected that these phases occur in smaller, more private groups. A study regarding wonder was done by fifteen SUNY Geneseo students in which each student conducted two qualitative interviews asking about personal experiences of wonder, and whether or not individuals still experience wonder in today's world. Based on an analysis of the data, I have found that there exists an example of the three phases explained by the authors in a private setting of a household. This paper takes the framework of Servais and Halloy and applies it to this setting in order to prove that these phases of wonder are not limited to large scale community building.

Selected for presentation at SUNY Undergraduate Research Conference, Syracuse, NY

SOCIOLOGY INDIVIDUAL SESSIONS

90 The Effect of Culture on Parenting Styles: Are There Similarities Between Latinx & Working-Class Parenting Styles?

ELENA CAMILO

FACULTY SPONSOR: STEVE DERNE, SOCIOLOGY
Arlie Hochschild claims that a person's class standing affects how they parent their children. This study was performed in order to determine if a culture has an effect on parenting styles, with a fixed lens on Latinx parents, to see if the parenting styles are similar to those of working-class parents. Through sociological introspection, it was found that the parenting styles of Latinx and working-class parents are fairly similar, therefore showing that culture is another aspect that can affect parenting styles.

427 Understanding the Hidden Lives of Non-Migrant Migrant Workers

ERIC MACALUSO

FACULTY SPONSOR: MICHAEL RESTIVO, SOCIOLOGY

EDGAR FELLOWS CAPSTONE PROJECT

The goal of this project is to learn about the lives, roles, and health needs of the Spanish-speaking communities in Western New York. Through collaboration with local organizations, I will learn about the lives of different groups, focusing primarily on dairy workers and Puerto Ricans who live and work in this area year-round. Using the experiences of seasonal workers described in the book, *Fresh Fruit, Broken Bodies: Migrant Farmworkers in the United States* written by Seth Holmes, I will compare and contrast the experiences of migrant workers in these local communities who perform more less transient agricultural work. Adopting a perspective where those being studied are equal collaborators in the research endeavor, I aim to be invited into the field and establish relations of mutual respect with those communities I am interested in learning from. I hope to present my findings through a series of talks on campus and with the health organizations that I have collaborated and learned from. In addition, I will be working with the Geneseo TOGETHER Program to determine the feasibility and acceptability of doing "Stop the Bleed" Training, which is traumatic bleeding first aid, with Spanish-speaking families in our community.

432 American Workplace Sitcoms

KELLY PARRETT

FACULTY SPONSOR: LISA MEYER, SOCIOLOGY
EDGAR FELLOWS CAPSTONE PROJECT

This project examines the workplace cultures of two American workplace sitcoms, *Parks and Recreation* and *The Office*, and the institutional issues that minority groups face in these fictional workplaces. These issues, including racism, sexism, and sexual harassment, are identified through exaggerated comedic portrayals, yet maintain real-life relevance. Using grounded theory methodology to collect both qualitative and quantitative data, I found repeated patterns that display institutional issues: the use of the phrases "boys' club," "bitch," and "that's what she said," the insinuation of characteristics based

on race, and employee behavior causing disciplinary meetings. Through my content analysis of the qualitative data, I find that instances of sexism, racism, and sexual harassment are highlighted through a realistic "mockumentary" form of comedy; therefore, although these American workplace sitcoms are fictional, they bring attention to similar workplace issues in the real world.

455 An Exploration of Interactions Between Patients and Care Providers

SYDNEY KLUGMAN

FACULTY SPONSOR: ANNE EISENBERG, SOCIOLOGY

EDGAR FELLOWS CAPSTONE PROJECT

My project is an exploration of a patient's relationship dynamics with multiple medical professionals. The project uses an autoethnographic method to organize the analysis from the patient perspective throughout my life. The research question focuses on the ways that the patient's, and the medical professional's identifying characteristics may influence the relationship. Characteristics of particular attention are the physician's training and educational background, length of medical relationship in my life, age, gender, and race.

506 Community Policing: From Broken Windows to a Broken System

EVAN SCHENKER

FACULTY SPONSOR: WILLIAM LOFQUIST, SOCIOLOGY

"Crime in any society is inevitable. From its inception, the United States has dealt with crime in different manners. In the mid-20th century, federal and local governments turned their attention to stopping crime preemptively rather than reacting to it after the fact. This analysis looks at the history of policing in the United States, discusses the development of community policing based on Wilson and Kelling's 1982 "Broken Windows" article, and takes a sociological approach to analyzing the effectiveness of community policing in New York City, as well as its relationship to racial biases, police violence, police culture, and reform. For the purposes of this analysis, the terms "broken windows policing," "community policing," "quality-of-life policing," and "order-maintenance policing" are all meant to refer to the use of high frequency and discretionary policing to target public disorder and prevent the further spread of crime."

THEATRE AND DANCE ENTIRE SESSION

177 TAKING FLIGHT

SESSION CHAIR AND FACULTY SPONSOR: MARK BROOMFIELD, THEATRE AND DANCE
SONIA BARTOLOMEO, COOPER BREED

Taking Flight, a new dance short film, choreographed to Bach Cello Suite Classical, delights in the unbound expression of joy,

newfound heights of friendship and soaring voices of hope for future generations. The performance and panel discussion will explore the process and journey of creating a solo dance work for film.

THEATRE AND DANCE INDIVIDUAL SESSIONS

5 Body Love

ZACHARY IANNOTTA, LAUREN HUMMEL,
NATALIE KNOX, EMMA FLAHERTY, OLIVIA
JOHNSON, KAITLYN ECK

FACULTY SPONSOR: JONETTE LANCOS,
THEATRE AND DANCE

Body Love teaches about the struggle of body shaming women face every day. Society teaches women they need to attain and maintain a certain figure which is desired as per today's norm. While dieting and exercising in itself is not harmful, some women tend to do it for the wrong reasons, and it is okay to not have to look like the model on the front of *Cosmopolitan* or *Vogue*. This dance illustrates the day-to-day torment young women face deciding whether or not to risk their own personal well being in order to look a certain way that society deems acceptable.

7 Solace

COOPER BREED

FACULTY SPONSOR: JONETTE LANCOS,
THEATRE AND DANCE

This piece was originally created for the Orchesis Spring 2019 Showcase and originally choreographed by me and Sonia Bartolomeo. This piece aims to embody the sense of community and strength within friendships. As Sonia was one of my very first friends here at SUNY Geneseo, it is also representative of our friendship and journey together. It was performed in the Geneseo Dance Ensemble fall showcase "Defying Limits".

95 Gajjda Bhangra Dance Performance

HIMA CHAKKA, YARO BAUTISTA MARTINEZ,
SYDNEY SCHMIDT, SPARROW POTTER,
RICHARD CUSUMANO, RAHUL SHARMA,
NICOLAS URRUTIA, MICHAELA VANWORMER,
GWENDOLYN CUNNINGHAM, MEENU
MUNDACKAL, NAOMI STEINBERG, RACHEL
FAIR, REBECCA RODRIGUEZ, SEAN HYLAND,
SWARNIMA DAS, VI

FACULTY SPONSOR: RANDY KAPLAN, THEATRE
AND DANCE

This is a dance performance exhibiting Punjabi culture.

349 Exploring the Connections that Underlie Aboriginal Dance and Modern Styles of Ballet and Contemporary Dance in "Road to the Stamping Ground" Featuring Jiří Kylián

STEPHANIE PODGUSKI

FACULTY SPONSOR: JONETTE LANCOS,
THEATRE AND DANCE

Jiří Kylián, both the artistic director and principal choreographer of the Nederlands Dance Theatre, went to Groote Island, Australia to attend a gathering of aboriginal tribal dancers in 1980. His aim was to explore the participants' verbal and non-verbal forms of communication and was one of only a few non-aborigines to attend the conference. Having no common language, the Aboriginal tribes could only communicate in simple English. Instead, each tribe brought with them their traditional dances from their local areas, and through movement and/or stamping, found a way to share their mystical experiences with the other tribes. Having been inspired by these aboriginal dances, Jiří Kylián was able to use his experiences to respectfully create the contemporary dance *Stamping Ground* which premiered in 1983. Through the documentary filmed about these experiences, viewers are able to discover the universal qualities that underlie modern ballet and the much older style of dancing of the aboriginal people. Through this analysis of the documentary, one can see the connections to the expert theories of dreamtime, totemic beliefs, choreometrics, and the collective unconscious that not only enable a greater understanding of the aboriginal people but also of ourselves.

372 Surviving the Odds: Czech Choreographer Jiří Kylián and Indigenous Australian Dance

MEGAN PALMER

FACULTY SPONSOR: JONETTE LANCOS,
THEATRE AND DANCE

Jiří Kylián was a Czech dancer born in the 1940s Prague who escaped the Soviet Union invasion of his country in 1968. Looking for a place to continue his passion for dance, he travelled to Germany, the Netherlands, and then stopped in Australia in the 1980s to watch the dances of the Aboriginal people. It was there that he was inspired, and he wished to create a respectful, non-appropriated dance based on his observations. This dance is known as *Stamping Ground*. My focus is primarily on Kylián's early years, before and during the Soviet invasion. Jiří Kylián fled a country that would soon impose oppressive restrictions against the arts, in addition to the chaos of the Prague Spring in the same year he fled. In a sense, he was a survivor. I believe that's what drew him to Aboriginal dances, where the Aboriginal people and their culture survived despite colonization, and hundreds of years of oppression and re-education. I argue that Kylián was drawn to Indigenous Australian dance because he felt a sense of kinship of what it meant to be a survivor.

12 Absence

LAUREN HUMMEL, SAMANTHA BRUNO,
SAMANTHA PERCY, NATALIE KNOX, JILLIAN
JOHNSON, MEGAN LECZINSKY

FACULTY SPONSOR: JONETTE LANCOS AND
MARK BROOMFIELD, THEATRE AND DANCE

"Absence" is a piece created to tell the individual story of each dancer through reflecting back on a time where they experienced a loss of someone

or something. The piece is about the internal struggles and voids that each dancer faces on their journey through the process of grief, and how they find acceptance whether that be individually or through human touch and interaction. Each dancer resembles a different stage of healing based on their individual stories, in the hopes that they find the closure that they need to truly heal.

WOMEN AND GENDER STUDIES ENTIRE SESSIONS

LGBTQ HISTORICAL AND CONTEMPORARY ISSUES

SESSION CHAIR AND FACULTY SPONSOR:
MELANIE BLOOD, WOMEN AND GENDER
STUDIES

186 Bystander Responses to Violence Against Transwomen: Potential Moderating Effects of Transphobic Attitudes ☒

MADELINE REICHLER

FACULTY SPONSOR: JENNIFER KATZ,
PSYCHOLOGY

Although a disproportionate number of trans women are subjected to violence, to date, no studies have investigated the willingness of bystanders to intervene to help a trans victim. Perception of a female victim as being transgender and bystander transphobia were hypothesized to predict less bystander willingness to intervene and more barriers to intervention. Undergraduate students (N = 124) who identified as both heterosexual and non-trans responded to a measure of transphobia and then were randomly assigned to read about a female victim of male violence who was slurred as either a "tranny" or a "slut." Next, they completed measures of intent to intervene, perceived danger, and personal responsibility to intervene. Results showed that participants reported the least intent to intervene when they had higher transphobic attitudes and were assigned to the "tranny" but not "slut" condition. With regard to barriers to intervention, although participants perceived less danger in the "tranny" condition than the "slut" condition, the type of slur was unrelated to personal responsibility to intervene. However, participants with higher transphobic attitudes reported less danger and less personal responsibility to intervene. The results highlight the importance of challenging transphobic attitudes that prevent transgender victims of violence from receiving help.

187 LGBTQ+ Safe Zone Training: a National Effort ☒

JESSICA BANSBACH

FACULTY SPONSOR: ALICE RUTKOWSKI,
ENGLISH

Geneseo's LGBTQ+ Safe Zone program is one among hundreds of similar programs across the United States, but that does not necessarily make it the same. What about Geneseo's Safe Zone

program stands out at the national level, and what are the current national trends in higher education Safe Zone programs?

188 LGBTQ+ Outreach: Challenge and Success ☞

VICTORIA COOKE

FACULTY SPONSOR: EUNISHA TUCKER, LGBTQ PROGRAMMING AND SERVICES

Victoria serves as a Marketing and Outreach Intern for the Office of LGBTQ+ Programs and Services. As part of her position, she supports the office by creating advertisements, managing social media accounts, and planning events with the LGBTQ+ Coordinator. Victoria will discuss the difficulties of promoting LGBTQ+ programming as well as the rewards of hosting successful community events.

189 Archiving History: Building a Digital Space for the Society for the Study of Homosexuality in the Middle Ages ☞

EMILY LUDWIG

FACULTY SPONSOR: GRAHAM DRAKE, ENGLISH Dr. Graham Drake, Geneseo professor of English, has been a longstanding member of the board of the SSHMA, which meets annually to present on all matters relating to LGBTQ+ history in the Middle Ages. As such he has compiled a large physical archive of materials spanning over 30 years which he wants to take digital for public access. This archival project has consisted of categorizing and scanning the physical materials and building a website where they can be hosted. This project has been an eye-opening look at the medieval history of a community which has often been called a modern invention.

WOMEN AND GENDER STUDIES CAPSTONE RESEARCH AND INTERNSHIPS

SESSION CHAIR AND FACULTY SPONSOR:
MELANIE BLOOD, WOMEN AND GENDER
STUDIES

191 A Case for Neurodiverse-Inclusive Sex Education: Preventing the Sexual Victimization and Criminalization of Individuals with Autism Spectrum Disorder ☞

ALYSSA CATHOLDI

FACULTY SPONSOR: AMANDA ROTH, WOMEN AND GENDER STUDIES

This presentation combines prior knowledge, experiences, research, and theory to draw attention to current issues at the intersection of sexuality and disability; more specifically, autism spectrum disorder and sexual health. This presentation will critique the ways in which

Western societies construct disability to “devalue bodies [and minds] that do not conform to cultural standards”, and how labels that imply deficits and weakness oppress individuals with autism spectrum disorder from expressing their sexuality. In addition, this presentation will discuss the importance of developmentally-appropriate or neurodiverse-inclusive, sex education to alleviate issues such as sexual victimization and offending in individuals with autism spectrum disorder.

192 From Compost to Nuclear Weapons: the Geneseo Activist Experience ☞

CLARA GALLAGHER

FACULTY SPONSOR: DAN DEZARN, OFFICE OF SUSTAINABILITY

The 17 United Nations Sustainable Development Goals cover a wide understanding of issues from climate change to clean water access to gender equality. In my four years at Geneseo, I have found all 17 of these goals to be present in my experience and have participated in many of them. These experiences have been on a campus-wide level in growing the composting program to have buckets in every building to attending the International Convention on the Abolishing of Nuclear Weapons in Paris, France. Within these movements, women have taken on very different roles and have had very different expectations. This presentation is to highlight the women who are leading these movements on a macro and micro level and the challenges these women face in order to understand how the micro affects the macro and to understand our connections amongst different movements. I also discuss what women and all gender roles might look like in the future and what we can do to better include intersectionality in sustainable movements for Geneseo students and international peacemakers.

193 Willow Domestic Violence Center Internship ☞

EMMA SLATER

For her internship at Willow, Emma worked as Mobile Advocate and a Hotline Crisis Responder. The goal of the mobile advocacy program is to serve clients who have barriers that affect their accessibility to Willow’s programs and services. Emma helped serve these clients by providing transportation to appointments, making skype appearances, and meeting clients for sessions in locations that best suit their needs. Furthermore, Emma also worked on developing a resource distribution list that included over 50 outside social service resources in the Greater Rochester area and all of the services and programs these organizations offer. A few of these services include food coverage, short-term shelter, security deposit payments, affordable housing opportunities, maternal support, counseling, child care, legal support, dental care, and many other vital services. Emma’s work on the crisis

hotline involved crisis intervention using trauma-informed care, power and control assessments, safety planning with clients, and offering resources and support for survivors of domestic violence. The skills and experiences Willow has provided Emma will be transferable in her future career as a social worker.

WOMEN AND GENDER STUDIES INDIVIDUAL SESSION

337 When Theory Meets Practice: Developing WGST-Related Curricula

EMILY LUDWIG, MADELINE REICHLER

FACULTY SPONSOR: AMANDA ROTH, WOMEN AND GENDER STUDIES

Students have been working in a directed study format on closely related but distinct projects around issues that arise from the "theory-practice" gap in women's & gender studies and social justice-oriented disciplines with deep ties to activism. One project is working to develop the outlines of a potential advanced course in women's & gender studies looking at feminist activism in relation to theory. The other is working on developing lgbtq+ related education curricula appropriate to an lgbtq+ center. Students will present pieces of their work, how they have come at issues of pedagogy, and what they have learned about the theory-practice gap.

PERFORMANCE

289 Waves by Sapphire Winterguard

SOPHIE HOLCOMB, HANNAH JOHNSTON,
ELEANOR WALKER, RILEY PLASS, CAITLIN
MOTT, EMILY MCINTOSH, ARIANA MASSARI,
MARGAUX CARMEL, JAYNEE OSBORNE,
REBECCA BARTLETT

FACULTY SPONSOR: LISA SMITH,
MATHEMATICS

Sapphire Winterguard is a completely student-run college guard, and requires no previous experience to join. Sapphire competes in the Northeast Color Guard Circuit, and has competed six seasons so far. Sapphire competed this season with their 2020 show “Waves.” The story behind our show is “With every year that passes, life gets a little less exciting, but the waves of life move us along and we can find a bit of comfort together.” This show has been created and managed by Sophie Holcomb, Rebecca Bartlett, and Jaynee Osborne.

POSTER SUBMISSION ABSTRACTS

ANTHROPOLOGY

167 Success or Struggle of a College Student Based on Mental Health? A Review of SUNY Geneseo's Support Services

KEYANTI CHAVIS

FACULTY SPONSOR: MELANIE MEDEIROS,
ANTHROPOLOGY

While there is research on mental health at SUNY Geneseo, few studies have examined firsthand accounts associated with the support services provided by the university and with individuals who have or have not had access to these resources. In this poster, I will present data from eight weeks of ethnographic data among students and staff on Geneseo's campus. Lack of awareness about support services provided, complex stigmatization of mental health, and lack of appropriate funding and outside resources create the biggest barriers for receiving and facilitating mental health support services. I argue that a greater emphasis on mental health across campus is necessary to improve the access, education, and treatment of decreased mental health for all students and staff.

399 Rates of Tuberculosis Mortality in Urban and Rural Areas of New York State Before the Age of Antibiotics

JILLIAN DEMARIA

FACULTY SPONSOR: KRISTI KRUMRINE,
ANTHROPOLOGY

From the late nineteenth and early twentieth century industrialization changed many aspects of American life. Mortality rates in the pre World War I era (1838 and 1930) changed due to many improvements of public health. The creation and emphasis over vaccinations, sewage systems, inspections of foods, and overall improvements in living and working conditions improved public health outcomes in all parts of America, in both rural and urban areas. As the changes occurred, tuberculosis mortality rates declined. This study explores death rates of tuberculosis in rural and urban poorhouses, as well as the general population of Rochester, in the nineteenth and early twentieth centuries in New York State, before the introduction of antibiotics. The purpose of this study is to connect the change in mortality rates with improvements in public health across the state. Tuberculosis mortality rates from poorhouses are being compared to the general population in Rochester, as represented by the data collected from Mt. Hope Cemetery. Due to public health improvements over the end of the nineteenth century and beginning of the twentieth century, mortality rates of communicable diseases like tuberculosis declined over time.

137 Skulls Tell Tales: A Comparative Study of Un-Provenienced Crania

ALICE LEE

FACULTY SPONSOR: KRISTI KRUMRINE,
ANTHROPOLOGY

In this study I have conducted a detailed analysis of several crania that have yet to be provenienced in the skeletal collection of the Physical Anthropology Lab. While some of these skulls have previously been matched to the correct post-cranial skeleton most of them have not and as such all were studied alone separate from any other skeletal material. The skulls were then compared analytically with a focus on any commonalities of sex, ethnicity, and age which may be present along with what determinations could actually be made with the parts of each skull that were available as some were fully intact while others were badly damaged. This study seeks to deepen understanding of craniometrics, skull morphology, and comparisons that can be made between specimens.

239 The Effect of Flooding on Water-borne and Vector-borne Illnesses in Historic Rochester, NY

ISABELLE STITT-FREDERICKS

FACULTY SPONSOR: KRISTI KRUMRINE,
ANTHROPOLOGY

The connection between flooding and other extreme water-related weather events with water-borne illnesses is a well-documented issue. Rochester, NY, which lies in the Genesee River valley, receives a significant amount of precipitation due to its proximity to Lake Ontario. Flooding, due to melting snow in the spring and general thunderstorms in the summer, caused the Genesee river to flood often before the construction of the Mt. Morris dam in 1948. Utilizing cemetery records from Mt. Hope cemetery in Rochester, NY, this study explores whether Rochester's history of flooding had any effect on water-borne or vector-borne illness deaths between 1840 and 1915. Using the cemetery records, death rates from water or vector-borne illnesses in the three months following hydrologic events will be calculated and comparisons made with similar periods that did not experience extensive rainfall or flooding. As climate change continues to increase rates of flooding and extreme weather events, historic Rochester and its rapid health infrastructure growth in the mid-late 19th century offers insight into how modern-day developing nations at risk for extreme weather events may benefit from social programs or infrastructure improvements. Also important is highlighting which diseases put communities most at risk following extreme water-related events.

184 Mortality Rates of Three Vaccine Preventable Diseases in Historical Rochester

KAYLA CARLIN

FACULTY SPONSOR: KRISTI KRUMRINE,
ANTHROPOLOGY

The purpose of this study is to explore and compare the mortality rates of diphtheria, pertussis, and pneumonia in Rochester, New York from the mid-19th Century until the mid-20th century. Public health initiatives, state resources, and historical beliefs about each disease will be used to help explain the mortality trends. Mortality statistics will be collected and analyzed using transcription data from Mount Hope Cemetery. Preliminary data shows that while diphtheria mortality rates dropped rapidly after the development of antitoxin and vaccine, pertussis rates and pneumonia rates have fluctuated. The underlying differences in these trends may be attributed to the infectiousness of the diseases and the beliefs about the diseases. Additionally, this study explores how trends in mortality rates from historical Rochester can inform modern efforts to increase vaccination coverage and disease prevention efforts.

367 Testing the Viability of a Sustainable Alternative to Pesticides for the Cattle Industry



DAVID PORTILLA

FACULTY SPONSOR: BARBARA WELKER,
ANTHROPOLOGY

Biting flies persist as a problem for cattle industries across the globe. Post-green revolution technology has led to handling this problem using pesticides which have many deleterious effects to the environment including pollution of already scarce groundwater. Recently, a study was published in which an alternative form of pest control was tested on dairy cattle and in my project, I test the viability of this alternative in western N.Y.

280 Exploring the Geographic Distribution of Childbed Fever Deaths in Mid-19th Century Rochester, NY

MEAGHAN PARKS

FACULTY SPONSOR: KRISTI KRUMRINE,
ANTHROPOLOGY

Childbed fever, formally called puerperal fever or puerperal septicemia, is an infection typically contracted by women after childbirth. Historically, childbed fever was a serious threat to maternal health. Childbed fever is caused by exposure of open wounds or abrasions, which are common after giving birth, to group A and B Streptococcal bacteria. Ignaz Semmelweis discovered that hand washing using a chlorinated solution reduced cases of childbed fever in 1847. This project reviews the instances of death from childbed fever in Rochester, New York from 1837-

Promotes sustainability

1860 and later from 1907-1919 and attempts to determine which areas of the city had the highest rates. Childbed fever was more likely to be spread by physicians than by midwives due to the physicians' other duties, such as work in cadaver labs. Neighborhoods with more affluent residents would be more likely to have access to physicians, whereas impoverished communities may have utilized midwives more. Because poorer individuals were less likely to see doctors, less affluent neighborhoods may have had lower rates of death from childbed fever. Information on deaths from childbed fever in Rochester was collected from the cause of death given in Mt. Hope cemetery death records.

BIOCHEMISTRY

206 Binding of Telomeric DNA G-Quadruplexes by Abietane Diterpene Natural Products

SARAH OSTROWSKI, TARRYN FRANCIOSA
FACULTY SPONSOR: RUEL MCKNIGHT,
BIOCHEMISTRY

G-quadruplexes are non-canonical higher order DNA structures formed from guanine rich sequences, made up of stacked G-tetrads stabilized by Hoogsteen base pairing and K⁺ ions. G-quadruplexes are overrepresented in the promoter regions of oncogenes and the 5'UTR of mRNA₁. As a result, G-Quadruplexes have been implicated as targets for possible anti-cancer therapeutic agents to treat previously "undruggable" targets like the *c-myc* and *ras* oncogenes¹. The human telomeric repeat, [5'G₃(T₂AG₃)₃], is a repeating, single stranded DNA sequence that can form G-quadruplexes. Telomerase, an enzyme expressed in ~90% of all cancers, is responsible for extending telomeric repeats, making cancer cells immortal. It has been shown that stabilization of telomeric G-quadruplexes can inhibit telomerase activity and therefore block the survival of cancer cells². The compounds used in the study are a group of abietane diterpene natural products from *Hyptis verticillata*, a plant native to the Caribbean and central America that has been used traditionally as an ethnomedicine and has been shown to have therapeutic effects. Some of these effects include anti-microbial, anti-inflammatory, and even anti-cancer activities. Using several biophysical techniques, we have investigated the binding characteristics of these compounds to G-quadruplex DNA as a possible rationale for their observed anti-cancer therapeutic effects.

BIOLOGY

166 Depth-related Morphology Changes to Secondary (Pharyngeal) Jaws in Snailfishes (Liparidae)

BEA DIPZINSKI
FACULTY SPONSOR: MACKENZIE GERRINGER,
BIOLOGY

The Liparidae, a family of marine fishes known as the snailfishes, exhibit the largest depth range of

all fish families—from the ocean's surface to the hadal zone. The deepest-living fish, the Mariana snailfish, was recently discovered in the Mariana Trench at over 8,000 meters deep. Given their habitat range, snailfishes display a broad diversity of adaptations to accommodate each environment, such as in feeding morphology. In our investigation, we looked at the pharyngeal jaws, a second set of jaws found in the throats of many fishes. Through analyzing CT scans of various species of snailfish from different depths, we have sought to categorize pharyngeal jaws based on dimensions, orientation, and shape. Through these morphological observations, we can gain insights to the lifestyle of these snailfishes, their diet, and how those factors change in contrasting environments and depths, such as the intertidal zone, hadal trenches, and polar regions. Here, we investigate if hadal snailfish possess more developed pharyngeal jaws to aid in eating larger amphipods, an abundant prey item in trenches. Since pharyngeal jaws change rapidly on an evolutionary scale to account for feeding habits, we can infer and compare what jaw adaptations help snailfish survive in these habitats.

370 Monitoring Wildlife Activity at the Campus Compost Pile

DAVID KORB

FACULTY SPONSOR: JENNIFER APPLE, BIOLOGY
To date there has been very little research into the effects of composting on local wildlife populations. This study's objective is to document the animals that frequently visit the compost pile on the west side of campus in order to further understand the effects of composting on local environments. To accomplish this, several game cameras have been installed near the compost pile to capture photographs of wildlife. In addition to quantifying the number and types of animals attracted to the pile, we aim to compare animal traffic at the compost pile to animal traffic in non-composting areas in order to understand the degree to which this concentrated food source might lead to elevated wildlife activity. Through this project and in conjunction with Geneseo's Environmental Organization, we hope to raise greater awareness of composting on SUNY Geneseo's campus. So far this monitoring effort has generated several hundred photographs, some of which are being utilized already in a social media campaign supported by GEO, that brings further awareness to composting efforts on campus.

355 Identification of Putative RNA Methyltransferases in

Trypanosoma brucei

LAURA WILLIAMS, XIANE SMITH
FACULTY SPONSOR: KEVIN MILITELLO,
BIOLOGY

Human African trypanosomiasis is a potentially fatal disease in sub-Saharan Africa that is caused by the protozoan parasite *Trypanosoma brucei*. RNA methylation may be an important mechanism for the regulation of gene expression in *T. brucei*, as this organism lacks regulatory DNA sequences. The presence of 5-methylcytosine has been detected in the RNA of *T. brucei* through

sodium bisulfite sequencing. Seven putative RNA methyltransferases were identified in the genome of the parasite via bioinformatics and were named TbCRMTs (*T. brucei* cytosine RNA methyltransferases). TbCRMT4 is required for maximum parasite growth as determined by RNAi knockdowns. In an attempt to determine whether TbCRMT4 functions as an RNA methyltransferase, the gene was expressed in *E. coli*, though SDS-PAGE results suggested protein fragmentation due to the presence of multiple bands. In light of this, fragments of the gene containing putative SAM-binding and catalytic sites were then inserted into a vector and transformed into competent *E. coli*. The construct which contains amino acids 87-852, when expressed at 37°C, is most reliably produced, as confirmed via SDS-PAGE/Coomassie blue staining and Western Blot analysis. We plan to perform assays on the isolated fragment to determine if CRMT4 is a bona fide RNA methyltransferase.

164 Development of a Low-cost Isotopic Method for Assessing Reproductive Strategies of Fishes

LYDIA FREGOSI, SARAH SUPLICZ

FACULTY SPONSOR: MACKENZIE GERRINGER,
BIOLOGY

Many fish species reproduce either once or multiple times over the course of their lives. These strategies are known as semelparity, where individuals participate in a single reproductive episode, and iteroparity, where they display multiple reproductive episodes. However, for some fishes it is impossible to follow them for their entire lifespan, and there is no known method to predict reproductive strategy. Our goal is to develop a chemical method to distinguish between semelparity and iteroparity in fishes. This method compares δ¹⁵N composition of different tissues using Isotope Ratio Mass Spectrometry. Isotopic composition of tissues depends on tissue turnover, so muscle tissue that grows constantly throughout life results in higher δ¹⁵N composition than brain tissue that exhibits little growth. We compare the isotopic composition of gonad tissue to muscle tissue and brain tissue to estimate the rates of gonad turnover. We examine the gonad turnover rates for fishes with known reproductive strategies to test the efficacy of the method. We then apply this method across multiple species with unknown lifespans to predict reproductive strategies for a broad range of fishes. This new technique would provide important lifespan information to inform conservation and management strategies for rare fishes.

160 Classification of Unknown Deep-sea Snailfishes Through Morphological and Genetic Evidence

BRETT WOODWORTH, LYDIA FREGOSI, JESSICA PALMERI, SARAH SUPLICZ

FACULTY SPONSOR: MACKENZIE GERRINGER,
BIOLOGY

With the high diversity of life on Earth, new species are constantly being discovered. Every species goes through a taxonomic classification

process to determine its place in the tree of life. Taxonomy involves examining the morphology of each species and describing its features. However, multiple species can share morphological characteristics, making it difficult to distinguish one species from another based on visual clues alone. Therefore, genetic data can provide powerful insights into relationships between species. Snailfishes (Family Liparidae) live in cold and temperate ocean waters from the intertidal zone to the deep sea. Snailfishes share morphological characteristics including scaleless, tadpole-like bodies and commonly a ventral suction disk, yet they can vary by environment. In this study, we focus on three deep-sea snailfishes that were caught in the Eastern Pacific Ocean, off California. Using micro-CT (microcomputed tomography) scans and physical measurements, we compared characteristics such as body ratios and fin ray counts. We then sequenced barcode genes to position these species in a phylogenetic context. By comparing the morphological and genetic data from our unknown snailfish species to those known, we can discover if they indeed constitute new species, furthering our understanding of the vast biodiversity in our oceans.

359 Site-directed Mutagenesis on R2 of non-LTR Retrotransposons to Study RNA Binding

BRIANNA CUNNEEN

FACULTY SPONSOR: VARUNI JAMBURUTHUGODA, BIOLOGY

Retrotransposable elements are genetic elements which are capable of changing their position in a genome and encode a reverse transcriptase enzyme that allows them to use an RNA intermediate in this process. The aim of this project is to identify potential RNA binding domains in the protein encoded by the R2 non-LTR retrotransposable element. This will be done by testing a model that proposes that the R2 protein binds each RNA end by either the “finger” region or the Thumb domain, regions of the protein found to bear similarities to major RNA binding domains in other reverse-transcriptase encoding proteins. The impact of transposable elements on human health underlies why the mechanism behind how a transposable element inserts itself into the genome should be fully explored. We expect to successfully mutate the protein coding region of wild type R2 protein to produce Q to A and R to A mutations in the Thumb domain. In future studies, the mutant protein expressed will be purified and used to study the ability of the protein to bind to RNA specifically and to identify potential binding domains.

272 An Analysis on Students' Perception of Knowledge in an Active Learning Environment

CAT STEELE

FACULTY SPONSOR: SUANN YANG, BIOLOGY
Students' perception of their knowledge can be associated with students' abilities in a course. Students can overestimate or underestimate their knowledge on a summative assessment due

to a variety of reasons. I studied a 200-level ecology course at a medium sized undergraduate institution. My goal is to see how an active learning classroom can affect student's confidence in their knowledge of the content and how it impacts their earned grades. In addition, I investigated the correlation between achieved score and other resources used in the lecture to see how this can increase or decrease their achieved grade. An anonymous survey was distributed through the course learning management system after each quiz or on paper after the final exam during the fall 2019 semester. The survey encompassed questions to cover explanatory factors, such as resources used, student opinion about their knowledge, and predicted grade. We found that students who perceived their knowledge to be higher than their actual score tended to have a large range of actual scores. These results suggest that lower-performing students are more likely to overestimate their knowledge. My study underscores the value of teaching students metacognitive skills, especially for lower-achieving students.

170 A Comparison of Native and Invasive Plant Species

Microhabitats in Western NY

EMELYN BELL

FACULTY SPONSOR: SUANN YANG, BIOLOGY
Previous research concluded that the extended leaf phenology of invasive plant species *Lonicera maackii* (Amur Honeysuckle) reduced seed predation, possibly due to less favorable microclimates for invertebrate seed predators. In the fall of 2019, we conducted a field experiment to observe the microhabitat preferences of snails. In our study, we selected six pairs of invasive *L. maackii* and native *Cornus racemosa* (Gray Dogwood) throughout the Roemer Arboretum. Twice weekly, we recorded temperature, relative humidity, air velocity, light, soil pH, and soil moisture along with the number and size of snails found on the plant and within 0.3m of its surrounding leaf litter. Preliminary results suggest that snail microhabitat preference was nonrandom with respect to the extended leaf phenology. We conducted a follow-up experiment to observe snail habitat preference in indoor enclosures. The snails were given an option between various native and invasive habitat conditions. The snails' movement between native and invasive habitats appeared to be complex and variable but suggested preferences may be present. Thus, plant leaf traits appear to be an important factor in shaping microhabitat preferences for snails in invaded plant communities. As vegetative diversity decreases, we will likely see more shifts in microhabitat preference.

Selected for presentation at Northeast Natural History Conference, Stamford, CT.

158 Optimization and Development of the Luria-Delbrück Experiment for Geneseo Genetics Labs

ABIGAIL SCHEFFLER

FACULTY SPONSOR: ELIZABETH HUTCHISON, BIOLOGY

The classic genetics experiment by Salvador Luria and Max Delbrück showed that mutations are present prior to selection rather than arising in response to selective pressures. In this experiment, we used *Escherichia coli* as our model organism and the antibiotics streptomycin and rifampicin to show students in a laboratory setting how this hypothesis can be applied. Specifically, we optimized antibiotic concentrations and the amount of bacterial cells to use in order for the activity to run smoothly and consistently in a student laboratory. We found that the ideal conditions are 1000 cells/ml and 25 micrograms/ml of streptomycin. These concentrations showed a larger variance in the individual cultures while the batch culture had a small variance supporting the Luria-Delbrück conclusions. Going further, we completed a variation of the Luria-Delbrück experiment using antibiotic discs. This modification has the potential to show the data in a more hands-on way for the students. In addition, we took samples of the resistant colonies to send for sequencing, and we will test for the presence of common mutations that confer streptomycin resistance.

194 Plant Diversity and Allergies

CATHERINE KILADA

FACULTY SPONSOR: SUANN YANG, BIOLOGY

The impact of industrialization and its resulting decline in biodiversity may be a contributing factor to the rapidly increasing prevalence of allergies across the United States. This decline in biodiversity reduces the contact between people and various tree species, causing an increase in the number of individuals who experience moderate to severe allergies. I predict there may be a correlation between myriad allergies and geographic location within New York State. Using an online survey distributed to the Geneseo student body, I will determine if there are certain areas of New York State that have higher reports of certain allergy types. The survey is intended to learn more about the urban biodiversity patterns in New York State by asking students to list lived-in locations by zip code and then note if they associate any of the listed locations with a change in their allergy severity. Participants are asked to list the types of trees on their property in order to determine if there are specific tree species that produce higher proportions of certain allergy types. I predict there is a correlation between specific tree species and allergy severity due to the type of pollen produced and its distribution pattern.

365 Clobetasol-induced Quiescence in the Vulvar Carcinoma Cell Line UMSCV-4 Can Be Overcome by Repeated Removal and Re-exposure to this Ultrapotent Corticosteroid

NOLBERTO JARAMILLO, NINA MUSTICO
FACULTY SPONSOR: JANI LEWIS, BIOLOGY

Vulvar cancer is rare, mostly afflicting women aged 60 and older. The cancer is often preceded by a common vulvar rash, lichen sclerosus, that is usually treated with the ultra-potent corticosteroid, clobetasol propionate. This treatment may, in turn, be associated with vulvar carcinogenesis. We found that clobetasol slows metabolism and proliferation in the vulvar carcinoma cell line, UMSCV-4 as revealed through MTT and BrdU/Ki67 assays. Upon removal from clobetasol, a subpopulation of UMSCV-4 cells had proliferation rates restabilize to baseline levels. The rate of cell death slightly increased in the presence of clobetasol as shown using trypan blue exclusion, but the majority of cells remained viable. RT-qPCR showed that the cell cycle inhibitors, p16 and p21 are upregulated while cyclin D1 are downregulated after 10 days of clobetasol treatment. The subpopulation removed from clobetasol proliferates at normal levels when re-exposed. These studies suggest that UMSCV-4 cells are a good model for studying quiescence. In addition, these studies highlight the potential for vulvar cancer cells to evade cancer treatments in the presence of clobetasol and lead to selection for more aggressive subpopulations.

224 Analysis of Foraging Bat Species on the SUNY Geneseo Campus

STEVE LOCE
FACULTY SPONSOR: KRISTINA HANNAM, BIOLOGY

Bats are often an overlooked or vilified taxon, but they perform numerous important ecosystem services including pest control, pollination, as well as nutrient cycling. Their nocturnal behavior, quick movements, and small size make them difficult to study. Audio recording is among the most effective ways to study bat populations, as the echolocation they use to find and capture prey can be recorded using high-frequency recording devices without the need to capture individuals. This study analyzed the patterns of bat foraging populations around the SUNY Geneseo campus from early June until late September with high-frequency audio recording to estimate the number of bats in different areas around campus. These recordings were analyzed with respect to environmental conditions, namely temperature, humidity, as well as time of year. As identified in a previous study, the most prevalent species on campus are the big brown bat (*Eptesicus fuscus*), the hoary bat (*Lasiurus cinereus*), and the silver-haired bat (*Lasionycteris noctivagans*). Our analysis suggests that seasonal variation had a much greater effect on foraging behavior than other environmental factors such as temperature and humidity.

319 Editing the MHC Class I Gene in *Xenopus laevis* using CRISPR/Cas9

ANNIKA MOUNTS, COLLEEN MCEWEN
FACULTY SPONSOR: HRISTINA NEDELKOVSKA, BIOLOGY

Some of the most valuable and prominent research in recent years has been on determining the purpose of a specific protein and its function. MHC Class I assists in the education of T cells to help distinguish self and non-self, which is a vital part of the immune system. However, MHC Class I is not detected in tadpoles, only adult frogs. Tadpoles, however, are immunocompetent; thus the role of MHC Class I in *Xenopus laevis* tadpoles is unclear. To determine the function of MHC class I in tadpoles, we inactivated the corresponding gene using CRISPR/Cas9. The CRISPR/Cas9 gene editing system is composed of two components; a guide RNA (gRNA) that targets a specific DNA sequence and the Cas9 protein that cuts the DNA. After the DNA is cut, the cell attempts to repair the DNA break, which introduces mutations, inactivating the gene. To date we have designed MHC class I specific gRNAs and injected them along with the Cas9 protein into fertilized *Xenopus* eggs to generate transgenic animals lacking MHC class I proteins. Currently we are testing the ability of our gRNAs to inactivate MHC class I and are characterizing the effect this has on transgenic tadpoles.

303 Genetic Diversity of a Non-native Ant-Mimicking Spider, *Myrmarachne formicaria*, in the Great Lakes

DANIEL FLEISCHMAN
FACULTY SPONSOR: JENNIFER APPLE, BIOLOGY
EDGAR FELLOWS CAPSTONE PROJECT

The goal of this study was to identify the genetic variation of the ant-mimicking spider, *Myrmarachne formicaria* (Araneae: Salticidae) in North America through molecular analysis of geographically distributed samples in the Great Lakes region. *M. formicaria* is native to Eurasia; however, it was recently introduced to northeastern Ohio in 2001 and has spread to surrounding regions. Our understanding of the extent of their ecological impact remains limited. Field collection utilized small, plastic flag “traps,” native broad-leafed plants, and anthropogenic structures where *M. formicaria* creates its web shelters to locate individuals. Genetic analysis consisted of extracting DNA from two legs removed from each specimen. Particular mitochondrial genes were amplified via a polymerase chain reaction, then the PCR products were purified before being sent to an external lab for sequencing. Initial sequencing results using the CO1 and ND1 genes confirmed the success of this methodology; however, there was no genetic variation among the populations for these gene fragments. Other mitochondrial and nuclear genes are being tested to identify gene regions with higher polymorphism. Genetic diversity analysis of *M. formicaria* allows for a deeper understanding of the history of the spider’s introduction and patterns of dispersal within its new North American range.

Northeast Natural History Conference, Stamford, CT.

299 Hemoglobin Burden Associated with Schistosomiasis and Malaria Coinfection in a Peri-urban Informal Community in Ghana

LUCAS SUTTON, SARAH BRACY
FACULTY SPONSOR: SUSAN MUENCH, BIOLOGY
Schistosomiasis and malaria impact the lives of millions of individuals living in West Africa. Schistosomiasis causes a global burden of 1.43 million disability adjusted life years while malaria is the leading cause of parasitic deaths yearly (Anisuzzaman 2020). Both infections have the potential to cause anemia, further debilitating the lives of those infected. Analysis is conducted from urine, feces and blood samples collected in Tomefa, Ghana, a peri-urban community outside of Accra which resides on a reservoir hosting schistosomiasis. Tomefa is affected by two different species of schistosomiasis, *Schistosoma haematobium* and *Schistosoma mansoni*. Data analysis shows lower levels of hemoglobin as well as malaria in individuals presenting with coinfection of both species. Lower hemoglobin levels can be severely detrimental to an individual’s health; untreated anemia can lead to severe fatigue, pregnancy complications, heart problems, or even death (Mayo Clinic 2019). In this economically impoverished community, chronic anemia has the potential to reinforce socioeconomic factors that make it more difficult for individuals to escape poverty. Targeting malaria and/or schistosomiasis control has the ability to increase hemoglobin levels, allowing for a more productive and healthy community.

245 Embryonic Zebrafish *gef* mutant Rescue

AUSTIN FEASLEY, THOMAS AMBALAVANAR
FACULTY SPONSOR: TRAVIS BAILEY, BIOLOGY
The *chaf1b* protein is a subunit involved in the formation of the CAF-1 histone loading complex. The *gef* (*good effort*) mutation is a 3 base pair deletion in the *chaf1b* (chromatin assembly factor 1) coding strand that causes neurodegeneration and retinal damage in zebrafish embryos six days post fertilization. It is suspected that maternal RNA within the embryo is depleted within that time frame, which leads to the tissue degradation. Our project is focused on studying a potential process capable of overcoming the lethal *gef* mutation. We began with production of the *chaf1b* mRNA by using viral polymerases to transcribe working *chaf1b* DNA from an amplified bacterial plasmid (pCSII), using the mMessage mMachine(R) kit. The functional mRNA will then be injected into homozygous *gef* mutants. If wild type *chaf1b* mRNA is sufficient to save *gef* mutants from death, then we can conclude that *chaf1b* is the affected gene in *gef* mutants. This finding should give some insight into the importance of *chaf1b* protein in Zebrafish, which is comparable to human CHAF1B and can be used to combat vision loss in humans.

493 The Effects of 5-Azacytidine on HLA-ABC, HLA-E, HLA-G and HLA-A Expression

ADAM HANSEN

FACULTY SPONSOR: ROBERT O'DONNELL, BIOLOGY

Epigenetic modifiers, like the DNA methylation inhibitor 5-Azacytidine (5-AzaC), have been shown to increase human leukocyte antigen (HLA) expression. The expression of HLA is required for a T-cell response to detect tumor cells. A lack of HLA expression allows tumor cells to escape immune detection. It has been previously shown that 5-AzaC is able to upregulate HLA-ABC expression in the cell line MDA-MB-435. However, other HLA proteins like HLA-E and HLA-G may be concurrently upregulated, which would have negative implications on tumor immunity. One flask of MDA-MB-435 cells was treated for 48 hours with 5-AzaC at 0.0025 mg/mL and another was left untreated. The cells were harvested and incubated with control antibodies or the experimental antibodies, Anti-HLA-ABC, Anti-HLA-G, and Anti-HLA-E and analyzed via flow cytometry. Preliminary experiments testing for the expression of HLA-E and HLA-G have both demonstrated a slight increase in their expression compared to the untreated cells. Although minor, the increase in HLA-E and HLA-G expression may have negative implications on tumor survival and pathogenesis. Understanding individual HLA upregulation may prove to be beneficial and applicable to cancer immunotherapy, an expanding field of improved cancer treatments.

260 Patterns of Occupancy of Artificial Nest Sites by Native Bees



ALLISON MENEDEZ

FACULTY SPONSOR: JENNIFER APPLE, BIOLOGY
Although people tend to think of honeybees when they think about pollination, many species of native bees are actually important pollinators. Declining native bee populations can be supported in several ways, including reducing pesticide use, providing native flowers, leaving natural nest sites unaltered, or even by providing artificial nests. At SUNY Geneseo, a bee barn with eleven wooden boxes filled with natural reed cavities of varying sizes was set up in the Spencer J. Roemer Arboretum last spring. Female bees lay brood in these cavities, and provision food for the developing young. Some native bees are overwintering in these cavities. I collected half of the boxes from the Arboretum and opened up half of the tubes to identify the contents. I will analyze relationships between the number and identity of immature bees in each tube, the diameter of the tube (6 mm or 8 mm), and the type of substrate separating brood and sealing tubes, which can be grass, leaves, dark or light mud, or sap. These results will indicate which overwintering species are utilizing artificial nests. They may also indicate which tube diameter is more supportive of desirable native bees, and which natural materials they use for nest construction.

266 Using a Network Approach to Study the Co-occurrence of Multiple Non-Native Species in Adirondack Communities

JACOB WALTER

FACULTY SPONSOR: SUANN YANG, BIOLOGY

A plant species' invasion success may be facilitated by the presence of other plant species from the same geographic origins. We investigated the extent to which co-occurring, non-native species originate from the same European plant communities for a variety of locations in the Adirondacks. To achieve this, I generated network visualizations in R that show the patterns of co-occurrence by non-native species with shared geographic history. I used plant survey data provided by the New York National Heritage Program for 6 locations around Adirondack State Park. Plant surveys identifying European Phytosocial Groups of non-native species were also used. Preliminary results indicate high rates of co-occurrence in species located in Northeastern Europe. The European phytosocial groups identified are similar to the Adirondack communities in ecosystem structure and climate. These results are important to consider when managing the introduction of new non-native species. Quantifying co-occurrence may aid in predicting the success of a single non-native plant species as well as the success of plant species from similar geographic origins. In the future, I aim to look at European phytosocial groups with the highest rates of co-occurrence and identifying abiotic factors that may be similar to invaded Adirondack communities.

Selected for presentation at Northeast Natural History Conference, Stamford, CT.

269 Age of Colon Cancer Screening - A Retrospective Review

CHRISTOPHER COOK

FACULTY SPONSOR: ROBERT O'DONNELL, BIOLOGY

Colon cancer is the third most common cause of cancer-related death in the U.S. In 2019, the American Cancer Society predicted that 101,420 people in the U.S. would receive a new diagnosis of colon cancer. Due to this high prevalence, there has been a recent debate about the appropriate age to start colon cancer screening. Currently, the American Society of Gastroenterology recommends that screening start for average risk individuals at the age of 50. Conversely, the American Cancer Society has recently recommended that colon cancer screening for average risk individuals begin at the age of 45. The aim of our study is to determine if there is any difference in precancerous polyp detection rate in a risk patients undergoing screening colonoscopy at age 50 versus between 45 and 49. We examined 200 at risk individuals who underwent screening colonoscopy at Digestive Disease Center of CNY, an outpatient endoscopy center. Out of these 200 patients, 52 of them were found to have precancerous polyps. Our results indicated

no significant difference in incidence of precancerous polyps between the two age groups ($p=.1702$). Our results indicate that there is evidence for the screening age to be lowered to below the age of 50.

Selected for presentation at SUNY Undergraduate Research Conference, Syracuse, NY.

271 Identifying Potential RNA Binding Domains in the Thumb Domain of R2 Protein

JESSICA PALMERI

FACULTY SPONSOR: VARUNI JAMBURUTHUGODA, BIOLOGY

Transposable elements are mobile DNA sequences. They are classified as DNA type elements or retrotransposons. R2 elements, the focus of my study, are a member of the later. Like other retrotransposons, the R2 element utilizes a "copy and paste" mechanism, in which it transcribes an RNA intermediate, which is reverse transcribed into DNA and inserted elsewhere in the genome. For the R2 element, this insertion site is exclusively within the 28S rRNA genes and insertion is thought to be mediated via target primed reverse transcription (TPRT). In order for the TPRT mechanism to occur, the 5' and 3' ends of the RNA intermediate must bind to R2 protein before it can cleave and insert its DNA into a new genomic site. Despite its importance in TPRT, RNA binding sequences of R2 protein are not well understood. The objective of this study was to create a lysine to alanine mutation in the highly conserved KPQQR sequence of the thumb domain of the R2 protein using site-directed mutagenesis, and to isolate this protein for use in future assays. By examining the RNA binding properties of the R2 protein, we can further understand the TPRT mechanism and its overall role in retrotransposon success.

333 Effectiveness of Batesian Mimicry in the Ant Mimicking Spider *Myrmarachne formicaria*

ALANNA RICHMAN, BEA DIPZINSKI

FACULTY SPONSOR: JENNIFER APPLE, BIOLOGY
Myrmarachne formicaria is a non-native ant-mimicking spider that was first recorded in New York in 2006. Little is known about its natural history in its native range in Europe and Asia or in its newly colonized range in North America. Some spider species are Batesian mimics that resemble ants in order to avoid being eaten, since many potential predators will not prey on ants. To assess the effectiveness of Batesian mimicry in this species, we staged encounters with a larger salticid spider species that could be a potential predator of *M. formicaria*. In total, 12 predator spiders were observed with ant-mimicking spiders, non-mimic salticid spiders, and ants (*Formica glacialis*). Behaviors were analyzed through video recordings to observe if specific behaviors increased likelihood of survival or were correlated with greater predator spider aggression. Initially, we found that predator spiders were more likely to attack or kill non-mimicking spiders than ant-mimicking spiders. However, predators later began killing ant-

mimicking spiders more frequently, a possible influence a longer duration of captivity. These experiments serve as an important step in learning about this species' interactions with native species in its newly colonized range.

Selected for presentation at Northeast Natural History Conference, Stamford, CT.

135 Coral-Sponge Interactions in Marine Protected and Non-Protected Areas Around San Salvador, Bahamas

ANNA MEICHENBAUM, MICHAEL HARVEY, BROOKE STICKLES

FACULTY SPONSOR: ISIDRO BOSCH, BIOLOGY

Overfishing of top predators is altering the ecology of reef systems. Fish predators of sponges, such as pufferfish and porcupine fish have been depleted by the aquarium trade. A decrease in predatory fish would free sponges from predation and allow them to compete more effectively with corals for space on the reef. The loss of spongivores is expected to have a greater positive effect on non-chemically defended sponges (palatable sponges), which grow faster than those that are chemically defended. The goal of this study is to survey fished (non-protected) versus non-fished (protected) sites to determine the abundance of corals and sponges that have been altered given a loss of predators to harvesting. Our hypothesis is that in fished areas, the faster growing, non-chemically defended sponges should compete more effectively with corals. This study will be carried out in marine protected reefs and non-protected reefs around San Salvador Island.

477 Loss of E-cadherin Expression in the Vulvar Carcinoma Cell Line, A431, Corresponds with Increased Cell Proliferation in the Presence of Transforming Growth Factor Beta-1

GENNA MCCORMACK

FACULTY SPONSOR: JANI LEWIS, BIOLOGY

A431 is a vulvar squamous carcinoma cell line that normally express E- and P- cadherin and cytokeratins 8 and 18. Treatment of A431 cells with dexamethasone permanently downregulates E- and P-cad in a subset of these cells, A431D, and subsequently causes gain of vimentin expression. Glucocorticoid clobetasol propionate (clob), which is often used to treat vulvar rash also caused A431 cells to downregulate E- and P-cad and upregulate vimentin. In the A431D population we found that transcription factors, Twist-1 and Snail were upregulated, suggesting a role in the downregulation of E- and P-cad expression. Signaling hormone, transforming growth factor beta-1 (TGFβ-1), is also associated with loss of E-cad via upregulation of Twist-1 and Snail. We hypothesized that clob may work through a similar pathway to TGFβ-1, and TGFβ-1 would cause downregulation of E-cad in A431 cells. Our results showed that TGFβ-1 did not cause downregulation of E-cad in the A431 cells nor did it accelerate or prevent the clob induced loss of E-cad. However, growth arrest patterns were observed in A431 that were not seen in A431D cells. Thus, loss of E-cad in A431D may

allow them to survive the negative growth impact of TGFβ-1 as seen in A431 cells.

Selected for presentation at American Association for Cancer Research Annual Conference, San Diego, CA.

479 Investigation into the Causes of Bushfires in Australia

KATHERINE MULLADY

FACULTY SPONSOR: GREGG HARTVIGSEN, BIOLOGY

Bushfires have always been common in Australia. However, due to climate change, they are becoming an increasing issue. I analyzed data for precipitation and temperature throughout Australia since 1859 to test the relationship between climate change and the severity of the bushfires. I was able to conduct this study by analyzing data for daily temperature and precipitation, from 1859-2019, and correlated these against the data for hectares burned for significant bushfires, from 1968-2019. From these results I found the relationship between temperature and precipitation appeared to be distributed like a bell curve with most precipitation occurring at moderate temperatures. I also found that temperature began increasing only after the 1970's. These findings are significant because if temperatures increase over time, this could cause precipitation to eventually decrease. However, I found no relationship between the median precipitation during the fire seasons and the significance of bushfires. I then looked into alternative reasoning for why major bushfires are occurring and analyzed drought length instead. It was found that there is a relationship between drought length and the severity of bushfires. This research shows how increasing temperatures, due to the repercussions of human activity, are causing climate patterns to change drastically.

131 Niche Partitioning and Overlap in the Fruiting Phenology of Native and Invasive Plant Species

EVAN BURR

FACULTY SPONSOR: SUANN YANG, BIOLOGY

In fruiting plants, competition for seed dispersers is an important factor in regeneration of the population. Partitioning niches across either disperser type or time facilitates the coexistence of plant species in a habitat filled with competing plants. An example of habitats where invasive fruiting species are common are secondary successional forests such as SUNY Geneseo's Roemer Arboretum, with its variety of native and invasive fruiting species. We analyzed the fruit production over three fruiting seasons for seven invasive species (e.g., *Lonicera maackii*, Amur honeysuckle) and five native species (e.g., *Parthenocissus quinquefolia*, Virginia creeper) to identify and investigate any partitioning of temporal niches and how this might influence species interactions. For the same plants each week, we counted the number of fruit present in three stages (green, intermediate, and ripe) for three fruiting seasons. Our results show that multiple invasive species overlap in fruit production with native species, though between-year variation in phenology changes the degree of overlap. Thus we found evidence for the

potential impact of competition for seed dispersers on the community due to the higher relative abundance of the invasive fruits. We discuss the implications of our findings on the regeneration of native plant species populations.

Selected for presentation at Northeast Natural History Conference, Stamford, CT.

454 Effects of Meiotic Drive on Developing Eyestalks in Stalk-eyed Flies

OLIVIA SMITH, KARISSA GARBARINI

FACULTY SPONSOR: JOSEPHINE REINHARDT, BIOLOGY

Teleopsis dalmanni, known as stalk-eyed flies, are known for sexually dimorphic eyestalks. Some individuals contain meiotic drive, known to influence eyestalk length and sex ratios. Our goal, to identify genes developing in eye tissue playing a role in causing meiotic drive, studying males with drive. Determining what genes are being disrupted by meiotic drive in individuals. We are studying this because males with shorter eyestalks have lower fitness. Since eyestalks are sexual ornamentation females would rather mate with males with larger eyestalks. To identify the genes, we dissected eye antennal discs from larvae and retained the carcasses. We extracted DNA from carcasses, performed PCR for markers diagnosing the sex and meiotic drive status of individuals, and sent them for fragment analysis. We identified 31 male, 66 female stalk-eyed larvae, and approximately one third of the flies within this population had meiotic drive. Using the larvae' eyeantennal imaginal discs from our dissections to measure differential gene expression using RNA from meiotic and non-meiotic drive individuals of each sex. After pooling tissues together by drive and sex we can extract RNA using an RNeasy extraction kit. We will send these samples for RNA sequence analysis to determine which genes are being affected by meiotic drive.

139 Detrimental Effects of Parrotfish Harvesting on Coral Reefs

JULIA OPHALS, RAEGAN BECKER

FACULTY SPONSOR: ISIDRO BOSCH, BIOLOGY

Parrotfish are critical herbivores that help maintain the competitive balance between coral and algae in tropical reef systems. The family of parrotfish are female-first sex-changing marine fish in which the largest dominant males and large females in the population contribute disproportionately to reproduction. We are testing the hypothesis that in Marine Protected Areas (MPAs) around San Salvador Island, The Bahamas, there will be a greater abundance of large male and female parrotfishes, whereas size selective fishing in non protected areas will result in larger individuals being scarce. This will reduce reproductive success and lower parrotfish abundance, leading to greater macroalgal cover and detrimental impacts on corals and reef communities.

144 Comparison of Coral Cover and Reef Diversity in Marine Protected/Unprotected Areas around San Salvador Island, The Bahamas

KATY TOTH

FACULTY SPONSOR: ISIDRO BOSCH, BIOLOGY

Coral diversity in tropical reefs is declining rapidly world-wide, especially within the Caribbean Province. However, some species, such as *Porites astreoides*, perform better under stress, making them increasingly dominant on reefs. Coral biodiversity will be highest in Marine Protected areas, where stressors, such as fishing, are minimized. This study will test the hypothesis that, in comparison to protected reefs, resistant corals will dominate in exploited reefs around the island of San Salvador, Bahamas. Surveys of coral communities will be conducted using transects at 3 locations within the San Salvador Marine Park and two sites outside the park. Species richness, evenness, coral composition, and coral cover will be compared statistically to evaluate the effects of stress on the coral community. Our working hypothesis is that resistant corals will dominate exploited sites resulting in lower coral community diversity and compromised reef health. The communities within the Marine Park are expected to be more diverse and consequently more resistant to environmental stress.

147 The Effect of a Histone Deacetylase Inhibitor on PD-L1, HLA-ABC, HLA-E, and HLA-G on Human Breast Cancer Cell Lines

ALEC TOUFEXIS, NIKHIL REDDY

FACULTY SPONSOR: ROBERT O'DONNELL, BIOLOGY

Increased expression of human leukocyte antigen (HLA) allows tumor cells to be more easily detected by the immune system. In previous research, epigenetic modifiers including the histone deacetylase inhibitor 3 (HDAC3), RGFP966, has been shown to decrease PD-L1 expression. PD-L1 expression inhibits T cell cytotoxicity, and decreasing it can enhance the immune response. We hope to elucidate whether or not HLA-ABC expression similarly decreases upon exposure to the HDAC3 inhibitor which would be detrimental to immune detection. Two breast cancer cell lines that express HLA-ABC are MCF-7 and MDA-MB-231. Our initial results show that HLA-ABC is expressed on the MDA-MB-231 and MCF-7 cell lines, while PD-L1 is only expressed by MDA-MB-231 cell line as demonstrated by flow cytometry. However, in subsequent experiments testing the effect of RGFP966, there were inconsistent results regarding the change in expression of HLA-ABC which requires further investigation. In addition, we also wish to examine other HLA proteins, such as HLA-E and HLA-G, which have been shown to be detrimental to immune detection. Future experiments are planned to optimize the doses of RGFP966 to maximize HLA expression in these breast cancer cell lines while limiting the expression of PD-L1, HLA-E and HLA-G.

153 Muscular Reconstruction of the Forelimb of the Theropod Dinosaur *Mononykus olecranus*

JADA SMITH

FACULTY SPONSOR: SARA BURCH, BIOLOGY

Mononykus olecranus was a small, nonavian predatory theropod that exhibited unusual forelimb size in comparison to other theropods. Its forelimbs were distinctly stunted in size with only one finger and claw on each hand. The perplexity of these forelimbs has prompted many to study the function of the *Mononykus* forelimbs. This study uses phylogenetic muscle reconstruction methods along with previous reconstructions of theropods such as *Tawa* and *Majungasaurus* to help us better understand what *Mononykus* may have been capable of. Overall, there are several modifications in the forelimb that improve the leverage of the shoulder flexors and elbow extensors. An improved lever arm for shoulder flexors like *Supracoracoideus* would be provided by the enlarged posteroventral process of the scapulocoracoid and the projecting deltopectoral crest of the humerus. Improved leverage for elbow extensors like *triceps brachii* would be shown by the massive olecranon process of the ulna and enlargement of the ectepicondyle of the humerus. The humerus also shows an enlargement of internal tuberosity, related to the shoulder adductors. These reconstructions, along with the rest of the forelimb, are consistent with the hypothesis that *Mononykus* used its unusually small forelimbs for digging or scratching, perhaps when foraging for insects.

486 Cell Cycle Effect on HLA expression in HTB-4 and MRC-5

NICK TURNQUIST, ANDREW KAREEPARAMPIL

FACULTY SPONSOR: ROBERT O'DONNELL, BIOLOGY

Human Leukocyte Antigen (HLA) is a gene that codes for cell-surface proteins that are the basis of our bodies' immune response. We observed two cell lines, HTB-4 and a non-cancerous cell line known as MRC-5. Our purpose for this experiment was to observe the effect of the cell cycle on HLA expression for these cell lines. Two flasks were prepared for each cell line: one confluent and one non-confluent. Flow cytometry analysis was performed for each of the four flasks. The flow cytometry results of the MRC-5 cells indicate increased HLA expression in the confluent flask, in the G1 phase of the cell cycle. A smaller amount of expression was found in the 48-hour group. Analysis of the HTB-4 cells revealed that there was more HLA expression in the confluent flask as well. These results show that for both cell lines, HLA appears to be expressed more in confluent cells that are not undergoing large amounts of proliferation. This suggests the cell cycle does have an effect on HLA expression for these cell lines. We would like to repeat it to verify our results and use this new information about HLA expression in drug treatment experimentation.

155 Analysis of *her4.1* and *ascl1a* in *gef* Mutants

RICO AMATO, CHRISTOPHER LEPORE, TESSA BEITER

FACULTY SPONSOR: TRAVIS BAILEY, BIOLOGY

Zebrafish are a model organism for studying developmental abnormalities, especially in the eye. The *good effort* (*gef*) mutant zebrafish have smaller eyes than wild-type embryos due to rapid retinal degeneration that becomes apparent only after two days post fertilization. The genetic problem arises from a deletion of intronic DNA sequence, which leads to the loss of an exon and disrupts the coding region of the *Chaf1b* protein. *Chaf1b* is a subunit of the Chromosome assembly factor 1 (CAF-1), a complex of three proteins that has a role in histone loading and chromatin regulation. This small eye phenotype has been hypothesized to be due to Tp53-mediated apoptosis; however, phenotypic analysis from complex *tp53*-morphants or *tp53zdf1* mutants and *gef* mutants suggests that the cause of cell death is not Tp53 dependent. Instead, we hypothesize that these issues are due to faulty signaling pathways, such as *Her4.1* and *Ascl1a*. These specific signaling molecules are involved in retinal cell fate specification. Both of these molecules are under direct control of histone deacetylases which selectively regulate both genes during retinal development. Differences in *her4.1* and *ascl1a* expression levels between *gef* and wild-type zebrafish embryos were analyzed by *in situ* hybridization.

Selected for presentation at Northeast Regional Meeting of the Society for Developmental Biology, Woods Hole, MA.

156 Age Estimation of Deep-Sea Trench Amphipods by the Presence of Autofluorescent Age Pigment Lipofuscin

JESSICA PALMERI, KIERSTEN COATES

FACULTY SPONSOR: MACKENZIE GERRINGER, BIOLOGY

Despite ongoing research, the environment and organisms in deep-sea trenches remain largely unknown. Hadal trenches are topographic depressions usually formed by subduction that reach depths of 6,000 m to ~11,000 m. In these deep-sea trenches, amphipod crustaceans are among the most abundant bait-attending taxa, scavenging carrion in temperatures varying from 1°C to 4°C. Despite their abundance in trenches, little is known about the biology and longevity of these amphipods. Our objective was to estimate the ages of amphipods sampled from the Peru-Chile Trench at depths ~6,000–8,000 m. We measured body length, head length, 4th coxal length, and weight of each amphipod. Sex was determined based on the presence or absence of oostegites, a female gonad, which were also measured in length. The autofluorescent pigment, lipofuscin, has served as an age marker in previous amphipod studies. We quantified lipofuscin concentration in amphipod brains using confocal microscopy. We compared

lipofuscin concentration alongside morphometric data to estimate age classes. By examining the relative age of amphipods in deep-ocean trenches, we gain insight on the overall longevity of organisms in the deepest parts of our oceans, informing future conservation and management of deep-sea trenches.

487 Controlling the Spread of Measles in an Unvaccinated School Population

RUTH VAN DER HEIDE

FACULTY SPONSOR: GREGG HARTVIGSEN, BIOLOGY

The Orthodox Jewish population in Rockland County, NY does not vaccinate due to religious beliefs, which allows diseases to spread quickly through the population. A caveman model was created to represent a private Jewish school typical of those in Rockland County, where $n.caves = 10$ and $cave.size = 20$ to create a population of 200 unvaccinated students. A measles infection ($R_0 = 15$) was introduced and infected individuals were removed from the school during the eight day infectious period at a varying number of days after infection, ranging from Day 0 to Day 8 of the infectious period. The data was analyzed for normality using a Shapiro-Wilk test and an ANOVA was performed to determine whether the data was statistically significant. Two boxplot graphs were created, representing the number of infected individuals and the length of the epidemic as a function of the day infected students were removed from the school. Removing children from the school within the first three days after infection significantly decreased the number of individuals who became sick as well as the duration of the outbreak in the school.

in combating the spread of EVD, as it greatly reduces the amount of contact between individuals in a population. By limiting the amount of hospitalizations and resulting EVD deaths, the burden that healthcare systems typically experience due to such outbreaks can be significantly lessened.

452 Potential Impacts of Basic Reproduction Number on the COVID-19 Epidemic

MARISA PRESUTTO

FACULTY SPONSORS: GREGG HARTVIGSEN, BIOLOGY, CHRISTOPHER LEARY, MATHEMATICS

The basic reproduction number (R_0) of a disease can be thought of as the number of cases that one case will directly generate if the rest of the population is susceptible to infection. The R_0 of COVID-19 has recently become clearer; toward the beginning of the outbreak, the Imperial College Group estimated it to be somewhere between 1.5 and 3.5 (Imai et al. 2020), but they have now assumed a value of 2.4 (Ferguson et al. 2020). Using the Watts-Strogatz small-world model, I examined the effects of different R_0 values within the original range on the maximum number of individuals infected at a time, the length of the epidemic, and the total number of individuals infected. Results indicate a critical point at $R_0 = 2.25$ where there is a significant, detrimental change in each of these epidemic measures. With the R_0 of COVID-19 at 2.4, this raises concerns for the spread of Coronavirus throughout our population. With an R_0 value greater than 2.25, my model suggests that the virus will run through the majority of our population very quickly with many cases at once, overwhelming hospitals. Evidently, this is the situation that we are currently witnessing and attempting to control.

suggested an insignificant increase in the number of associated complications as prior vaccination dosages increased. This study demonstrates the effectiveness of vaccinations, with the potential vulnerability for future complications not being as severe this epidemic, most probably due to rapid vaccination efforts and isolation of exposures.

482 Investigating the Spread of the Australian Bushfires Using a Spatially-explicit Model

LAURA ZOPF, KATHERINE MULLADY

FACULTY SPONSORS: GREGG HARTVIGSEN, BIOLOGY, CHRISTOPHER LEARY, MATHEMATICS

Australia had one of the worst fire seasons this past year, with millions of acres burned, especially in highly dense and dry areas of the Eucalyptus forests. Climate change is impacting how severe fires are by increasing temperatures and droughts, creating increased amounts of fuel, such as dry leaves and bark. To investigate this issue, I developed a model that tests how tree density affects fire extent and duration. My model suggests two important factors that density plays. One factor is the probability of trees remaining unburned. I found that there's a critical point where trees remaining plummet around 59 percent to where no remain alive after 80 percent. I also found that burning time increases with density until it peaks at the critical point. After this, the time decreases due to the rapid spread of fires at these higher densities. My results suggest that, if a forest is above this critical point, the fires are likely to extend further and burn trees at a faster pace. This creates a major problem, with increasing global climate change and drying of the Australian bush, in mature forests throughout the country which will impact humans and unique species that live there.

BIOLOGY & MATHEMATICS

484 Modeling Social Distancing Methods and Their Effectiveness in Combating the Spread of Ebola

RACHEL FAIR

FACULTY SPONSORS: GREGG HARTVIGSEN, BIOLOGY, CHRISTOPHER LEARY, MATHEMATICS Ebola virus disease (EVD) is a rare but severe disease that is transmitted among humans through direct-contact with, and close proximity to, infected bodily fluids. From 2014-16, West Africa experienced the largest Ebola outbreak ever recorded, infecting over 28,000 people, and killing over 11,000. Although the symptoms of EVD are treatable, the disease can be extremely deadly, with an average of 50% EVD cases resulting in a fatality. In areas where healthcare is scarce and vaccinations are not readily available, the practices of social distancing and self-quarantining have been shown to be highly effective in combating the spread of EVD. To evaluate the effects of social distancing and quarantining on the spread of EVD through a population, a small world, network-based model was implemented. The model population was evaluated to determine the most beneficial method of quarantine. Our study indicates self-quarantine to be an extremely effective method

483 Effectiveness of MMR Vaccination in Orthodox Jewish Neighborhoods

MEENU MUNDACKAL

FACULTY SPONSORS: GREGG HARTVIGSEN, BIOLOGY, CHRISTOPHER LEARY, MATHEMATICS Measles is a highly contagious disease, where large outbreaks arise by direct contact between susceptible (unvaccinated) and infectious individuals. Many Orthodox Jewish neighborhoods were affected by measles from 2018-2019. To quantify the vaccination effort on this susceptible population, a retrospective analysis was used to study the NYC and Rockland County populations using a differential equations model. A subsequent model, known as a realistically-structured network model, studied only the NYC population, in relation to typical household size. Random vaccination strategies were applied in three cohorts: unvaccinated family members, members with 1 prior MMR dose, and members with 2 prior MMR doses. In both models, the total number of individuals who got sick decreased with vaccination effort. The network model supported significantly less sick individuals with 1 prior MMR dose, and even more so with 2 prior doses. ANOVA's were calculated to test working vaccination effort, all with $p < 0.001$. The differential equations model

470 Quantifying the Shape of a Plant (*Brassica rapa*) During Growth Under Different Light Intensities Using Fractal Geometry

MATT COTRONEO

FACULTY SPONSORS: GREGG HARTVIGSEN, BIOLOGY, CHRISTOPHER LEARY, MATHEMATICS Over time plants not only increase in size but also change their shape. Quantifying this change in shape, however, is challenging. Fractal dimension, a measure of how these plants fill space, can provide a wholistic understanding of plant shape and how that shape changes as the plants react to their environments. I used a high-resolution, three-dimensional scanner to estimate the shape of *Brassica rapa* plants during growth under three different light intensities: low (40 μ Einsteins), medium (75 μ Einsteins) and high (100 μ Einsteins). From these data, each plant's above-ground shape was quantified using fractal geometry. The fractal dimension (D) of plants grown under the low and medium light conditions increased asymptotically with growth rates 0.13769 and 0.16009, respectively, to fractal dimension 1.660 and 1.640, respectively. Plants grown under high light had a mean constant fractal dimension of 1.524 over the course of the

experiment. I developed a 3-dimensional diffusion-limited aggregation model of plant growth over time that accounts for light intensity in order to test whether this simple set of rules can simulate plants with a similar shape. Results suggest that the model is capable of generating plants with a fractal dimension growth curve comparable to that of experimentally grown plants.

469 Life or Death: Decision Making in Sexual Disease Treatment Matters

JASON IPOLITO

FACULTY SPONSORS: GREGG HARTVIGSEN, BIOLOGY, CHRISTOPHER LEARY, MATHEMATICS Syphilis is an STI that has recently made a resurgence in homosexual populations. When infected, a patient has two options: seek treatment immediately or do not seek treatment. I used a system of differential equations that includes susceptible, exposed, treatment receptive, treatment non-receptive, cured, and dead state variables in order to determine the relationships among transmission rate, treatment options, and death rate. My model suggests that an individual's treatment option has a larger effect on death rate than the transmission rate inherent to the disease. The model also contains two sets of equilibria: an unstable trivial disease free condition and stable non-trivial equilibria in which the susceptible state converges on 0.063, exposed converges on 0.024, treatment receptive converges on 0.012, treatment non-receptive converges on 0.63, cured converges on 0.26, and dead converges on 0.012. My results indicate that education about treatment options may reduce the burden of syphilis in the population.

465 Modeling Vaccine Efficacy for Tuberculosis in a Prison Population

KAITLYN MUNDACKAL

FACULTY SPONSORS: GREGG HARTVIGSEN, BIOLOGY, CHRISTOPHER LEARY, MATHEMATICS Tuberculosis is a highly contagious disease and is particularly problematic in confined communities such as prisons. I simulated how tuberculosis moves through a prison population and tested how much vaccination effort is needed to control its spread. To explore this, I tested adding ever increasing numbers of randomly placed edges in a network and determined the size of the largest component. Afterwards, I removed edges in the model using two different methods, one illustrating if the edges were removed randomly and the other starting with prisoners that had the most connections, to simulate the effect of vaccination. My results show that as edges are taken off, one would have to put in less vaccination effort if distributing based on the degree of the vertex, at about 30-40% effort, rather than removing them randomly, which would need 40-60% effort. This research could help prison administrators reduce the likelihood of prisoners contracting diseases and can also aid scientists when they're scrambling to develop a

vaccine in a short time frame to see how much effort they need to reduce an epidemic.

CENTER FOR COMMUNITY

172 The Impact of Extracurricular Leadership Activities on Adolescent Life Satisfaction

BRITTANY BEARSS

FACULTY SPONSOR: NICHOLAS PALUMBO, CENTER FOR COMMUNITY

Previous research has shown that leadership development along with the satisfaction of the three basic psychological needs: autonomy, relatedness, and competence; and experiencing feelings of vitality lead to optimal functioning and development and positive life satisfaction (Ryan & Deci, 2000; 2001). The current study uses Self Determination Theory (SDT) and Authentic Leadership Theory (ALT) as guiding frameworks to examine the relationship between leadership activities and adolescent life satisfaction. The study aimed to explore how the three basic psychological needs, feelings of vitality, and leadership activities (in and outside of school; ISLA and OSLA respectively) impact reported life satisfaction. Data was collected from 109 high school students in 12 Western New York districts. A statistically significant hierarchical regression model revealed significant relationships between outside of school leadership activities and life satisfaction both alone (adjusted $R^2 = 8.8\%$) when coupled with vitality. (adjusted $R^2 = 35.3\%$) and when both are joined with basic psychological needs satisfaction (adjusted $R^2 = 44.0\%$). With this knowledge, community leadership program options may be explored by areas where they are not readily available. The results of this study suggest that expanding and developing community-level activities for all youth may lead to higher levels of life satisfaction.

Association for Psychological Science, Chicago, IL.

CENTER FOR INTEGRATIVE LEARNING

97 Communication Barriers Beyond Spoken Language: Senegalese Nonverbal Codes

SOPHIA PIAZZA

FACULTY SPONSOR: LYTTON SMITH, CENTER FOR INTEGRATIVE LEARNING

Through the ambassadorship program and the funds provided by the The Gérard Gouvernet Ambassadorship in French Language and Cultures I was able to take part in intercultural communication research, specifically studying Senegalese nonverbal communication codes - facial expressions, eye contact, touching, tone of voice, dress, posture, and spatial distance between people - and how differences in these patterns can hinder effective communication between diverse cultures. With the scholarship I lived in Dakar, Senegal for one month in Summer of 2019. While in Senegal, I was able to travel around the country recording observations and

conducting interviews while living with a host family and fully immersed in Senegalese society. The poster will focus on my personal experience and accounts along with secondary research conducted to support my findings.

298 Rural Economic Growth and Disease Intervention in Ghana; The Edward Pettinella '73 Endowed Ambassadorship in Business

LUCAS SUTTON

FACULTY SPONSORS: LYTTON SMITH, CENTER FOR INTEGRATIVE LEARNING, SUSAN MUENCH, BIOLOGY, WILLIAM ANYAN, BIOLOGY, PALLAVI PANDABIOLGY, ECONOMICS

Schistosomiasis is a leading parasitic infection that debilitates many individuals in sub Saharan Africa. Because this parasitic infection involves a snail as an intermediate host, we use a native prawn species as a natural predator to decrease the population of this snail community. This study focuses on Tomefa, a primarily fishing peri-urban community located at the outskirts of Accra, the capital city of Ghana. A survey was given to the local community measuring economic characteristics. In the laboratory, *Macrobrachium* spp prawn exhibit preference of *Bulinus* snails over *Biomphalaria* snails while non-parasitic snails were consumed in higher proportion to parasitized snails. Of the local community surveyed, 72.5% classified fishing as their primary source of income. With a median income of 400 GC in the community, these prawns would provide an aquaculture opportunity to increase incomes. The introduction of *Macrobrachium* spp into the Weija reservoir has potential to decrease the total population of snails hosting the schistosome parasite while also increasing the socioeconomic status in the local fishing community.

CHEMISTRY

385 Optimizing Nitrogen Concentrations to Maximize Lipid Yields for Biodiesel Production

WADY JACOBY, PAVEL ANANEV, LAUREN SAGGESE, MAX MULLER, DARIA ZHOGINA
FACULTY SPONSOR: BARNABAS GIKONYO, CHEMISTRY

Select subspecies of microalgae are considered to be the most promising candidates for third generation renewable resources of biodiesel. Algae not only ingest excess carbon emissions from the atmosphere, they also convert it into energy-dense lipids which can be harvested, and then transformed into biodiesel. However, before the fuel industry can adopt algae farming as a realistic alternative to fossil fuels, the process of harvesting algal lipids must be optimized further. Our research aims to make algal lipid extraction more realistic by determining the ideal growing conditions of the algae species *Chlorella vulgaris*. Recent experiments have demonstrated that sequestration of environmental nitrogen from algal cultures results in an increased percentage of lipid mass among the cultures. In our

experiment, three algae cultures were grown to their population capacity using standard Bold's Basic Media, and were then exposed to new media containing varying concentrations of nitrates: 0 mg/mL, 0.25 mg/mL, and 1.0 mg/mL. After an incubation period, the algae underwent a Folch's lipid extraction procedure, and the resulting lipids' masses were compared. In the future, our group would like to finesse our harvesting process by implementing proven techniques – such as microwave radiation to further break down the cell membranes.

154 Alfalfa Hay as Non-human Feedstock for Second Generation Biofuels: Hope or hoax? II

ARIANNA SORIANO, SOFIA KOSTRINSKY
FACULTY SPONSOR: BARNABAS GIKONYO,
CHEMISTRY

The excessive use of fossil fuels has negatively impacted the environment because of greenhouse gas emissions. Researchers are now searching for ways to counterbalance the damage which has been done to the Earth after centuries of greenhouse gas emissions. Potential alternatives to fossil fuels include biofuels, an overlooked and cost-effective source of energy. Many efforts have been focused on the production of first-generation biofuels, fuels attained from human food sources, such as corn. First-generation biofuels have been linked to the increase in food prices, which is a problem because it negatively impacts many developing countries. Our research is geared towards the production of second generation biofuels, which rely on non-human food sources, specifically alfalfa hay. Second generation biomasses, such as alfalfa hay, are ideal as biofuel feedstock, because they are cheap, and have the power to constrain greenhouse gas emissions, while not taking away major human food sources or causing competition for new land. For this research project, the ionic liquid 1-butyl-3-methylimidazolium chloride was used in the pretreatment of the alfalfa hay, in order to produce glucose. Glucose quantification methods applied include UV spectroscopy and DNS analyses. The results are presented and discussed within.

109 Bone Fracture Repair: Testing Porous Properties of Calcium Phosphate Bioactive Cement in Comparison to Pig Bone

JUSTIN GABRIEL, DEAN IVANOVSKI, NOSHEIB JADOON
FACULTY SPONSOR: BARNABAS GIKONYO,
CHEMISTRY

The most effective and useful method for supplementing and replacing bone is through autografts. However, autografting comes with risks as a result of the invasive nature of the procedure which is caused by removing small sections of bone and implanting at the fracture site. This study aims to develop an alternative system to replace autografting. For these initial studies, we use pig fibula to compare the properties of that to our novel cement system. The novel cement is composed of Calcium Phosphate Cement (CPC), a biocompatible bone

substitute composed of Hydroxyapatite (HA) constitutes a major component of human bone. This will serve as the base ingredient for the cement. These cements allow for successful osteointegration and the initiation of bone growth, because of these properties we focus our efforts in the challenges of adequate porosity size with the use of different concentrations of chitosan and sodium bicarbonate. Results of the experiment show that the sample most similar to the bone sample was the chitosan sample.

354 Observation of Acid Penetration of Nano-gold Doped Sol-gel System

ERIC KOESSLER, MIR ALI
FACULTY SPONSOR: KAZUSHIGE YOKOYAMA,
CHEMISTRY

The penetration of the acid into gold doped sol-gel material was measured. The acid penetration speed increased as the nano size increased up from 5 nm to 20 nm. Then there was almost no penetration at 60 nm. The nano dependent rate change was complex and needs to be investigated further. Also, recent new methodology to create the gel showed a significance stability and it took more than a few days to complete the penetration.

353 Interfacial Interaction of Amyloid Beta Peptide 1-40 with ThT

ISHAN DESHMUKH
FACULTY SPONSOR: KAZUSHIGE YOKOYAMA,
CHEMISTRY

The amyloid beta peptide 1-40 ($A\beta_{1-40}$) was prepared over nano-gold colloidal surfaces together with Thioflavin T (ThT) dye as a fluorophore. The fluorescence assay of ThT displayed two different types of fluorescence bands: 1) mainly originating from free-ThT and 2) ThT significantly interacted with $A\beta_{1-40}$. The ThT directly interacted with $A\beta_{1-40}$ adsorbed over the gold colloidal surface. Significant evidence supporting that $A\beta_{1-40}$ has higher binding affinity than a gold colloidal surface was obtained. A series of studies on fluorescence decay time were collected at various pHs, ranging from pH 1 to pH 12 and with several gold colloidal sizes ranging from 10 nm to 100 nm. It was concluded that ThT attached to either 22Glu or 23Asp of the $A\beta_{1-40}$ through an electrostatic interaction between adjacent $A\beta_{1-40}$ monomers, as $A\beta_{1-40}$ proceeds a folding conformational change. The spacing between adjacent $A\beta_{1-40}$ monomers was increased for gold colloidal sizes of 50 nm and above. An identification of the ThT attachment site in $A\beta_{1-40}$ simultaneously confirmed that the hydrophilic segment of $A\beta_{1-40}$ was used in binding to the gold colloidal surface and hydrophilic site of $A\beta_{1-40}$, networking with the other $A\beta_{1-40}$ adsorbed on the gold colloidal surface.

295 Biomimicry: Investigating the Active Site Model of Lactate Racemase

STEPHANIE PODGUSKI, MAISY ROSS
FACULTY SPONSOR: BRANDON TATE,
CHEMISTRY

Because of humans' heavy impact on nature with industrialization and resource extraction, biomimetics, also known as biomimicry, is a study that has emerged. Biomimetics utilizes observations from nature to comprehend the principles of underlying mechanisms and apply concepts that may benefit science, medicine, engineering and the like. An area of biochemistry we are applying this to is the lactate racemase enzyme. This metalloenzyme is found in many prokaryotic organisms and catalyzes the interconversion between the two optical isomers of lactic acid. The structure of this enzyme consists of a square-planar nickel (II) ion coordinated by a histidine residue and a pincer ligand. We are synthesizing a model of this enzyme using biomimetic chemistry to further expand our knowledge on the mechanism and reactivity of lactate racemase. We hope that the findings from this model will lead to a greater understanding of the unique organometallic cofactor of lactate racemase. This will help improve designs for biomimetic catalysts that can be used in many different areas of everyday life, especially but not exclusively, renewable fuels. **Selected for presentation at SUNY Undergraduate Research Conference, Syracuse, NY.**

352 Determination of Nano-scale Adsorption Orientation of Peptide

AKANE ICHIKI
FACULTY SPONSOR: KAZUSHIGE YOKOYAMA,
CHEMISTRY

The simulation of a peptide coverage was conducted by assuming a prolate shape of all amyloidogenic peptides taking a spiking-out orientation. In order to reproduce the extracted peptide coverage ratio, the involvement of a secondary layer was suggested. The secondary layer was considered to be due to the networking of the peptides. Both $A\beta_{1-40}$ and $B2M$ are considered to have a partial charge (+) distribution centering around the prolate axis. The α -syn, on the other hand, possesses a distorted charge distribution. For relatively lower coverage (< 0.56), a prolate was assumed to conduct a gyration motion, maintaining the spiking-out orientation in order to fill in the unoccupied space with a tilting angle of approximately 30°.

183 Cannabis Sativa: Pretreatment and Fiber Content Analysis

DINA BU, SARAH SCHMIDLIN, SOFIA KOSTRINSKY, ARIANNA SORIANO
FACULTY SPONSOR: BARNABAS GIKONYO,
CHEMISTRY

Cannabis sativa commonly known as hemp, is one of the fastest-growing plants whose refined products have immense commercial value. Refined hemp is included in various products: biofuels, biodegradable plastics, textiles, dietary supplements, paper, clothing and much more. Hemp fibers are also used in construction and manufacturing applications as a way to strengthen composite products. These qualities make hemp a high yielding, sustainable, and environmentally friendly crop with the potential to yield valuable raw materials for a large number of applications. Our research evaluates the

pretreatment of hemp and the comparative analysis of the fiber content thereof. Our goal is to determine the suitability and the potential use of ionic liquid-based pretreatment (1-butyl-3-methylimidazolium chloride) for the breakdown of hemp lignocellulosic biomass. The collected data is presented and discussed.

348 Establishment of Peptide Aggregation Process

KAYLEE HAUSRATH

FACULTY SPONSOR: KAZUSHIGE YOKOYAMA, CHEMISTRY

Cannabis sativa commonly known as hemp, is one of the fastest-growing plants whose refined products have immense commercial value. Refined hemp is included in various products: biofuels, biodegradable plastics, textiles, dietary supplements, paper, clothing and much more. Hemp fibers are also used in construction and manufacturing applications as a way to strengthen composite products. These qualities make hemp a high yielding, sustainable, and environmentally friendly crop with the potential to yield valuable raw materials for a large number of applications. Our research evaluates the pretreatment of hemp and the comparative analysis of the fiber content thereof. Our goal is to determine the suitability and the potential use of ionic liquid-based pretreatment (1-butyl-3-methylimidazolium chloride) for the breakdown of hemp lignocellulosic biomass. The collected data is presented and discussed.

107 Investigating the Promise of Lignocellulosic Biofuels: Rice Husks as Non-human Feedstocks



SOFIA KOSTRINSKY, DINEEN VOGLER, CLAIRE MARTIN, ARIANNA SORIANO

FACULTY SPONSOR: BARNABAS GIKONYO, CHEMISTRY

The Earth has endured years of damage caused by an overuse of fossil fuels. Many are combating the damage with alternative energy. Biofuels represent an economical and often overlooked alternative to fossil fuels. Efforts have been geared toward the use of human food sources such as sugarcane (first generation biofuel). Although first generation biofuels aid in curbing greenhouse gas emissions, they lead to increasing food prices, which negatively impacts developing countries. This research focuses on the production of second generation biofuels that rely on non-human food sources, which are superior to first generation biofuels in that they do not take away from a food source. This project specifically focuses on the use of rice husks as a biofuel feedstock. Second generation biofuels are also relatively inexpensive. The outermost layer that is separated from the rice grains during the milling process is usually thrown away as a waste product. Rice husks are ideal as a biofuel feedstock because they are cheap if not free, and they have the power to curb greenhouse gas emissions. For this project, an ionic liquid (1-butyl-3-methylimidazolium chloride) was used for the pretreatment of the rice husks to yield glucose.

Glucose quantification methods applied include refractometry and DNS analyses.

384 Chimney Swift Project

HIINA ASAMI, BRIAN ZAPFEL

FACULTY SPONSOR: BRANDON TATE, CHEMISTRY

Chimney Swift Project is a student team promoting conservation for chimney swifts, which are a species of small insectivorous bird found throughout the eastern United States and Canada during their breeding season, May to September. In the winter months, they migrate to the Upper Amazon Basin in South American countries. In a natural setting, chimney swifts nest in hollow trees which were common in the old-growth forests prominent in the United States before European colonization. Currently, chimney swifts population is on a steep decline due primarily to human caused habitat destruction. A 3% decline has been reported each year, and overall 75% of the population has been lost since 1970. This decline is believed to be primarily related to a decrease in the number of suitable nesting sites as newer buildings are being constructed with chimneys designed to keep out wildlife. These birds are considered vulnerable by the International Union for Conservation of Nature, and conservation efforts across Eastern North America are crucial to the survival of the species. We as a team, are creating a breeding habitat through the construction of an artificial nesting tower for chimney swifts at SUNY Geneseo.

174 Developing Oxidation of Alcohols in Sand

JOHN LEPORE, STEPHANIE ALVAREZ MERLOS, THERESA LAM, KATELYNN DUX

FACULTY SPONSOR: ROBERT TORREGROSA, CHEMISTRY

EDGAR FELLOWS CAPSTONE PROJECT

We present the oxidation of alcohols into aldehydes and ketones using $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$ in sand. Several alcohols undergo oxidation using an appropriate solvent to afford aldehyde and ketones in good yields. The reactions were analyzed by TLC, ^1H and ^{13}C -NMR. The developed reaction is also compared to reactions done using silica gel.

Selected for presentation at SUNY Undergraduate Research Conference, Syracuse, NY.

347 Nano-scale Description of Dynamical Adsorption Orientation

SAKURA HAMAZAKI

FACULTY SPONSOR: KAZUSHIGE YOKOYAMA, CHEMISTRY

The energy loss of dye-embedded amyloid beta peptide 1-40 ($\text{A}\beta_{1-40}$; fluorescein-attached $\text{A}\beta_{1-40}$, $\text{FA}\beta$) was examined with various sizes of gold nano-colloidal particles. The fluorescence profile implied which segment of $\text{A}\beta_{1-40}$ was used for the adsorption. The entire dynamical profile of fluorescein was successfully explained by a relative degree of interaction between a fluorescein and the gold nano-particle surface. The $\text{FA}\beta$ was utilized to create a hydrophilic-charge interaction at the nano-scale interface of

$\text{FA}\beta$ and gold nano-particle under DMSO (dimethyl sulfoxide) environment. In this case, we hypothesize that the $\text{FA}\beta$ adsorbed over the nano-colloidal surface through the hydrophilic (N-terminal side) segments. Since the entire dynamical profile of fluorescein can be understood as a relative degree of interaction between a fluorescein and the gold nano-particle surface, observed quenching features must imply that fluorescein attached side (C-terminal) is very closely located to the nano-gold colloidal surface.

324 Synthesis of Alternative Fuels using Bimetallic Hydrogen Activation for Clean Energy

OLIVIA SCHOENFELD, JAYESH PATIL

FACULTY SPONSOR: BRANDON TATE, CHEMISTRY

Our project aims to develop catalysts for the conversion of hydrogen gas to carbon-based liquid fuels with high energy density. Our approach involves bimetallic catalysts, supported by bifunctional ligands, which have the potential to break the symmetry of the hydrogen molecule. Oxidative addition of hydrogen across a metal-metal bond is expected to produce a metal hydride complex featuring both a hydridic metal hydride and an acidic metal hydride. We anticipate metal dihydrides of this nature will be poised for the hydrogenation of a carbon source such as carbon dioxide. Here we report the synthesis and NMR characterization of key bifunctional ligand scaffolds and our plans for the preparation of metal complexes with the potential to act as catalysts for the conversion of hydrogen gas to liquid fuels.

COMMUNICATION

6 Communicating About Celiac Disease and Gluten Intolerance

SONIA BARTOLOMEO

FACULTY SPONSOR: MEREDITH HARRIGAN, COMMUNICATION

The purpose of this study is to understand the communicative, social, and relational experiences of people who have Celiac Disease or a Gluten Intolerance. We will also be studying the experiences of siblings, parents, or partners of someone with Celiac Disease or Gluten Intolerance. We are interested in symbolism, privacy management, social support, and facework.

EDUCATION

168 Multiliteracies, Multimodalities, and Social Studies Education

LAURIE TRICAMO

FACULTY SPONSOR: BRIAN MORGAN, EDUCATION

This project explores multiliteracies, multimodal education, and its use in designing social studies curriculum. Specifically, multiliteracies provides a framework for understanding and productively using multiple modes in social studies education.

Supported by a survey of literature, and an analysis of current pedagogical practices, an example of multimodal social studies curriculum will be provided.

250 Play History: Common Trends in Preservice Teachers' Play Histories

KARIANNE SANTULLO

FACULTY SPONSOR: JEANNE GALBRAITH, EDUCATION

This qualitative study investigates teacher candidates' play histories/autobiographies. The study investigates the questions, (1) What kinds of play and creative experiences do the teacher candidates share in their autobiographies? (2) How will these play and creative experiences influence their integration of play as future Early Childhood Educators? (3) What implications do these findings have for the integration of play and play experiences for Early Childhood Teacher Education? Data sources include the teacher candidates' "play history autobiographies." The data is being analyzed using qualitative thematic analysis through coding for common themes. This poster will share the initial analysis of the first question and initial interpretations of possible implications for the students as future teachers.

GEOGRAPHY

87 Environmental Change in Chimney Bluffs State Park, New York: 1953 to 2017

MICKAYLA BUISCH

FACULTY SPONSOR: STEPHEN TULOWIECKI, GEOGRAPHY

Chimney Bluffs State Park (2.42 km²) is a park in New York State bordering the south shore of Lake Ontario. The park is home to a unique geologic feature and tourist attraction, a series of 46-meter tall bluffs formed from an eroded glacial drumlin along the lake. The park is constantly undergoing environmental changes that contribute to its signature landscape. Increases in erosion from recreational use coupled with rising lake levels and increased flooding events in recent years have created an unstable environment within the park. The purpose of this research is to describe environmental change within Chimney Bluffs State Park. This study quantified three changes: land cover changes, shoreline erosion, and bluff erosion. Using ArcGIS software along with historic aerial photographs and topographic maps, the park's land cover, shoreline, and bluff boundaries were mapped and analyzed from ca. 1953 to 2017. Results suggest that while the park has reforested, erosion occurring within the park (0.61 meters per year) exceeds the average shoreline erosion rate for Lake Ontario as a whole. This research offers insight into the park's dynamic landscape, helping managers better understand environmental changes within the park.

Selected for presentation at American Association of Geographers, Denver, CO.

216 Using Rochester's Family Public Housing in the "Crescent of Poverty" as a Catalyst for a Solar Initiative ☞

CHRISTOPHER MILLER

FACULTY SPONSOR: JENNIFER ROGALSKY, GEOGRAPHY

Both the climate crisis and poverty rates in US cities have increased rapidly, with few solutions. This research examines the relative solar potential in public housing developments in Rochester, NY, specifically in the area of concentrated poverty called the "Crescent of Poverty." Also examined are societal benefits that an inclusive solar/sustainability movement provides for Rochester. Rochester is a mid-sized, diversely populated city with an overall poverty rate >30% and a childhood poverty rate >50% (Murphy, 2018). These alarming rates have contributed to the creation of the "Crescent of Poverty", where the majority of family public housing developments are located. Solar potential is analyzed with ArcGIS Pro, and is then overlaid with family public housing developments to show those that exhibit the highest potential for solar energy. Qualitative data required to understand societal benefits were obtained through literature and interviews with community development officials. Results suggest that many of the areas where solar potential is at its peak are also sites of family public housing. Qualitative results reveal that through implementation of inclusive programs that involve "sweat equity", populations normally unable to afford solar panels, may actively participate in and benefit from the solar initiative, while also increasing Rochester's sustainability.

40 Urban Food Swamps: Analysis of Urban Food Swamps, Their Consequences, and a Consideration of Mitigation Strategies Within Rochester, NY ☞

ELIZABETH OSBORN

FACULTY SPONSOR: JENNIFER ROGALSKY, GEOGRAPHY

A "food swamp" is an area with a high density of establishments selling high-calorie fast and junk food options, relative to a disproportionately low number of grocery stores and other healthier options (Reel & Badger, 2014; Cooksey-Stowers et al., 2017). Limited access to healthy foods, accompanied by overexposure to unhealthy options, breeds diet-related health issues for disadvantaged populations in low-income central city areas, characterized by an influx of corner stores and fast food establishments filling the void of grocery stores and other healthy-food options. This research examines the phenomenon of food swamps and their consequences for urban populations and offers a consideration of mitigation strategies. I explore a case study of the characteristics of urban food swamps in Rochester, NY through interviews, site visits to relevant community development organizations, textual analysis and interpretation, and GIS analysis. Most importantly, this research provides examples of

avenues to address the problem at various scales. There are currently some mitigation efforts in Rochester, but more action is needed. This research recognizes that health and wellness disparities often stem from deeper-rooted issues of poverty and segregation, and that addressing these broader issues with policy initiatives and zoning modifications are key to long-term food swamp mitigation.

Selected for presentation at American Association of Geographers Annual Meeting, Denver, CO.

225 Linguistic Diversity of Islam: The Case of Airbnb

EMMA HALLIDAY

FACULTY SPONSOR: DARRELL NORRIS, GEOGRAPHY

The Islamic world is often thought of as a homogenous grouping of countries having a Muslim population, yet as seen throughout almost every aspect of analysis, it is incredibly diverse. In the interest of examining these differences more closely, this research focuses the on varied linguistic makeup across the Islamic World. Data was collected on the reported linguistic abilities of Airbnb hosts for the 300 most expensive rentals in twenty Islamic cities. The typology of this study categorizes cities in an effort to compare the linguistic competence of cities of similar size, wealth, and magnitude of international traffic. Data was gathered on prominent international languages likely to be spoken among the business and tourism visitors to these areas, offering insight into the Muslim World's "multilingual" cities. Major standouts of this study were the cities Ajman and Dubai which consistently defy both regional and categorical trends and display exceptionally high rates of linguistic presence across the board. Ironically, Arabic in both Emirate cities is abnormally low compared to Saudi Arabia and North Africa, leading to questions of exactly who is renting out these properties.

228 Biden's Bounce: The African American Vote and Biden's South Carolina Comeback

RACHEL MORRIS

FACULTY SPONSOR: DARRELL NORRIS, GEOGRAPHY

On February 29, 2020, registered Democrats across South Carolina came out to vote for their preferred primary candidate. At the time of this primary, former Vice President Joe Biden needed a win to show that he was still a contender in the race. As the poles closed that night, it was clear that South Carolina was going to give Biden the win and this momentum eventually propelled his campaign to a bigger win on Super Tuesday. South Carolina is an important primary state with 63 delegates available, and it can make or break a candidate's chance of securing the nomination. It is important to win over one of the most important groups in the Democratic party in South Carolina, which are the African American voters. African Americans make up 27% of the state's population and with a majority of African Americans being registered democrats, getting their votes can mean the difference between winning and losing. African American voters in

South Carolina are an important part of the primary process and looking at where they live and how they voted in the election is an important part of analyzing Joe Biden's big win.

GEOLOGICAL SCIENCES

244 Thermal Demagnetization: Implications for the Emplacement of Maiden Creek Sill, Henry Mountains, Utah

JOHN ENRIGHT

FACULTY SPONSOR: AMY SHELDON,
GEOLOGICAL SCIENCES

The Maiden Creek Sill in the Henry Mountains, Utah, has been a site for the study of remanent magnetization. The analysis of remanent magnetization gives insight into a material's position of the geomagnetic north pole on the Earth at the time of its formation. Previous works used alternating field demagnetization (AFD) methods and were unsuccessful for completely demagnetizing remanent magnetization. Thermal demagnetization (TRD) is a technique used to break down components of thermal magnetization. This method is used in combination with the Principle Component Analysis (PCA) to obtain the high-temperature component of magnetization. This vector component indicates the mean position of the material at the age of its formation. This experiment used the Model TSD-1 Thermal Specimen Demagnetizer, JR-6A Spinner Magnetometer, in combination with Microsoft Excel to obtain vector component diagrams and the position at formation. This method suggests that it is a viable method for measuring the full remanent magnetization of rocks. This conclusion comes from the fact that thermal demagnetization almost destroys the entire magnetic signature at high enough temperatures. This suggests that thermal demagnetization is an effective method for extracting paleomagnetic information from this portion of the Maiden Creek Sill.

176 Comparison of Using a Schmidt Hammer to Evaluate Strength of Rock to Conventional Methods

AUSTIN FELDMAN, JOSEPH SAVOIE

FACULTY SPONSOR: SCOTT GIORGIS,
GEOLOGICAL SCIENCES

A Schmidt hammer is a device designed to test the strength of concrete, mainly hardness. More recently, the hammer has been used to measure rock strength. We seek to test the hypothesis that rebound readings from the hammer should correlate with other conventional measures of rock strength, specifically fracture density. We compared readings from the hammer to fracture densities at different packages in the outcrop located at Seth Green Drive in Rochester, NY. A best fit line was applied to a graph of the fracture density versus rebound reading. The R^2 value of the best fit line was .076, which indicates that no correlation exists between the readings from the Schmidt hammer and the fracture density of the rock. We concluded that the Schmidt hammer is

not an effective means of measuring strength of local sedimentary strata. One potential limitation of our experiment was the lack of access to outcrops of a wide variety of rock types and compositions. Another possible limitation was the large range of values measured at each package. Both issues are interesting avenues for potential future research.

136 Predation on Microbivalves by Juvenile Naticid Gastropods on San Salvador Island, The Bahamas

MADDIE TETREAU, ELIZA MERGES

FACULTY SPONSOR: D JEFF OVER, GEOLOGICAL SCIENCES

Predator-prey interactions, where snails eat clams, evolutionarily has been a key interaction within marine molluscan communities. There is evidence of molluscan extinctions in the fossil record that are marked by changes in predation ratios. In this study, we will investigate predation of microbivalves by juvenile naticid gastropods in a shallow marine setting on San Salvador Island in the Bahamas. We propose to test predation density within different environments (facies) of a lagoonal setting. Significantly different ratios between these facies in one time period can indicate that predator-prey interactions can change over time from one environment to another. It is more efficient to test this with juvenile microbivalves, due to a greater abundance and less bias in preservation in microfauna than macrofauna. Our null hypothesis is that there will be no significant variation in predation densities between the different facies. When comparing our data to other time periods, we could determine the presence of a molluscan extinction event.

226 Analysis of Soil at a Flooding Site in Avon, NY

KATIE MEERDINK, MADELINE WALDOCK

FACULTY SPONSOR: AMY SHELDON,
GEOLOGICAL SCIENCES

A residential area in East Avon frequently floods in response to rainfall or snowmelt events, and the water remains pooled in place long afterwards. This study seeks to determine the cause of the flooding. Soil samples were collected from several locations at the site and analyzed to determine the array of grain sizes present. It was determined that approximately 47% of the sediment at the site is smaller than 63 microns, which is the threshold for silts and clays (mud), meaning that approximately 53% of the sediment is sand sized or larger. The large amount of smaller grain sizes, combined with poor sorting within the soil, result in small pore spaces and a lack of connectivity between the pores. This makes it difficult for the soil to drain water, and hence, ponding occurs.

253 The Impact of Physical and Chemical Weathering on Iron Slag from Standish, NY

MARIA LEONARD

FACULTY SPONSOR: DORI FARTHING,
GEOLOGICAL SCIENCES

From 1883 to 1907, magnetite ore was smelted in Standish, NY. During this time, a large amount of slag, a byproduct of smelting, was created. The slag is now in a pile that covers ~13 acres in the northeastern region of the Adirondacks. The impact of weathering is evident through a comparison of samples collected ~15 years ago to partner samples still out in the field, which are more fractured and have calcitic weathering rinds. For more quantitative data, we carried out a field experiment and a leaching test. In the field experiment we exposed different slag samples (glassy, chalky, and massive) to rain and monitored the changes in mass over an 8 week period. All samples lost mass, however the greatest loss came from the glassy sample (1.3% lost). We carried out a simple acid leaching test using 2M nitric acid on four samples. Bulk chemistry of pre and post test samples was determined by XRF. The chemistry of slag from Standish is dominated by SiO_2 , CaO , and $\text{Fe}_2\text{O}_3(t)$. A highly vesicular slag showed the largest changes and all the other samples lost mass and showed changes in major elements as well as in Ba, Sr, and Zr.

Selected for presentation at Geological Society of America, Phoenix, AZ.

364 The Thermal vs. Alternating Field Demagnetization of Samples from the Pine Valley Mountain Laccolith, Utah

EMILY POLIZZI

FACULTY SPONSOR: SCOTT GIORGIS,
GEOLOGICAL SCIENCES

Previous demagnetization experiments performed on samples collected from the Pine Valley Mountain Laccolith in Utah were inconclusive as a result of the high coercivity of their magnetic mineralogy. The purpose of this experiment was to determine if thermal remnant demagnetization (TRD) would be a more effective method of treatment for the samples than the alternating field demagnetization (AFD) previously used. Using cores that had the weakest response to the AFD allowed us to see exactly how much of an effect the TRD had. The hope was that the TRD treatment would allow us to overcome the maximum blocking temperature of the magnetic minerals that the AFD treatment could not. The experiment was successful in that 80% of the selected cores showed graphical results demonstrating the samples decaying completely to the origin.

464 Introductory Instructional Movies for GSCI 131- History of Life

ARIELA MINKOVSKY

FACULTY SPONSOR: D OVER, GEOLOGICAL SCIENCES

The purpose of this project is to create supplementary pre-lab videos and quizzes for GSCI 131: History of Life. These supplements will assist students in understanding the abstract scientific concepts and procedures used, prior to implementing them in the laboratory setting. After this project is completed, students enrolled in GSCI 131 will watch instructional videos and take a five-question quiz on canvas prior to each

lab period. Each pre-lab video states the goal of the lab, shows example specimens, demonstrates the techniques used, and addresses common errors made in the lab. The end goal of this project is to promote student learning and improve average GSCI 131 grades.

411 Analysis of Hillslope Stability, Harriman, Tennessee

WALTER HENNINGS, ANTHONY WAGMAN
FACULTY SPONSOR: NICHOLAS WARNER,
GEOLOGICAL SCIENCES

We seek to conduct a hillslope safety analysis of a hill located in Roane County, Tennessee, composed of the Gilpin-Petros soils. This unit is composed primarily of residuum from sandstone, siltstone, and shale. The stability of the hill was assessed using a one-dimensional infinite slope-stability model. This model was used to calculate the factor of safety under both dry and wet conditions based on a set of assumptions derived from soil lithology and hydrologic parameters. Simulations in ArcGIS show that under dry conditions, the slope is unconditionally stable at all locations. Under conditions of sufficiently heavy rainfall (>9 inches of rainfall in a 24 hour period), results indicate that the slope becomes unstable at the top and could result in slope failure.

387 Conodont Analysis of the Williamson Formation, Silurian, Tryon Park, New York State

MIRANDA FELONG, YASONA LIKA
FACULTY SPONSOR: D JEFF OVER, GEOLOGICAL
SCIENCES

The Williamson Formation exposed along Palmer Glen in Tryon Park in western New York State is a grey-black shale consisting of flat, sheeted layers, interbedded with thin beds of laminated, fine-grained limestone. It lies unconformably over the Sodus Formation, marked by a conglomerate phosphate bed, also known as the 'Second Creek Bed' (Lin and Brett, 1988). Within the lower Williamson Formation *Stimulograptus clintonensis* (graptolite) and *Pterospathodus amorphognathoides* (conodont), indicate deposition during either the middle or late Telychian in an offshore marine environment. We collected conodonts, the teeth of an extinct eel-like creature that existed during the Cambrian to late Triassic period, from the basal phosphate bed and a phosphate-rich limestone bed 0.8 m higher in the section. Taxa include *Distomodus*, *Panderodus*, and *Pterospathodus*. Identification of the fragmented specimens did not allow biostratigraphic refinement. The conodont color indicated burial temperatures of approximately 60°C–140°C.

366 Mineralogical Analysis of Iron Slag from Standish, NY

RACHEL KELK
FACULTY SPONSOR: AMY SHELDON,
GEOLOGICAL SCIENCES

In the mid 1800's and into the early 1900's, Standish, NY was the site of a blast furnace, which extracted iron from the local Adirondack ores. Over the course of In the mid 1800s and into

the early 1900s, Standish, NY was the site of a blast furnace, which extracted iron from the local Adirondack ores. Over the course of 100 years of industrial activity, this forge left behind a large 60 ft tall pile of slag, a byproduct of the smelting processes. This research aimed to better understand the variety of phases present at the site as well as products associated with weathering. Though there are a variety of slag types found in the Standish slag pile, all are chemically dominated by CaO and SiO₂. Powder X-ray diffraction (XRD) of numerous samples from Standish indicate that there is phase homogeneity throughout the site and that materials like glass, gehlenite, pseudowollastonite, and quartz dominate the unweathered material. In some highly eroded and fissile slag samples, calcite is an additional phase. Many samples at the site are coated with a layer of white powder that is composed of a mixture of Ca-rich phases. XRD analyses of slag samples exposed to laboratory leaching experiments with nitric acid indicate that calcite is the dominant phase lost in multiple samples. Overall, the breakdown of the Ca-silicates dominates the weathered products at the site.

277 Determining the Rate of Laccolith Emplacement Using Thermal Demagnetization, Pine Valley Mountains, Utah

CHANDLER PERRINO
FACULTY SPONSOR: SCOTT GIORGIS,
GEOLOGICAL SCIENCES

In southwestern Utah, 43 rock samples have been drilled out of the Pine Valley Mountains Laccolith, a mass of igneous rock that has been intruded between rock strata causing uplift in the shape of a dome. The goal of this project is to determine the rate which magma intruded to form the laccolith. Due to the presence of a massive landslide in this location, it is likely that the laccolith inflated instantaneously. Therefore, the magnetic signature present in these samples should be similar to the location of the magnetic north pole at the time the laccolith was emplaced. A thermal remnant magnetization (TRM) is recorded when magma cools below the Curie temperature in the presence of a magnetic field. The TRM is measured by putting the samples through the AGICO JR6A Spinner Magnetometer and thermal demagnetization oven. The temperature at which these samples lost their magnetization ranged from 625- 700°C. The location of the magnetic north pole suggested by the measured thermal remnant magnetization matched the predicted location of the north pole at the time the laccolith was emplaced. These results are consistent with rapid laccolith growth.

331 Evaluating Anthropogenic Impacts on Lacustrine Health: Assessing Mollusk Skeletal Degradation in Conesus Lake, Livingston County, NY

QUINN DIPZINSKI, ALEC BADER
FACULTY SPONSOR: JACALYN WITTMER
MALINOWSKI, GEOLOGICAL SCIENCES

Lacustrine environments are highly sensitive to anthropogenic activities. Shells can be disarticulated, fragmented, abraded, corroded, eroded, or encrusted by other organisms after death. Bivalve and gastropod shells were used as indicators for ecosystem health, correlating shell degradation and anthropogenic activity to draw conclusions regarding the impact of human activity on the lake's ecosystem. The hypothesis for this study states gastropod shells in more pristine areas of Conesus Lake are expected to be less degraded than in polluted or environmentally stressed regions of the lake. The northern section is recreationally used, and is thought to be more anthropogenically active, whereas the south area is a marsh containing a fishing inlet. Samples were collected from the lake during the summer of 2018. Shells were analyzed using a stereomicroscope and scored (0, 1, 2, etc.) based on taphonomic damage categories from Rothfus (2004), and categorized as pristine (showing very little degradation) and damaged (fragmented, loss of color, chipped edges, etc.). Comparisons were made between the number of pristine and damaged samples from each location, including live assemblages. This study will support efforts to protect the Conesus Lake ecosystem and other lacustrine environments around New York state.

329 Analysis of Contaminants in Conesus Lake, New York Using Sediments and Live-Dead Communities

GRACE BUECHNER
FACULTY SPONSOR: JACALYN WITTMER
MALINOWSKI, GEOLOGICAL SCIENCES

Lacustrine environments are closed systems that are sensitive to natural and anthropogenic changes. Conesus lake, a finger lake in western New York, is a lacustrine system that has had a long history of anthropogenic interactions with the lake. This investigation compares the northern and southern regions of Conesus lake to determine anthropogenic influence of the ecosystem by examining the live-dead biodiversity of macroinvertebrates. The working hypothesis is that the live-dead community of macroinvertebrates in the southern portion of the lake represent a more 'natural' ecosystem, while the macroinvertebrate community in the northern region depict a more anthropogenically influenced ecosystem. Multiple surface samples were collected from the south and north regions of Conesus lake along a 40-meter transect that is perpendicular from the shore. Live-dead skeletal communities and soft-bodied macroinvertebrates were separated and identified to the lowest taxonomic level. Biodiversity analyses were used to compare the live-dead fidelity of communities by assessing diversity and abundance. It is expected that the southern region of the lake will have a higher agreement between the live and dead population and greater biodiversity compared to the northern region.

307 *Tentaculites minutus* in the Lower Clinton Group

NOAH ZAFFINO

FACULTY SPONSOR: D JEFF OVER, GEOLOGICAL SCIENCES

Tentaculites minutus Hall 1847 are small, 3.0-8.0 mm long, ringed conchs of an enigmatic extinct organism from the Lower Silurian that are common in the Lower Clinton Group. The type specimen was described as being from the Sodus Shale in Rochester, New York, but the actual fossil is labeled as coming from Clinton, New York. The location in Clinton was not specified by Hall or on the type specimen from the American Museum of Natural History. The purpose of this study is to find the likely type locality in Clinton, based on the lithology and preservation of the type specimen through survey of the literature and assessment of Clinton Group exposures in and near Clinton, New York. This study will also illustrate the type specimens and other specimens from Clinton and Rochester.

286 Detecting Human Impacts on Live-dead Macroinvertebrate Communities in Honeoye Lake, New York

LAUREN KAEHLER

FACULTY SPONSOR: JACALYN WITTMER MALINOWSKI, GEOLOGICAL SCIENCES

Lake ecosystems can be particularly susceptible to human impacts that leave a record of environmental change within the living and dead community. The ecosystem of Honeoye Lake, a finger lake in Ontario County, New York, can be assessed by comparing the macroinvertebrate death assemblages to the living community. Honeoye Lake is heavily influenced by human activity: housing developments, a southern public boat launch, and a northern man-made beach. We predict that the northern region will have a poor live-dead agreement influenced by beach renourishment and high housing density. Surface samples were collected from the north and south along a 40-meter transect from shore. Water quality measurements were collected from each sampling location. Live organisms were identified, counted, sediment samples were dried and hand sieved. Whole and fragmented skeletal remains of macroinvertebrates were collected, counted and identified to the species level. Quantitative analysis of live-dead species will assess the agreement between live and dead communities. The expected results will demonstrate a greater abundance and diversity of live and dead macroinvertebrates in the south compared to the north. If there is a significant anthropogenic influence on the lake community, we will see a negative relationship between the living and dead community.

279 Magnetic Susceptibility of Kettle Point Formation, Ontario, Canada

ABIGALE O'CONNOR

FACULTY SPONSOR: D JEFF OVER, GEOLOGICAL SCIENCES

The Kettle Point Formation is an Upper Devonian black shale that preserves the Frasnian-Famennian boundary, which marks the most extreme of the three extinction events that comprise the Late Devonian mass extinction. The purpose of this study is to determine a high resolution location of the boundary within the Gore of Chatham core from Ontario, Canada. This determination will improve the understanding of the environmental conditions leading up to the Kellwasser event of the Late Devonian mass extinction. The specific location of the boundary will also improve the ability to correlate this rock unit to others that were deposited during the same time period in different locations. Small sections of the core were analyzed for bulk-mass magnetic susceptibility in average increments of 0.05 meters using a AGICO MFK 1-A Multi-Function Kappa bridge. The δMS data were then plotted and a spectral analysis was conducted to isolate individual cyclic trends within the core. The Frasnian-Famennian boundary was determined to be located at a depth of 134.59 meters in the core. The boundary is observed to have taken place during a magnetic susceptibility increase, and therefore indicates a sea level fall.

HISTORY

201 American Influence on Japanese Birth Control

KATHERINE COLLINS, KASSIDY SCHAD, KATIE DE ONIS, RACHEL BROOKS

FACULTY SPONSOR: CATHERINE ADAMS, HISTORY

The birth control pill was legalized in the United States in 1965, and 34 years later, in 1999, the birth control pill was legalized in Japan. For decades, Japan clung to pronatalist ideas for moral and economic reasons; preventing births and abortions were not socially acceptable actions. Furthermore, a decreased birth rate was considered an economic threat, as a smaller workforce would seemingly result in decreased productivity. Despite the negative preconceptions about the effects of birth control being long-held in Japanese society, activists, such as Margaret Sanger and Shidzue Ishimoto, disputed them by opposing the government's censorship policies. Activists sought to educate people about how valuable birth control and family planning could be; it can allow women to gain more independence, women to preserve their health, families to prevent economically burdensome births, etc. We will present an overview of the world wide Birth Control Movement, with a specific focus on American influence on the Japanese Birth Control Movement with our poster. The Birth Control Movement in Japan will be our primary focus, as the nation took particularly long to accept birth control.

98 The Misrepresentation of Native American Women in the Media and Their Social Activism Against Violence and Mistreatment

EMMA MEEKS, ALLISON PAJDA, BRIDGET MARSHALL

FACULTY SPONSOR: CATHERINE ADAMS, HISTORY

This poster takes a look at the myths and stereotypes surrounding Native American women in media and throughout history. We examined the work that Native American women have done in social movements such as #TakingBackTigerLilly and Not Your Mascot, that are working towards dispelling the stereotypes and false impressions surrounding them. This poster also examines the violence that native women are exposed to and their social activism through movements. These movements are meant to show people the truth about the violent acts that affect native women and their communities.

232 LGBTQ+ Women in the 1970s United States

JOHN TRUTT, YESLANDI URENA, EILEEN TORRES, CHRISTINA FABER

FACULTY SPONSOR: CATHERINE ADAMS, HISTORY

We will look at the roles and actions of LGBTQ+ women throughout the decade on equal rights and equality for the community. We will take a look at the lesbian publication "The Ladder," poems and stories written by women at the time, and other primary documents that brings us into the shoes of these women and their desire for change in the 1970s. Members and allies of this community can benefit from learning about the experiences and history of LGBTQ+ visibility by women, as they had a profound impact on the growth of queer acceptability throughout the country's history.

100 Diversity in Labor Unions

GEORGE MACKO, JONELL MALDONADO, CHRISTIAN FRENCH, SHANNON NORTON

FACULTY SPONSOR: CATHERINE ADAMS, HISTORY

The poster will discuss the activism of women in minorities during the Labor Movement in the 19th and 20th centuries. It will cover specific issues pertaining to African, Chinese, and Jewish American women: what problems affected them, what changes they wanted made, and how they worked to get those changes through their labor unions and social activism. These issues include daycare for Chinese working mothers, improved wages and working conditions for immigrant workers, and the representation of African Americans and other racial groups within larger labor unions. These issues are supported by documents including newspaper clippings, photos of parades and protests, and personal letters between labor activists.

103 Reproductive Health of Migrant Women

ERIN BUTLER, BROOKE THOMPSON, KYANNA WIGGINS

FACULTY SPONSOR: CATHERINE ADAMS, HISTORY

Given the current political situation in the United States, the study of migrant women has become more relevant than ever. We have researched the

complications and obstacles migrant women face in terms of their reproductive health in the US since World War II. They have frequently faced obstacles such as limited access to health care, unjust sexual exploitation, limited medical supplies and services, female genital mutilation, lack of education, and unwanted pregnancies. We will be comparing data from this demographic of women to similar demographics in other progressive states around the globe. In addition, the use of primary sources allows for a thorough analysis from different perspectives within the US regarding this issue.

LANGUAGES AND LITERATURES

138 Clean Energy & Transportation in China ☞

ELLA NIELSEN, LINDA LIN, SCOTT HAWLEY
FACULTY SPONSOR: JASMINE TANG,
LANGUAGES AND LITERATURES

In our presentation, we are going to analyze China's energy and transportation policies. We are interested in how China will develop its transit policy with the growth of the population and the addition of several new urban cities. The way these cities are planned will not only have an impact on China but on the rest of the world. We will focus on the emergence of green technology and how China is exporting its technology globally.

Selected for presentation at Undergraduate Research Conference, Syracuse, NY.

MATHEMATICS

358 Hybridization of Particle Swarm Optimization and Pattern Search Algorithms With Application

ERIC KOESSLER

FACULTY SPONSOR: AHMAD ALMOMANI,
MATHEMATICS

We test three methods of hybridizing particle swarm optimization (PSO) and pattern search (PS) to improve the global minima, speed, and robustness. All methods let PSO run first followed by PS. The first method lets PSO use a large number of particles for a limited number of iterations. The second method lets PSO run normally until tolerance is reached. The third method lets PSO run normally until the average particle distance from the global best location is within a threshold. Numerical results using non-differentiable test functions reveal that all three methods improve the global minima and robustness versus PSO, while the third method also improves speed versus PSO. The third hybrid method was also applied to a basin network optimization problem and outperformed PSO with filter method and genetic algorithm (GA) with implicit filtering.

MILNE LIBRARY

270 The Importance of Undergraduate Research Publications in Geneseo and Beyond

NICOLE CALLAHAN, JAIME DEVITA

FACULTY SPONSOR: JONATHAN GRUNERT,
MILNE LIBRARY

Having a publication on campus devoted to undergraduate research provides something invaluable for both students and a college community at large. At Geneseo, The Proceedings of GREAT Day is such a journal. The Proceedings publishes the works of student presenters at last year's GREAT Day, those which best demonstrate the rigor and excellence of undergraduate research at Geneseo. This presentation argues for research publications at the undergraduate level and for the academic and professional benefits they provide. We look specifically at how publishing such works Open Access presents a new and exciting dimension to the process. Now in its eleventh year, The Proceedings of GREAT Day continues to publish creative and scholarly student work presented at GREAT Day. It serves as a primary example of how research journals can be accessible and help record and develop further the intellectual and creative works on campus.

NEUROSCIENCE

117 The Effects of Comorbid Alcohol and Cocaine Use on a Cognitive Maze Task

SHREYYA MALIK, YUME IRIYAMA, LAURA BAUER

FACULTY SPONSOR: ALLISON BECHARD,
NEUROSCIENCE

In U.S., 1 out of 4 adults reported binge drinking in the past month, a prevalence that increases to over 50% in college populations. Binge drinking is a common precursor for alcohol use disorder, and risk of polydrug use also increases. Cocaine is frequently used in combination with alcohol. Little is known about the history of binge drinking and comorbid cocaine influence on memory. We developed a mouse model of alcohol and cocaine co-use to investigate how comorbidity influences performance on a working memory task. We ran two groups of mice that differed in their history of alcohol use. Group 1 consisted of C57BL6/J male mice that were allowed to drink for 4 weeks (2hrs/day, 4x/week) and then were tested on the Barnes Maze (working memory task). After 1 more week of drinking, mice were again assessed for working memory following an injection of cocaine (20mg/kg, I.P.). Group 2 consisted of C57BL6/J male mice that did not drink alcohol and were assessed in the working memory task. After 1 week, they were retested in the task following an injection of cocaine. Comparisons were made across groups for differences in cognitive abilities following cocaine use that result from the co-use of alcohol.

Selected for presentation at Western New York Undergraduate Psychology Conference, Buffalo, NY.

130 Reducing Stereotypic Behavior with a Ketogenic Diet

ANNA BELTRAMINI, ALICIA BAUERS, JOSEPH SPANO, ANDREW GUIDO

FACULTY SPONSOR: ALLISON BECHARD,
NEUROSCIENCE

Now a popular fad diet, the ketogenic diet (KD) is a high-fat, low-carb diet that for decades has been used for treatment of intractable epilepsy. Recent therapeutic applications of KD in animal models include treatment of dementia, obsessive-compulsive disorder, and autism. These disorders are associated with stereotypic behaviors (repetitive, invariant behaviors with no apparent function) that are life-impairing and stigmatizing. However, little is known about their underlying mechanisms and no effective pharmacological treatments are available. Here, we present a novel application of KD to reduce stereotypic behavior in an inbred strain of mice (FVBN/J) that displays a prominent repetitive circling behavior. In Experiment 1, we reduced overall stereotypic behavior in aged (18 months) mice with 3-week administration of KD. In Experiment 2, adult (6-8 months) females were paired such that a "spinner" mouse and a non-spinning control mouse were housed together (N=14 cages). Using an ABAB design, we compared stereotypic behavior between assessment periods on normal food diet and on KD. These data show an interaction between time and diet on stereotypic behavior. Following Golgi-Cox histochemistry, the density of dendritic spines in the dorsal and ventral striatum were investigated as one potential neurobiological mechanism for these effects.

Selected for presentation at SUNY Undergraduate Research Conference, Syracuse, NY.

118 Environmental Enrichment as a Treatment for Cocaine Relapse

SHREYYA MALIK, YUME IRIYAMA, LAURA BAUER

FACULTY SPONSOR: ALLISON BECHARD,
NEUROSCIENCE

Cocaine addiction is a problem for millions of people, however we are still lacking an effective treatment. It is characterized by compulsive behaviour which marks difficulties in remaining abstinent, with a high risk of relapse. Here, I focus on the interaction between the post-drug environment and drug-seeking by testing one potential environmental treatment, an enriched environment (EE), to reduce risk of cocaine relapse. This study proposes to investigate neural circuits involved in environmental protection of context-induced relapse. Mice exposed to cocaine will be assessed for preference of a cocaine-associated context using the conditioned place preference (CPP) paradigm. Mice will then be housed in either standard or EE cages for 2 weeks of withdrawal, before being returned to the CPP chamber for a test of context-induced relapse. I hypothesize that EE will reduce cocaine relapse, an outcome

associated with the changes in activation in brain regions related to reward and addiction.

PHYSICS & ASTRONOMY

105 Micro Survival Structure (MiSSt): Housing Innovations for Disaster Relief

CATHERINE FEDOR, JACK AGNES, PEYTON RAVE
FACULTY SPONSOR: STEPHEN PADALINO,
PHYSICS & ASTRONOMY

The intensity of natural disasters has increased in recent years due to the effects of climate change. Given the number of people who lose their homes after these disasters, new methods of quickly erecting temporary housing are needed to help NGOs mitigate their loss. The basic necessities of water, food, and heating, as well as electricity for communication and lighting must be restored. In some past disasters, it has taken months to establish adequate housing. In order to quickly alleviate these problems, we have constructed a Micro Survival Structure (MiSSt). This has been designed as a lightweight, insulated, two person structure that can be rapidly deployed by ground or air. A passive solar thermal heating system keeps the structure warm, while a photovoltaic solar panel provides electricity by charging a battery for use during the day or at night. This battery can charge phones and power LED lights, while solar thermal energy is stored in heat sinks for use in the absence of solar heating. Rainwater collection produces a safe water source while wells are compromised by flooding. Several scale model prototypes have been constructed, tested, and will be on display during GREAT Day.

293 MOLY - Monitoring Oxygen Levels in nTOF Scintillators Using Cosmic Ray Muons

SEAN KING

FACULTY SPONSOR: STEPHEN PADALINO,
PHYSICS & ASTRONOMY

HEDP and ICF facilities employ nTOF methods to measure neutron energies. Laser induced fusion facilities use the beam pulse as a start signal and Xylene scintillators as the stop signal to obtain the time of flight. To improve timing performance, the scintillator liquid is quenched with oxygen, reducing the light production. However, oxygen reacts with the scintillator liquid, causing the detector photo flash decay time to increase, reducing the energy resolution of the detector. An in-situ monitoring system which uses cosmic ray muons to determine the oxygen concentration, is being developed at SUNY Geneseo. The method uses a stack of one EJ200 plastic scintillator with the oxygenated xylene detector below it. As cosmic ray muons pass through the stacked detectors, a coincidence signal is produced by the electronics indicating an event has occurred within a few nanoseconds, confirming a muon passed through the stack. The signal fit-parameters of the xylene are good indicators of the oxygen concentration. Over the summer of 2019, a proof of concept was deemed successful in measuring

a difference in oxygen levels. Throughout the 2019-2020 school year, a larger detector has been built to amplify the count rate and expedite data acquisition.

396 Radioactive Decay Measurements of ^{41}Ar for SLIC

EMILY VANDERBILT, NICOLE GINDLING
FACULTY SPONSOR: STEPHEN PADALINO,
PHYSICS & ASTRONOMY

The short-lived isotope-counting system (SLIC) being built for the OMEGA laser facility at LLE requires gaseous radioisotopes for calibration purposes. Using a Plutonium-Beryllium (Pu-Be) source at SUNY Geneseo, ^{41}Ar was made by capturing thermal neutrons via the $^{40}\text{Ar}(n,\gamma)$ reaction. Once activated, ^{41}Ar beta decays, producing an electron with endpoint energy of 1.198 MeV. The daughter product is found to be the second excited state of ^{41}K 99.1% of the time. This decays to the ground state and emits a 1.293 MeV gamma ray. To accurately measure the beta activity of ^{41}Ar , the Gamma-X system at Geneseo, is used as a high precision counting station. Gamma-X is composed of 3 orthogonal pairs of Thallium doped NaI detectors surrounding a central cubic counting region with sides of 8 cm. Each of the six detectors is shielded in 11.5 cm of lead and clad in aluminum to reduce background radiation. The calibration was performed by integrating the counts in the 1.293 MeV gamma peak. Measuring the decay curve of the peak counts confirms the origin of the peak. The radioactive ^{41}Ar gas will then be used as an electron calibration source for the SLIC system used in ICF and HEDP nuclear reaction studies.

Selected for presentation at Division of Plasma Physics, Fort Lauderdale, FL.

389 Plasma Demonstration Chamber

VIZMA LEIMANIS, LUIS YANEZ ZAMORA

FACULTY SPONSOR: JAMES MCLEAN, PHYSICS & ASTRONOMY

Repairs and improvements were made to a vacuum chamber so that it can be used as a scientific demonstration at the Rochester Museum & Science Center. The chamber demonstrates Paschen's Law by creating a direct current plasma between pairs of stainless steel plates. Paschen's Law determines the minimum breakdown voltage necessary to start a discharge between two electrodes as a function of gas pressure and gap length. Specifically, there is an optimum product of pressure and gap length for which the required voltage is smallest, roughly 500 V. Three pairs of plates, having different gap lengths, will allow us to demonstrate how plasma can form only with the right conditions. Much time and effort has gone into figuring out how to properly assemble the chamber. In addition to calculations to find the desired plate separations, assembling the demonstration is the primary effort of this project. A vacuum pump connects through an aluminum table to evacuate a glass bell jar to 1/10000 of atmospheric pressure, monitored with a thermocouple gauge. A high-voltage power supply to an electrical feed-through energizes

the plates. We hope to upgrade the system to allow control of the residual gas to single pure elements.

234 Spherical Radiation as a Model for Gravitational Waves

NAMI NISHIMURA

FACULTY SPONSOR: THOMAS OSBURN,
PHYSICS & ASTRONOMY

In order to obtain a theoretical model of gravitational waves from astronomical sources, we seek to solve the wave equation in spherical coordinates. First, we use separation of variables to simplify the partial differential equation and through that process, spherical harmonics describe angular dependence of the wave function. Next, we use an expansion to express the dependence of the wave function on radius. As a result, the wave is represented as a periodic function that propagates towards large distance. This model is analogous to how gravitational waves travel towards the earth.

297 Modeling Optical Extinction Spectra of Polystyrene Beads in Water

JUSTIN D'SOUZA

FACULTY SPONSOR: GEORGE MARCUS, PHYSICS & ASTRONOMY

To model the global climate, it is critical to understand how light interacts with particles in the atmosphere. Extinction spectra have been measured and simulated for a model system consisting of polystyrene beads in water. These beads have sizes comparable to atmospheric aerosols and can be dyed to mimic the properties of soot. Once the simulation is validated by comparing optimized simulation parameters to nominal particle properties, it can be used to study soot aerosols. We show that our simulation program can return reasonable values for the size and optical properties of this model system.

240 Target Characterization Using Rutherford Backscattering

Spectroscopy

MATT KLEIN, JOVAHN ROUMELL, ANTHONY COOPER

FACULTY SPONSOR: CHARLES FREEMAN,
PHYSICS & ASTRONOMY

Rutherford backscattering spectroscopy (RBS) is a non-destructive, ion-beam analytical technique that is used to determine properties of a target such as thickness, areal density, and elemental composition. This scattering is the result of Coulomb forces between the target atoms and the incident particle. The energy spectrum of the scattered ions depends on the atomic number of the target atoms as well as the target thickness.

285 Modifications of Cosmic Watch Muon Detectors for Deployment at Letchworth State Park

KEVIN SEITZ

FACULTY SPONSOR: KURTIS FLETCHER,
GEORGE MARCUS, PHYSICS & ASTRONOMY

For an American Physical Society funded physics outreach project, fifteen Cosmic Watch cosmic ray muon detectors, designed at MIT, are being assembled by students at Geneseo. Over the summer of 2020, ten detectors will be deployed around Letchworth State Park to educate park visitors about cosmic rays. The muon detection rate and cumulative count are displayed on a small OLED screen, with an LED flashing every time a muon passes through the detector's scintillator. Each incidence is also logged to a micro SD card. Customized open-source software was used to allow the OLED and SD card to work simultaneously. The detectors will be placed in clear plastic enclosures during deployment in the Park. The batteries and SD cards will be replaced each week. To prepare the detectors for deployment to the outdoors, modifications have been made to the original Cosmic Watch design. Each detector will be powered by its own lithium-ion battery. However, the power draw of the detector is below the threshold of most Li batteries, and this causes the battery to turn itself off. Detector hardware has been modified to generate repeated current pulses to keep the battery active. After September, the detectors will be redeployed elsewhere.

POLITICAL SCIENCE & INTERNATIONAL RELATIONS

377 Burkina Faso and Sustainability: A Historical Tradition and a Present Need ☞

AARON COHEN

FACULTY SPONSOR: KARLEEN WEST, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

For my GREAT Day presentation, I will be examining the African country of Burkina Faso. This country has struggled with an anti-democratic past, experiencing violent transfers of power between leaders. In addition to this crisis of state management, they have been dealing with the adverse effects of climate change, as their land continues to erode in a process called desertification. For my presentation, I will examine past approaches to the environment by the various heads of state and administrations that have existed since it became independent from France. In particular, I will focus on Thomas Sankara's legacy, a leftist revolutionary, on the institutions and policies of the country. As well, I will examine the provisions Burkina Faso has established for the marginalized and impoverished communities within the nation, as these are often the people who experience the brunt of climate change. I will also examine the international environment that has existed around these regimes, in order to better understand why Burkina Faso's history looks the way it does. I hope this presentation allows me and those to whom I present to better understand the challenges these types of countries may face and how to combat them.

368 China's Climate Issue ☞

DEVIN MCMANUS

FACULTY SPONSOR: KARLEEN WEST, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

The theory of Post Materialism states that as a population grows wealthier it shifts its focus from economic growth towards social issues such as environmental quality and personal freedoms. The Chinese Communist Party have raised millions of people out of poverty due to the economic policies which they have pursued over the last 30 years. China has relaxed environmental regulations, labor laws, and punished dissent towards party leadership. These policies have produced massive amounts of environmental pollution as the country became the world's factory. China now leads the globe in greenhouse gas emissions and are a major contributor to climate change. In recent years, the Chinese government has adopted environmental policies aimed at limiting their emissions and pursuing policies of renewable energy. These changes are being pursued by an Authoritarian regime that does not allow the public to speak out in the form of social movements. What role does government structure of China play in its attempts to transition towards a sustainable future? Has China's rapid uplift of median household wealth put pressure for greater environmental protection?

252 Money in Politics and the First Amendment

SEAN BURNS

FACULTY SPONSOR: JEFFREY KOCH, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

This presentation will focus on the impact of money on politics and particularly the First Amendment, with its intention to propose an improvement to American Democracy.

374 Amazonian Degradation: A Sovereign Issue for Brazilian Geopolitics or a Globally Impactful Act of Political Power

JAMES TUBRIDY

FACULTY SPONSOR: KARLEEN WEST, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

Over the past 50 years, nearly 270,000 square miles of the Amazon rainforest has been deforested. This degradation of a world resource by the Brazilian government in pursuit of economic expansion is globally impactful and desperately requires attention. On the surface this issue appears to be a political battle only in Brazil over how the nation may best utilize its resources within its sovereign territory, and any external opinion on the subject is just that, an opinion. However, a deeper look at this issue presents itself as far more complex than this simple reduction of the problem initially shows. The plethora of services the Amazon rainforest provides—as implied by labeling the Amazon as “a world resource”—affects not only the South American ecological and environmental wellbeing but these same categories across the entire world in profoundly impactful ways. This leaves us with the following question: how do we create a way to economically incentivize the Brazilian government to not alter the Amazon for its economy? In order to answer this, a nuanced approach must be taken that describes not just one but an array of solutions, all of which must be

implemented to resolve this globally catastrophic issue.

386 Rise of Nuclear Power in China



CHRISTOPHER ROTTLER

FACULTY SPONSOR: KARLEEN WEST, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

This poster will focus on the rise of nuclear power in China, as well as the potential negative and positive effects on the environment in China.

282 The Environmental Issues from Overpopulation in India ☞

STEVEN SCIGLIABAGLIO

FACULTY SPONSOR: KARLEEN WEST, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

In this project, I will be conducting research on the issue of overpopulation in India, which is currently the world's second most populous country. Starting in 1951, the Indian population experienced a massive expansion relative to the earlier above average increases it had undergone. This rapid expansion continued on for the next 50 years up until the start of the 20th century. However, despite lower annual population increases in recent years, the population of India is still massive, which has led to numerous environmental issues. My research will examine how this overpopulation started in the mid-20th century, shortly after the end of British colonial rule in the country (1947). Also, I look into what sorts of environmental issues sprung from this massive population growth and what measures the government has taken to mitigate them. Lastly, some projections on India's overpopulation and environmental problems will be examined to have some insight on where the country is heading in this time of worldwide environmental crisis.

284 Talkin' Bout a Revolution: American Protest and Counter-Protest Movements in the Twentieth and Twenty-First Century

ALEA TIBERI

FACULTY SPONSOR: JEFFREY KOCH, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

This poster represents my research for my senior seminar in Political Science. This project explores different protest and counter-protest movements throughout the United States in the last one hundred years. Through comparative study, this project tracks and collates these different protest and counter-protest movements. This research attempts to answer the following questions: Have the nature of protest and counter-protests movements changed over time? If so, how have these movements adapted to modernity? Protest and counter-protest movements are some of the most direct opportunities for American citizens to engage in our democracy. Therefore, this project also explores the important implications of different protest and counter-protest movements over time as they related to the larger concept of the health of American democracy as a whole.

417 Social Welfare for Foster Children with Mental Illness

MOLLY MATTISON

FACULTY SPONSOR: EUNJU KANG, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

This research explains the need foster children have for better mental health care due to the amount of foster children with mental illnesses. In my research I will be answering the question: What can the federal government do to help foster children with their mental illness?

I have found that 80% of foster children suffer from mental illness, whether that be PTSD, anxiety, depression, DID, or any other mental illness. Foster families are given a plan to follow when they receive their foster child, but many times these children do not get the care they need. In my project I will be finding a better social welfare policy that tackles this issue.

181 Same Day Voter Registration and Increasing Voter Turnout

ALEXANDER SHORT

FACULTY SPONSOR: JEFFREY KOCH, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

Among major democracies, the United States has one of the lowest voter turnouts. Presidential elections in the United States see a turnout of only about 60% and turnout for midterm elections is even lower. These percentages are made worse when one considers that the population that does vote isn't representative of the demographics of the nation as a whole. One of the reasons that voter turnout is so low is because many states require potential voters to register months before election day. A remedy to this problem that has been utilized by other nations and some states within the U.S. is same day voter registration. This policy allows people to register to vote on election day rather than having to register prior to the day of the election. If the federal government were to implement this policy nationwide, the voter turnout would increase and the population that voted would be more representative of the nation as a whole.

392 Gender Norms and Economic Inequality: Implications for American Democracy

EMILY PASCALE

FACULTY SPONSOR: JEFFREY KOCH, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

There is a growing body of evidence that shows a correlation between gender inequality and economic inequality. Often these highly unequal societies, such as the US, have stringent gender norms that disparately affect how men and women think and behave, including the kinds of political opinions they express. My research will focus on the implications of divergent gender norms for American democracy, particularly for proposals aimed at redressing economic inequality. Because this normative behavior has gendered the perceptions of political parties and policies—such as men cognitively linking redistributive policies to a feminine ethos—these gendered ideas may undermine policies that have potential to close the economic gap.

395 Problems Facing America: How Reforms are Changing

Democracy

VINCENT MECCARIELLO

FACULTY SPONSOR: JEFFREY KOCH, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

I plan to summarize what reforms are and how they highlight the corruption in certain aspects of American democratic system. Reforms such as abolitionism, prison, and women's rights have had major impacts on American society, creating harsh partisan lines between political parties. Some institutions in America are inherently undemocratic, creating corruption and negatively effecting democratic society. I plan to address these as well as give possible solutions that could help create a more representative democratic society.

141 The Trend of Gentrification in Urban Areas in Comparison to the Decline of Homeless Shelters that House Single-Parent Families.

DEBORA JAVIER

FACULTY SPONSOR: EUNJU KANG, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

In New York City the rise of gentrification often comes at the expense of marginalized New York families being pushed out. Statistics show that homeless families often make up three-quarters of the cities shelter system. As the living income rises in New York City, I'd like to research single-parent households who've suffered homelessness in regard to rising rents. In addition to this, I'd also like to study how many homeless shelters have been built and how many neighborhoods are being gentrified. Another cause I will be researching will be the de-funding of public housing, the local government and federal funding's amendment could be a factor in the staggering rate of homeless shelters needed for the rising single-parent households.

398 The Effects of Government Funded Childcare on Income Inequality

LINDSEY HILL

FACULTY SPONSOR: JEFFREY KOCH, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

Income inequality is a consistent issue in the United States. Many political scientists have studied ways to diminish the gap between the incomes of citizens. I hypothesize that nations that provide government funded childcare and family leave will show smaller levels of income inequality than those who do not. This will be studied through a comparison of the nations and an analysis of their income inequality.

403 The Spread of Acid Rain in Europe and the Actions Taken Against It

NICHOLAS KONOPKA

FACULTY SPONSOR: KARLEEN WEST, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

Acid rain includes the deposition of the acidic combustion products sulfur dioxide, various

nitrogen oxides, and chloride, this can be either as dry gases or particles, or as wet deposits in various forms of precipitation. These pollutants undergo a series of chemical transformations into sulfuric or hydrochloric acid. I will go in depth with how these pollutants are spread throughout Europe through different short and long-ranged transport methods, as well as any policy issued in response to combat acid rain. While analyzing the politics surrounding the growing threat of acid rain in Europe, I will utilize game theory to explain the choices of the political actors in this situation. Game theory acknowledges three broad categories including interests, ideas, and institutions to explain the rationale behind these political actors' actions. I will argue that Europe will only work towards solving the acid rain issue in periods of economic stability and will not try to prevent the rain at cost of economic revenue.

410 Condon - Senior Capstone Course Research Paper

TIMOTHY CONDON

FACULTY SPONSOR: JEFFREY KOCH, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

Political platforms on social welfare issues that directly affect the lives of millions of citizens can make or break a candidate's campaign for office. Therefore, it is important to view and understand public opinion towards these programs. Not only the general public's attitudes, but the attitudes of specific sub-groups as well, such as political affiliation, ideology, age, gender, race, religion, education, and class. The opinions of sub-groups have important implications for how candidates will campaign on social welfare issues and how policymakers will shape public policy regarding welfare programs. This paper will both summarize and analyze datasets of public opinion since 1990 on government spending on various social welfare programs both by sub-group and the public at large, as well as explore how public opinion affects public policy. My conclusion holds that the general public steadily favors a larger role and spending by the government on social welfare. Numerous Americans are exhausted by the unmitigated costs of goods such as health and education which most democratic nations essentially offer as human rights; so much so that outspoken socialists such as Sen. Bernie Sanders and Rep. Alexandria Ocasio-Cortez have received unprecedented amounts of popularity and favorability.

113 Student and Staff Safety vs. Gun Violence

TAYLOR BELLIS-ESCUADERO

FACULTY SPONSOR: EUNJU KANG, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

I will be researching current school safety policies that have been implemented following the school shooting in Parkland Florida and the Santa Fe tragedy. I will focus on the policies of three states: New York, Florida, and Texas. I chose New York to research what is currently being done in our state in regards to school safety. I chose Florida because of the large impact Parkland had on the United States in making school safety a priority. I chose Texas because, as of this year

2020, they are the state with the largest number of school shootings. After researching these state policies to see what is working and what is not, I will propose a school safety policy of my own. The main focus of the policy will be centered around school security and preventing guns on school campuses.

391 Mental Health Policy for College Students

HEIDI GRANVILLE

FACULTY SPONSOR: EUNJU KANG, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

College students who struggle with mental illness need more resources and support services readily available to them while they are in school. This would help them succeed both as students and as maturing adults. Data collected from Penn State conclude that mental health issues are increasing as time goes on, more students are seeking counseling services, and more students have considered suicide. This data serves a purpose that the current public policy is not enough. Ultimately, when schools are ill-equipped to helping students who suffer from mental illnesses, those students cannot reach their maximum potential, and consequently, the suicide rate is higher among them. On the other hand, for those who struggle with mental illness, non-sufficient treatment and resources affects their overall quality of life. Federal and state governments need to play a larger role in providing sufficient support services, training, and resources to properly equip colleges with an issue on the rise.

212 Environmental Issues in Chile

JONATHAN BRENNAN

FACULTY SPONSOR: KARLEEN WEST, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

This research assignment will examine and analyze environmental issues that face Chile. Chile is a country located along the coast of Latin America, and has long been known for its economic and political stability within the region. With that being said, the nation of Chile has quite an extensive natural ecosystem and great biodiversity. Furthermore, Chile has a wide-ranging coastline that is greatly affected by the worldwide pollution and mistreatment of the oceans. This research project shall explore a number of environmental and ecological issues present within the Latin American nation of Chile. Some issues that will be studied within this research project are land use and conservation, air and water pollution, as well as governmental policies and actions regarding the environment within the country of Chile.

296 An Ecofeminist Perspective on Water Insecurity and Gender Violence in Ethiopia ☒

ABIGAIL SICKLES

FACULTY SPONSOR: KARLEEN WEST, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

Water insecurity is both an environmental and social issue that impacts many countries in Sub-Saharan Africa. Women are often the primary water collectors in these societies, and the lack of access to clean water has been associated with an increase in male violence against women.

☒ Promotes sustainability

Ecofeminism provides one framework to consider the efforts made by the Ethiopian government to improve water accessibility as well as the political and economic ramifications water insecurity has on this society. It also allows this issue to be seen as one that disproportionately impacts women and girls in Ethiopia due to the emphasis on traditional gender roles.

481 The Rise of White Identity Politics in Modern America

WILLIAM DORFNER

FACULTY SPONSOR: JEFFREY KOCH, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

This project seeks to outline the rising role that racial identity, specifically white identity, has played in our political discourse in recent years. Research suggests that there is a growing trend of using white identity as a means of getting elected to office in America resulting in events such as the election of Donald Trump and the Charlottesville Rallies of 2017.

229 Deforestation: The Impacts of Tavy, Timber, and Tourism in Madagascar ☒

CAMILLE MONTALBANO

FACULTY SPONSOR: KARLEEN WEST, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

The battle against deforestation within Madagascar has been a priority of conservationists for decades. Despite Madagascar's incredible landscapes and biodiversity, local agricultural practices have led to widespread habitat loss, species extinction, and resource depletion across the country. This issue is reminiscent of the Tragedy of the Commons, the theory that individuals tend to exploit shared resources until the demand outweighs supply. I will show that deforestation has deeply threatened the lives of Malagasy people through the continuation of practices for short-term economic gains. Despite the cultural complexities of changing local systems, I argue that the devastating effects of deforestation may only be reversed through a shift towards community-based efforts promoted by the government.

302 The Effects of the Media on Political Polarization in America

MATTHEW MALONE

FACULTY SPONSOR: JEFFREY KOCH, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

Polarization in American politics has been increasing because of a lack of political knowledge among average American citizens and social sorting among political parties which has allowed the media to cater their messages to further divide Americans.

306 The National Popular Vote Plan: A possible course of reform for the Electoral College

IAN KIRKPATRICK

FACULTY SPONSOR: JEFFREY KOCH, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

Does the Electoral College establish a system to elect U.S. presidents that truly represents the will of U.S. citizens? This question is subject to much debate in political science. Advocates of Electoral College reform assert that it fails to uphold the democratic principle of majority rule. One possible course of reform is the National Popular Vote Plan, in which member states pledge to award their Electoral College votes to the winner of the national popular vote. In order to determine the validity of this proposal, the advantages and disadvantages of this reform must be considered

287 The Question for the Modernization Theory ☒

FUMI OGURA

FACULTY SPONSOR: REVERIEN MFIZI, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

I would like to research how democracy affects individual economic growth all over the world. In general, democratic countries have higher economic growth than non-democratic countries. The primary reason for this theory is that democracy and capitalism are mostly the two sides of the same coin. Thus, democratic countries can promote economic growth easier than authoritarian regimes. For example, most countries in Middle East do not adopt democracy and overall GDP is not as high as developed countries like the US and European countries. However, some Middle Eastern countries that have rich oil resources are relatively rich compared to other developing countries adopting democracy. In addition, recent economic development of China should not be overlooked. Although China does not adopt democracy, GDP of China is the second largest in the world following the US. This is because China started adopting capitalism while maintaining authoritarian political institution. We should also take into account that there are significant wealth gap in each country. I would like to measure how democracy influences economic well-being, focusing on individual-level wealth, not state-level one. I will use statistics indicating the relation between democracy and GDP per capita.

320 Child Abuse in the Foster Care System

ISABEL FRY

FACULTY SPONSOR: EUNJU KANG, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

At first glance, the foster care system seems to be a safe and welcoming option for children. However, this is because the foster care system has done an excellent job of creating this facade. Once the facade is broken down, the reality of the treatment of children in the foster care system is unacceptable. Children who are put into foster care are at a much higher risk of being abused than they were in their previous home. This issue is of great importance because children's lives are at stake. Children in the foster care system are one of the most at-risk groups, as they can not fight for themselves, and are heavily discouraged from speaking up about their experiences, in fear that they will be placed in a new home where there could potentially be more

abuse. Child abuse in the foster care system needs to be brought to the public's attention because it is time that the polished facade of foster care is taken down.

219 Insuring America's Youth: Examining the Success of Medicaid and CHIP Coverage

JAMES MCGLYNN

FACULTY SPONSOR: EUNJU KANG, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

Children make up 23% of the nation's total population, but make up 32% of all persons in poverty. Given the overrepresentation of children among the US impoverished population, questions are raised on how best to provide much needed medical coverage to low income children. Currently, programs such as Medicaid and CHIP seek to provide low or no cost health coverage to children in low income households. However, the uninsured rate for children has risen from 4.9% to 5.5% in 2018. This is equivalent to about 425,000 children becoming uninsured. Do Medicaid and CHIP do enough to ensure that children in low income households receive low cost health coverage? Healthcare has become a central issue in the current 2020 presidential race. Multiple democratic candidates have advocated for "Medicare for All" single payer plans, while others advocate for a public option that would allow for both private insurance and a government run healthcare system. Would these options provide for low income children better than the current arrangement of Medicaid and CHIP coverage? These questions will be explored in detail.

343 The Relationship Between Authoritarianism and the Management of the Chernobyl Disaster

COURTNEY KLEIMAN

FACULTY SPONSOR: KARLEEN WEST, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

On April 26, 1986, disaster struck Ukraine when a nuclear power plant exploded and sent radioactivity into the atmosphere. In this poster, I will be evaluating the long term effects of how an Authoritarian regime reacted to this nuclear catastrophe. Even though this accident caused by human error occurred over 20 years ago, the long term effect still impacts the environment today. The Ukrainian Government's decision to stay silent about the disaster until 36 hours after it occurred is one of the main reasons many of the effects are still impacting the world today. The Chernobyl accident was the largest regional release of radionuclides and it caused a major contamination of the environment. I will be using an institutionalist theoretical approach to help explain the Ukrainian government's reaction to this accident. Intercity telephone networks were disabled, and the employees of the nuclear plant were prohibited from sharing the news of the disaster with anyone. The Soviet Union's decision to not make an official statement about the accident until days after it occurred shows the lack of transparency the government has with its citizens.

215 The Fight for The Right to Live



MARLIE HESS

FACULTY SPONSOR: EUNJU KANG, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

The opioid epidemic is becoming a serious crisis throughout the United States of America, and addiction as a disease is the pandemic that people need to start paying more attention to than COVID-19. Addiction is a serious disease and those who suffer from it are often neglected from society. This can make matters worse for those with addiction. The capitalist mentality that this entire country is founded on permeates the Big Pharma industry, which can be attributed to being a big contributor to the opioid addiction crisis. Everyone knows someone who struggles with addiction—1 in every 3 Americans has a substance abuse problem. This is a huge percentage of the population, because of that the government needs to step in and intervene by setting up harm reduction policies that can be implemented nation wide. Some of these harm reduction policies can include, but are not limited to, on-site naxalone, same-day treatment facilities, and safe-injection houses.

259 Housing as a Human Right: Addressing Family Homelessness in New York City

ALBERTA ESHENOUR

FACULTY SPONSOR: EUNJU KANG, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

New York City has the largest homeless population in the United States. In fiscal year 2019, 132,660 New Yorkers entered the New York City municipality including 44,300 children. Families with children accounted for 70% of this population. These data represent an 80% increase in family homelessness since 2002 and make clear the fact the United States Interagency Council on Homelessness goal to end family homelessness by 2020 has not been guided by proper social policy in the City of New York. The Bloomberg and De Blasio Administrations represent two extremely different ideologies, however, neither administration, to this point, has been able to improve the condition of family homelessness in New York. This work seeks to examine housing and homelessness policies under the Bloomberg and de Blasio Administrations, and their success, or lack thereof, in addressing the city's homelessness issue. Due to the abbreviated nature of this work, the list is not exhaustive, however, it discusses major shortcomings of both administrations in reducing family homelessness. Finally, this work seeks to recommend a set of robust policy solutions to reduce the number of New York City families experiencing homelessness.

196 The True Effects of French Carbon Tax on the Environment



ALEX HOKAJ

FACULTY SPONSOR: KARLEEN WEST, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

What started as a new proposal to help the environment has turned into a nationwide outcry

by constituents in France, completely whitewashing the new laws. What started as a new proposal to help the environment has turned into a nationwide outcry by constituents in France, completely whitewashing the new laws instituted by French president Emmanuel Macron. A carbon tax, which would increase the prices of diesel fuel and regular gas prices, was believed to help France create a smaller carbon footprint on the country. President Macron's plan would help to reduce the use of fuel-guzzling cars and assist in quelling the effects of man-made climate change. However, this new tax outraged citizens across the entire country and they have taken to the streets to protest. The *gilet jaunes* movement, in response to Macron's new law, have been producing smog emissions through their protests, causing an increase in the country's carbon footprint. Was the new tax to save the environment beneficial? Or did it just increase the country's contribution to global climate change?

357 Australia's Environmental Struggle

DEVIN MURPHY

FACULTY SPONSOR: KARLEEN WEST, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

For my research I will be studying the country of Australia, and will be focusing on the polarized political views of climate change and the environmental issues that affect the country. In Australia, like many other countries around the world, there are different clusters of people that have polarized views on climate change. In Australia, environmental change has been impacted by increasing populations and the subsequent increase in development, extraction of resources, and of course climate change. In my research I will be focusing on how Australia's environmental politics have handled these issues in the past and will discuss how environmental political institutions have caused Australia to fall behind in an "international green political movement."

346 Environmental Movements of the Pacific Island Nations

SCOTT WILLIAMS

FACULTY SPONSOR: KARLEEN WEST, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

Climate change poses an unprecedented threat to marginalized groups around the world. Rising sea levels, increased natural disaster frequency and intensity, and a multitude of other hazards endanger all people, but especially those with the fewest resources available to respond. The small island nations of the Pacific stand to endure enormous suffering from climate change related hazards and have little ability to respond. This project examines responses among these island nations, focusing on novel environmental movements that arise to combat climate change and secure the long term future of their cultures. Examinations of case studies from Tuvalu and the Marshall Islands will demonstrate how environmental movements can leverage international efforts to reduce warming and mitigate the worst impacts of climate change.

178 Reducing Re-incarceration Rates in Non-Violent Drug Offenders

BAILEY WEISS

FACULTY SPONSOR: EUNJU KANG, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

The goal of this project is to show how drug abuse treatment can help reduce the risk of reincarceration in non-violent drug offenders. I will primarily focus on New York State which has about 212,000 drug offenders in state prisons (2016) and its programs for this category of an offender to compare it with studies and other states. So far in my research, I have found that in 2008 the Human Rights Watch found that NYS violated international human rights due to how it handles drug-related crimes. This pushed for drug law reform in NYS, which seemed to lower requirements for NYS sponsored treatment. Although NYS has made some reforms in its drug policy, it still is not treating the majority of non-violent drug offenders. If the goal of NYS corrections facilities is to correct the behavior of the individuals sentenced there then it is clear that they are failing, as rates of reincarceration for this community are still the majority outcome. My findings at this point show that correctional facilities that had drug abuse treatment or post-incarceration drug abuse treatment were far less likely to see individuals re-offend than those that did not offer treatment.

327 Identity Politics in the Supreme Court

ANNE MARREN

FACULTY SPONSOR: JEFFREY KOCH, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

Identity politics leads to individuals making political decisions to help those most similar to them. This leads to underlying bias towards those in your racial and socioeconomic group. The Supreme Court has been notorious for a lack of diversity on the bench. I will explore the consequences of this and how it has resulted in withdrawing civil rights away from certain groups.

330 Public Opinion and Policy Regarding Welfare in the United States

THOMAS WIRTH

FACULTY SPONSOR: JEFFREY KOCH, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

I will make observations and analysis on different aspects of America's welfare system, the public's view on welfare and how policy regarding welfare spending connects with public opinion.

89 The Underrepresentation of African Americans in Government and Its Effects on Democracy

ANNA DI FEDE

FACULTY SPONSOR: JEFFREY KOCH, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

My research presents the lack of representation of African American interests in the American political system, particularly in Congress. It explores the causes of this underrepresentation and the effects that it has on democracy within

the United States. Although there has been a vast increase in black leadership over the last 50 years, there is still a divisive gap in terms of racial equality within American politics. I seek to understand the nature of this gap, and the impact that it has on American democracy and representation for the black population in public policy.

198 Green Revolution in Bali and the Impact of Top-Down Development Programs on a Complex Ecosystem

MADELINE REILLY

FACULTY SPONSOR: KARLEEN WEST, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

This poster will analyze the Green Revolution development programs of High Yielding Rice Varieties in Bali, Indonesia and the subsequent impacts on rice yields, biodiversity, and pests. This can be studied through an institutional perspective, focusing on development programs, the Indonesian government, and spiritual water temples that all had an impact on how rice harvests were coordinated. This environmental issue can be used to highlight the implications of top-down development programming that lacks an adequate social, historical, or economic analysis of a preexisting traditional system that exists within a non-Western country.

200 The Political Clout of Wealthy and Poor American Indian Tribes

KATIE SHEPARD

FACULTY SPONSOR: JEFFREY KOCH, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

Since the passage of the Indian Gaming Regulatory Act, casinos on reservations have become lucrative sources of income for not only tribal governments but also state governments. With an increase in wealth, many tribes have increased their lobbying forces to become major political players in the state and the federal government. But, while some tribal governments have become financially stable due to gaming others have become physically and economically isolated making some tribal governments extremely poor. Poor tribal governments continue to have problems and when lobbying is not an option grassroots movements such as protests become the most viable source of political clout. By examining the political power of both wealthy and poor tribal governments it can be determined that wealthy tribes are more successful with traditional lobbying while poorer tribes have become more successful with social movements.

203 Madagascar's National Park System and Sustainability: A Study of Social and Cultural Responses to Sustainability Initiatives

KATE HUPPE

FACULTY SPONSOR: KARLEEN WEST, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

To better understand sustainability in the global south, we can look at Madagascar's initiatives to preserve the country's endemic biodiversity. More specifically, one may explore the country's

National Park System to gain a deeper understanding of the initiatives as well as the responses of individual's in surrounding areas. The Malagasy government has, in more recent years, searched for ways to protect biodiversity as environmental degradation accelerates worldwide. The legal decisions of the state impact those living in the areas surrounding National Parks.

463 Lack of Women in Government

NICHOLAS CLARK

FACULTY SPONSOR: JEFFREY KOCH, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

This poster will discuss possible reasons why we see less women in government positions in the US, examining factors such as political party but also societal pressures as well of possible lack of support. It will also compare the number of women in government in the US with other countries.

507 Partisan Polarization: American Democracy's Silent Enemy

BRYAN SOKOLOWSKI

FACULTY SPONSOR: JEFFREY KOCH, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

During a time of intense partisan polarization, our democracy and it's respective institutions, have experienced several instances of gridlock. Our elected representatives failure to pursue crucial pieces of legislation has provoked the general public to disapprove of government and politicians. Today's partisan polarization has changed the entire political environment in the United States. Today, politics is an area people stay far away from nowadays, fearing to expose their beliefs, or intolerant of opposing partisan views. Some are also led to believe that their views or opinions do not matter, nor would they change the results of an election. For politicians, it has become a strategic game, designed for the affluent. Those that are affluent enough to run for public office are tasked with overcoming their opponents in order to gain an elected official position. This research will illustrate the evolution and development of partisan polarization in the United States, and how such political polarization has affected both constituents and elected government officials.

PSYCHOLOGY

111 How Environmental Threat Moderates the Relationship Between Warm Glow and Environmental Intentions

SAMANTHA BAUTISTA, INGER-MARIE O'TOOLE, HANNAH SESERMAN

FACULTY SPONSOR: JAMES ALLEN, PSYCHOLOGY

Research indicates that warm glow predicts environmental intentions (Hartmann et al., 2017). However, it is not clear whether warm glow interacts with environmental threat to predict environmental intentions. This research, using a sample of college students found that these two variables do interact. The pattern of this interaction indicated that the relation between warm glow and environmental intentions was

strongest for participants with medium and high levels experiencing environmental threat. Interestingly, low environmental threat participants had high levels on environmental intentions regardless of their level of warm glow. This pattern suggests that the positive feelings of warm glow free participants who may be experiencing anxiety about the threat of environmental problems to engage in more environmentally conscious behaviors.

416 The Effects of Early Life Trauma on Anxiety and Alcohol Use is Modified by Environment

KATHERINE KOMPANIJEK, ALLISON BECHARD, MELISSA HERMAN, GAVIN VAUGHAN, KEARA MULLIN

FACULTY SPONSOR: ALLISON BECHARD, PSYCHOLOGY

Early life trauma is a risk factor for later anxiety and alcohol use disorders. However, the role of the post-trauma environment on the development of such disorders is not well understood. In the present study we investigated experience-dependent changes in anxiety and alcohol use after exposure to early trauma. Young mice (day 23) were exposed to a predator odor (synthetic fox pheromone, TMT) and then reared in either standard (SE) or enriched environments (EE). Adolescent anxiety and conditioned fear were reduced in EE-males, but not EE-females. Adult mice were then tested for their preference to drink alcohol. Alcohol intake escalated across sessions for all mice, however, EE mice had overall lower levels of alcohol use. Interestingly, exposure to TMT affected alcohol preference in EE mice, but not standard mice. Findings demonstrate the environment as a developmental modifier of post-trauma anxiety and alcohol use disorders.

Selected for presentation at Western New York Undergraduate Psychology Conference, Buffalo, NY.

104 Gender Differences in Bystander Responses to Male Violence Against a Transwoman

JULIA DEACON, MADELINE REICHLER, PHOEBE MAXWELL, KATRINA SAYLOR

FACULTY SPONSOR: JENNIFER KATZ, PSYCHOLOGY

No studies have examined bystander responses to violence against apparent transwomen, which reflects the general lack of research on transgender identities in the field of psychology. Given gender differences in socialization, men, as compared to women, were expected to report less intent to intervene to help a transwoman subjected to violence. Men were also predicted to show less victim sympathy and greater transphobia. Undergraduate participants (N = 107) who self-identified as heterosexual and cisgender responded to a measure of transphobia and then to a scenario of male violence against a woman. Specifically, they were randomly assigned to one of two conditions in which the victim was slurred as a “tranny” or a “slut.” They then completed measures of intent to intervene, sympathy for the victim, and

perception of the victim. Those assigned to the trans-slur condition perceived the victim as trans. Results also showed that, compared to women, men reported less intent to intervene when the victim was perceived as trans. Regardless of their perception of the victim, women showed more victim sympathy and less transphobia than men. Although naturalistic research methods are needed to extend these preliminary findings, the results highlight gender differences in helping transwomen.

162 White U.S. College Students' Perceptions of Prospective International Students From Asia vs. Europe

ELIZABETH MCCABE

FACULTY SPONSOR: JENNIFER KATZ, PSYCHOLOGY

Although institutions of higher education benefit from enrolling international students, many international students of color studying in North America describe being devalued by host peers. The current study compared the responses of the dominant racial/ethnic group to prospective students from different races/continents. White, non-Latinx college students in the Northeastern U.S. (N = 228) read a short application and essay purportedly written by a high school senior. The student was either from China or Scotland and described themselves as having either model minority stereotypical or counter-stereotypical attributes. After random assignment to one of these four conditions, participants evaluated how likely the prospective student was to be admitted to their college and the student's academic and social competence. Unexpectedly, despite identical grades and standardized test scores, participants perceived the Chinese student as more likely to be admitted but less academically competent than the Scottish student. Regardless of race, international students with stereotypical attributes were seen as less socially competent than those with counter-stereotypical attributes. These findings suggest that racial dissimilarity affects host peers' responses to international students, potentially reducing receptivity towards students of color who study abroad.

Selected for presentation at SUNY Undergraduate Research Conference, Syracuse, NY.

39 Gender, Partner, and Task in 7-Year-Olds' Assertive and Affiliative Language with Siblings and Friends

MOLLY O'BRIEN, EMILY SALVEMINI, ARIELLA, SHREYA MISHRA, MIKAELA FREEMAN

FACULTY SPONSOR: GANIE DEHART, PSYCHOLOGY

As part of a longitudinal study following sibling and friend interactions from early childhood through adolescence, we focused on the use of assertive and affiliative language by 7-year-olds during play with siblings and friends. Children were taped during free-play, board game, and construction tasks with a sibling and a same-age friend. Contrary to results of past research, task and interaction partner mattered more than

gender in girls' and boys' use of assertive and affiliative language.

Selected for presentation at Association for Psychological Science, Washington, D.C.

49 Daily Attention Bias

BRIE DERELLA, CHAZMIN LYNCH

FACULTY SPONSOR: BRADLEY TABER-THOMAS, PSYCHOLOGY

Previous research has shown a correlation between anxiety and attentional bias to threat. For anxious individuals, attentional bias to threat has been shown to activate areas in the brain such as the amygdala. The amygdala is (i) associated with fear and anxiety, (ii) involved in the link between anxiety and hypervigilance for threat, and (iii) exerts excitatory influence on the release of cortisol, the stress hormone, which follows a daily (diurnal) pattern. Previous research has yet to study the diurnal patterns of attention bias to threat and its association with levels of anxiety. To address this gap, we examined whether attention biases to threat follows a similar pattern of daily fluctuations, and if the variation in that pattern relates to levels of anxiety. To assess this relationship, in an ongoing study, SUNY Geneseo students will complete the dot-probe paradigm, which is a commonly used method to measure attention to threat, at four time periods in one day. The hypothesis is that attentional biases will follow a similar diurnal pattern as seen with cortisol levels, and this pattern will be related to daily fluctuations in anxiety.

202 Topography of Salience Network Connectivity in Pediatric Anxiety

JULIA STARACE, MAI NGO, ANNE NOBILING

FACULTY SPONSOR: BRADLEY TABER-THOMAS, PSYCHOLOGY

Little is known about potential neurological differences in the brains of anxious children. This research aims to explore neural links to pediatric anxiety by comparing functional connectivity patterns in the brains of anxious and non-anxious children. Temperamental differences such as shyness are linked to anxiety, can be observed in children from a young age, and research has suggested that shy children at risk for anxiety have altered topography of the brain's salience network. In the present study we predict that children with a diagnosed anxiety disorder will exhibit a similar altered topography in the salience network. Data on 45 children with and without anxiety were downloaded from an open source database (OpenNeuro.org dataset “ds000144”), which included demographic information and resting-state fMRI scans. After quality assurance checks and data normalization, functional connectivity patterns were analyzed in order to compare salience network topography in anxious and non-anxious children. Preliminary analyses of participants suggest that anxious children may exhibit an altered topographical pattern of salience network connectivity.

294 Multi-voxel Pattern Analysis of Spatial Navigation fMRI Data

JONATHAN MCCART

FACULTY SPONSOR: JASON OZUBKO,
PSYCHOLOGY

Multi-voxel pattern analysis (MVPA) is a technique for extracting the information present in time series neural data by subdividing the brain image into “voxels” which store information about brain activity during fMRI data collection. This information is analyzed for patterns that indicate a relationship to a stimulus or task using the information present across a subset of voxels which represent a region of interest in the brain. In this experiment, we seek to analyze the data from a spatial navigation study using MVPA in order to determine the orientation of a participant at different times during the study. Specifically, we seek to isolate the activity of hippocampal voxels, and use their information as a set of predictors for the classification of the participant’s location. The classification methods that will be used are linear discriminant analysis (LDA), linear support vector machine classification (SVC), random forest classification (RF) and gradient boosting classification (GB). These models will be compared on the basis of test set accuracy.

242 Egoistic Values Moderating the Relationship Between Warm Glow and Environmental Intentions

BRIDGET RYNNE, EMILY BENGART, INGER-MARIE O'TOOLE, HANNAH SESERMAN, MARIA MCCAFFREY, ANAHI CHABLA, SAMANTHA BAUTISTA, OTTO JUNIOR

FACULTY SPONSOR: JAMES ALLEN,
PSYCHOLOGY

Previous research indicated that warm glow predicts proenvironmental intentions. However, interactions with other factors have not been tested. It is not clear how warm glow might interact with altruistically related motivations to protect the environment. This study examines a potential interaction between egoistic values and environmental intentions using a college sample. Results showed a significant interaction. The pattern of the interaction shows that warm glow increases environmental intentions among those with low and moderate egoistic values. High egoistically motivated participants are high in environmental intentions despite amount of warm glow. These results suggest that warm glow from performing an environmentally friendly behavior motivates environmentally friendly participation among those who don't think environmental problems pose a direct threat to their wellbeing.

222 Response to Loss among People with Depression: Insight Into the Neural and Learning Mechanisms Fueling Depression

NATASHA COTRUPPI, TAYLOR HOTMER, FLEURIAN FILKINS, MAYA COTTONE, SAMUEL CAPONI, MAGGIE ALDRICH, LINDSAY HERNADY
FACULTY SPONSOR: MICHAEL LYNCH,
PSYCHOLOGY

Do individuals with Major Depressive Disorder show decreased neural activity following a monetary loss? Do they show a different pattern of learning in subsequent choices? This study investigated fluctuations in neural activity across the dorsolateral prefrontal cortex (dlPFC) following a simulated monetary loss. Loss was experienced during a decision-making task, the Iowa Gambling Task (IGT), in which participants made choices under conditions of uncertainty. We measured fluctuations in neural activity using functional near-infrared spectroscopy, (fNIRS) detecting changes in blood oxygenation across the dlPFC. The association between neural activity following losses and subsequent choice patterns of individuals reporting high versus low levels of depressed symptomatology were examined. It is hypothesized that depressed individuals will show decreased neural activity across the dlPFC following loss. Decreased activation may be explained by conditioning following repeated exposure to loss. It is hypothesized that individuals who display symptoms of depression will also show fixed patterns of decision making during the IGT task. Their inability to change decision making strategies following experiences of loss may support a learned helplessness theory of depression.

213 Alcohol Use and Its Association with Neural Activity and Subsequent Decision Making

FLEURIAN FILKINS, LINDSAY HERNADY, MAYA COTTONE, NATASHA COTRUPPI, SAMUEL CAPONI, MAGGIE ALDRICH, TAYLOR HOTMER
FACULTY SPONSOR: MICHAEL LYNCH,
PSYCHOLOGY

This study monitored changes in blood oxygenation across the dorsolateral prefrontal cortex (dlPFC) while a participant completed the Iowa Gambling Task (IGT). More specifically, fluctuations of blood oxygenation in the ventromedial prefrontal cortex (vmPFC) were investigated. The intention of the IGT task is to evaluate a participant's decision-making under conditions of uncertainty. Following each decision, the participant receives a reward and/or a penalty. Functional near-infrared spectroscopy (fNIRS) was used to measure changes in blood oxygenation levels across 16 locations on the dlPFC, and this study specifically looked at optodes in the vmPFC. It is hypothesized that those who reported symptomatology of alcohol abuse will have decreased activity in the vmPFC during trials in which the participant's decision results in a penalty. Subsequently, it is expected that decreased vmPFC activation will be associated with a decreased likelihood to switch to a less risky decision making strategy.

209 Varieties of Pseudoneglect: Personality Traits Predict Distinct Biases in Spatial Attention

JEREMY SAWYER, JACKSON PULIZZI, NICHOLAS PERKINS, HEATHER AIKEN
FACULTY SPONSOR: JEFFREY MOUNTS,
PSYCHOLOGY
EDGAR FELLOWS CAPSTONE PROJECT

Pseudoneglect refers to an asymmetry in spatial attention whereby neurologically intact individuals make leftward errors on tasks such as bisecting a line. Multiple tasks have been designed to measure this attentional asymmetry. Interestingly, many measures of this spatial attention bias do not correlate with one another. In the current research, we find that two common measures of pseudoneglect, while not correlated with one another, are each correlated with different personality traits. These findings suggest that the various measures of pseudoneglect may be tapping into distinct asymmetries in hemispheric activation that both influence the allocation of attention and give rise to individual differences in disposition.

375 Forgetting Memories: How Meaning Influences Memory Decline in the Hippocampus

BRENDAN HINES

FACULTY SPONSOR: JASON OZUBKO,
PSYCHOLOGY

Cognitive neuroscience research suggests that forgetting may depend on which brain areas are supporting a memory, and whether the memory is for meaningful or less meaningful content. The hippocampus is known to represent more vivid recollections of the past, and hippocampal memories appear to decay at the same rate regardless of meaning. In contrast, the medial temporal lobe represents more intuitive feelings of familiarity, and is better at retaining memories for meaningful experiences over time. We sought to test the impact of interference on hippocampal and non-hippocampal memories. We had participants study and recognize a list of random words in a continuous recognition task, providing us with ratings of which words were recollectable (i.e., likely being remembered hippocampally) and which were not. Subjects then viewed an interference list of words that was either semantically related or unrelated to the studied words. In a final phase, we assessed whether memory for the original items had declined due to the interference items. While the related interference items generally accelerated forgetting, they had a much bigger impact on previously recollected words (i.e., hippocampally-dependent memories). Our study demonstrates that when it comes to forgetting, hippocampal memories may have some sensitivity to meaning.

328 Quality of College Students' Close Peer Relationships

MARY SIMPSON, KAITLYN WEST, ERIN DONAHOE, MADELINE BIRD
FACULTY SPONSOR: KAREN MOONEY,
PSYCHOLOGY

This study compares the quality of different types of college students' relationships: same-sex (SS) friendships, other-sex (OS) friendships, and romantic relationships. Previous research by Hand and Furman (2009) indicated that adolescents perceived their OS friendships as less supportive than both their SS friendships and romantic relationships. Adolescents also perceived their OS friendships as having less conflict than their romantic relationships. The current study attempts to replicate these findings with college students, who tend to have

more time and opportunity to develop close OS friendships. In addition, we examine the power dynamic in these relationships, as well as several factors of each type of relationship, including length of the current relationship and previous experience with each type of relationship.

119 The Role of Post-Encoding Retrieval on Cognitive and Neural Representations of Spatial Environments

BROOKE DEMETRI, JONATHAN MCCART, HARRIS SCHWAB, KAITLYN BERTLEFF
FACULTY SPONSOR: JASON OZUBKO, PSYCHOLOGY

Spatial memory is an important ability for navigating around one's surrounding environment. However, due to the challenges of developing experimental paradigms that utilize large scale, real-world environments, little research has analyzed, in detail, the development of cognitive maps over time. Past research in rodents has shown that hippocampal place-cells replay during periods of quiet wakefulness, suggesting that mental replay of recent spatial experiences is tied to the development of cognitive maps. In humans, we hypothesize that the development of cognitive maps could therefore be manipulated by having participants selectively recall recent navigational experiences. We analyzed the development of cognitive maps for novel, real-world spatial environments in two groups, a spatial sequencing group (SSG) and rote-retrieval group (RRG), over a period of 2 weeks using Google Street View software. After navigating through the environment, participants' spatial memories were tested with either rote retrieval or spatial sequencing recognition tests. Our preliminary results suggest the RRG was more successful navigating previously learned routes than the SSG with more practice on the trained routes, whereas the SSG may have developed some ability to discover shortcuts by being encouraged to think more broadly about the routes they were learning, and not rely on memorization.

161 The Effects of Environment on the Development of Cocaine-seeking

GAVIN VAUGHAN, AKANE ICHIKI, SHREYYA MALIK
FACULTY SPONSOR: ALLISON BECHARD, PSYCHOLOGY

Cocaine addiction is a major individual and societal issue. This study aimed to investigate the environmental and social factors that influence the development of cocaine addiction. Mice were reared in either standard housing or enriched housing. Cocaine preference was measured using the Conditioned Place Preference paradigm, in which subjects are conditioned to associate an injection of cocaine (20mg per kg. I.P.) with a particular side of a 3 chambered arena. Subjects reared in enriched environments displayed increased preference for cocaine in cue primed tests. All subjects displayed cocaine preference in cocaine primed tests. This may be attributed to the enhanced memory that is often seen in mice reared

in enriched environments. Additionally, the large dosage of 20mg per kg of cocaine may have been too strong, diminishing potential enrichment effects. Future studies will focus on behavioral assessments with weaker dosages as well as neurobiological assays.

Selected for presentation at Western New York Research Conference, Buffalo, NY.

159 The Effects of Trauma on the Response to Cocaine

GAVIN VAUGHAN, KEARA MULLIN, KATHERINE KOMPANIJEK, ANNACLAIRE MODICO, MAREN HOGAN, MELISSA HERMAN
FACULTY SPONSOR: ALLISON BECHARD, PSYCHOLOGY

Exposure to adverse events is a risk factor for substance use disorder. We modeled this in an inbred strain of mice by exposing adult males to a predator odor (a synthetic fox pheromone, TMT) and then assessing 1. Cocaine-induced locomotion, and 2. Conditioned place preference (CPP) of cocaine. TMT was an effective stressor as indicated by freezing behavior, an absence of movement that is an instinctive fear response in mice. Interestingly, in a 1-hour baseline locomotor test, TMT-exposed (TMT+) mice were more active than non-exposed (TMT-) mice. In addition, following a cocaine (10 mg per kg) injection (i.p.) TMT+ mice showed a cocaine-induced increase in activity, whereas TMT- mice did not. Finally, mice were conditioned to associate one side of a 3-chambered arena with cocaine (10 mg per kg) and were then tested in a 30-minute session of free exploration (15 minutes of cue-prime, 15 minutes of drug-prime). One week later, an identical 30-min session of free exploration was conducted. The time spent inside the drug-associated context was considered an indication of the rewarding properties of cocaine.

Selected for presentation at SUNY Undergraduate Research Conference, Syracuse, NY.

151 The Interaction Between Biospheric and Egoistic Values Predicting Environmental Intentions

ANAHI CHABLA, INGER-MARIE O'TOOLE, HANNAH SESERMAN, MARIA MCCAFFREY, SAMANTHA BAUTISTA, OTTO JUNIOR, EMILY BENGART
FACULTY SPONSOR: JAMES ALLEN, PSYCHOLOGY

Previous research indicates egoistic values and biospheric values individually predict environmentally positive intentions. However research has not examined the potential interaction between these two factors. This study found that these factors do interact using a sample of college students. The pattern of this interaction indicated that the relation between biospheric values and environmental intentions was strongest among high egoistically motivated participants. These results suggest that the combination of concern for the health of the environment (biospheric concern) and selfish concern for how environmental problems might affect the self (egoistic concern)

produce the highest levels of environmental intentions.

143 Mothers' and Children's Perceptions and Observed Aggression and Rough-and-tumble Play in 7-Year-olds' Sibling Relationships

NIKI LAM, ADRIANA MURTHA, KIARA MAHER, ISABELLA ECHEVERRIA, ELIJAH LORAH
FACULTY SPONSOR: GANIE DEHART, PSYCHOLOGY

The present study compared mothers' and children's perceptions of 7-year-olds' sibling relationships with observed aggression and rough-and-tumble play. Coded videotapes of 3 tasks and questionnaires were used to collect data about perceived and observed aggression and RTP. Results suggest that the accuracy of mothers' and children's perceptions vary.

Selected for presentation at Association for Psychological Science, Chicago, IL.

140 Time Spent Together and Conflict Relationships in 4-year old's

DESTINY DRAGGETT, CLAIRE RODGERS
FACULTY SPONSOR: GANIE DEHART, PSYCHOLOGY

We have previously examined connections between observed conflicts and questionnaire-based indicators of interaction frequency amongst siblings and parental intervention in 4-year olds. In the present study, the research methods repeated the observation of conflict through video coding and questionnaire-based indicators of sibling relationship characteristics. Qualitative aspects of sibling relationships such as their time spent together, duration of conflict, and turns in a conflict illustrated the nature of sibling conflicts through their interactions. We hypothesized that sibling conflict relationships with one another differed in terms of the amount of time that they spent together during both the school day as well as time during non-school days. For instance, sibling relationships would have greater conflict relations when they are reported as having more hours spent together through parent questionnaires. In addition we examined how parental interventions impacted the relationship between time spent together and conflicts.

129 Attachment and Emotion Dysregulation as Predictors of Interpersonal Problems, Friendship Satisfaction, and Romantic Relationship Maintenance

XIAO JUN CHEN, CHALYNE BARROW, XIARA COLON
FACULTY SPONSOR: MONICA SCHNEIDER, PSYCHOLOGY

Researchers studying adult attachment have linked insecure attachment styles to various relationship challenges across relationship contexts, including friendships and romantic relationships. We

examined the mediating role of emotion dysregulation and negative affect in the relationship between insecure attachment and various relationship outcomes. Participants completed a survey assessing attachment style, emotional dysregulation, interpersonal problems, experiences with anger & jealousy, romantic relationship maintenance behaviors, and friendship quality. Correlations revealed that greater avoidant and anxious attachment were associated with increases in all emotional dysregulation issues, more anger, greater interpersonal problems, and lower friendship satisfaction. Only avoidance predicted fewer relationship maintenance behaviors and lower friendship intimacy; only anxiety predicted greater jealousy. Results indicated that the inability to regulate negative affect explained the relationship between both attachment styles and interpersonal problems. Lack of clarity regarding emotions partially explained the relationship between avoidance and relationship maintenance behaviors. Regarding friendships, we found that avoidants' reluctance to share personal information about themselves partially explained why they report lower friendship satisfaction. We found two contradictory paths for anxious attachment: although there was a significant positive direct effect of anxiety on friendship intimacy, interpersonal problems and lack of emotional awareness partially explained a negative relationship between anxiety and friendship intimacy.

29 Acculturation, Education, and Parenting: An Analysis of African Immigrant Family Dynamics

NEHA PATIL, BRITTANY BEARSS, AWAB SHAWKAT

FACULTY SPONSORS: GANIE DEHART, PSYCHOLOGY, NICHOLAS PALUMBO, CENTER FOR COMMUNITY

This study's prior research on African Immigrant individuals briefly discussed parent-child relationships using focus group data. In response, individual interviews were conducted with original participants (N=14). Utilizing Family Systems Theory, thematic analysis highlighted salient themes regarding sibling parentification, differential cultural experiences, and parental assimilation—illuminating complexities within multi-directional/cultural family dynamics.

Selected for presentation at Association for Psychological Science, Chicago, IL.

185 Influences of Early Relationships in Latinx College Students

CARMEN MARTINEZ, CINTA RENALDI, OLIVIA SANCHEZ, DANIELLA QUIROZ, CASSIDY GOUCHER, DENIS MAZARIEGOS

FACULTY SPONSORS: GANIE DEHART, PSYCHOLOGY, NICHOLAS PALUMBO, GOLD

This qualitative research aims to analyze and better understand how earlier relationship quality influences relationships in emerging

adulthood for Latinx college students. This phenomenological investigation analyzed focus group data using thematic analysis. Results revealed that factors influencing identity, parental expectations and closeness within the family were salient in sibling relationships.

Selected for presentation at Association for Psychological Science, Chicago, IL.

WOMEN AND GENDER STUDIES

190 Punk Prayer: The History of The Riot Grrrrl Movement

SOLEIL RIVERA, HAILEY MARTIN, QUENTIN WALL

FACULTY SPONSOR: CATHERINE ADAMS, WOMEN AND GENDER STUDIES

The "riot grrrrl" movement was an underground subculture of music that began in Washington State (Particularly in Olympia) in the early 1990s. It consisted of all-female bands that combined feminist values and politics in the form of punk music. It spread quickly across the nation, and the US, where it went on to influence the globe, and their society and politics, becoming a much more international movement. Here, we will be covering the foundations of the "riot grrrrl" movement, list a few bands and their impacts on the nation, and the significance of the movement on aspects of society, as well as its relevance to today.

GREAT DAY MUSIC SUBMISSIONS

83 SOUTHSIDE BOYS

ANDREW KEMLER, ANDREW BITTEL, ANDREW WEBER, BRETT HAMMES, CALEB WILDER, CESAR FLORES, DAN DADDARIO, EVAN PANZER, GEORGE PERDOMO, HARRISON SMITH, JACK GRANT, JACK SWANSON, JACOB GOLDBERG, JORDAN PEYER, JULIAN LEE, KIERAN THOMAS, MITCHELL NEILSON, OWEN MONTEFERRANTE, ROCKY NARDONE, NICOLETTE MARCIANA
FACULTY SPONSOR: GERARD FLORIANO, MUSIC

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FACULTY SPONSOR: TAYLOR GALE, STUDENT LIFE

85 HIPS 'N HARMONY

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FACULTY SPONSOR: KATHRYN ROMMEL-ESHAM, EDUCATION

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FACULTY SPONSOR: JAMES KIMBALL, MUSIC

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FACULTY SPONSOR: CARLY HEROLD, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

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FACULTY SPONSOR: WILLIAM TIBERIO, MUSIC

120 GENESEO INCLUSIVE CHOIR

IMAGINE INCLUSION; COMMUNITY ADVOCATES ENDOWED AMBASSADORSHIP IN COMMUNITY ENGAGEMENT

LAUREN STERNBERG, EVAN PANZER, CESAR FLORES, CLAIRE PRUNIER, GENNA BURKE, STEPHANIE WALL, MARION AVILA, MELANIE CLANCY, KAILIN FOOTER, ALLISON PAJDA, RACHEL SKIDMORE, BRIANNE KUBALA, CHRISTINA LUONGO, DYLAN MCCLURG, CHELSEA WATERS, KAYLA BRADY, KRISTEN GUYETT, TYLER HEIMAN, HANNAH FINCH

FACULTY SPONSOR: LYTTON SMITH, CENTER FOR INTEGRATIVE LEARNING

My ambassadorship aims to educate Geneseo students and community members about intellectual and developmental disabilities (IDDs) through personal experience. I attended conferences hosted by the National Down Syndrome Congress and Best Buddies International to learn ways to become a better advocate for inclusion. As a future physician, I also attended a "research rally" focused on advancements in medical care for people with IDD. Upon returning from my experience, I implemented some of the ideas I learned during my travels. With the help of my musically inclined peers, I started an inclusive choir where Geneseo and LIVES students sing together as well as learn and build friendships. With my ambassadorship, I hope to eliminate the stigma associated with IDD and help my peers imagine a truly inclusive campus.

504 FLUTE CHOIR AT GENESEO

BRITTANY SULLIVAN, ABIGAIL DOVE, GABRIELLE SHEEHAN, BRIANNA DONLON, ALLISON NORTH, CAITLIN CLACK, LAUREN LAMBIE, TIM MCKNIGHT, SHANNON MCGAUGH, ANALIESE VASCIANNIE, CHRISTINA WAITE, KATHERINE COTTEN
FACULTY SPONSOR: KATHRYN SCARBROUGH, MUSIC

THE GREAT BATTLE OF THE ARTISTS

LAYLA KAISER

34

Pawbucks: This piece was inspired by my love for cats and Starbucks alike. It started out as a simple doodle, but quickly turned into something I think most students can relate to. We all deserve a little treat sometimes! Artwork created using Procreate for iPad.

A Happy Place: This piece was created as a reflection of artists and how creating art (or things in general) can be a way to create a safe and happy place of self-expression for many people. Choosing a dragon to represent the artist in this work was just another fantastical aspect of the piece, and alludes to the endless possibilities we open up to ourselves as artists. We have no limits in what we can achieve. Artwork created using Procreate for iPad.

F1-Do: F1-Do was inspired by the movie "Alien" and my love for the 1995 anime Neon Genesis Evangelion. I created this robot dog-like character during my freshman year of college. I always imagined him as a quirky character and faithful companion. While robots will never replace our furry canine friends, I think F1-Do represents a spirit of creation and our ever moving progress towards a better future, for humans and animals alike. Artwork created using Procreate for iPad.

ISAIAH JOHNSON

54

Supreme Being: Try to find the name "Isa" hidden somewhere on the Budai! I created this artwork with watercolor, spray paint, and marker. This was inspired by the year of the dragon which is the year I was born and the buddha (Budai). I made it in 2018 for fun and the colors and overall vibe of the piece makes it one of my favorites.

Worlds and Bridges: Try to find the name "Isa" hidden somewhere on the Budai! (appears once) This artwork was made with colored pencil and acrylic paint. Inspired by family and places I've traveled throughout my life. My father lives in South Korea, My sister lives in Guam, and I live in New York. So the installation of the cities and historical landmarks that bridge us all together are all significant to me. I made this artwork in 2019 and the mix of my past experiences, ideas, and vibrant colors are what make it special.

Words Are Power: Try to find the name "Isa" hidden somewhere on the Budai! (appears 2x). This artwork was made with colored pencil, acrylic paint, spray paint, graphite, and pen & ink. Inspired by the idea that words hold a lot of power. I believe that people can speak things into existence and that they can change someone's entire based on the words you say to them at key moments. I created this piece of art in 2019 and I like how there is a mystical kind of feel to it.

JOHNATHAN RZEPKA

116

Mistakes to be Made: Portrait of me and my brother as kids. Oil pastel on acetone washed background. Pallet of white and blue for subjects.

A long and wicked path to walk: Photograph, Landscape of sunrise- silhouette of horizon

Me and you, forever here and never again: Photograph -landscape sunset in Geneseo

EMMA SHORT

217

Fame, Fandom and the Woman in the Spotlight: An Analysis of Fame through Perfect Blue and Cleo from 5 to 7: A 20 minute video essay where I will explore the fame and the celebrity-fan relationship spotlight using analysis from two films, Perfect Blue by Satoshi Kon and Cleo from 5 to 7 by Agnes Varda. I want to know what propels fame, why we desire it, and how we perceive and treat those who achieve it. I want to focus specifically on women in the spotlight, and the extreme standards that are set for them. My film will be broken up into 4 sections: Fame, The Fan, The Woman in the Spotlight, and Modern Day Examples. I will include elements of my own personal life in this video essay in order explore these issues firsthand as a woman who has wondered what it would be like to be famous. I hope to unpack the complicated relationship of fame and fan that often causes us to view women (and celebrities in general) in the spotlight as objects or images that we can own, despite not knowing them whatsoever.

CINDY CASTILLO

371

Los Buenos Días: Influenced by my Mexican heritage, Los Buenos Días was made using watercolor gouache on Arches watercolor paper. The man is seen placed at the center as he glares up to the sky. On the back of the painting is a short poem in Spanish. This is a homage to my great-grandparents who worked in the fields in Buena Vista, Mexico. May we never forget our roots and our home.

El Trabajador abajo del Sol: Made using watercolor on arches watercolor paper, this painting illustrates a working man. His skin is a beautiful, rich brown color which emulates the color of my great-grandfathers skin after a long day working the fields in Mexico

La Mujer: Influenced by Latin American artists, this piece plays homage to all the incredible woman in my life who helped mold and raise me. Watercolor on arches watercolor paper.

HEATHER AIKEN

414

Black Panther: I painted this for my dad. It took the full day, every single day, for about two weeks! Acrylic on canvas, 2019.

AL TEJERA

497

Sapphic in Primary: (2020) Watercolor on Cold Press Paper, 9 x 12 inches. Sunlit kisses in short tempo and cherries plucked from a deep azure.

KATHERINE BENSBURG

501

Exploring Color Theory Using An Everyday Object: Title: Exploring Color Theory Using An Everyday Object Medium: Watercolor on Watercolor Paper Year of Work: 2019 Size: 9 in. x 12 in. Description: The purpose of this work was to explore color theory through glazing and mixing of dark colors. Glazing is the layering of colors to create intense, rich passages of color, surface textures, and form. Dark colors are a combination of a color, its complement, and ultramarine blue. Top Left: A monochromatic value study in ultramarine blue. Top Right: A study of glazing the local (actual) color of an apple without a shadow. Bottom Left: A study of glazing the local color of an apple and incorporating only its complement to produce an incomplete shadow. Bottom Right: A study of glazing the local color of an apple and incorporating its complement and ultramarine blue to produce a complete shadow. Professor Thomas MacPherson, thank you for sharing your enthusiasm for the arts with the SUNY Geneseo community.

BRENDAN HINES

503

Renascence: The woman in this piece represents how people continually undergo cycles of life and death, termed samsara by Hinduism. She begins in a state of self-love and general contentment with her life. Using her most inner hands to caress herself, she is deadly and striking, a picture of confidence. But she begins to wear down; she has become discontent with some of her traits. Cracks in the mirror start fragmenting down its length and she begins to fall apart. More and more she realizes the need for change and adaptation. she starts to mentally exaggerate her flaws and only sees evil when she reflects on herself. Disgust and doubt roil in her, as she begins to accept death of herself with open hands. Finally, she undergoes the transition. Though necessary and needed by her, the process of burning oneself alive is painful. The mind resists change and screams until the very end. Her fingers cross and bend to remind her this process is needed and to wish for a fortunate end. When she has reforged herself, she clutches her chest and remembers why she has always burned herself down: so that she could become everything she ever wanted.

Relinquish: We're always told to repress the monsters within. To fight our vices and never relent. That certain deviations from the norm should be corrected or we will be punished by society. If we don't obey certain social conventions, we are seen as deviant and strange. Even choosing behaviors which are of no threat or consequence to others can be met with violent opposition by those who are obsessed with maintaining order and quelling individual expression. We only have a certain amount of mental willpower, and by embracing our darker sides, we can increase our power and stop wasting mental effort on fighting our demons. This woman has relented to her demons, and is being devoured by them. But after they have broken her down and she figures them out, she will be able to live with them on her own terms and empower herself. Though she will still

maintain certain moral standards, she is singularly focused on understanding herself and expressing herself through her words and actions without thought to what others think. After she relinquishes to her demons, she is no longer paralyzed by the perception of others.

Deso: This piece is based off a shot from the television series True Detective. The woman represents the up-swing of the crest of passion, crashing on her and causing her to continually feel white-hot pain. Feeling anything strongly invokes pain the more the feeling is embraced. She swells with feelings of envy, wrath, lust, and pride. She feels this toxic mixture of unbridled vice and wants to slough off her feelings like they are dead skin. But part of her clings to the past, to her deeply held regrets and grudges that have shaped who she is. Rather than make peace with

her demons, she defies them, knowing they will rip her apart. She is full of the death urge, knowing that it is time for this version of herself to die and be reborn. She will endure an internal hell, where she is mentally burned down again and again. Every time she closes her eyes she sees the glow of the city, her future ambition, freedom, power, and beauty that seem so far away. She knows that she will one day be dead, but for now she is desolate.

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