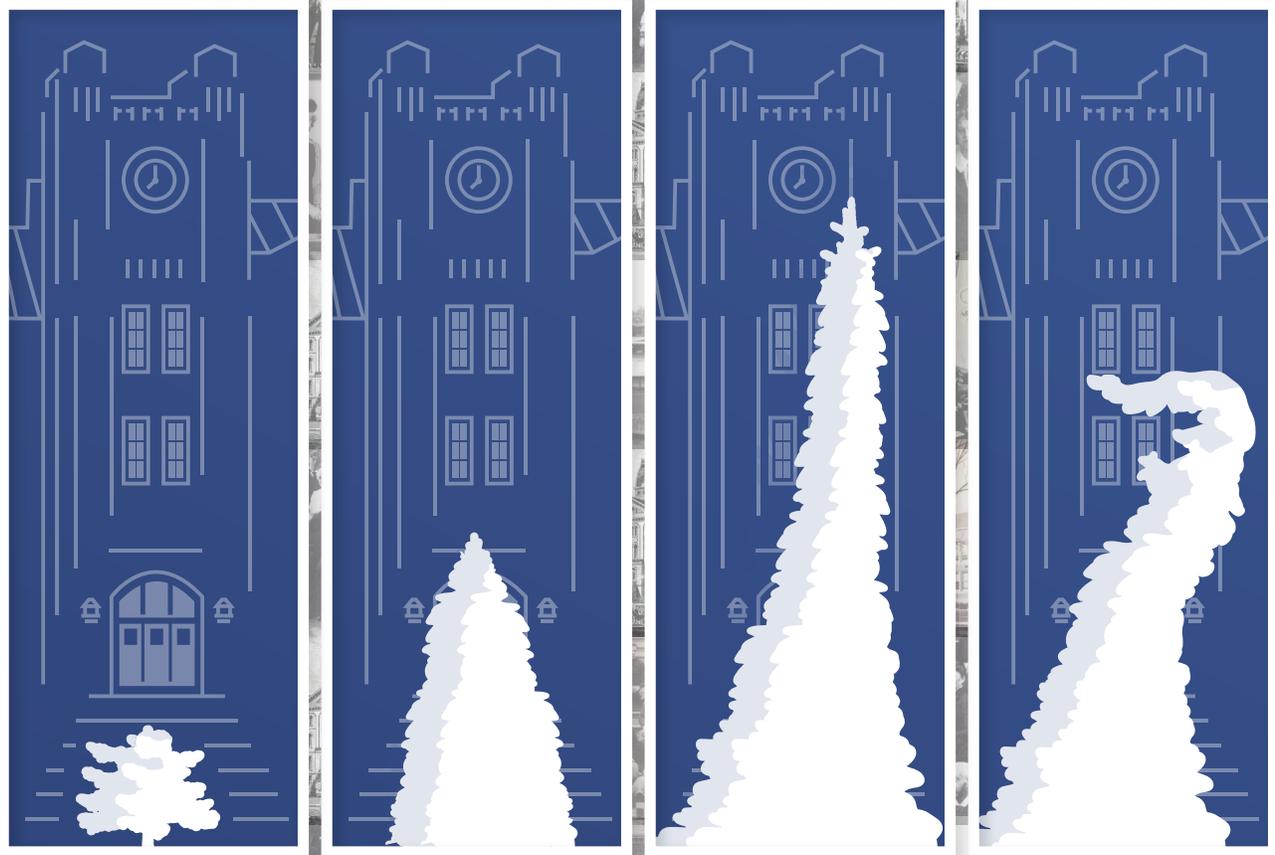




# GREAT DAY '22



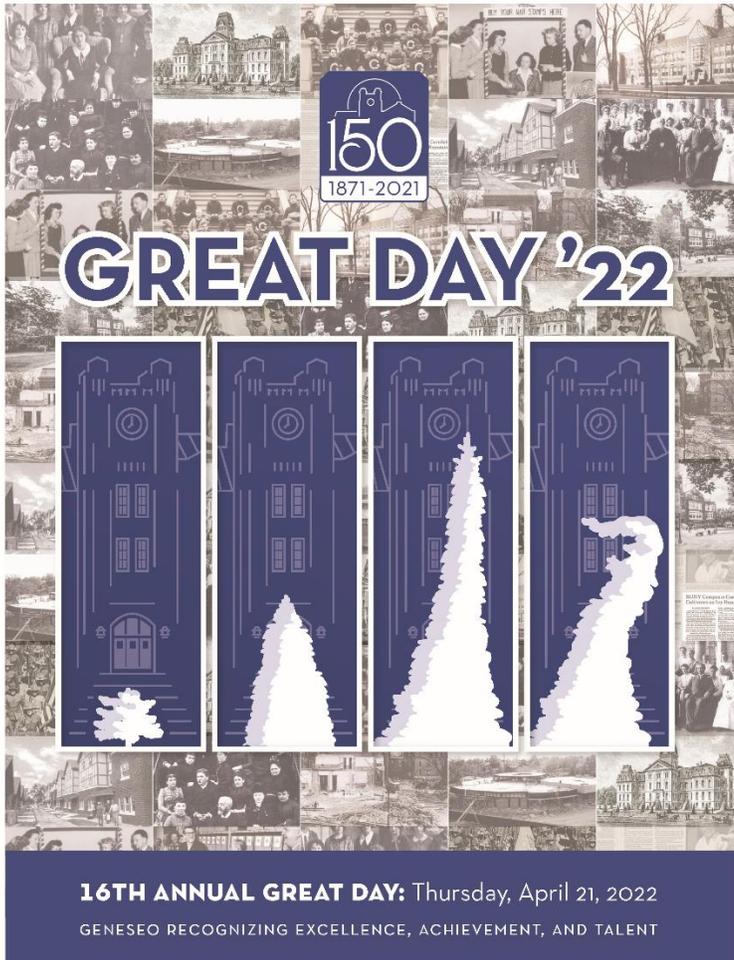
**16TH ANNUAL GREAT DAY:** Thursday, April 21, 2022

GENESEO RECOGNIZING EXCELLENCE, ACHIEVEMENT, AND TALENT

## Welcome to SUNY Geneseo's Sixteenth 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](http://www.geneseo.edu/great_day)



This program lists the abstracts for all submissions for GREAT Day 2022. We're happy that GREAT Day 2022 will once again be held in person on Thursday, April 21, 2022. The keynote address by Dr. Diane Stinitz '89 will be held on Thursday, April 21<sup>st</sup> 1.45-3.00pm in Wadsworth Auditorium

Scholarly and creative projects in a variety of formats will be available for viewing beginning April 26<sup>th</sup>. To view presentations, check the [Virtual Program](http://www.geneseo.edu/great_day) on the GREAT Day webpage at: [http://www.geneseo.edu/great\\_day](http://www.geneseo.edu/great_day)



GREAT Day often falls on or near Earth Day, which is held on April 22<sup>nd</sup> each year. In recognition of this, presentations that promote sustainability are designated by a leaf symbol -  - in this program.

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

GreatDayGeneseo



@GeneseoGREATDay



geneseo.edu/great\_day



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## ABOUT THE VIRTUAL GREAT DAY PROGRAM:

- [GREAT Day 2022 On-line Program](#)
- This year's program utilizes the Oxford Abstracts conference platform.
- PDFs of some posters are available within the on-line program's [Poster Gallery](#) or from individual abstracts.

<b>GREAT Day Schedule</b>		
<b>KICK-OFF COFFEE HOUR HONORING 10- AND 15-YEAR SPONSORS AND PRESENTATION OF 2021 PROCEEDINGS</b>	8:00 AM - 8:50 AM	Bailey Atrium
<b>CONCURRENT SESSION 1</b>	9:00 AM - 10:15 AM	
1A: Linguistic Justice		Welles 115
1B: Adopt-a-Business: Small Businesses Bounce Back		Welles 119
1C: Edgar Fellows Panel 1		Welles 131
1D: Edgar Fellows Panel 2		Welles 132
1E: Prisons, Police, and Power: A Critical Examination of Systems of Social Control and Punishment in the United States		Welles 117
1F: The Ripple Effects of Slavery in North America		Bailey 101
1G: Mathematics for Sustainability		Bailey 102
1H: Student Projects for Sustainable Impact, Local and Global		Bailey 104
1I: Modeling the COVID-19 Pandemic		Bailey 105
1J: Genetics and Genomics		Bailey 204
1K: Mock Trial at Geneseo Presents: State of Midlands v. Dakota Sutcliffe		Bailey 203
<b>MUSIC FESTIVAL: STRING AND WOODWIND ENSEMBLES</b>	10:00 AM - 11:00 AM	Doty Recital Hall
<b>CELEBRATING THE ARTS: BATTLE OF THE ARTISTS</b>	10:00 AM - 6:00 PM	MacVittie College Union Kinetic Gallery
<b>CONCURRENT SESSION 2</b>	10:30 AM - 11:45 AM	
2A: History of Mathematics I		Welles 115
2B: Personal and academic growth with the LIVES program		Newton 204
2C: Edgar Fellows Panel 3		Welles 131
2D: Edgar Fellows Panel 4		Welles 132
2E: Movements for and Against Repression in the 20th Century		Welles 117
2F: Women's and Gender Studies Capstone Presentations 1		Bailey 101
2G: On-Campus Food Forest Discussion Room		MacVittie College Union Fireside Lounge
2H: Applied Mathematics and Physics		Bailey 104
2I: Dance, Opera, and Social Change		Bailey 105
2J: Applied and Computational Mathematics with Statistical Analysis		Bailey 204
2K: Asian-American Undergraduate Students' Experience during the COVID-19 Pandemic		Bailey 103
2L: Students Making Change on Geneseo's Campus and Beyond		Bailey 203
2M: Navigating Social Media and Remote Work		Bailey 201
<b>MUSIC FESTIVAL: A CAPELLA HOUR</b>	11:00 AM - 12:00 PM	Doty Recital Hall
<b>CELEBRATING THE ARTS: POETRY READING: ON APOLOGIES</b>	12:00 PM - 12:30 PM	Sturges Quad (Rain location: Blake 208/210)
<b>POSTER SESSION 1</b>	12:00 PM - 1:30 PM	MacVittie College Union Ballroom

<b>MUSIC FESTIVAL: STRING BAND PERFORMANCE</b>	12:00 PM - 12:30 PM	MacVittie College Union Lobby
<b>MUSIC FESTIVAL: PIANO GARDEN PROJECT</b>	12:45 PM - 1:45 PM	Brodie
<b>CELEBRATING THE ARTS: POETIC GALLERY: PRETTY LITTLE THINGS</b>	12:45 PM - 1:45 PM	Welles 111
<b>KEYNOTE: DR. DIANE STANITSKI '89, JACK '76 AND CAROL '76 KRAMER ENDOWED LECTURESHIP</b>	1:45 PM - 3:00 PM	Wadsworth Auditorium
<b>CONCURRENT SESSION 3</b>	3:15 PM - 4:30 PM	
3A: History of Mathematics II		Bailey 204
3B: Edgar Fellows Panel 4		Welles 131
3C: Edgar Fellows Panel 5		Welles 132
3D: Women's and Gender Studies Capstone Presentations II		Welles 115
3E: Cultural Change and Remembering the Past		Bailey 105
3F: Words and Birds: Early English Language and Literature		Welles 216
3G: Gender, Race and War in K-12 classrooms		Bailey 102
3H: Lessons from Fish Biology: Metabolism, Stress, Development, & Diversity		Bailey 103
3I: The Stakes of Politics in the 2020s		Bailey 104
3J: On-Campus Food Forest Discussion Room 2		MacVittie College Union Fireside Lounge
3K: Law, Literature, and Humanities		Welles 119
3L: African Lived Experiences Represented in African Literary Works		Welles 117
<b>MUSIC FESTIVAL: MUSIC ENSEMBLES</b>	3:15 PM - 4:30 PM	Wadsworth Auditorium
<b>POSTER SESSION 2</b>	4:30 PM - 6:00 PM	MacVittie College Union Ballroom
<b>RECEPTION</b>	4:45 PM - 5:45 PM	MacVittie College Union Ballroom
<b>CELEBRATING THE ARTS: HERSTORY - DANCE PERFORMANCE</b>	6:00 PM - 7:00 PM	Schrader 152

# 2022 GREAT DAY Honors and Proceedings of GREAT Day 2021

## GREAT DAY HONORS

Each year on GREAT Day we acknowledge the work of so many whose support and dedication make GREAT Day the special program that it has become. Thank you sponsors and GREAT Day Proceedings participants.

## FIFTEEN-YEAR AND 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 16<sup>th</sup> Annual GREAT Day, we would like to acknowledge the following faculty and staff who, as of this year, have served as a sponsor for at least 15 or 10 GREAT Days:

### 15-YEAR SPONSORS

#### BIOLOGY

Jennifer Apple  
Isidro Bosch  
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Susan Bandoni Muench

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#### ENGLISH

Graham Drake

#### GEOLOGICAL SCIENCES

Dori Farthing  
Scott Giorgis  
D. Jeffrey Over

#### MATHEMATICS

Christopher Leary

#### PHYSICS AND ASTRONOMY

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Charles Freeman  
James McLean  
Stephen Padalino  
Aaron Steinhauer

#### PSYCHOLOGY

Ganie DeHart  
Michael Lynch  
Monica Schneider



### 10-YEAR SPONSORS

#### ANTHROPOLOGY

Kristi Krumrine

#### THEATRE AND DANCE

Jonette Lancos



### 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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#### PSYCHOLOGY

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#### SCHOOL OF EDUCATION

Jeanne Galbraith

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Becky Leathersich

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Jessica Gilbert

#### POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

Hannah Brant  
Andrew Hart

#### OFFICE OF SUSTAINABILITY

William McDevitt

#### HISTORY

Amanda Lewis-Nang'ea

## PROCEEDINGS OF GREAT DAY 2021

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 2021 is now available!

### Featuring:

- Interview with Dr. Adam Frank, Helen F. and Fred H. Gowen Professor at the University of Rochester's Department of Physics and Astronomy, presenter of the GREAT Day 2021 Jack '76 and Carol '76 Kramer Endowed Lectureship keynote address.
- Interviews with Lytton Smith, Professor of English and Director of the Center for Integrative Learning and Anne Baldwin, Director of Sponsored Research, GREAT Day 2021 co-chairs.
- Interview with Jaime DeVita, student editor for the Proceedings of GREAT Day 2020

STAFF: ALLISON BROWN AND DANIEL ROSS

STUDENT EDITORS: **ETHAN OWENS AND QUINTEN SESKIN**

## Students and Faculty Mentors Published in the Proceedings of GREAT Day 2021

THE MENTAL AND EMOTIONAL IMPACT OF BEING A COLLEGE-AGED BLACK WOMAN AMID THE CURRENT SOCIOPOLITICAL CLIMATE

**DREW BRODY O'NEIL**  
MELANIE MEDEIROS

CARE IN A COLLEGE PANDEMIC: MASKS AS AN EXTENSION OF THE SELF

**ELIZABETH MAC KAY**  
JENNIFER GUZMAN

MASK CULTURE

**EMILY VESPERMAN AND ALLISON PANARO**  
MELANIE MEDEIROS

LGBTQ+ EXPERIENCES WITH THE COVID-19 PANDEMIC

**ISABELLE STITT-FREDERICKS**  
MELANIE MEDEIROS

SAMANTHA EGE: REVEALING THE LEGACY OF BLACK CLASSICAL COMPOSERS THROUGH THE WORK OF FLORENCE PRICE

**ALLISON NORTH**  
MONICA HERSHBERGER

THE GENESEO LITERARY MAGAZINE PROJECT

**LARA MANGINO**  
RACHEL HALL

MUSLIM INTEGRATION IN SWEDEN AND THE NETHERLANDS IN THE TWENTY-FIRST CENTURY

**NICHOLAS LORENZO**  
ROBERT GOECKEL

IDENTIFYING POTENTIAL RNA BINDING DOMAINS IN THE THUMB REGION OF R2 PROTEIN

**BROOKE DEMETRI AND JESSICA PALMERI**  
VARUNI JAMBURUTHHUGODA

THE EFFECTS OF BIOLOGICAL CONTROLS ON SOIL SEEDBANKS AND THE HABITAT RESTORATION OF A SECONDARY SUCCESSIONAL FOREST

**ANNA MEICHENBAUM**  
SUANN YANG

ENVIRONMENTAL EDUCATION: AN ACTIVE PEDAGOGY TO INTEGRATE ENVIRONMENTALISM, ENGAGEMENT, AND EQUITY

**OLIVIA WHITMARSH**  
ROBERT FEISSNER

BLACK GEOGRAPHIC POSSIBILITIES IN HIGHER EDUCATION

**KAZON ROBINSON**  
JENNIFER ROGALSKY

RAINWATER HARVESTING ON GENESEO'S CAMPUS

**CHARLIE KENNY**  
AHMAD ALMOMANI

DISENTANGLING NATURE VERSUS NURTURE IN A MOUSE MODEL OF ALCOHOL USE

**LAURA BAUER**  
ALLISON BECHARD

APPLICATION OF THE SEIRD EPIDEMIC MODEL AND OPTIMAL CONTROL TO STUDY THE EFFECT OF QUARANTINE AND ISOLATION ON THE SPREAD OF COVID-19

**LUZ MELO**  
SEDAR NGOMA

# The Jack '76 and Carol '76 Kramer Endowed Lectureship

## Community, Climate, and Communication: A GREAT Combination

DR. DIANE STANITSKI , '89, PHYSICAL SCIENTIST

Thu. April 21st, 1:45-3:00pm, Wadsworth Auditorium



### About Dr. Diane Stanitski, Deputy Director of the [NOAA Global Monitoring Laboratory](#)

Dr. Diane Stanitski graduated from SUNY Geneseo in 1989 with a double major in Geography and Communications while also spending four years on the intercollegiate women's soccer team as a Geneseo Knight. Her growing interest in climate led her to graduate school at Arizona State University where she had the opportunity to conduct fieldwork at the top of the Greenland Ice Sheet and across the Juneau Icefield in Alaska. She completed her dissertation research along the Colorado River studying the impacts of Glen Canyon Dam on the downstream riparian climate.

In 1997, Diane became a professor in the Geography-Earth Science Department at Shippensburg University, PA where she took students to the field and taught courses in the outback of Australia, the depths of the Grand Canyon, and rural Vietnam. After a 3-week journey to the tropical Pacific as a Teacher at Sea, Diane transitioned to working for the National Oceanic and Atmospheric Administration (NOAA) where she received the NOAA Environmental Hero Award for her work in science education. Diane first worked as a program manager in the NOAA Climate Program Office, supporting an international OceanSITES program that involved populating the ocean with buoys and emerging technology to improve our understanding of the changing climate.

Diane now serves as Deputy Director of the NOAA Global Monitoring Laboratory (GML) in Boulder, Colorado, overseeing atmospheric monitoring stations around the world where critical observations are made of greenhouse gases and other important atmospheric constituents. The science conducted at GML contributes to the Intergovernmental Panel on Climate Change (IPCC) and other major scientific reports. Additionally, Diane serves as co-chair of the US Global Change Research Program's Observations Interagency Working Group, coordinating NOAA's climate observing efforts with other federal agencies. She previously served as the Executive Director of the PA Geographical Society, Director of the Climate Specialty Group of the Association of American Geographers, and a co-chair of the American Meteorological Society's Symposium on Education.

Diane has co-authored five children's science books and enjoys traveling, sailing, cycling, ham radio, and volunteering in her church and community. Her career has taken her to more than 40 countries across six continents. She also taught climate change and geography courses at the US Naval Academy, the University of Colorado at Boulder, and Montana State University during her 15-year teaching career.

# Music Festival

## String Ensemble

10:30-11:00am Thursday, 21 April, 2022, Doty Recital Hall

### 280 • String Quartet

Andrew Bergevin, Piper Beckwith, Elle Maier, Emma Oechsner

#### Abstract

A performance by the String Quartet

#### Subject Category

Arts and Humanities Categories: Music

#### Faculty Sponsor Department

Music

#### Faculty Sponsor

Andrew Bergevin

## A Capella Hour

11:00am-12:00pm Thursday, 21 April, 2022, Doty Recital Hall

### 287 • A cappella performance

**HIPS N HARMONY 11-11:12AM**

**EMMELODICS 11:12-11:24AM**

**EXIT 8 11:24-11:36AM**

**BETWEEN THE LINES 11:36-11.48AM**

**SOUTHSIDE BOYS 11.48AM-12.00PM**

Jenna Guyette, Sparrow Potter, Grace McMillan, Evan Weaver, Madelyn Hill, Allen Sanders, Genna Burke, Jacob Roberts, Lindsey O'Hern, Noah Longshore, Katie Cole, Taylor Bramhall, Kevin Barbuto, Lauryn Bennett, Olive Crawford, Lyndsay Tudman, Olivia Aupperlee, Hannah Brewer, Sophia Crisafulli Longobardi, Madeline Cheney, London Patane, Gwen Cunningham, Grace Perry, Khara Simons, Emily Zenger, Paige Spiehler, Isabella Picciano, Hannah Cole, Nicole Acquavella, Aidan Nichols, Andrew Kemler, Taylor Constantino, Kaylie Barbosa, Julia Grunes, David Cross, Alex O'Reilly, Penelope Zenhausern, Nicole Lallier, Abby Rockwood, Anna Krebbeks, Ellie Crowe, Lauren Magans, Julia Berger, Alexa Sampugnaro, CJ Lee, Jaideep Dhamoon, Jayden Sherman, Jordyn Axelrod, Julia Yakowyna, Kat Johnson, Katie Edwards, Kelly O'Kane, Kyle Caster, Logan Linares, McKenzie Flynn, Mel Dembinski, Melanie Clancy, Prince Massie, Rebecca Wowk, Sarah Mertson, Bradley Adams, Jacob Anspach, Robbie Beirne, Cameron Franke, Jacob Goldberg, Aidan Hellman, Joshua Hemmings, Jeffrey Kucerak, Evan Panzer, Brian Parrett, David Potter, Justin Robinson, Ethan Shaw, Ryan Silverstein, Harrison Smith, Christian Tewksbury, Kieran Thomas

#### Abstract

Performances by Geneseo's A Cappella Groups

#### Subject Category

Arts and Humanities Categories: Music

**Faculty Sponsor Department**

Music

**Faculty Sponsor**

Monica Hershberger

## String Band Performance

12:00-12:30pm Thursday, 21 April, 2022, MacVittie College Union Lobby

### 279 • String Band

Annalise Campo, Abigail Dove, Michelle Gagliardo, Li Jensen, Timothy Kresock, Gianna Mantha, Evan Panzer, Samantha Rompala

**Abstract**

Performance by the String Band

**Subject Category**

Arts and Humanities Categories: Music

**Faculty Sponsor Department**

Music

**Faculty Sponsor**

James Kimball

## Piano Garden Project

12:45-1:45pm Thursday, 21 April, 2022, Brodie

### 128 • Geneseo Piano Garden Project

Samantha Rompala, Li Jensen, Evan Panzer, Kaylie Barbosa

**Abstract**

In the late 1960s, New Zealand composer Annea Lockwood (b. 1939) began working on a series of four compositions for pianos that were no longer in playable condition. She eventually called these pieces Piano Transplants. In the second one, "Piano Garden," Lockwood turned a broken piano into a natural masterpiece by planting a garden in and around it. On GREAT Day 2022, the Piano Garden Committee will recreate "Piano Garden." The purpose of this project is to highlight connections between the arts and sustainability, and to bring the campus and community of Geneseo together. The Piano Garden Committee will plant their garden in and around a well-loved but no-longer-playable piano in the courtyard in front of Brodie Fine Arts Building. Following the committee garden planting, students and faculty will perform live music.

**Subject Category**

Arts and Humanities Categories: Music

**Faculty Sponsor Department**

Music

**Faculty Sponsor**

Monica Hershberger, Michael Masci

## Music Ensembles

3:30-4:30pm Thursday, 21 April, 2022, Wadsworth Auditorium

### 282 • Percussion Ensemble

Benjamin Zakes, Devon Underwood, Hannah M. Smith, Joshua Hemmings, Katelyn Adis, Katherine Burns, Lucas Glomb, Nicholas Mazzola

#### Abstract

A performance by SUNY Geneseo's Percussion Ensemble.

#### Subject Category

Arts and Humanities Categories: Music

#### Faculty Sponsor Department

Music

#### Faculty Sponsor

Jim Tiller

### 283 • Jazz Ensemble

Adam Comstock, Anthony DeFazio, Andrew Granger, Dominic Rodriguez-Donohue, Daniel Coffed, Erica Hoenig, Frank Bubbico, Genna Burke, Hannah Nyhan, Jillian Orr, Jessica LoPresti, Kayla Andersen, Nicholas Mazzola, Ryan Lehning, Spencer Ruediger, Thomas Festa

#### Abstract

A performance by SUNY Geneseo's Jazz Ensemble

#### Subject Category

Arts and Humanities Categories: Music

#### Faculty Sponsor Department

Music

#### Faculty Sponsor

William Tiberio

### 284 • Trumpet Ensemble

Alannah Egan, George Perdomo, Jack Katz, Thomas Festa

#### Abstract

A performance by SUNY Geneseo's Trumpet Ensemble

#### Subject Category

Arts and Humanities Categories: Music

#### Faculty Sponsor Department

Music

#### Faculty Sponsor

Roy Smith

# Celebrating the Arts

## Battle of the Artists

10:00am-6:00pm Thursday, 21 April, 2022, MacVittie College Union Kinetic Gallery

## Poetry Reading: On Apologies

12:00-12:30pm, Sturges Quad (Rain location: Blake 208/210)

### 281 • On Apologies

Shannon Altman, Emma Belica, Lauren Davies, Heather Heckman, Jessica Marinaro, Genevieve Moulton, Shawna Smith, Maddie Tavernier, Ralph Velasquez, Mandy Xiang

#### Abstract

Layli Long Soldier's poetry collection *Whereas* asks us to consider apologies. We all know that many of the apologies we encounter on a day-to-day basis are less than ideal, but after reading Long Soldier's poetry we find ourselves asking what exactly makes a bad apology—how do we identify it? What makes a good apology? What purpose does apologizing serve, especially in the face of serious grievances? Through a reading of our creative writing, we want to explore the function and building blocks of the modern apology, to dig deeper into the meanings behind our words so we may consider what elevates an apology from a performative action to a genuine sentiment.

#### Subject Category

Arts and Humanities Categories: English

#### Faculty Sponsor Department

English Department

#### Faculty Sponsor

Ken Cooper

## Poetic Gallery: Pretty Little Things

12:45-1:45pm, Welles 111

## Herstory - Dance Performance

6:00-7:00pm, Schrader 152

### 26 • Herstory

Natasha Frank, Madison Harding, Kiera Horan, Thalia Maynor, Alexandria Richards

#### Abstract

*Herstory* (*Her-story*) is a new dance work celebrating the struggle and strength of women choreographed by Andrae Dunwoody. The new work fuses modern, street jazz and hip hop to music by Dianne Reeves and Janet Jackson. Herstory powerfully weaves individual narratives of women that speaks to a shared and collective experience across differences. Herstory developed out of a new academic microcredential program Performance as Social Change. The program promotes an understanding of the critical role arts-based performances play in facilitating and advancing social change through interdisciplinary coursework. Through a collaboration with the guest artist Andrae Dunwoody from Rochester, New York, students drew on their lived experiences and research in the course to create the dance. Originally composed of eighteen students, Herstory is restaged with five dancers. Restaging the work offers students an opportunity to further develop their character and the interpretation of the dance for new audiences. Designed with an expressed commitment to diversity, equity, inclusion and racial justice, students exit the course with a broad array of transferable

skills and competencies related to social change, leadership, multiculturalism, civic engagement, research, communication and performance.

**Subject Category**

Arts and Humanities Categories: Dance

**Faculty Sponsor Department**

English

**Faculty Sponsor**

Mark Broomfield

## Concurrent Sessions

### 1A: Linguistic Justice

9:00-10:15am Thursday, 21 April, 2022, Welles 115

**Session Chair**

Thalia Maynor

### 212 • History and Connotations of Linguistic Assimilation

Matthew Keller

**Abstract**

As a speaker and writer of primarily White Mainstream English, my presentation's goal will be to exemplify how arbitrary language is and how there is no 'right' or 'wrong' way to speak English. I'll go over some examples of how standardized English has been used in the past as an assimilating force, how it continues to be used in this way, and how we may begin to see that use change in the near future. This will primarily be the history and connotations part of the group presentation.

**Subject Category**

Arts and Humanities Categories: English

**Faculty Sponsor Department**

English

**Faculty Sponsor**

Gillian Paku

### 252 • Decolonize the Mind: Developing Black Linguistic Consciousness

Makayla Williams

**Abstract**

My presentation is an introduction to the socio-linguistic scholarship of April Baker-Bell and a discussion of how Baker-Bell's methods, findings, and questions can be related to the Geneseo campus community to create change. Baker-Bell has co-authored a demand for Black Linguistic Justice that urges us to "decolonize our minds." Her work invites us to think about how much we internalize current social beliefs around standardized English and Black English, what damage those beliefs can do, and what sort of information we need in order to start raising a different, more inclusive, anti-racist linguistic consciousness. I'll lead a discussion on what kinds of changes we could introduce at Geneseo.

**Subject Category**

Arts and Humanities Categories: English

**Faculty Sponsor Department**

English

**Faculty Sponsor**

Gillian Paku

**206 • She Talking Like: Code-Meshing**

Thalia Maynor

**Abstract**

One important way to affirm Black English not only as a legitimate language but also as one that can be used effectively in academic writing is to code-mesh. My presentation will explain both code-switching and code-meshing, provide examples of and resources for code-meshing, and discuss some of the common queries about or pushback against it. I'll present some of my own code-meshing in Geneseo coursework, connecting the ground-breaking work of Loretta Mary Aiken ("Moms Mabley") to the importance of bringing Black English into new academic spaces to change the status quo rather than conforming to it.

**Subject Category**

Arts and Humanities Categories: English

**Faculty Sponsor Department**

English

**Faculty Sponsor**

Gillian Paku

**1B: Adopt-a-Business: Small Businesses Bounce Back**

9:00-10:15am Thursday, 21 April, 2022, Welles 119

**Session Chair**

Eric Brown

**218 • Adopt-a-Business: Small Businesses Bounce Back**

Giovanni Cicordia-Timm, Joseph DiGilio, Michael Gannon, Madison Harding, Heather Hashizume, Madison Mulder, Gabrielle Scibelli

**Abstract**

Hear what the Adopt-a-Business interns have worked on this past academic year to get Western New York small businesses back on their feet after the many struggles they have faced due to the pandemic. Through client meetings both virtually and in person, the interns have provided business owners with the digital marketing tools needed to stay competitive. Adopt-a-Business has been able to see these businesses return back to pre-COVID levels after delivering support with social media marketing strategies by introducing clients to new platforms and resources available to help with their needs. These businesses have learned how to adapt to the continuing shift to online events and the new marketing strategies that have emerged. Join us in watching how we have helped our clients reinvigorate the digital transformation of their business to connect with others and build customer relationships in the local community.

**Subject Category**

School of Business Categories: Marketing

**Faculty Sponsor Department**

Small Business Development Center

**Faculty Sponsor**

Peter Markulis

**1C: Edgar Fellows Panel 1**

9:00-10:15am Thursday, 21 April, 2022, Welles 131

**Group Session Chair**

David Levy

**173 • Understanding the Inequities Created by a Neoliberal Approach to Education & Adopting Equitable Practices in the Mathematics Classroom**

Kaitlin Miron

**Abstract**

In 1954, Brown v. Board of Education was a landmark decision credited with desegregating schools. However, white families used school choice – among other methods – to maintain segregation in schools. School choice models are still used today, with proponents claiming that a neoliberal approach to education leads to competition between schools, forcing districts to improve the quality of education their schools offer. This approach to education begs the following questions: Who has access to actually engage in school choice? What happens to a public school that cannot compete? In a neoliberal context, school closures are not uncommon, and often non-public means of schooling will take place of closed schools, impacting the surrounding community. Another common justification for school closures is underutilization of schools, yet the same schools that are labeled as “underutilized” often struggle with being under-resourced. Resource distribution in schools is largely dependent on local property taxes, as well as state and federal funding, which often come with performance-based stipulations. Ultimately, this neoliberal approach to public education entrenches inequities in one of our last socialized institutions. Teachers need to bear in mind the inequities their students face as they design lessons and establish their teaching practices. As a Math Adolescent Education major, I will share ways in which the math classroom can become a more equitable place for all students by analyzing teaching practices and ways to incorporate multicultural and historical contexts for math, in order to change student perceptions of who belongs in the math field.

**Subject Category**

School of Education Categories: Adolescence Education: Mathematics

**Faculty Sponsor Department**

Mathematics

**Faculty Sponsor**

Erin Harris

**171 • The Emmeline Austin Wadsworth Memorial Fountain: Its Past and Its Future**

Emily Benton

**Abstract**

The Emmeline Austin Wadsworth Memorial Fountain on Main Street is a major landmark in the town of Geneseo. Overtime, changes have been made to the fountain, both for its benefit and detriment. These changes can be used to observe the town of Geneseo over the years and how public monuments such as this age. In both 2009 and 2016 the fountain was worked on by conservators at Moorland Studios to repair and preserve the monument. The current condition of the fountain, the conservation work performed in the past, and potential future work that will be considered.

**Subject Category**

Arts and Humanities Categories: History

**Faculty Sponsor Department**

Art History

**Faculty Sponsor**

Lynette Bosch-Burroughs

**172 • Her Clothes Are Kinda Funny, Her Hair is Running Wild and Free: A Comparative Study of Body Image in Media**

Madeline Miller

**Abstract**

This presentation examines body type representation on two social media applications -- Tik Tok and Instagram -- along with the frequency of sexualized content on each app. How do these factors impact the average viewer? Is there anything Tik Tok and Instagram can do to prevent over-sexualized content on their application? How do the differing demographics of these apps impact our answers to these questions? With new consumers of all ages signing up for these apps every day, the questions above and their answers become more important than ever in an increasingly media-driven society.

**Subject Category**

Social Science Categories: Psychology

**Faculty Sponsor Department**

Psychology

**Faculty Sponsor**

Steven Kirsh

**1D: Edgar Fellows Panel 2**

9:00-10:15am Thursday, 21 April, 2022, Welles 132

**Session Chair**

Wendy Pogozeleski

**164 • Is Cool Japan Cool?**

Michael Kleinlercher

**Abstract**

Japanese cuisine, music, and animation have taken the world by storm – in general terms, soft power used effectively capturing the eyes of children and adults over the past 40 years. This phenomenon originally gained traction in part due to an explosive postwar economy and a powerful democratic government, setting Japan up as a relatively stable modern state. Presently, the rise of Korean popular culture has challenged Japan as a rival in soft power exports. This ‘Korean Wave’ sparked in the 1990s due to the mass popularity of Korean dramas and pop-music. During this early period, Korean influence abroad was minimal whereas the Japanese government was already an established power. A rapid spread in popularity blindsided the Japanese government, which in 2013 spawned the ‘Cool Japan’ initiative as a reaction to potential waning influence. This paper discusses the desired objectives of Japanese soft power through promotion of ‘Cool Japan,’ the effectiveness of the program, as well as issues with enactment of the ‘Cool Japan’ initiative. This will be compared with the ‘Korean Wave’ and its effectiveness, followed by potential policy changes to ‘Cool Japan’ to assist in the wielding of soft power abroad.

**Subject Category**

Social Science Categories: Political Science

**Faculty Sponsor Department**

Political Science and International Relations

**Faculty Sponsor**

Anand Rao

**166 • An Econometric Analysis of the Impact of Machismo on Female Labor Force Participation in Latin America**

Hunter Roy

**Abstract**

Machismo, the societal standard of overwhelming masculinity, holds a grip on the region of Latin America and has had lasting impacts on women's roles in the public sphere. This literature review and estimated regression model seek to explain the relationship between several economic and social factors and Female Labor Force Participation rates (FLFPR) in the region of Latin America. The literature review is divided into three sections: a focus on machismo origins, the role of machismo on FLFPR, and the general relationship between gender roles and economic growth. Built off of previous research, the model uses econometric analysis to provide an estimated regression function which helps to explain the impacts of different factors on FLFPR. The model incorporates factors such as the proportion of women in parliament, the Women's Business and Law Index, adolescent fertility rates, percentage of females with a bachelor's degree, and GDP growth rates in order to determine the relationship between societal standards and FLFPR. The results show that GDP growth and female educational attainment are statistically significant and positively related to FLFPR and female government participation is statistically significant and negatively related to FLFPR.

**Subject Category**

School of Business Categories: Economics

**Faculty Sponsor Department**

School of Business

**Faculty Sponsor**

Christopher Annala

**162 • Developmental THC Exposure Produces Motor and Somatosensory Deficits**

Cassidy Goucher

**Abstract**

Tetrahydrocannabinol (THC) is the primary psychoactive ingredient in marijuana, one of the most commonly used recreational drugs in the world. With growing legalization, many mothers are consuming THC during pregnancy and many teens are using the drug. Further research is needed to understand the effects that THC has on both direct consumers, such as adolescents, and indirect consumers, such as fetuses. Current studies suggest that in-utero and adolescent exposure to THC can produce various physiological and behavioral impairments. The present study aimed to identify potential psychomotor effects of prenatal and juvenile exposure to THC. Long-Evans rat pups were assigned to two cohorts: prenatal exposure (dams received an oral dose of THC from gestational day 1 to postnatal day 21) and juvenile exposure (pups received an oral dose of THC from postnatal day 21 to postnatal day 40). A three-part motor battery—consisting of grip strength, somatosensory reflex, and motor coordination tests—was conducted throughout the lifespan at juvenile, young adult, middle age, and old age periods. Developmental THC exposure significantly increased somatosensory reflex latency time along a dose response curve in both male and female rats, but had no effect on grip strength capabilities. Motor coordination followed a dose-response curve for juvenile animals, but a reverse dose-response curve for young adult animals. Altered mechanisms of the cannabinoid receptor type-1 (CB1R) system, including GABA, glutamate and dopamine responses, may explain some of the motor abnormalities observed in this toxicological study.

**Subject Category**

Social Science Categories: Psychology

**Faculty Sponsor Department**

Psychology

**Faculty Sponsor**

Vincent Markowski

## 1E: Prisons, Police, and Power: A Critical Examination of Systems of Social Control and Punishment in the United States

9:00-10:15am Thursday, 21 April, 2022, Welles 117

**Session Chair**

Denise Scott

### 39 • Racial Disparities in Sentencing Practices in the United States

Amy Lynch

**Abstract**

Studies have shown that the prison system treats people unfairly and has led to mass incarceration, in the United States. Multiple practices have been implemented in the system, such as mandatory minimum sentences, which exacerbate the mass incarceration problem. Moreover, Black Americans are far more likely to be imprisoned than whites. It is not because Black people commit crimes more often than white people, but because there are unequal sentences and other consequences for similar crimes based on a person's skin color. Scholars argue that, in modern times, rather than something that is obvious and overt, or clearly written into laws, racism and other forms of inequality are more subtle in the sense that they are experienced through the ways that laws are practiced and followed. In this paper, I look at how Foucault's theory of the panopticon represents the structure of the prison as well as the experience of people upon their release from prison; specifically, when they are a part of the parole or probation program. Racial disparities as they pertain to the prison system, not only affect those incarcerated, but also families and children, voting and the results of elections, and socioeconomic status. Changes should be made in order to fix the prison system and these problems; however, there are various changes that could be made it is unclear what would be the best solution. I argue that the changes would have to be widespread and dramatic to be effective at reducing these differences.

**Subject Category**

Social Science Categories: Sociology

**Faculty Sponsor Department**

Sociology

**Faculty Sponsor**

Denise Scott

### 41 • Mass Incarceration in the Land of the Free

Makenzie Pagano

**Abstract**

Beginning in the 1970s, America's incarcerated population began to rapidly increase. Since then, America has become the world leader in incarceration. America, despite being known as "the land of the free," holds the highest number of incarcerated individuals, in terms of the total number and per capita. However, the system of mass incarceration has not equally targeted all individuals or groups in the U.S. There are huge racial disparities among the incarcerated population. America disproportionately incarcerates minorities, specifically Black and Latino populations, compared to their white counterparts. This paper argues that we need to look at the treatment of minorities throughout America's

history to acknowledge and understand that mass incarceration in America is and should be viewed as, a system of racialized social control. Throughout America's history, there's been political subjugation and categorization based on race, along with cultural beliefs about racial categories, which combine to structure our politics, policies, and institutions. The system of mass incarceration is a result of policies and practices embedded with racial bias. In fact, I found that policymakers are more likely to be manipulated and influenced by racial stereotypes which associate black people and racialized immigrants with crime. Therefore, my findings suggest that America's system of mass incarceration purposely targets minority populations, and is a system of racialized social control.

**Subject Category**

Social Science Categories: Sociology

**Faculty Sponsor Department**

Sociology

**Faculty Sponsor**

Denise Scott

**42 • Backing the Blue: The Enabling Institutions of Police Misconduct**

Mikaela Burke

**Abstract**

For many in the U.S., the importance of protecting the interests of the free market has provided justification for the need for police. Moreover, we often defend police misconduct because, when an emergency occurs, there is often no other option but to call the police. When officer misconduct occurs, we are often placated by the fact that perhaps it was just one bad apple. However, my paper attempts to show that the way we think about policing as a faulty but generally benevolent institution is not an accident and has for years been propagated by the federal, state, and local governments alongside police unions, creating what Antonio Gramsci refers to as a "false consciousness" among the American public. By examining the location of police in the American class structure, and the unions that conceal and protect them from consequence, I highlight how police act in contrast to the interests of the general public and function primarily as weaponized managers of property on behalf of the state. I also discuss the discretionary power of police, the ideological impacts of 'Back the Blue,' and how policing can truly affect the lives of the most vulnerable and disadvantaged populations. Finally, I stress the importance of considering the consequences of living within a well-funded, highly-militarized security state and the possible alternatives to this status quo.

**Subject Category**

Social Science Categories: Sociology

**Faculty Sponsor Department**

Sociology

**Faculty Sponsor**

Denise Scott

**1F: The Ripple Effects of Slavery in North America**

9:00-10:15am Thursday, 21 April, 2022, Bailey 101

**Session Chair**

Justin Behrend

**99 • "My Attachment to Rochester... Shall Endure with My Life": Frederick Douglass, Amy Post, and Social Reform Networks in 1850s Rochester, NY**

Jenny Bartholomay

**Abstract**

When Frederick Douglass moved to Rochester in 1847 to begin his newspaper publishing career, the city was already home to several passionate abolitionists and social activists. This included Amy and Isaac Post, who were also involved in the women's suffrage, temperance, and religious reform movements. What Rochester lacked, however, was the kind of iconic leader cities like Boston found in William Lloyd Garrison. By utilizing New York's existing abolitionist network to grow his newspaper and fund Underground Railroad activity, Douglass not only became a leader in Rochester that highlighted the role of Black Americans in the abolitionist movement, but he also developed several relationships that revealed deep connections between various social reform efforts of the time.

Understanding the significance of Douglass's time in Rochester relies heavily on the analysis of personal correspondences between Douglass and fellow abolitionists, excerpts from his newspaper, and publications from anti-slavery societies in the area. These sources present the challenges and successes of mid-nineteenth-century social reform efforts in a less romantic way than many popular myths related to abolition, but still offer a compelling narrative about the work of both Black and white activists and speak to the significance of Rochester itself.

**Subject Category**

Arts and Humanities Categories: History

**Faculty Sponsor Department**

History

**Faculty Sponsor**

Justin Behrend

**121 • Chairs, Textiles, and Sugar: How Enslavement Made its Way into Northeast History Museums between 1975-1995**

Lara Goodman

**Abstract**

When acts of racial violence cascade onto the news cycles, Northeast Americans clutch their pearls and hold on tightly to the notion that they aren't responsible because there was no slavery in the north. We tell ourselves that we are the "good" part of the country and point fingers at the backward South. However, this concept of a liberal abolitionist north is a falsehood. In Summer 2020, many Americans were jolted awake to the newfound societal emphasis on Black history, culture, and credit amidst the rise of the Black Lives Matter movement. As a result, institutions such as museums started to center more on narratives of people of color to meet the demands of the public. However, the push for change within museums to showcase hard history dates back to the rise of social history in the 1960s. Just as museums were making this change in interpretation, two widespread memories of America were being disseminated to the public through the bicentennial of 1976 showcasing colonial nostalgia and recognition of Black history month in the same year. Through interviews with these museums and an evaluation of changes in interpretation, it is clear that the story of enslavement were mainly incorporated through the use of material objects, such as chairs, sugar, and textiles.

**Subject Category**

Arts and Humanities Categories: History

**Faculty Sponsor Department**

History

**Faculty Sponsor**

Catherine Adams

**165 • Relating the Iroquois Smallpox Epidemic to the Native American Slave Trade of the Lower South**

Christopher Pitre

**Abstract**

In the early 1610's and 1620's a smallpox epidemic devastated the Iroquois population. This caused a spike in warfare in the 1650's to 1701, traditionally termed the Beaver Wars, that caused the depopulation and displacement of Native nations surrounding the Iroquois. Iroquois warfare at this time was aimed at capturing as many prisoners as possible and adopting them into their society in order to repopulate their towns after the epidemic. One of the nations that were displaced due to Iroquois "mourning war" warfare was the Erie. The Erie eventually emigrated south to the colony of Virginia where they became known as the Westo. These Westo brought the gun fueled warfare of the North to the South and monopolized an industry of slave raiding for a short period of time. The Westo captured native people and forced them into slavery and then sold them to the English. The fear the Westo caused inspired the coalition of smaller nations to congregate into the Cherokee and Creek confederacies. After the dismantling of the Westo, the Cherokee and Creek became involved in the Native American slave trade specifically with the Carolina colony. A previous historian, Alan Gally, estimated that around 51,000 Native Americans were trafficked as slaves through South Carolina. This presentation aims to provide a bridge between two indigenous histories along the East Coast to show a interconnected Native American world.

**Subject Category**

Arts and Humanities Categories: History

**Faculty Sponsor Department**

History

**Faculty Sponsor**

Justin Behrend

**1G: Mathematics for Sustainability**

9:00-10:15am Thursday, 21 April, 2022, Bailey 102

**Session Chair**

Ahmad Almomani

**210 • Optimization of Renewable Energy Sources using Particle Swarm Algorithm** 

Marcus Paone

**Abstract**

In this presentation we apply a technique known as particle swarm optimization to the problem of minimizing the power generated by a renewable energy source while still meeting consumer demand. We compare the performance of this method to a technique known as artificial fish swarm optimization which was used in previous research to solve the same problem. The rate of convergence and the accuracy of both methods are analyzed.

**Subject Category**

Science and Mathematics Categories: Applied Mathematics

**Faculty Sponsor Department**

Mathematics

**Faculty Sponsor**

Ahmad Almomani

**178 • The Role of Calculus in the Sustainability of Nature and Mankind** 

Laya Davis

**Abstract**

Students who do not intend to pursue careers involving mathematics often ask “how will learning calculus help me in the future?” This question is highly valid; however, it often goes unanswered. Even those who do plan to pursue mathematical careers often have a disconnect between their calculations and the application of such computations. This presentation bridges the gap between the two fundamental theorems of calculus, differentiation and integration, and the real world. Through the application of derivatives and integrals, real-world problems regarding sustainability and wellness will be examined, along with possible solutions. The environment plays a huge role in everyone's lives, creating an opportunity for all majors and interests to benefit from this discussion. The purpose of this presentation is to not only increase the knowledge of calculus but also increase the awareness of how it could help solve the ecological problems we face.

**Subject Category**

Science and Mathematics Categories: Applied Mathematics

**Faculty Sponsor Department**

Mathematics

**Faculty Sponsor**

Ahmad Almomani

**203 • Wind Farm Optimization** 

Jackson Brazo

**Abstract**

Climate change is a growing problem, one of our concerns being the lack of sustainable energy resources caused by a heavy reliance on nonrenewable energy sources such as fossil fuels for power. One possible solution would be to convert from nonrenewable energy resources to their renewable counterparts, such as wind power. The focus of this presentation will be the optimization of a large scale wind farm operation to aid in the planning of this potential operation to ensure the best possible results. The objective for this model is to maximize the total power extracted by the wind turbines as a function of the wind speed, direction, intensity, and probability of occurrence. I will be using four different derivative free algorithms, Genetic Algorithm(GA), Particle Swarm(PSO), Simulated Annealing(SA), and Pattern Search(PS), to optimize the production capacity of the wind farm. All four of these algorithms are derivative free solvers, they each use different random search techniques to find the maxima or minima in order to avoid difficult or time consuming derivative calculations. I will apply each of the four algorithms to the given objective above one hundred times and compare the results using a data profile and performance profile to determine which solver works best with the given objective. The factors used in comparison are the percentage of runs which find the global extremum as well as the average number of iterations per run required to find the global extremum.

**Subject Category**

Science and Mathematics Categories: Applied Mathematics

**Faculty Sponsor Department**

Mathematics

**Faculty Sponsor**

Ahmad Almomani

**182 • Using Mathematical Modeling to Create a New Pyramidal Compost Bucket Design** 

Elizabeth Klosko

**Abstract**

SUNY Geneseo's campus has a compost collecting program where students, faculty, and staff can empty their compostable items into bins which are emptied weekly. However, the bins release a putrid scent when opened, deterring SUNY Geneseo community members from using them. A phenomena commonly known as Pyramid Power

claims that the pyramid shape, when exactly scaled to the size of the Great Pyramid of Giza, has properties that, once compostable items are put under it, can limit the growth of microorganisms and therefore reduce the foul smell. Using a 3-D printing device, we will scale and print the pyramid to the size of the current compost buckets. Then, we will test if microorganism growth and foul scent is decreased inside the pyramid shape as compared to inside the current compost bucket design.

### Subject Category

Science and Mathematics Categories: Mathematics

### Faculty Sponsor Department

Mathematics

### Faculty Sponsor

Ahmad Almomani

## 1H: Student Projects for Sustainable Impact, Local and Global

9:00-10:15am Thursday, 21 April, 2022, Bailey 104

### Session Chair

Dan DeZarn

## 251 • Inclusion and Sustainability: An Ethnography of BIPOC Student's Experience in SUNY Geneseo

Jess Rivera, Uniqua Jones

### Abstract

Sustainability is an ever-growing space with increasing diversity in the academic realm from its humbling beginnings. Environmental education-related programs are increasingly expanding and offering a plethora of courses and co-curricular activities in public universities, lagging behind more endowed private schools. Many students of color frequently attend public universities like Geneseo, face additional barriers that affect their academic and social involvement, more so if they are first-generation college students. This research serves to assess how Geneseo serves or neglects certain aspects of amending these additional barriers students of color face and their presence in “green” spaces and how it relates to addressing the structural racism in engaging with these spaces. Through a mix of ethnographic interviews and survey data, we focused on extracting key themes to summarize how these power dynamics may be perpetuated or address these inequities. Through various program offerings such as internships, courses, and community programming many Black, Latine and Asian students face many facets of this structural racism in Predominately White Universities, like Geneseo, in the spaces of sustainability. We hope to provide this as a baseline through mixed methods research with coding after interviews and participatory and observational notes. In a Post-Covid context, green access for students of color experiencing multiple forms of oppression can be increasingly inaccessible. We find that Geneseo takes great strides in continuing to integrate sustainability into the “Geneseo experience” but providing proactive support, avoiding tokenism, and empowering non-white voices in those spaces can be a contested question.

### Subject Category

Interdisciplinary and Other Categories: Sustainability Studies

### Faculty Sponsor Department

Office of Sustainability

### Faculty Sponsor

Dan DeZarn

## 40 • The Geneseo Compost Program

Holly Moore, Yaro Bautista Martinez, Kayla Andersen, Katelyn Adis

### **Abstract**

The purpose of this presentation is to educate the student body on compost: the decomposition process and the status of the Geneseo compost program. Composting diverts organic waste such as food scraps, plant matter, and paper products from the landfill to decompose and create nutrient-rich soil rather than adding to the landfill and emitting methane. We will discuss the origins of the program and our goals for the future. For now, the Geneseo compost program is primarily student run by members of the Office of Sustainability. The Office is operating through a directed study class called Campus Sustainability Leadership lead by Dan DeZarn, the Director of Sustainability. Within this class there are 18 students split into specialized subcommittees that work to make the Geneseo community a more eco-friendly place. The compost committee is made up of four students: Holly Moore, Yaro Bautista Martinez, Kayla Andersen, and Katelyn Adis. Once a week we drive around campus picking up and dropping off little green buckets filled with compost from the Union, residence halls, and academic buildings; then we dump them at the compost pile and clean them for the next run. Our mission is to increase compost across campus through educational workshops, publicity, media promotion, and student engagement. In this presentation, you will learn the process of composting, its environmental benefits, what exactly you can compost, and where to bring it. If you would like to become more involved in sustainability on this campus there will be opportunities offered during the presentation.

### **Subject Category**

Interdisciplinary and Other Categories: Sustainability Studies

### **Faculty Sponsor Department**

Office of Sustainability

### **Faculty Sponsor**

Dan DeZarn

## **195 • Replating Civic Engagement**

Jocelyn Haines

### **Abstract**

Imagine if you were a school-aged child in the African nation of Uganda whose school has been closed for over two years due to the COVID-19 pandemic and access to food has been negatively impacted by price fluctuations and disruptions to agrifood supply chains. Now imagine that you are a SUNY Geneseo student who is passionate about combating food insecurity on a global scale. While it seems straightforward to draft up a plan addressing this issue and implementing it yourself, it leaves out two vital components: sustainability and community input.

Keeping those points in mind, I have constructed a project that I hope will help my peers rethink how they can sustainably tackle prominent global issues such as food insecurity. This upcoming summer, I will be collaborating with local organizations in Jinja, Uganda to integrate improved energy-efficient cooking stoves into select schools in the surrounding region, providing a reliable source of nutritious food for children. The money saved on fuel will be used to further expand the stoves into the neighboring regions. Once back at SUNY Geneseo, I will share the knowledge and skills I've acquired to the college community through hands-on engagement and interactive events on-campus. This Student Ambassadorship Project was made possible by the generous donor funding for the Ambassador in Diversity.

### **Subject Category**

Interdisciplinary and Other Categories: Ambassadorship

### **Faculty Sponsor Department**

Center for Integrative Learning

### **Faculty Sponsor**

Lytton Smith

## 1I: Modeling the COVID-19 Pandemic

9:00-10:15am Thursday, 21 April, 2022, Bailey 105

### Session Chair

Gregg Hartvigsen

### 144 • Effects of Mutation, Evolution, and Partial Immunity on the SARS-CoV-2 Pandemic

Marisa Presutto

#### Abstract

Despite the recent relaxing of restrictions, the SARS-CoV-2 virus persists with new variants emerging over time. Due to their highly contagious nature, the emergence of the Omicron variants heighten our concerns for the continued evolution of this virus and its ability to evade vaccines. Continual transmission leads to more opportunities for mutations that will prolong the pandemic. Using a method that simulates the evolution of the spike protein through mutation, this study models the evolution of SARS-CoV-2 as it spreads from person to person in an individual-based network model. Mutations result in changes in the transmissibility of strains. Because of the growing diversity of strains in the population, individuals can become infected multiple times. However, partial immunity from previous strains can confer resistance. Within the model, certain strains evolved adaptive traits such as high transmissibility or a high number of mutations that allowed them to evade the immune systems of hosts. While most strains failed, a few strains had high success and led to cycles of infections as they moved through the population. Repeated periods of infections rising and falling were seen across simulations. Additionally, immunity wane had a large impact on the cycles of infection and reinfection. Ultimately, the ability of SARS-CoV-2 to evolve and escape immune response will have a significant impact on our futures.

#### Subject Category

Science and Mathematics Categories: Biology

#### Faculty Sponsor Department

Biology

#### Faculty Sponsor

Gregg Hartvigsen

### 190 • The effects of vaccination rates, waning vaccine efficacy, and network structure on the spread of SARS-CoV-2

Yannis Dimitroff

#### Abstract

The SARS-CoV-2 pandemic has impacted the entire world and led to nations trying to limit the spread of the disease through the use of vaccines. However, there is evidence that these vaccines exhibit waning efficacy. We developed a network-based SEIRV model with 25,000 people to test how vaccines can curb the spread of SARS-CoV-2 while incorporating this waning efficacy. We found that the two largest factors impacting the total number of individuals infected were the rate of vaccination and the network structure. Our model suggests that  $R_0$  of the virus significantly impacted the number of infected individuals. The negative effect of waning vaccine efficacy was extremely small compared to the overall effectiveness of vaccination rates in combating the spread of SARS-CoV-2. Therefore, our results support the continued effort to vaccinate as many people as possible to best combat the pandemic.

#### Subject Category

Science and Mathematics Categories: Biology

#### Faculty Sponsor Department

Biology

**Faculty Sponsor**

Gregg Hartvigsen

**186 • Modeling & Exploring COVID-19 and the Partisan Gap**

Grace Maley

**Abstract**

The highly transmissible SARS-CoV-2 virus gave rise to a global pandemic causing many nations to take preventative measures, such as mask wearing and social distancing, to slow its spread. These measures are not only effective in controlling the high transmission of SARS-CoV-2, but they have important impacts on the number of individuals that become infectious and the length of the pandemic. However, these measures have increasingly become more of a political issue in the U.S. where, at times, republican (red) counties have more than double the number of cases than democratic (blue) counties. We developed a network-based SEIR model to analyze this partisan gap. This network contained two model populations that each simulate expected behavior in a red county and a blue county. Interactions between these two populations were controlled using a rewire parameter and two different network structures were tested. We found that the small-world network structure significantly increased the duration of an epidemic at low rewire values compared to the preferential attachment network. Results also show that the proportion of blue individuals to red individuals is a significant variable in determining the number of overall individuals that become infected in the population. Not only did red individuals contract SARS-CoV-2 more readily when interacting with other red individuals, but when blue individuals interacted with more red individuals they suffered from more cases and red individuals had fewer. Results highlight the immense impacts that the partisan gap has on the fate of the SARS-CoV-2 virus.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

Mathematics

**Faculty Sponsor**

Gregg Hartvigsen / Christopher Leary

**1J: Genetics and Genomics**

9:00-10:15am Thursday, 21 April, 2022, Bailey 204

**Session Chair**

Elizabeth Hutchison

**64 • Genomic Study of Wild Bacteria and Yeast from New York's Finger Lakes Region**

Cole Zsemlye, Hannah Valensi

**Abstract**

Both bacterial and yeast species can perform fermentation, and these fermenters not only have important roles in the environment but have potential commercial applications as well. The goal of our project was to isolate and sequence the genome of several of these microbes. With this, we would be able to determine metabolic or biochemical pathways that allow them to be successful in these fermenting environments. To do this, samples of wild fruit, soil, and plants were collected, and serial dilutions of each sample were plated onto rich media to obtain single colonies. Colonies were selected and replated until a pure culture was obtained. Microscopy was used to determine whether the colonies were bacterial or eukaryotic in nature. Once this was determined, we isolated DNA from six chosen samples and amplified a portion of the rDNA region for preliminary identification. This resulted in finding the genus to which these samples

belong and making a rough estimate of what species they are most closely related to. Finally, we chose three strains (two yeast and one bacterial) to send for whole genome sequencing via Illumina sequencing. These genomes were analyzed using the Galaxy genome analysis interface. Quality checks were performed on the data along with annotating the genomes with Prokka and RAST software. Further research continues to characterize each isolate phylogenetically while also determining which metabolic and fermentation pathways are present in each isolate.

### **Subject Category**

Science and Mathematics Categories: Biology

### **Faculty Sponsor Department**

Biology

### **Faculty Sponsor**

Elizabeth Hutchison

## **80 • Cooperation of Selfish Genetic Elements in Stalk-Eyed Flies**

Suhani Patel, Benjamin McPherson

### **Abstract**

SGEs are selfish genetic elements that increase the likelihood of their own transmission regardless of the host's best interest. Transposable elements (TEs) and meiotic drivers are both types of SGEs. SGEs subsequently result in genetic conflict as they disrupt functional elements in the genome. We are working to better understand the cooperation of selfish genetic elements in Stalk-Eyed flies. Transposable elements are counteracted by small non-coding RNA molecules called piRNA. These RNA molecules work by reducing the expression of TEs by degrading TE RNA transcripts. Prior work in stalk-eyed flies has shown that TEs are expressed at a higher rate in male carriers of meiotic drive (SR males). We are comparing the expression of piRNA in SR and wild-type males using small RNA sequencing analysis software (proTRAC, PILFER) designed for this type of data. If meiotic drive and TEs cooperate, we would expect to see increased expression of piRNAs targeting TEs in SR males.

### **Subject Category**

Science and Mathematics Categories: Biology

### **Faculty Sponsor Department**

Biology

### **Faculty Sponsor**

Josephine Reinhardt

## **253 • Models of Meiotic Drive in *Teleopsis dalmanni***

Julia May, Usman Chaudhry, Jimin Son

### **Abstract**

The main question we are studying is; how does meiotic drive impact a population of stalk-eyed flies? The law of segregation states that one of two alleles has an equal probability of being inherited. Meiotic drive in *Teleopsis dalmanni*, or stalk-eyed flies, violates this. A specific gene causes the X chromosome to always be passed on, causing a disproportionate production of females. We created different models in SLiM 3.6, a flexible population genetics simulator, to study varying conditions and analyze the fitness impacts. Three different outcomes for the population in each simulation were possible: loss of drive, maintenance of drive, or fixation of drive (extinction). We created and maintained drive in our simulation by assigning specific fitness values to each genotype (drive male, non-drive male, drive female, non-drive female, and carrier female). The carrier female had the highest fitness, from heterozygote advantage, whereas the drive male had the lowest fitness. Then we implemented beneficial, deleterious, and neutral mutations to view the effect drive had on fitness. Followed by the addition of inversions; regions in the chromosome that do not recombine and can no longer share genetic information, of varying sizes. Within each genotype, the fitness

values were not as significantly different with the changing inversion size, compared to the fitness values between genotypes. Furthermore, we would like to implement sexual selection, specifically females preferring to mate with non-drive males, since this is representative of stalk-eyed fly behavior in nature.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Josephine Reinhardt

## 1K: Mock Trial at Geneseo Presents: State of Midlands v. Dakota Sutcliffe

9:00-10:15am Thursday, 21 April, 2022, Bailey 203

**Session Chair**

Pallavi Panda

### 70 • Mock Trial at Geneseo Presents: State of Midlands v. Dakota Sutcliffe

Alexander Berg, Danielle Crowley, Dasha Dranovsky, Trevor Funcheon, Nicole Kemmett, Lauren McCormick, Xander Michaels, Kya Primm, Daniel Regan, Carley Salerno, Abigail Verhayden, Ethan Whitehead

**Abstract**

Dakota Sutcliffe was originally charged with and convicted of felony murder. Sutcliffe's conviction was overturned, and the case was remanded back to the trial court after the Midlands Supreme Court found the felony murder rule to be unconstitutional. The State of Midlands has indicted Sutcliffe on one count of Aggravated Arson for the burning of Chuggie's Bar and the death of a local firefighter, Jaylen Williams. Join Mock Trial at Geneseo to see an abbreviated version of the fictional court case that we have spent the year preparing, presenting, and competing with against other schools and decide for yourself - Is Dakota Sutcliffe guilty?

**Subject Category**

Social Science Categories: Political Science

**Faculty Sponsor Department**

School of Business

**Faculty Sponsor**

Pallavi Panda

## 2A: History of Mathematics I

10:30-11:45am Thursday, 21 April, 2022, Welles 115

**Session Chair**

Jeff Johannes

### 46 • Is there anything he Kant do?

Sklyar Reed

**Abstract**

Until Immanuel Kant, it had always been assumed that space and time were properties of the world. In his studies of the philosophy of mind and perspective, Immanuel Kant transitioned himself from philosopher to mathematician. In an

effort to transition metaphysics into a future science, Kant throws a wrench in the common conception that synthetic a priori knowledge is impossible and provides good evidence for the possibility of pure mathematics. Being a philosopher, he was comfortable with unanswerable questions and uncertainty. In his study of mathematics as purely space and time, Kant found no need to answer questions, but to create a myriad more. In his famous *Prolegomena to Any Future Metaphysics*, Kant establishes a new take on our cognition of space and time rather than the reality of it as the laws of nature are simply the laws of our mental faculties. When answering the question, which is also the title of part one of his prolegomena, "how is pure mathematics possible," Kant reveals the answer in our underlying intuitions of space and time as well as our sense experience of the concepts.

**Subject Category**

Science and Mathematics Categories: Mathematics

**Faculty Sponsor Department**

Mathematics

**Faculty Sponsor**

Jeff Johannes

**47 • Integration by Parts**

Danielle Bellis

**Abstract**

I will discuss the history surrounding integration by parts. My presentation will cover a historical proof of its validity, some background on its founder, Brook Taylor, as well as what the integration by parts formula might've been used for at the time of its inauguration. This presentation will give the listeners a perfect mixture of mathematics and history: our two favorite things!

**Subject Category**

Science and Mathematics Categories: Mathematics

**Faculty Sponsor Department**

Mathematics

**Faculty Sponsor**

Jeff Johannes

**49 • An In Depth Look at the Origins of Game Theory and the Nash Equilibrium**

Alex O'Reilly

**Abstract**

Game Theory is not only used in economics, but also in things like contract negotiations in sports. This distinguished topic is widely taught throughout different branches of education, but its history is not so well known. In this paper I will be exploring the history of game theory from its origin days to the development of the Nash equilibrium, while also talking about key figures like John Nash.

**Subject Category**

Science and Mathematics Categories: Mathematics

**Faculty Sponsor Department**

Mathematics

**Faculty Sponsor**

Jeff Johannes

## 2B: Personal and academic growth with the LIVES program

10:30-11:45am Thursday, 21 April, 2022, Newton 204

### Session Chairs

Taylor Baltz and Megan Leczinsky

### 2B • Our Strengths and Our Struggles as We All Adjust to College Life

Kyle Nash, Kayleia Brooks, Samantha Mandell, Melissa Mitchell, Shania Guyett, Bailey Bastine, Sarah Pope, Emily Link, Auron Bennett

#### Abstract

Students in the LIVES Program surveyed SUNY Geneseo students regarding their strengths and struggles. The LIVES students then compared and contrasted the survey responses with their own strengths and struggles. Survey results showed that the two groups of students had many strengths and struggles in common, suggesting that college students have quite similar experiences, regardless of “ability.”

#### Subject Category

Interdisciplinary and Other Categories: Other

#### Faculty Sponsor Department

Communication

#### Faculty Sponsor

Emi Kanemoto

#### Group Session Name

Personal and academic growth with the LIVES program

#### Group Session Chair

Taylor Baltz / Megan Leczinsky

### 2B • Our Audit Classes and Internships

Mya-Lyn Albanese, Dakota Pilc, Cody Schlageter

#### Abstract

Students in the LIVES Program will share their experiences in their audit classes and internships, and the strategies they have employed to be successful in their endeavors at SUNY Geneseo.

#### Subject Category

Interdisciplinary and Other Categories: Other

#### Faculty Sponsor Department

Communication

#### Faculty Sponsor

Emi Kanemoto

#### Group Session Name

Personal and academic growth with the LIVES program

#### Group Session Chair

Taylor Baltz / Megan Leczinsky

### 2B • Where We are and Where We are Going

Jackson Breen

**Abstract**

Students in the LIVES Program will share their individual “road maps,” which show where they began, where they are now, and where they hope to go in the future. They will also discuss how being included on a college campus has impacted their time at SUNY Geneseo.

**Subject Category**

Interdisciplinary and Other Categories: Other

**Faculty Sponsor Department**

Communication

**Faculty Sponsor**

Emi Kanemoto

**Group Session Name**

Personal and academic growth with the LIVES program

**Group Session Chair**

Taylor Baltz / Megan Leczinsky

**2B • How the LIVES Program Prepared Me for Life After College**

Hannah Finch, Brandon Schneider, Tyler Heiman, Rachel Skidmore, Doug Schlenker, Kristen Guyett

**Abstract**

This presentation will summarize the students’ time in the LIVES Program by addressing where they are headed and how the LIVES Program has helped them to reach their dreams. Each student will share the knowledge, LIVES activities, and show how he or she has grown during their time in the program.

**Subject Category**

Interdisciplinary and Other Categories: Other

**Faculty Sponsor Department**

Communication

**Faculty Sponsor**

Emi Kanemoto

**Group Session Name**

Personal and academic growth with the LIVES program

**Group Session Chair**

Taylor Baltz / Megan Leczinsky

**2C: Edgar Fellows Panel 3**

10:30-11:45am Thursday, 21 April, 2022, Welles 131

**Session Chair**

Lisa Meyer

**154 • Incentivizing Equitable Justice in a Capitalistic Society**

Jackson Diamond

**Abstract**

Born of the modern-day horrors of the American judicial system which have increasingly been revealed to us, this project began as an attempt to build a regression model to test the ability of a policy to increase the equitability of justice in a capitalistic society such as America's. Understanding that incentives are the fuel for the capitalist fire, we attempted to identify multiple policies which we thought, if implemented, had the possibility to incentivize a more equitable form of justice than that which is served today. After identifying five distinct policies which we thought held this potential through a review of the literature on the subject, we decided to shift gears to focus on just one of those policies: day fines. More specifically, since day fines have been implemented in various regions and in various ways previously, we crafted a model which we hope will point towards the way in which a day fine system can be implemented that will lead to the most equitable form of justice being served by it. If this form of the day fine system is implemented in capitalistic societies, there will no longer be laws punishable by fines which are only crimes to those who are poor. We hope that this project will lead to further research on policy implementations which can increase the equitability of justice, but also a broader dialogue about the equitability of justice in capitalistic societies such as America.

**Subject Category**

School of Business Categories: Economics

**Faculty Sponsor Department**

School of Business

**Faculty Sponsor**

Christopher Annala

**155 • Predicting NCAA Division III Cross Country Results with Machine Learning**

Riley Grossman

**Abstract**

This research project had the end goal of making reasonably accurate predictions for the results of the 2021 Division III Cross Country Championships. The use of linear regression and other machine learning models were a perfect way to accomplish this goal. This presentation will discuss some basic machine learning models and important concepts as well as all of the other things that are necessary to complete a large data science project such as this one. Finally, it will conclude with how the predictions compared to the real results and the corresponding analysis.

**Subject Category**

Science and Mathematics Categories: Mathematics

**Faculty Sponsor Department**

Mathematics

**Faculty Sponsor**

Cesar Aguilar

**156 • Gender and Chinese Exclusion**

Kate Welch

**Abstract**

Seven years before the Chinese Exclusion Act (1882), Chinese women were effectively banned from immigrating to the United States through the Page Act of 1875. Officially, the Page Act was a ban on immigration for the purpose of indentured servitude, particularly prostitution. But in practice, the United States government capitalized on and perpetuated stereotypes that all Chinese women were prostitutes to halt their immigration to the United States. I argue that this indirect path to Chinese women's exclusion is linked to our lack of recognition of the Page Act and its impact. In this presentation, I will discuss the creation of the "lewd Chinese woman" stereotype, the way Chinese women were

mobilized against at the time of the Page Act, deeper motivations for Chinese women's exclusion, and finally, the impact and recognition of these events.

**Subject Category**

Arts and Humanities Categories: History

**Faculty Sponsor Department**

History

**Faculty Sponsor**

Kathleen Mapes

**167 • Phenotypic Characterization of *fsd-1* Overexpression Strains in *Neurospora crassa***

Hannah M. Smith

**Abstract**

The filamentous fungus *Neurospora crassa* can undergo both asexual and sexual reproduction. However, little is known about the molecular mechanisms that regulate the *N. crassa* female sexual development cycle. Previous research has shown that the transcription factor *fsd-1* controls the development of female reproductive structures in *N. crassa*, and  $\Delta$ *fsd-1* strains are sterile. The goal of this project is to phenotypically characterize strains that overexpress *fsd-1* to better understand the downstream processes affected by this transcription factor. We used Illumina RNA sequencing to map the transcriptional changes that occur as a result of the overexpression of *fsd-1*, and used Galaxy to analyze our data. To confirm our results, we used qRT-PCR to measure the expression levels of selected genes. We also conducted mating experiments to analyze the ability of the overexpression strains to produce viable ascospores. Our results show that *fsd-1* overexpression results in differential expression of over 1000 genes relative to the wild type strain, and that genes related to melanin and cell wall biosynthesis are upregulated in overexpression strains. This is significant because it correlates with the phenotypes of these overexpression strains, which have excess pigmentation. Analysis of the reproductive abilities of female strains that overexpress *fsd-1* showed that these strains can produce ascospores, but that the ascospores do not germinate. These findings give us insight into the function of *fsd-1* during sexual development as we continue to characterize this transcription factor.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Elizabeth Hutchison

**Group Session Name**

Edgar Fellows Panel VI

**Group Session Chair**

TBD

**2D: Edgar Fellows Panel 4**

10:30-11:45am Thursday, 21 April, 2022, Welles 132

**Session Chair**

Suzanna Rubright

**168 • Evaluating the Factors Affecting Civic Participation at SUNY Geneseo**

Jacob Reid

**Abstract**

This paper will use survey data from students at the State University of New York at Geneseo to evaluate the factors that affect students' willingness to be civically engaged and active participants in the political system.

**Subject Category**

Social Science Categories: Political Science

**Faculty Sponsor Department**

Political Science and International Relations

**Faculty Sponsor**

Jeffrey Koch

**169 • The Neuroscience of Dance**

Carlie Stalker

**Abstract**

Dance is a universal form of human expression and social behavior. When we use our bodies in dance we move and control our limbs and body through the brain and the vast network of nerves throughout the body. There have been a variety of studies done on how the body's nervous system controls simple movements such as finger tapping or ankle rotating. However, dance is much more complicated than simple movement and includes the movement of multiple limbs as well as the awareness of music being danced to and the space around the dancer. As such, the neurological basis of dance has been far less studied and has only seemed to appear in research over the past couple of decades. This presentation aims to examine these studies and the various neurological mechanisms used when we dance. Even further, it examines the implications of these studies in a clinical sense, particularly therapeutic applications for patients with neurodegenerative disorders like Parkinson's Disease. Finally, with the research gathered, I propose my own method of dance therapy for patients of motor impairments in attempt further the clinical implications that the neurology behind dance offers.

**Subject Category**

Social Science Categories: Psychology

**Faculty Sponsor Department**

Psychology

**Faculty Sponsor**

Lisa Meyer

**170 • The Queer Experience in Brazil, Through Art**

Kate Yates

**Abstract**

Art is a powerful tool to express one's identity and opinions, and can spark discussion or conflict surrounding controversial topics such as political and social rights. In Brazil, LGBTQ+ identities and rights are one of these topics, and there is a unique queer culture that has grown and changed over time. Through selected art pieces from Brazilian artists, I analyze their meaning and explore their creation in relation to major political and social developments in Brazil which have affected, or continue to affect, queer Brazilians and their rights.

**Subject Category**

Arts and Humanities Categories: History

**Faculty Sponsor Department**

History

**Faculty Sponsor**

Ryan Jones

**2E: Movements For and Against Repression in the 20th Century**

10:30-11:45am Thursday, 21 April, 2022, Welles 117

**Session Chair**

Jovana Babović

**60 • The Last Not-So-Golden Days of the Thirties: Repression and Acknowledgement of Austrofascism and National Socialism in Austrian History Education**

Sarah Fadlaoui

**Abstract**

After the First World War, Pan-Germanism, or, the creation of a unified German state, was an extremely popular idea in Austria. Today, the quickest way to anger an Austrian is to call them German. What changed? After the Second World War, Austria wanted to create a national identity separating itself from Germany. One of the founding myths of the Second Austrian Republic, the *Opfermythos* (victim myth), maintained that Austria was the first victim of Nazi Germany's aggression. This promoted the untrue idea that the Anschluss came completely against the will of the Austrian people and created a distorted memory of the Austrofascist regime that repressed its authoritarian nature and similarities to Nazi Germany. This myth remained widely accepted and as official doctrine until 1988 when Kurt Waldheim's run for president brought international attention to the complicit roles Austrians played in the Holocaust. Since then, Austria has been moving towards a historical memory focused on remembering those persecuted by the Nazis and reflecting on Austrians' own roles in this persecution. That being said, repression and lapses still persist, particularly in the memory of the Austrofascist regime. In this paper, I examine Austrian educational sources and how school curricula and textbooks handle the Austrofascist and National Socialist periods. I also examine the broader historical memory of these time periods that changes in education reflect and argue that shifts in the memory of Austrofascism reflect shifts in the memory of National Socialism in Austria.

**Subject Category**

Arts and Humanities Categories: History

**Faculty Sponsor Department**

History

**Faculty Sponsor**

Jovana Babović

**109 • South Africa's Anti-Apartheid Movement through Violent and Non-Violent Means**

Lucas Brenner

**Abstract**

Reframing Nelson Mandela's place in the narrative of the anti-apartheid movement means recontextualizing the tension between violent and non-violent means of protest. This paper breaks down those complicities and examines the violent and non-violent branches of the anti-apartheid movement. To do this I examined the methodology, tactics, and ideology of some of the major groups within each branch. I will also examine the South African government responses and reactions that caused/affected the groups within each branch. From this research, I have concluded that if no other option is effective in ridding oneself of oppression then the use of violent methods can be seen as justifiable. This study

forces one to examine and fully understand the motives behind different groups using violent means before instantly assuming that they're "terrorists".

### **Subject Category**

Arts and Humanities Categories: History

### **Faculty Sponsor Department**

History

### **Faculty Sponsor**

Amanda Lewis-Nang'ea

## **149 • Legacies of the Loop: How the Inner Loop Impacted Rochester's Landscape**

Terra Peter

### **Abstract**

Rochester is one of the most segregated cities in the United States. There are many factors that contribute to this; however, one unique consideration for Rochester is the Inner Loop. Construction on the Inner Loop began in 1952 as many other cities in America began creating larger highway systems to accommodate rising automobile usage. When finished in 1965, the Inner Loop was a 2.7-mile belt of highway that encircled Downtown Rochester and allowed for easy access to or around the city. In order to build the Loop, many buildings that were once integral parts of vibrant neighborhoods, including apartments and local businesses, were demolished. Using articles from Rochester's Times Union and Democrat and Chronicle newspapers as well as real estate maps, I show that the Inner Loop's construction disparately impacted minority and low income residents while benefiting those living outside the Loop, and that its effects contribute to Rochester's lingering segregation. The Inner Loop is still a part of Rochester's discourse as Rochestarians attempt to reconstruct neighborhoods that were altered or removed for construction. Having lived in Rochester my entire life until college, I have witnessed some of these revitalization measures and changes in the Inner Loop landscape, which piqued my curiosity regarding its history. This paper covers not only its history, but why it is important to acknowledge the negative impacts the Loop had on the city it was intended to serve.

### **Subject Category**

Arts and Humanities Categories: History

### **Faculty Sponsor Department**

History

### **Faculty Sponsor**

Jovana Babović

## **2F: Women's and Gender Studies Capstone Presentations 1**

10:30-11:45am Thursday, 21 April, 2022, Bailey 101

### **Session Chair**

Caroline Woidat

## **222 • The Representation of LGBTQ+ Youth in Media**

Phoebe Maxwell

### **Abstract**

Many studies have been conducted regarding the importance of representation to minority populations, including racial/ethnic, ability, and gender/sexual minorities. This presentation will cover the capstone paper investigating the representation of LGBTQ+ youth in shows offered on streaming services such as Netflix and Disney+, specifically Sex Education (found on Netflix), Kipo (found on Netflix), and The Owl House (found on Disney+). The paper examines

whether these shows present a positive or negative image of LGBTQ+ youth and draws from psychological journals to explain how this can impact LGBTQ+ viewers, as well as discussing possible improvements to these representations.

**Subject Category**

Interdisciplinary and Other Categories: Women's and Gender Studies

**Faculty Sponsor Department**

English

**Faculty Sponsor**

Caroline Woidat

**69 • All Girls to the Front: An Analysis of Exclusionary Practices and Discrimination in the Riot Grrrl Movement**

Anna Mallia

**Abstract**

The Riot Grrrl movement of the 90's paved the way for women to enter punk spaces that they had been historically barred from, as well as created a distinctly new form of punk music that combined feminism, marxist ideals, and alternative aesthetics. This movement is often associated with third wave feminism, however it should be noted that many women of color, including Asian and Black women, felt excluded from this movement. While a unique and exciting, culturally progressive music scene emerged from this movement, most of the bands and people associated with this movement are white, cisgender women— forcing the question as to how radical this movement actually was. A 1992 *Newsweek* article described the movement as "young, white, suburban and middle class." This presentation will address both the challenges and faults the Riot Grrrl movement presented for non-white, non-cisgender women and highlight the successes of women of color involved in the movement that have been glossed over and gone unacknowledged for too long. I will also discuss the way feminist punk functions in 2022, analyzing the impact of digital feminism making it easier than ever to create and share feminist thought and music.

**Subject Category**

Interdisciplinary and Other Categories: Women's and Gender Studies

**Faculty Sponsor Department**

English

**Faculty Sponsor**

Caroline Woidat

**271 • WGST Capstone: Poetry Chapbook Reading**

Kat Johnson

**Abstract**

A poetry reading sharing poems from an original chapbook, titled "how to handle things with care even when they are not breakable". The chapbook is a twenty-something poet's musings on the ways in which gender, sexuality, and grief -- three things often expected to function in a binary way -- are not as black and white as they are often made out to be, as well as the ways in which they intersect with one another.

**Subject Category**

Interdisciplinary and Other Categories: Women's and Gender Studies

**Faculty Sponsor Department**

English

**Faculty Sponsor**

Maria Lima

## 67 • Pretty Little Things: A Poetic Gallery

Kayla Eyer

### Abstract

*Pretty Little Things: A Poetic Gallery* is a gallery-style display of a collection of poems commenting on the hypersexualization of adolescent girls and the lingering impact of growing up alluring and unprotected. It circles themes of nature, sexual trauma, and beauty the same way sharks circle seals— continually, and in preparation for the kill. The collection alternately picks up emotions of rage, misery, and isolation, but works towards believing in an idyll where beauty comes without a price. In some ways, the presentation functions as a manifesto and manifestation for survivors of childhood sexual assault; a reassurance that with age comes clarity, distance, and some semblance of peace. The presentation will be set up as a gallery display, allowing visitors to alternately read poems and view snapshots of internet culture that display the way broader society works to fetishize girlhood, situating the poems within the societal norms that birthed them.

### Subject Category

Arts and Humanities Categories: English

### Faculty Sponsor Department

English

### Faculty Sponsor

Caroline Woidat

## 2G: On-Campus Food Forest Discussion Room

10:30-11:45am Thursday, 21 April, 2022, MacVittie College Union Fireside Lounge

## 260 • Big Change in a Little Space: On-Campus Food Forest Discussion Room

Lauren Goulet, Brendan Shortt

### Abstract

Join us for an engaging discussion on our Ambassadorship project! We'll discuss agriculture techniques such as no-till and polyculture, and share about the short- and long-term goals of the project. Interact with multiple hands-on stations and help us expand the conversation on sustainable food production!

Project Description:

How might we establish a yield-producing food forest as a tool to inform and empower local farmers, members of the SUNY Geneseo community, and other community partners on sustainable food growing practices? Our project focuses on incorporating multiple facets of sustainability by engaging food security, infrastructure, permaculture and education. This space will rely on practices such as polyculture - focusing on an eight layer food forest structure - and no-till soil management. In addition to the physical planting and production in the space, the project will encompass outreach, education, and resource building for the local community. The time and effort that we put in during the pilot process will continue to produce both physical and educational yields for years to come.

This Student Ambassador Project is made possible by generous funding from John '87 and Mary Grace '84 Gleason Ambassador in Student Affairs.

### Subject Category

Interdisciplinary and Other Categories: Sustainability Studies

### Faculty Sponsor Department

Office of Sustainability

### Faculty Sponsor

Dan DeZarn

## 2H: Applied Mathematics and Physics

10:30-11:45am Thursday, 21 April, 2022, Bailey 104

### Session Chair

Charles Freeman

### 95 • Investigating Cauchy's Construction of the Real Numbers

Sarah Dohr

#### Abstract

While common understanding allows us to visualize and interpret simple sets of numbers such as the naturals, integers, and the rationals, these sets insufficiently account for all of the numbers that mathematicians utilize. This presentation will demonstrate the process of constructing the real numbers by using our understanding of convergence, Cauchy sequences, and equivalence relations. We begin by defining real numbers to be sets of rational approximating sequences that converge to the same value. In order to properly define a real number, we must develop a method to effectively and properly group Cauchy sequences into sets. This presentation will include a demonstration of such a procedure, and the proofs of theorems and properties necessary to assemble the reals. By constructing the real numbers, one establishes the foundations of the principles and properties from which many of the most famous and widely used theorems are derived.

#### Subject Category

Science and Mathematics Categories: Mathematics

#### Faculty Sponsor Department

Mathematics

#### Faculty Sponsor

Cesar Aguilar

### 147 • Using Rutherford Backscattering Spectroscopy depth profiling to characterize targets at SUNY Geneseo

Jovahn Roumell

#### Abstract

Rutherford Backscattering Spectroscopy (RBS) is an ion beam analytical technique that can be used to study thin film properties. In this technique, a beam of energetic protons or alpha particles is incident on the sample and the energy of the scattered ions is measured. The energy spectrum reveals characteristics about the sample including thickness and elemental composition. RBS can be further developed using a technique known as depth profiling, in which a more sophisticated fitting of the resulting energy spectrum is used to measure the concentration of dopants in the sample as a function of depth. At SUNY Geneseo, we have been performing RBS experiments using ion beams from our 1.7 MV Pelletron particle accelerator. RBS has been used to measure the elemental composition and thickness of various thin layers of copper and gold deposited on a silicon wafer using Geneseo's thin film evaporator. We have also measured the presence of impurities in targets used in high energy density physics. This research is funded by a grant from the DOE through the Laboratory of Laser Energetics.

#### Subject Category

Science and Mathematics Categories: Physics

#### Faculty Sponsor Department

Physics and Astronomy

**Faculty Sponsor**

Charles Freeman

**34 • Probability of Blackjack Using Markov Processes**

Drew Southcott

**Abstract**

Blackjack has numerous variations to the game, including "House Rules" and the number of decks of cards being used. As the number of decks increase, Blackjack probabilities can be approximated using an infinite deck assumption; where the probability that the next card will be any given denomination is 1/13. Off this assumption, we can model the dealer's end states and the player's decisions by using Markov Processes. These are defined to be random processes in which the future is independent of the past.

**Subject Category**

Science and Mathematics Categories: Applied Mathematics

**Faculty Sponsor Department**

Mathematics

**Faculty Sponsor**

Katelynn Kochalski

**2I: Dance, Opera, and Social Change**

10:30-11:45am Thursday, 21 April, 2022, Bailey 105

**249 • Evolution of Dance through Social Change**

Alexandria Richards

**Abstract**

My capstone project will be focused on Black dance being used to address social and political issues with the African American community.

**Subject Category**

Interdisciplinary and Other Categories: Black Studies

**Faculty Sponsor Department**

History

**Faculty Sponsor**

Catherine Adams

**33 • Opera in the Virtual World**

Paris Interdonato-Carreras

**Abstract**

Did Covid-19 detrimentally disrupt the opera world by periodically robbing it of live productions and audiences? Or, did it create a new realm of endless economic opportunity? Live theaters have a finite amount of seats, which eventually sell out. But what if tickets didn't have to sell out? Imagine being immersed in an opera viewing right from the comfort your own home. This is very possible with the use of Virtual Reality technology, such as an Oculus headset. The solution could possibly accommodate people who would prefer to stay in, who could not get tickets to the live performance because they were sold out or too expensive, or a younger audience who thrives more in a digital setting. Vocal Performance and Business Administration Major, Paris Interdonato-Carreras, conducted a brief experiment with a

handful of participants who watched an opera using an Oculus 2 headset. Based on the results, she will discuss possibilities for economic growth, and greater inclusion in the Opera Industry.

**Subject Category**

Interdisciplinary and Other Categories: Other

**Faculty Sponsor Department**

Music

**Faculty Sponsor**

Monica Hershberger

**239 • The Impact of the African Diaspora on 20th Century Dance**

Jaina Dinino

**Abstract**

The 20th century has been recognized as an era of integrating African American dancers into modern dance. During this period there was an overarching sentiment of inclusion, cultural expression, and weakening the significance of race defining identity. This universal sentiment among African American dancers and choreographers throughout the 20th century influenced dancers like Arthur Mitchell to establish companies and dedicate their careers to uplifting African American dancers. Overall, the emphasis of inclusion, cultural expression, and the popular notion that race shouldn't define one's identity as a dancer during the 20th century led Mitchell to establish the Dance Theatre of Harlem in 1969, which paved the way for the integration of African American dancers into ballet.

**Subject Category**

Arts and Humanities Categories: Dance

**Faculty Sponsor Department**

Theatre and Dance

**Faculty Sponsor**

Jonette Lancos

**119 • The Innovations of Modern Dance**

Shannon Ervay

**Abstract**

During the turn of the 20th Century, as Art Nouveau became prominent within American style and Physical Culture was establishing itself among the United States, the art of dance was evolving with the times. With the shift in art style came a collaboration of ideas in the arts, including the combination of movement and emotion studied by Francois Delsarte and the blend of music and movement in the teachings of Emile Jaques-Dalcroze. As a result of the work of these artists and the changing lifestyle of the United States, new innovations were brought into the world of dance. Previously viewed as an art known for the structure and tricks of ballerinas, women such as Loie Fuller and Isadora Duncan ushered in Modern Dance. Modern rejected the performative aspect of dance and allowed it to be composed based off the movements tied to those feelings. Loie Fuller introduced new components of ingenuity to the art of dance, debuting with lights, props, and fabrics, inspired by the shifting styles of the period, which broadened the dynamics of dance as a performance. Isadora Duncan, a feminist, argued for the rawness of human emotion within movement, a component to dance inspired by Delsarte and Dalcroze. These artists had integral roles in paving the path for future modern dancers and brought back the artistic aspect of dance within performances. Modern evolved the world of dance to become an art that is composed of humanness and emotion.

**Subject Category**

Arts and Humanities Categories: Dance

**Faculty Sponsor Department**

Theater and Dance

**Faculty Sponsor**

Jonette Lancos

**2J: Applied and Computational Mathematics with Statistical Analysis**

10:30-11:45am Thursday, 21 April, 2022, Bailey 204

**Session Chair**

Sedar Ngoma

**106 • Self-Evaluation and Statistical Analysis**

Jaehyung Lee

**Abstract**

Towards the end of my military service, I tried to find ways to maintain a high-disciplinary lifestyle even after my release. After much contemplation, I decided to develop a grading system for my day-to-day life, which sprouted from the concept of math exams. The graded exams allow us to improve our mathematical knowledge by analyzing our weaknesses and strengths. Thus, by utilizing quantifiable variables that best represent the fullness of my lifestyle and by implementing various mathematical models, I was able to construct an effective grading system for my day-to-day life.

The self-evaluation project comprises three main procedures: collecting meaningful data, applying statistical analysis, and visualizing indicative findings in daily life. The goal is to find numerous insights and unique patterns with over 500 days' worth of data using R. Also, a more comprehensive understanding of the lifestyle will be obtained by utilizing advanced statistical concepts such as linear regressions and various correlation tests. Ultimately, these findings will provide better guidance for me to achieve healthier life patterns in the future.

**Subject Category**

Science and Mathematics Categories: Mathematics

**Faculty Sponsor Department**

Mathematics

**Faculty Sponsor**

Chi-Ming Tang

**137 • Polynomials of the Hypergeometric Function**

Dwight Dinkins

**Abstract**

The hypergeometric differential equation and its solutions was first found by Euler and then extensively studied by Gauss, Kummer, Pfaff, and Riemann. Riemann observed that second-order equations with three regular singular points suffices to represent its solutions as two linearly independent hypergeometric functions-- effectively generalizing all second-order differential equations that possess this property. As a result, the hypergeometric function has a variety of applications in mathematical physics and analysis, such as Schwarz-Christoffel mappings, special functions, problems in quantum mechanics etc. Here, I consider the absolute and uniform convergence of its series solutions, its analytic continuation on the branch cut  $[1, \infty)$ , and application to spherical harmonics-- particularly to Legendre and Laguerre polynomials. Additionally, I'll show how fractional integration by parts can be used to transform Euler's integral representation for the hypergeometric function to another integral in which two of the parameters of the hypergeometric function are interchanged and its implication.

**Subject Category**

Science and Mathematics Categories: Mathematics

**Faculty Sponsor Department**

Mathematics

**Faculty Sponsor**

Ahmad Almomani

**240 • A Space Dependent Inverse Diffusion Coefficient Problem for a Parabolic Equation**

Robert Sinesi

**Abstract**

We explore an inverse problem in a parabolic partial differential equation in which a space-dependent diffusion coefficient is computed numerically. The recovery of the diffusion coefficient is accomplished by means of additional conditions to the direct problem: an integral constraint and a final time measurement. A reconstructive algorithm has been derived using the additional constraints, but the solution is unstable since inverse problems are ill-posed. Tikhonov regularization was performed in order to ensure a stable solution. The use of regularization not only provides a stable solution to the ill-posed problem, but also ensures stability with the presence of noise. Therefore, this solution will accommodate measured data, where some degree of noise is inevitable.

**Subject Category**

Science and Mathematics Categories: Mathematics

**Faculty Sponsor Department**

Mathematics

**Faculty Sponsor**

Sedar Ngoma

**123 • Numerical Investigation of the Tacoma Narrows Bridge Phenomenon**

Scott Ward

**Abstract**

The Tacoma Narrows bridge is a well known phenomenon of resonance frequency in which if the right frequency is hit things such as a bridge tearing apart will occur. This phenomenon did not follow Hooke's law which is a linear relationship in which the force on a spring is the same whether you compress or stretch it the same amount due to the bridge not being a spring. Instead, we will replace the linear Hooke's law restoring force with a nonlinear force to account for stronger restoring force. The model equations are too difficult to derive close-form solutions. We will use numerical methods to study how vertical motion of the wind on the bridge led to twisting oscillations that were greatly magnified.

**Subject Category**

Science and Mathematics Categories: Applied Mathematics

**Faculty Sponsor Department**

Mathematics

**Faculty Sponsor**

Sedar Ngoma

**2K: Asian-American Undergraduate Students' Experience during the COVID-19 Pandemic**

10:30-11:45am Thursday, 21 April, 2022, Bailey 103

**Session Chair**

Anjoo Sikka

**57 • Asian-American Undergraduate Students' Experience during the COVID-19 Pandemic**

Jacob Houseman, Tucker Landwehr, Sean McBride, William Widarsono

**Abstract**

The coronavirus disease 2019 (COVID-19) has profoundly affected the entire world. Classes went online, masks became mandated, people were falling ill, isolation and uncertainty were at an all-time high for most. Unfortunately, Asian-Americans had additional challenges due to the pandemic, including hate and discrimination from other Americans who unjustifiably blamed them for it. Students were sent home away from their college campuses during the early stages of the COVID-19 pandemic. So Asian-American students had to navigate the conflict between family and student responsibilities, particularly those that required a different self-orientation (i.e., independent vs. interdependent). This exploratory, national study focuses explicitly on the Asian-American undergraduate students' experiences during the pandemic to understand and reveal underlying ordeals. Participants were recruited via friends, professional colleagues, multicultural programs, and campus organizations. After signing the informed consent, participants received an online survey consisting of a 43-item questionnaire on the pandemic experience and academic work as an undergraduate, a 21-item brief collectivism questionnaire (BCQ), and a 9 question relationship with close friends survey. The study included 89 participants from 19 different U.S. states. Findings included participants dealing with issues with access to study spaces (39%), counseling (24%), textbooks (21%), social services (20%), finances (19%), Internet (16%), health services (15%), and reference books/articles (9%). Seventeen (17%) percent of respondents reported being discriminated against, 25 percent reported family members or close friends being harassed due to their country of origin, and twenty-eight (28) percent reported being concerned or very concerned about discrimination.

**Subject Category**

Social Science Categories: Psychology

**Faculty Sponsor Department**

Psychology

**Faculty Sponsor**

Anjoo Sikka

**2L: Students Making Change on Geneseo's Campus and Beyond**

10:30-11:45am Thursday, 21 April, 2022, Bailey 203

**Session Chair**

Nicholas Palumbo

**24 • The Little Free Thoughts Library **

Ashlee Kuzemchak

**Abstract**

Inspired by the multitude of Little Free Libraries in the nation, the Little Free Thoughts Library (LFT) seeks to create an expressive community on the SUNY Geneseo campus. The collaborative nature of the library allows students to continuously create and express their thoughts anonymously to develop a cycle of reflective writing and creativity throughout the student body. The LFT provides a multitude of materials for students, including sustainable writing tools, sketchbooks, and notebooks. Housed in the Geneseo Opportunities for Leadership Development room in MacVittie College Union, the LFT is a bookcase open for students to drop by, take some supplies, and spend some time with their thoughts at their place of residence, then stop by to drop off their entry, read another, add to another, or create another entry. The continuous nature of the LFT aims to provide students an outlet for thought expression and free

creativity. The LFT is also on social media, with an Instagram account dedicated to showcasing entries and highlighting student wisdom on campus; students on campus are interviewed about their Little Free Thought they would like to share with others, and this thought is then posted on Instagram anonymously or with a photo of the individual if desired. The goal is to present the knowledge, wisdom, and creativity housed on the SUNY Geneseo campus and create a cultivating community.

**Subject Category**

Arts and Humanities Categories: Literary Arts

**Faculty Sponsor Department**

Center for Community

**Faculty Sponsor**

Nicholas Palumbo

**261 • Harvesting Sustainable Energy: Solar Air Heater for the SUNY Geneseo eGarden Greenhouses** 

Katelyn Adis, Kayla Andersen, Emma Parker

**Abstract**

This presentation highlights topics of sustainable energy, climate change, food security and student innovation. The Geneseo Energy Garden (eGarden) greenhouses are currently heated by an electrical heater, which has a high energy demand and is therefore not sustainable. In an effort to remedy this issue, students Katelyn Adis, Kayla Andersen, and Emma Parker are in the process of constructing a solar air heater that utilizes thermal energy from the sun as an alternative to the current method. With a more sustainable heating system, produce from the greenhouses, which supports food security in the community, will have a lower carbon footprint due to independence from conventional energy sources. The project team has designed a collector which allows for experimental exploration and ongoing optimization of the system. At this presentation, attendees will be introduced to the collector design process, as well as current progress and future implementation of the initiative's deliverables. Ultimately, local community members will be able to leverage a similar collector design for applicable rural heating needs. This Student Ambassador Project is made possible by generous funding from the James Houston '80 Ambassador in Innovation Award for 2022.

**Subject Category**

Interdisciplinary and Other Categories: Sustainability Studies

**Faculty Sponsor Department**

Center for Integrative Learning

**Faculty Sponsor**

Lytton Smith

**262 • Let's Get Vaccinated**

Brennan Wilcox

**Abstract**

Roughly a million Americans have died from Covid-19, despite this, a third of Americans have yet to receive a single dose of the Covid-19 vaccine nearly two years into the global pandemic. The CDC has estimated that 14% and 7% of Livingston and Monroe County, respectively, are hesitant or unsure about receiving the Covid-19 vaccine.

Let's Get Vaccinated is a public health project designed to help address the issue of vaccine hesitancy. The project aims to utilize the rapport that every day people have with those in their social circles. Specifically, the project aims to guide those who are in favor of the Covid-19 vaccine in having discussions with their unvaccinated friends, family members, and peers. Let's Get Vaccinated will educate these vaccine advocates on the fundamental science behind vaccines, as well as how to effectively communicate this information. This will be done through a combination of informational

workshops, booklets, and online resources. This Student Ambassador Project is made possible by generous funding from the Community Advocates for SUNY Geneseo.

**Subject Category**

Interdisciplinary and Other Categories: Ambassadorship

**Faculty Sponsor Department**

Center for Integrative Learning

**Faculty Sponsor**

Lytton Smith

**136 • NYC Chinatown Smiles: Creating Accessibility to Oral Care**

Alyssa Lee

**Abstract**

This presentation explains a Student Ambassadorship project that aims to encourage healthy oral hygiene habits and promote health literacy in the Asian American and Pacific Islander (AAPI) community by providing resources and access to oral care through a “community box.” By collaborating with local dentists, schools, and organizations in NYC Chinatown and providing resources and information about oral health, this project will raise awareness of the importance of practicing healthy oral hygiene and change how the community perceives overall oral health. Research overwhelmingly shows that practicing oral hygiene and maintaining overall oral health is critical for an individual because it prevents oral diseases and other harmful diseases that can affect the quality of life. Unfortunately, oral health within the AAPI community is often overlooked. Data about the status of oral health of the AAPI community is severely limited due to being under-researched and from the lack of participation by the community in medical research. Language barriers, low-income status, the lack of health literacy and education regarding oral health, and the lack of accessible resources all negatively impact AAPI oral health. This Student Ambassador Project is made possible by generous funding from The Frank Vafier '74 Ambassador in Leadership.

**Subject Category**

Interdisciplinary and Other Categories: Ambassadorship

**Faculty Sponsor Department**

Center for Integrative Learning

**Faculty Sponsor**

Lytton Smith

**2M: Navigating Social Media and Remote Work**

10:30-11:45am Thursday, 21 April, 2022, Bailey 201

**Session Chair**

Avan Jassawalla

**18 • Effectively Managing a Mix of Remote, In-office, and Hybrid Employees (working some days remote and other days in-office) During and After the Covid-19 Pandemic/ Lockdown.**

Danielle Silver, Sydney Stevens

**Abstract**

Last semester, our team evaluated effectively managing a mix of remote, in-office, and hybrid employees in the workplace amid a pandemic. The Covid-19 pandemic has caused many businesses to close due to a lack of effective management. Diving deeper into this topic we narrowed our search down to two research questions:

- How have corporations' and managements' productivity levels changed due to a variety of remote, in-office, and hybrid work?
- Due to the rapidly changing work settings of companies, how has management dealt with the complexity of balancing effective work in remote, in-office, and hybrid settings while continuing to follow the company's values and keeping up with their employees' morals?

**Subject Category**

School of Business Categories: Business Administration

**Faculty Sponsor Department**

School of Business

**Faculty Sponsor**

Avan Jassawalla

**37 • Diet Fads: The New Danger of Social Media Diet Culture on Young People**

Megan Miller

**Abstract**

Social media have become identifiable of the twenty-first century. Social media contain influencers and specified content, much of which pertains to health, wellness, and lifestyle. The purpose of this study is to highlight the negative effect that social media, specifically diet culture and content has on the physical and mental health of young people. Along with this, the study aims to conclude what effects the physical and mental health of young people, including, the content they view, the activity they engage in, which platforms they prefer, and how they feel after viewing content. This includes analyzing older diet trends and how they transition into newer trends, as well as television content, the dangers, and effects of social media consumption, and how theories of communication apply. This study will close the gaps as to why social media diet culture content is damaging to physical and mental health in young people.

**Subject Category**

Social Science Categories: Communication

**Faculty Sponsor Department**

Communication

**Faculty Sponsor**

Atsushi Tajima

**3A: History of Mathematics II**

3:15-4:30pm Thursday, 21 April, 2022, Bailey 204

**Session Chair**

Jeff Johannes

**50 • Lagrange's Theorem: A History of a Theorem of Groups**

Amanda Daum

**Abstract**

Joseph-Louis Lagrange was a French mathematician who developed what we know today as Lagrange's Theorem, in regards to group theory. Since there was no such thing as group theory back when Lagrange was a mathematician he took a different approach. Solving the algebraic equations with powers of 5 or higher was the problem that Lagrange conquered and he related his findings to symmetric equations. These findings created the earliest form of Lagrange's

Theorem. Abbati was the first mathematician who successfully completed a full proof to Lagrange's Theorem. Cauchy was the mathematician who found the generalized Lagrange's Theorem that we have today.

**Subject Category**

Science and Mathematics Categories: Mathematics

**Faculty Sponsor Department**

Mathematics

**Faculty Sponsor**

Jeff Johannes

**51 • Stirling Numbers**

Seth Gartner

**Abstract**

I explore the life and mathematical achievements of James Stirling, a mathematician from Scotland who lived from 1692 to 1770. Stirling is best known for his discovery of Stirling numbers of the second kind, denoted  $S(n,k)$ . Stirling numbers of the second kind, or Stirling partition numbers, represent the ways to partition  $n$  objects into  $k$  non-empty subsets. This is a key concept in the field of combinatorics, specifically enumerative combinatorics. We will take a look at the history that led up to this discovery, and how it impacted the math world.

**Subject Category**

Science and Mathematics Categories: Mathematics

**Faculty Sponsor Department**

Mathematics

**Faculty Sponsor**

Jeff Johannes

**52 • Geometric Dissections and Dissection Theory**

Shannon Steindel

**Abstract**

Geometric dissection problems involve cutting or slicing one shape, and then rearranging it in a way that it creates a completely new and different shape. This has been used many times throughout history and there are thousands of different versions of dissections. It spans all the way back to Archimedes' Stomachion, which is contained in his Palimpsest. One prominent theorem surrounding this is the Wallace-Bolyai-Gerwien Theorem, in which W. Wallace, Farkas Bolyai, and P. Gerwien prove that any two simple polygons of equal area are equidecomposable.

**Subject Category**

Science and Mathematics Categories: Mathematics

**Faculty Sponsor Department**

Mathematics

**Faculty Sponsor**

Jeff Johannes

**53 • Quadrilaterals and their Contributions to Non-Euclidean Geometry**

Christina Eames

**Abstract**

Following Euclid's *Elements*, mathematicians all over the world attempted to prove Euclid's fifth postulate. In their failure to prove this parallel postulate, Ibn al-Haytham, Omar Khayyam, Giovanni Saccheri, and Johann Lambert unknowingly made important contributions to a new, non-Euclidean, geometry, using quadrilaterals in their quest for answers to the proof. Non-Euclidean geometries, such as spherical and hyperbolic, opened up new connections between mathematics and science as the study of space aligned with mathematics and geometry.

**Subject Category**

Science and Mathematics Categories: Mathematics

**Faculty Sponsor Department**

Mathematics

**Faculty Sponsor**

Jeff Johannes

**54 • The Bolzano-Weierstraß Theorem**

Megan Friske

**Abstract**

In analysis, the Bolzano-Weierstraß theorem says that every bounded sequence in the real numbers has a convergent subsequence. This theorem is named after the mathematicians, Bernard Bolzano and Karl Weierstraß. The theorem was first proved in 1817 by Bernard Bolzano but was identified later and proved again by Karl Weierstraß in 1854. Both Bolzano and Weierstraß studied functions defined on sequences of real numbers. Bolzano's lemma, which today is known as the greatest lower bound property for real numbers, allowed Weierstraß to prove that every bounded infinite set of real numbers has a limit point. Thus, the Bolzano-Weierstraß theorem came to be.

**Subject Category**

Science and Mathematics Categories: Mathematics

**Faculty Sponsor Department**

Mathematics

**Faculty Sponsor**

Jeff Johannes

**3B: Edgar Fellows Panel 4**

3:15-4:30pm Thursday, 21 April, 2022, Welles 131

**Session Chair**

Michael Mills

**175 • Intergenerational Programs and a Practice of Implementing Lessons about Aging and Older Adults with Preschoolers**

Cayley Dickens

**Abstract**

Intergenerational programs have significantly increased in prevalence within the United States over the last few decades; therefore, there has been an increase in programs that involve interaction between both young children and older adults. This project began with a literature review investigating such programs. The literature review considered research on various related topics including concepts of care, care facilities for both the young and the elderly, the history of intergenerational programs, children's perceptions of the elderly, and outcomes and possible impacts of intergenerational programs. Examining several intergenerational programs indicated that they could have positive and mutually beneficial outcomes for both children and elderly adults. However, children's perceptions of the elderly were

found to be influential regarding outcomes. Stereotypes develop early and tend to remain constant, so negative attitudes younger children develop towards older adults could potentially be combated with educational initiatives. Thus, the second portion of the project centered around the development of a lesson series for preschool-aged students. This portion aimed to evaluate if discussing aging and older adults with young children could influence more positive attitudes towards the elderly. Due to changes in implementation of the lesson series and limitations, there are no conclusive results to support or reject the hypothesis about educational initiatives. Nevertheless, the project resulted in an informative first attempt at educating young children on the topics of aging and older adults, with room for many alterations to gain better insight into how intentional teaching could potentially alter children's perceptions positively.

### **Subject Category**

School of Education Categories: Early Childhood/Childhood Education

### **Faculty Sponsor Department**

School of Education

### **Faculty Sponsor**

Jeanne Galbraith

## **177 • A Man Separate to God: John Milton's *Samson Agonistes***

Isaac Schiller

### **Abstract**

In one of John Milton's final works, *Samson Agonistes*, the broken hero Samson stands apart from his Israelite countrymen in ability and closeness to God. Samson is gifted at birth immense strength which is connected to his hair and a prophecy which declares that he will "lead in delivering Israel from the hands of the Philistines." From Milton's Puritan perspective of the seventeenth century, Samson may be of the "lower" Jewish race, but is also a prefiguration of Christianity. Milton handles this complexity by emphasizing the problematic role of Mosaic Law within the Israelites' ideologies while liberating Samson from such laws. To these Israelite characters, Samson has broken the law by marrying non-Jewish women, and the law states that it is necessary to sacrifice a bird in repentance for this deed. While Samson's comrades seek his release and repentance through animal sacrifice, Samson instead sacrifices himself in order to fulfill his lofty destiny. In doing so, he not only purifies his body through sacrifice, but creates a real solution for the Israelites' subjugation. However, this sacrifice also gives Samson a complicated relationship to his human peers. While he transcends their forms of government and relationships, which Milton views Christianity as surpassing, his death also serves the nation of Israel. While Samson is still a man "separate to God," his separateness still serves immediate Jewish needs in ways his comrades cannot. While Milton was not sympathetic toward modern Jewish people, his writing retains the emphasis the Torah places upon Jewish culture.

### **Subject Category**

Arts and Humanities Categories: English

### **Faculty Sponsor Department**

English

### **Faculty Sponsor**

Samuel Fallon

## **153 • Andrea Levy and the Black British Bildungsroman**

Abigail Anderson

### **Abstract**

This presentation examines the works of Black British author Andrea Levy and their applicability to the bildungsroman genre. Historically, this genre has produced young white male protagonists; thus, Levy's black female protagonists can be seen as either necessarily excluded, or as indicative of a new application of the genre. This presentation will argue the

latter. Levy's first three books are semi-autobiographical, and recount racism that she experienced herself. Her protagonists spend the events of their respective novels encountering racially motivated bias, which prevents them from developing in the same way as those who do not experience this bias. As a result, the protagonists of Levy's novels find themselves disillusioned from society in a way which directly subverts the expected "return to the fold" that characterizes commonly cited examples of the bildungsroman. This presentation argues that Levy's novels can and should be categorized as bildungsromanse, as they demonstrate the growth of protagonists realistically, in direct dialogue with how growth is disproportionately stunted in reality.

**Subject Category**

Arts and Humanities Categories: English

**Faculty Sponsor Department**

English

**Faculty Sponsor**

Maria Lima

### 3C: Edgar Fellows Panel 5

3:15-4:30pm Thursday, 21 April, 2022, Welles 132

**Session Chair**

Jani Lewis

## 157 • The Impact of Food Purveyors on Immigrant College Students' Relationships with Food

Gail Cabahug

**Abstract**

Food relationships represent not only a biological and physical importance, but also a psychosocial and cultural merit. Food behaviors can create meaning, belonging, and value. When this relationship becomes unhealthy, however, it can lead to adverse biopsychosocial health outcomes, such as disordered eating behaviors. Although it is widely understood that the media, government, and families represent dominant food authorities, which subsequently have a long-term impact on people's eating behaviors and attitudes towards food, college food purveyors have yet to be studied as a type of food authority. As a result, the role of college campus food purveyors in influencing students' relationships with eating often goes unrecognized. This is particularly troubling when considering that existing inequities, generational trauma, and cultural exclusion can contribute to altered food relationships and eating behaviors in immigrants. The goal of this study is to investigate the scope of influence college campus food purveyors can have, and to determine whether the creation of cultural food insecurity can impact eating disorder pathology. By analyzing data gathered from SUNY Geneseo students, this study creates a comprehensive view into immigrant students' relationships with eating and with food. Using testimonies on adverse coping mechanisms that result from a lack of cultural inclusivity in food options, the study opens a wider discussion on the relationship between college campuses and the increased risk for disordered eating.

**Subject Category**

Social Science Categories: Psychology

**Faculty Sponsor Department**

Anthropology

**Faculty Sponsor**

Melanie Medeiros

## 160 • Identification of Bacteria from Conesus Lake

Christine Lynch

**Abstract**

Summer Blooms of *Synechococcus*, a diverse genus of single-celled photosynthetic bacteria (known as picocyanobacteria) appear to be a new phenomenon in Conesus Lake. Some species of marine and freshwater *Synechococcus* reportedly produce cyanotoxins. If the Conesus Lake species are toxin producers, then it is possible they pose a risk to the lake ecosystem and to public health. Laboratory cultures of picocyanobacteria isolated from Conesus Lake contain at least two species, and it appears that different forms dominate when grown in two different nutrient media. The goal of the proposed work is to characterize the species in culture and to determine the taxonomic identity. To date we have evidence of the size and pigment production of the dominant species. Segments of the 16S rRNA have been amplified using PCR with cyanobacteria specific primers. The amplicons will be sent out for DNA sequencing and the data used to identify the species present in culture. Efforts to isolate single clones and to determine whether cyanotoxins are being produced in the cultures are also underway. The results of these studies should help us better understand the picocyanobacteria community of Conesus Lake and assess any risks that summer blooms might pose to the lake ecosystem and to recreational activities in the lake.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Isidro Bosch

**161 • Establishing Quiescence in Vulvar Cancer Cells using Fluorescent Fusion Protein mVenus-p27k-**

Vincent Scalcione

**Abstract**

Vulvar cancer is relatively rare, only accounting for about 0.4% of all cancers, and mainly afflicting women age over the age of 60. It “occurs on the outer surface area of the female genitalia” [2,6]. The development of a rash, known as vulvar lichen sclerosis (VLS) may precede this type of cancer. These rashes are typically treated with an over-the-counter corticosteroid, clobetasol. However, our previous findings indicate this clobetasol treatment may be harmful for patients in the long term. Treatment of the vulvar cancer cell line, UMSCV-4, with clobetasol led to inhibition of cell growth but not cell death. Subsequent removal of clobetasol after prolonged treatment allowed the cells to regain mitotic ability. Thus, it is thought that these cells entered quiescence, which is “a cell-cycle arrest that occurs due to devoid of nutrition and/or mitogens/growth factors” [4]. It is characterized by pure metabolism and no division. Additionally, the Lewis Laboratory determined that these cells were no longer responsive to a secondary treatment of clobetasol – they continued to divide when re-exposed to the drug. Thus, although clobetasol may provide temporary relief for patients with VLS, its effectiveness may wear off over time, and may contribute to carcinogenesis. Through a number of experiments involving MTT assays, flow cytometry and immunofluorescence, we have taken steps to establish the specific state of these UMSCV-4 cells during and after the exposure to this drug.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Jani Lewis

**3D: Women’s and Gender Studies Capstone Presentations II**

3:15-4:30pm Thursday, 21 April, 2022, Welles 115

**Session Chair**

Caroline Woidat

**185 • Grassroot Organization: The Need for Change**

Natalie Schuster

**Abstract**

Change for equality and equity in minorities and women starts as a question and challenges the current system that dictates our laws and government in the United States. Any movement regarding social justice has started out as a question to why an injustice has happened to them. A small or a grassroots movement is a self-organized, local level organization that encourages people to unite together to fight for a common cause that needs to change. Throughout history our current form of government has systematically oppressed people of color, specifically black individuals by disregarding their identity and rights for centuries. Finally gaining rights after decades of fighting, new forms of oppression were created to ensure that black people couldn't register to vote, as well as segregation and Jim Crow laws. With the recent international recognition of the Black Lives Matter movement (BLM), the conversation about racism and police violence sparked demands for change in a system that is prejudiced towards Black Americans. There has been backlash against the BLM movement; banning books that teach children about racism and white privilege. They argue that the objective of the book is to teach children about Critical Race Theory (CRT), which is negative in their eyes. CRT is a way of thinking that challenges the current judicial and education system in America that suppresses minority populations. People of color and women are necessary when it comes to the success of a grassroots organization, as shown by the BLM movement and scholars of CRT.

**Subject Category**

Interdisciplinary and Other Categories: Women's and Gender Studies

**Faculty Sponsor Department**

English

**Faculty Sponsor**

Maria Lima

**181 • The Intersection of HIV/AIDS and Illicit Drug Use: Barriers, Stigma, and Prejudice**

Andrew Levine

**Abstract**

Human Immunodeficiency Virus (HIV) is a debilitating lifelong disease that affects millions of lives, and while first associated with gay men in the 80s and 90s, it has started to impact individuals with intersecting identities, plagued with discrimination and prejudice. One group that is stigmatised on multiple different axes are drug addicts, who face stigma for not only living with HIV, but also due to societal discrimination against illicit drug users (IDU). This double-edged prejudice manifests in structural and institutional discrimination, barriers, and internalisation of stigma. My presentation will review current literature about the different structural, institutional, and interpersonal complications that are typically not discussed in current HIV and/or drug addiction discourse. Moreover, the literature argues that this issue is not solely centred in North American-Western Europe (NAWE) countries, but is a world-wide issue that takes on different forms of discrimination and prejudice. After discussing how the different structural and institutional-level forms of discrimination manifest specifically for IDU LWH, I will discuss how this kind of discrimination affects these individuals on a micro and interpersonal level, arguing that internalised stigma and prejudice aids in structural barriers and violence to be justified by those in power. My time at the Alcohol and Other Drug internship will additionally provide support for my arguments. Understanding the different forms of stigma that affect IDU and people LWH and the needed support is imperative when focusing on these groups independently, but is an evermore salient issue when these identities are intertwined with each other.

**Subject Category**

Interdisciplinary and Other Categories: Women's and Gender Studies

**Faculty Sponsor Department**

English

**Faculty Sponsor**

Caroline Woidat

**87 • The Unconscious Teaching of Gender Norms in our School System**

Abby Wendler

**Abstract**

Our education system does not require teachers to discuss and teach gender in the classroom, yet students are still indirectly taught what is and is not acceptable for different genders. Observing and interviewing classrooms at different schools in a 50 mile radius of Geneseo, these subconscious teachings are reflected in students' daily actions and words. They are also reflected in teachers' conversations and lesson plans. The misinformation and avoidance of uncomfortable conversations surrounding gender and sexuality in the classroom leads to discrimination, superiority complexes, and the beginnings of excusable oppression. Shadowing a straight cis-gendered middle-aged white woman teaching kindergarten and a gay cis-gendered middle-aged white woman teaching fifth grade for two months each revealed the dangers of preaching gender stereotypes; yet, shadowing these teachers also revealed the harms of avoiding the topics of gender and sexuality all together. This presentation will highlight the consequences both of these teacher's students faced due to their teacher's misinformation or lack of information and how future teachers can help make gender and sexual minorities more visible and heard in the classroom.

**Subject Category**

Interdisciplinary and Other Categories: Women's and Gender Studies

**Faculty Sponsor Department**

English

**Faculty Sponsor**

Maria Lima

**207 • Sexual Health and Safety: What High School Health Class Didn't Teach You**

Parker Slawetsky

**Abstract**

Education in the United States focusing on sexual health is definitely lacking to say the least. It is underestimated how important it is to understand one's own body and one's options to protect themselves from STIs, HIV, accidental pregnancy, or simply enjoying a pleasurable and comfortable sexual life. In order to have a healthy and productive sexual life it is important to be aware of the options available for you. I have compiled statistics about effectiveness rates for contraceptives as well as important facts about the best way to protect oneself from STIs. Using information I have learned from previous courses as well as my own research I have worked on creating a presentation that is inclusive to all bodies and people amongst varying identities. I have created a questionnaire to be distributed amongst students to compile information about what students already seem to know about sexual health and what needs to be focused on in order to best serve the Geneseo community.

**Subject Category**

Interdisciplinary and Other Categories: Women's and Gender Studies

**Faculty Sponsor Department**

English

**Faculty Sponsor**

Caroline Woidat

## 3E: Cultural Change and Remembering the Past

3:15-4:30pm Thursday, 21 April, 2022, Bailey 105

### Session Chair

Kathleen Mapes

### 104 • The Best Friends of Silent Film: The Intersection of Charlie Chaplin's and Douglas Fairbanks' Silent Films within American Society, 1919-1939

Samantha Anderson

#### Abstract

The silent film era is a treasure of entertainment and history compiled into one element that culminated productions of many famous and influential individuals, including Charlie Chaplin and Douglas Fairbanks. The work of these two men have been highlighted in their own light with the accomplishments they have made in their films and the social aspirations developed by audiences across the United States during the early twentieth century. Past historians have researched and critiqued the films of these gentlemen but there is a component that no one has gone into depth about behind the screen: their friendship. The key points that are addressed in my research are the connection between the two artists, escalating from their upbringing, their beginning years as actors, how they were brought together by a singular production company, *United Artists*, and evaluating films created by Chaplin and Fairbanks from the 1920s to the late 1930s. These factors correlate to the overall analysis of the partnership of Chaplin and Fairbanks through the progression of their art and translated into the growth of a long-lasting friendship.

#### Subject Category

Interdisciplinary and Other Categories: Film Studies

#### Faculty Sponsor Department

History

#### Faculty Sponsor

Justin Behrend

### 266 • Heroes of Lake Champlain: A History of the Military in Upstate New York

John Dubay

#### Abstract

This presentation aims to capture the storied history of military involvement in Plattsburgh, New York and its surrounding areas. Starting with the region's early battles during the Revolution and War of 1812, this history travels through the development of ROTC and the foundation of the Plattsburgh Air Force Base, into the present developments following the closure of the base, and its impact on the communities around the region. In addition, the ways in which local history are (or are not) addressed by the public through iconography and education are explored, with the goal of reasserting the value of one's sense of place in facilitating greater understandings of local, regional and general history.

#### Subject Category

Arts and Humanities Categories: History

#### Faculty Sponsor Department

History

#### Faculty Sponsor

Kathleen Mapes

## 3F: Words and Birds: Early English Language and Literature

3:15-4:30pm Thursday, 21 April, 2022, Welles 216

### Session Chair

Diana Morley

### 63 • The Significance of Falconry in Old English Literature

Elizabeth Roos

#### Abstract

Who were the first falconers of England? This paper examines the importance of falconry to Old English literature and culture. Falconry, or the practice of hunting wild quarry with trained birds of prey such as hawks, eagles, and falcons, has a long and lengthy history, with concrete evidence appearing in Anglo-Saxon England as early as 600 AD. Numerous literary and material examples of falconry from Anglo-Saxon England will be analyzed in a search for what falconry symbolizes in Old English literature and what falconry means to Old English culture, particularly in regards to faunal bird of prey remains, equipment, artwork, language, and other evidence.

#### Subject Category

Arts and Humanities Categories: English

#### Faculty Sponsor Department

English

#### Faculty Sponsor

Graham Drake

### 93 • Misogyny, Monstrosity, and Patterns of Power in Old English Poetry

Lauren Silverman

#### Abstract

This paper examines the Old English poems of *Beowulf* and the lesser-known elegy *The Wife's Lament* in the light of modern understandings of gender and gender theory. In particular, it will look at the ways womens' deviation from gender norms is treated as a deviation from nature itself. In *The Wife's Lament*, the nameless narrator finds herself exiled from her community, one of the worst fates one could experience in the Anglo-Saxon world, for her departure from gender confinements in order to be reunited with her husband, while in *Beowulf*, Grendel's Mother is killed for the same set of actions that would have seen a man praised. Both fates demonstrate the conclusion of a cycle of dealing with those that threaten a status quo founded on the oppression of adjacent demographics: to villainize their deviance, to punish them for it, and to erase them from future eyes.

#### Subject Category

Arts and Humanities Categories: English

#### Faculty Sponsor Department

English

#### Faculty Sponsor

Graham Drake

### 96 • Etymology of "Silly"

Genevieve Moulton

#### Abstract

Though a seemingly simple word, the term “silly” has undergone a fascinating history. From its first usage as a word of great esteem to its modern day definition describing something foolish, “silly” has undergone pejoration during the transition from Old English to Modern English. Linguists have studied the word and are unsure of the clear path the word has taken but have composed multiple definitions to try to understand its journey. By examining the many, now obsolete, definitions of the word, linguists can work to uncover the complex background of the word. Following the history of the definition in the Oxford-English Dictionary and the Middle English Dictionary, the word is derived from the etymon “seely”. It originated as a word of great esteem and praise, mostly in connection to religious figures and homilies. The word was frequently used as a noun, adjective and adverb and was also found in the verb form though this usage is now obsolete. The word continued its transformation in the mid 15th through 17th century and was mainly defined in the Scottish dialect in relation to women and children. This shift started the push towards using the adjective in terms of a lower esteem and foolishness. In Modern English, the word is fairly common and almost always used to describe something as thoughtless or ridiculous. The journey of “silly” is a prime example of the complex work linguists do to uncover the secrets of earlier forms of English.

**Subject Category**

Arts and Humanities Categories: Literary Arts

**Faculty Sponsor Department**

English

**Faculty Sponsor**

Graham Drake

### 3G: Gender, Race and War in K-12 Classrooms

3:15-4:30pm Thursday, 21 April, 2022, Bailey 102

**Session Chair**

Alice Rutkowski

### 31 • What did it take for women to be considered 'equal' to men in New York?

Katelyn Daniels

**Abstract**

For my final assignment in ENGL 467, I had the opportunity to complete an inquiry lesson plan relating to my major; Early Childhood and Childhood Education. This was unique in that it presented how final education projects can work into minor/concentration courses. My 4th grade inquiry lesson titled “What did it take for women to be considered ‘equal’ to men in New York” leads students through an investigation of the women’s suffrage movement in New York State as an example of how different groups of people have gained equal rights and freedoms over a period of time. Through examining specifically women during the Civil War and those associated with the Seneca Falls Convention, students will have an overview of what women had to fight for and who the main leaders were in creating change for women’s rights.

Under the first supporting question and task, students will describe the events in the story Nurse, Soldier, Spy: The Story of Sarah Edmonds, a Civil War Hero and examine what kinds of things Sarah Edmonds got to do being dressed as a man. Under the second supporting question and task, students will create a presentation on an individual who sought to bring out change and learn about the other significant female figures during this time. Under the third, students will examine the events that occurred at the Seneca Falls convention and align their findings with women’s rights we still have to this day.

**Subject Category**

School of Education Categories: Early Childhood/Childhood Education

**Faculty Sponsor Department**

English

**Faculty Sponsor**

Alice Rutkowski

**28 • Using College Content Knowledge to Enhance Lesson Development**

Ashley Pacheco

**Abstract**

It is important to apply the knowledge we learn in our college courses to our everyday life and future careers. As an education major, I used my knowledge from my English course on Women and the Civil War to craft a fourth-grade lesson plan on African American liberation. The social studies inquiry lesson was centered around answering the compelling question “what role did African Americans play in their own liberation?” This inquiry lesson expanded over multiple class days and allowed students to analyze literature, images, articles, fact sheets, and even a wanted poster. By interpreting these featured sources the students would participate in formative performance tasks to answer the supporting question of the day. The fourth-graders will learn about important African American figures like Frederick Douglass and Harriet Tubman and how they helped to abolish slavery. As well as discovering what slavery was like in New York and how it still impacts our world today. In the end, the students put their new knowledge to use and take informed action. Having the students take action with the information that they learned is an important way to create change in our world similar to the individuals who they learn about throughout this inquiry lesson.

**Subject Category**

School of Education Categories: Childhood Education/Special Education

**Faculty Sponsor Department**

English

**Faculty Sponsor**

Alice Rutkowski

**30 • Curriculum Design Incorporating College Content in Grades 7-12**

Francheska Colon

**Abstract**

This lesson plan was created as a final project for the course English 467, where we explored the different perspectives of women during the Civil War. The lesson plan that was created focused primarily on the distinction between Womanism and Black feminism within a High School level. The two pieces I used within the lesson plan were Harriet Jacobs A. Incidents in the Life of a Slave Girl and Mary Chesnut. A Diary From Dixie. Both of these readings are distinct in terms of the women's life experiences, yet they both have a clear connection to Black feminism and womanism. The issue that this lesson plan address is the notion that some students may not comprehend the definition of Black feminism and Womanism and how they differ from one another. Students will be given selected pages to read and discuss within their groups and then will proceed to fill out a semantic feature analysis. A grid is used in the semantic feature analysis technique to help students investigate how different collections of items are connected to one another. Students may identify connections, make predictions, and learn essential concepts by completing and studying the grid. This method improves understanding and vocabulary. Working with the terms Black feminism and Womanism, students will observe that certain parts are similar while others remain distinct. This lesson serves as an introduction to our overall discussion of intersectionality and our larger unit in celebration of Women's Heritage Month.

**Subject Category**

School of Education Categories: Adolescence Education: English

**Faculty Sponsor Department**

English

**Faculty Sponsor**

Alice Rutkowski

## 59 • A Lesson on the Empowerment of Diverse and Inclusive Literature in the Classroom

Marlee Fancett

### Abstract

It's no secret that there's a lack of representation of Black culture and history in classrooms across the nation, reflected by the lack of Black authors included in the line-up for English Language Arts classes. In response, the presented lesson plan, which aligns with various standards and research-based strategies such as Bloom's Taxonomy and Pre-Teaching, is part of a twelfth grade unit focus on the influence of African American literature on genre. To prepare students for tracking the evolution of autobiographies in African American literature, this specific lesson focuses on Susie King Taylor's memoir, *Reminiscences in My Life in Camp with the 33D United States Colored Troops, Late 1st S.C. Volunteers*, to define the genre and inspect literature as a form of resistance and a source of empowerment. To expand on this concept, there is supplemental poetry in which Samuel King powerfully reflects on his own schooling, commenting that the lack of recognition and representation of Black individuals is detrimental for minority students. These pieces of literature open a discussion for students to reflect on their own experiences, the lack of diversity and representation, and what they want and need to learn in the classroom to feel empowered. Of course, this lesson isn't the ultimate answer as it is only one day out of what needs to be year-round inclusion and diversity in the classroom. This lesson, though, is a springboard encouraging educators and students to recognize the empowerment of literature for all writers and readers.

### Subject Category

School of Education Categories: Adolescence Education: English

### Faculty Sponsor Department

English

### Faculty Sponsor

Alice Rutkowski

## 3H: Lessons from Fish Biology: Metabolism, Stress, Development, & Diversity

3:15-4:30pm Thursday, 21 April, 2022, Bailey 103

### Session Chair

Brett Woodworth

## 65 • The Pace of Life of Deep-sea Fishes

Brett Woodworth

### Abstract

Metabolism is the sum of all chemical reactions in the body and drives nearly all life processes, including growth, reproduction, and development. In the deep sea, low temperature and high pressures are thought to impact metabolism by slowing the kinetic movement of particles. Temperature and body mass are the two main parameters that affect metabolic rate, the rate at which biochemical reactions occur. Therefore, metabolism is expected to decrease as depth increases. However, metabolic rate is difficult to determine in the deep sea. Direct respirometry of deep-sea fishes is challenging, so metabolic enzymes have been used as a proxy for metabolism. However, metabolic enzymes are imperfect proxies for metabolic rate because enzymes function differently when organisms are taken out of their natural environment. To investigate fish metabolic activity with increasing depth, we analyzed swimming kinematics as a proxy for metabolism in fishes across a large depth gradient (>5000 m) using open source videos from the National Oceanic and Atmospheric Administration's (NOAA) Okeanos Explorer, and personal recordings. We analyzed swimming kinematics in four dominant fish taxonomic orders. Results show that swimming speed decreases with habitat depth in the orders where shallow-water and deep-sea swimming kinematic data were collected. Water temperature and ocean

oxygen concentration were positively correlated with swimming speed, but temperature seems to have a stronger correlation with swimming speed changes. Metabolism provides insight into the demands the environment places on organisms, how it constrains organism physiology, and provides insight into deep-sea energy consumption.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Mackenzie Gerring

**116 • Isolating total RNAs to Investigate the Role of Non-coding RNAs (ncRNAs) in Zebrafish Stress Response**

Zana Sawas, Jacqueline Schoer, Alex Jakubiak

**Abstract**

Climate change has put a lot of stress on aquatic ecosystems all around the world, which has had a large influence on fish species. Tuna is a reliable source of sustenance for many people around the world. Based on recent studies, non-coding RNAs (ncRNAs) such as piRNAs, miRNAs, and lncRNAs could modify steady-state levels in response to environmental stressors such as food scarcity, pH, and temperature change. Our goal is to find potential ncRNA candidates in zebrafish as a model organism for tuna that are responsive to stressors that mimic those which are caused by climate change. These zebrafish sequences will be compared to tuna fish sequences to learn more about how these ncRNAs contribute to the epigenomic response to these stressors. We have successfully isolated total RNA from harvested zebrafish organs from stressed and unstressed populations in this work. In the future, we will use RT-qPCR to quantify the steady-state levels of pre-selected ncRNAs based on reports from other organisms. Candidate ncRNAs that are shown to be successful will be employed in the future to help wild tuna fish populations in the Philippines and to learn more about their adaptations to natural climate change stressors.

**Subject Category**

Science and Mathematics Categories: Biochemistry

**Faculty Sponsor Department**

Chemistry

**Faculty Sponsor**

Salvador Tarun

**256 • Identifying Ptch2 Signaling Effects on Zebrafish Retinas**

Arianna Falletta, Noe Stephens, Brittany Gaynor, Katie Morgan

**Abstract**

Zebrafish are a useful model organism in studying developmental biology. One topic of interest is their ability to regenerate tissues, including retinal cells. Uncovering genetic pathways for this disease could be applicable to humans, as humans and zebrafish have numerous analogous genes. This allows researchers to find common pathways between humans and zebrafish and study the development of tissues through their signal pathways using techniques such as in situ hybridization. The focus of this study will be on Patched 2, and its role in zebrafish retinal regeneration. Ptch2 is a part of the Hedgehog (Hh) signaling pathway and functions to control the patterning and development of many tissues, such as the retina. Although it has been found that pch2 is a vital part of retinal regeneration, it is unknown which cells in the retina of zebrafish the Ptch2 transcript is produced. We want to be able to characterize a genetic pathway for Ptch2 and Ptch2 signaling proteins that drive gene expression changes inside the nuclei of the retina of zebrafish. By using in situ hybridization, we hope to discover what specific cells in the retina produce Ptch2, what complement other

histochemical studies about what cells receive Ptch2 signaling, and determine what cells and genes are ultimately important for regeneration. First, we prepared a riboprobe in order to be able to detect our target DNA during in situ hybridization. We will then use our probe to carry out the rest of the in-situ hybridization procedure and take pictures of the results.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Travis Bailey

**68 • Drivers of Deep-Sea Fish Community Biodiversity in Caribbean Waters**

Chryssanthi Tzetzis, Julia Cappiello, Erin Patton, Nikki Fuller, Gabriel Rosado, Abisage Sekarore, Emily Morgan, Makena Scarlata, Brett Woodworth

**Abstract**

High biodiversity is a key indicator of the health and stability of ecosystems, including ocean habitats. The deep waters surrounding Puerto Rico contain a variety of habitats and geological features that provide refuge to a wide range of organisms. These habitats and features include seamounts, ridges, trenches, and canyons. In this project, a Remotely Operated Vehicle (ROV) was used to dive and map the regions off the coast of Puerto Rico and the Virgin Islands to better understand the biodiversity. Data and videos from the National Oceanic and Atmospheric Administration Office of Ocean Exploration Research (NOAA OER) Expedition 1811 (EX1811), suggest that fish biodiversity decreases with increasing ocean depth. Fish taxonomic orders seen at greater depths include the Ophidiiformes, Notacanthiformes, and Aulopiformes. Morphological changes included elongated bodies and smaller head-to-body ratios, which were recorded with increasing depths. The number of families observed decreased with increasing dissolved oxygen concentrations and decreasing temperature. Fish observations on varying substrate types suggest that sediment type may influence biodiversity. A visual analysis showed that soft sediments had higher demersal fish biodiversity, compared to rocky and mixed substrates. This study explored how different environmental parameters including: depth, temperature, dissolved oxygen, and substrate type drive fish community composition, increasing our knowledge of ecosystem function and overall biodiversity.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Mackenzie Gerringer

**3I: The Stakes of Politics in the 2020s**

3:15-4:30pm Thursday, 21 April, 2022, Bailey 104

**Session Chair**

Terra Peter

**189 • Fair Housing and the Constitution: Implications for State and Local Policies**

Terra Peter

**Abstract**

American cities are still plagued by segregation in a supposedly post-racial America, in no small part due to unequal housing opportunities. The Fair Housing Act (FHA), Title VIII of the 1968 Civil Rights Act, provides protection from discrimination against race, ethnicity, religion, sexual orientation, family status, and disability, but in this paper, I focus on racial discrimination. While this federal law provides protection against any discrimination in the process of buying and selling of property, there are still tensions between local, state, and federal policies that have left discretion on housing to the states. I begin with a history and analysis of major federal statutes and Supreme Court cases surrounding fair housing and race. The earliest cases regarding fair housing established its legality within the context of the Fourteenth Amendment. After the passage of the FHA in 1968, more recent cases considered what aspects of housing should be left to states, essentially leaving each state to decide what could be considered a proximate cause of a certain policy, thus deciding if the policy could be challenged under the FHA or not. I discuss the implications of these policies and decisions at the state and local level using the states of Michigan, New York, and Illinois as contemporary case studies, which are where some of the most segregated cities in America are located. Through these examples, I argue that an alternative approach is needed in guaranteeing fair housing access.

### **Subject Category**

Social Science Categories: Political Science

### **Faculty Sponsor Department**

Political Science and International Relations

### **Faculty Sponsor**

Aaron Herold

## **79 • Hobbes' Deification of the State: Instituting the Supremacy of the "Mortal God"**

Uliana Kitar

### **Abstract**

An analysis of Hobbesian political theory and its implications on religion, both as an institution and as a state mechanism. As one of the earliest liberal theorists, much of Hobbes' theory has been applied to our democratic system while advocating for a system completely distinct from our own. Hobbes' *Leviathan* and other related works demonstrate the influence of redefined religion upon multiple facets of both political and social life. Hobbes' most infamous work *Leviathan* outlines a political framework designed to achieve preservation of man and, most notably, the commonwealth; however his justification for such a political system would be incomplete without acknowledging key foundational concepts of power and human nature. In justifying *Leviathan*, Hobbes utilizes the power of religion as a political tool in maintaining control - both politically, as a state structure, and civically, through the institution of a new moral code. Especially in an age of high religious fervor, Hobbes' idea of an absolute sovereign opposed the sovereignty and power of God, facilitating justification to maintain legitimacy. In granting the sovereign absolute power over a commonwealth, Hobbes must address religion for "no one can serve two masters." Hobbes' work encapsulates a distinct view towards the role of government as an institution and the relationship between the commonwealth and sovereign in order to achieve an ultimate goal of preservation - and whether such a goal is justified.

### **Subject Category**

Social Science Categories: Political Science

### **Faculty Sponsor Department**

Political Science and International Relations

### **Faculty Sponsor**

Aaron Herold

## **35 • Staff in Legislative Reference Bureaus: The Influence of Lobbying**

Hannah Rohrabacher

### **Abstract**

In this project, I explore the relationship between the role of legislative staff and the influence of lobbyists in three U.S. state legislatures (California, Wisconsin, and Wyoming). I explore this dynamic through an original data collection on staff in legislative reference bureaus (LRBs) and statutes and regulations on lobbying activity. Staff in LRBs serve an important and distinct role compared to personal staff for legislators; LRB staff tend to the more technical rather than political aspects of policymaking by providing nonpartisan, factual research and legal advice to legislators. Legislators enter office with varied political experience, abilities, and backgrounds. Many legislators, especially new ones, are not well-versed in the technical aspects of drafting legislation. LRB staff help fill the knowledge gap and may lessen the influence of lobbyists in the policymaking process.

I leverage the variation of professionalism of state legislatures using the Squire Index to explore this relationship: California (ranked #1), Wisconsin (ranked #26), and Wyoming (ranked #49). I find that a less professionalized legislature is more likely to have fewer regulations on lobbying, which has important implications for understanding the role and influence of lobbyists and special interest groups in state legislatures. The more professional LRB staff and resources a legislator has access to limits the advantages held by lobbyists and can reduce lobbying influence.

### **Subject Category**

Social Science Categories: Political Science

### **Faculty Sponsor Department**

Political Science and International Relations

### **Faculty Sponsor**

Hanna Brant

## **229 • The Factors Preventing the American People from Rectifying Increasing Income Inequality**

Jackson Diamond

### **Abstract**

Rising income inequality in America has been plain to see over the past three decades; CEO pay increases have outpaced that of the average worker exponentially, while the costs of living have steadily risen at a pace above which the salary of the average worker has increased. Americans have noticed this trend, and all indications are that they have been supportive of policies which would rectify this. Increased taxation on the highest income earners has consistently polled as the most popular policy implementation across the aisle over the aforementioned timespan. These observations naturally lead to the following question: in a supposed “democracy”, where the power is supposed to lie in the hands of the people, why haven’t the American people been able to rectify the increasing income inequality they have noticed? In order to answer this question, I will look to identify the factors at play in American governance which have prevented the will of the people from prevailing. Some factors I will look at in this regard are the impact of campaign finance reforms, special interest groups, and the will of political elites. I will look to identify specific legislation which shifted power away from the American people, making it harder for them to have their will expressed through governance. This will culminate in a recommendation for policy implementation which will again even the playing field in American democracy, allowing the American people to rectify the income inequality plaguing the nation.

### **Subject Category**

Social Science Categories: Political Science

### **Faculty Sponsor Department**

Political Science and International Relations

### **Faculty Sponsor**

Jeffrey Koch

## **3J: On-Campus Food Forest Discussion Room 2**

3:15-4:30pm Thursday, 21 April, 2022, MacVittie College Union Fireside Lounge

**Session Chair**

Lauren Goulet

**260 • Big Change in a Little Space: On-Campus Food Forest Discussion Room** 

Lauren Goulet, Brendan Shortt

**Abstract**

Join us for an engaging discussion on our Ambassadorship project! We'll discuss agriculture techniques such as no-till and polyculture, and share about the short- and long-term goals of the project. Interact with multiple hands-on stations and help us expand the conversation on sustainable food production!

**Project Description:**

How might we establish a yield-producing food forest as a tool to inform and empower local farmers, members of the SUNY Geneseo community, and other community partners on sustainable food growing practices? Our project focuses on incorporating multiple facets of sustainability by engaging food security, infrastructure, permaculture and education. This space will rely on practices such as polyculture - focusing on an eight layer food forest structure - and no-till soil management. In addition to the physical planting and production in the space, the project will encompass outreach, education, and resource building for the local community. The time and effort that we put in during the pilot process will continue to produce both physical and educational yields for years to come.

This Student Ambassador Project is made possible by generous funding from John '87 and Mary Grace '84 Gleason Ambassador in Student Affairs.

**Subject Category**

Interdisciplinary and Other Categories: Sustainability Studies

**Faculty Sponsor Department**

Office of Sustainability

**Faculty Sponsor**

Dan DeZarn

**3K: Law, Literature, and Humanities**

3:15-4:30pm Thursday, 21 April, 2022, Welles 119

**Session Chair**

Betsy Colón, William Hall

**74 • The Relation of Justice to the U.S. Capitol Riot**

Brianna Cohen

**Abstract**

The insurrection on the U.S Capitol building on January 6th, 2021 stunned Americans as they watched the collapse of order and lawfulness conducted by their fellow citizens. Those who participated came to the capitol with the intention of protesting the confirmation of president-elect Joe Biden, as they believed his victory was fraudulent. Causing destruction, injuries, and death in their wake, the rioters were not led by former President Donald Trump, as he told them he would. The former president encouraged the insurrection, but did not participate, keeping his interests at the forefront. This paper explains how the dynamics of the insurrection relate to Plato's Republic. It explains how the events that took place on January 6th, as well as the mindsets of those involved, acted, according to Plato's definitions, unjustly rather than justly.

**Subject Category**

Arts and Humanities Categories: Philosophy

**Faculty Sponsor Department**

English

**Faculty Sponsor**

Graham Drake

**117 • I Bring You Murder: The Ultimate Betrayal—A Look at the Use of Othello as a Metaphor in Murder Trials**

Lyndsay Tudman, Hailey Cullen, Olivia Schmidt, Hannah R. Smith

**Abstract**

From the mid-nineteenth century to the early twentieth century, the New York Times archive contains articles comparing people involved with murder or violent assault trials to Shakespeare's play, Othello. Several of the cases involved interracial couples between a Black man and a white woman, and the violence motivated by jealousy from one partner towards the other. As we researched the cases, patterns of who was compared to Othello and how those individuals were characterized emerged. We noticed that oftentimes, an individual's characterization consistently correlated with their race. Because of this consistency, we decided to investigate the direct motives behind the racialization behind the receiver of the article's sympathy. We found that the racially motivated comparisons to Othello were made, characterizing Black men in the cases as villainous and the white women as victims. In these murder trials, the white women are constantly subjected to the privilege of victimization, thus reinforcing the villainization of the Black male character. This was done to maintain white supremacy and reestablish perceived societal roles. Our project analyzed reconstruction politics and how it contributes to public fascination with murder. In this polarization between Black male villainous characters and the white female victim character, the public finds entertainment, as it adds another layer of danger and interest to the murder. These murder trials strip Othello of any sympathy and prevent him from being seen as a victim—he is just another Black man threatening societal roles, and, therefore, can only be dangerous.

**Subject Category**

Arts and Humanities Categories: English

**Faculty Sponsor Department**

English

**Faculty Sponsor**

Samuel Fallon

**3L: African Lived Experiences Represented in African Literary Works**

3:15-4:30pm Thursday, 21 April, 2022, Welles 117

**Session Chair**

Alexandria Richards

**272 • Gender Inequity Entrenched in Post-Colonial African Society**

Rebecca Perry

**Abstract**

This paper shows that gender discrimination, particularly treating women in lesser ways, is a problem that plagues African countries. This issue has not always been present; in pre-colonial times men and women were treated remotely as equal counterparts and coexisted in harmony. As Westerners began to colonize Africa, the patriarchal conditions that were intertwined in their society already started to become embedded in African society as well. Consequently, a power imbalance was established, and men began to dominate over women in society. Women were viewed as inferior and as a result were not granted access to the same opportunities as men including the right to education and ability to share their stories. Using Tsitsi Dangarembga's novel, *Nervous Conditions*, to highlight instances of inequity during the 1960's

in Zimbabwe and to emphasize the need for societal change, this paper offers approaches to bring back the harmony among genders that existed in African societies before colonization such as the increase of female leaders in schools and the expansion of the creative economy.

**Subject Category**

Interdisciplinary and Other Categories: Africana Studies

**Faculty Sponsor Department**

English

**Faculty Sponsor**

Olaocha Nwabara

**273 • Tsitsi Dangarembga's *Nervous Conditions*: Help, Hinder, or Both? The Zimbabwean and African Perspective on Missionary Presence**

Maeve Morley

**Abstract**

This research paper focuses on the Christian missionary presence in Zimbabwe, the impact of their presence on the social, socio-political, and economic aspects surrounding the country and its people, and the Zimbabwean perspective or response to their presence. In previous history, one primary claim that colonial forces have made is that their presence and insertion of their socio-economic aims and way of life into the already pre-established African way of life, was beneficial to the African continent and its people. However, with the help of literature, many people have learned that these outside forces have inflicted harm, rather than have helped. The interest in researching this particular topic lies in the question of whether or not the Zimbabwean perspective of missionary presence in Zimbabwe was negative, positive, or somehow varied. In connection with Tsitsi Dangarembga's *Nervous Conditions*, I will be exploring this question.

**Subject Category**

Arts and Humanities Categories: English

**Faculty Sponsor Department**

English Department

**Faculty Sponsor**

Olaocha Nwabara

**275 • The Yoruba Diaspora and its Survival in the Post-Colonial World**

Amina Diakite

**Abstract**

This research paper will explore the issue of religious wars on the African continent in connection to colonialism, imperialism, and slavery. It will also explore the survival of the Yoruba religion worldwide despite these things and its ability to prosper amongst more prevalent faiths today. This research paper will delve into the connection created between the Yoruba religion, its ethical teachings, and otherworldly religions and practices influenced by it to reassert a sense of unity. The Yoruba religion can be a vehicle for solidarity amongst faith-full people within the African diaspora, among many other African traditional religions. Rediscovering what the Yoruba religion offers can allow for a celebration of similarities instead of encouraging competition. This essay will analyze "The Handbook of Yoruba Religious Concepts" by Baba Ifa Karade as he works to extract the history of the Yoruba religion and its evolution into different forms of itself around the world. Karade can clearly explain the similarities between modern religious concepts and where the Yoruba religion has influenced other religions and practices worldwide.

**Subject Category**

Interdisciplinary and Other Categories: Africana Studies

**Faculty Sponsor Department**

English

**Faculty Sponsor**

Olaocha Nwabara

## Poster Presentations

12:00-3:30pm Thursday, 21 April, 2022, MacVittie College Union Ballroom

and

4:30-6:00pm Thursday, 21 April, 2022, MacVittie College Union Ballroom

### ANTHROPOLOGY

#### 91 • Suggestions for How Geneseo Faculty Can Improve Students' Experiences in Office Hours

Tyler Grasso

**Abstract**

This study explores Geneseo undergraduate students' experiences in and attitudes towards faculty office hours. In semi-structured interviews with eight undergraduate students (conducted in the Fall 2021 semester), students were asked to reflect on practices by faculty that made them feel welcome or unwelcome while visiting office hours, as well as how they feel before their visits. Practices by faculty that are received well by students include remembering or asking for students' names, receiving students warmly, making an effort to connect with students, and having their office door open. Conversely, students say that they feel unwelcome when a professor's office is disorganized, when they are constrained by a time slot, or when they feel rushed by a professor, among other reasons. Several students noted that they feel nervous or stressed before entering office hours. Faculty members should consult these findings in order to improve students' academic experiences.

**Subject Category**

Social Science Categories: Anthropology

**Faculty Sponsor Department**

Anthropology

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Jennifer Guzmán

#### 72 • How Provider-Patient Interactions Influence Patient Experiences

Emily Lumbis

**Abstract**

The interaction between a patient and a provider is crucial to the success of any medical or healthcare appointment. It often goes overlooked, and there is more of a focus on the provider correctly diagnosing and treating the patient. Although patients will remember the success of being properly diagnosed and treated for an illness, what truly stands out is the way the interaction went. This ethnographic research project focuses on provider-patient interactions from the patient's perspective, and how those interactions shaped their experiences. The goal of this study was to better understand the interactions between patients and providers and the overall patient experience. Through the use of

semi-structured interviews, data was collected from college students at SUNY Geneseo about their patient experiences and interactions with providers. Based on the results, this research argues that the interaction a patient has with their provider influences their overall satisfaction with the experience, that the provider believing the patient is important to the success of the encounter, and finally that providers and patients should have an equal power dynamic, as one exerting more power than the other does not produce beneficial interactions or experiences. This study provides a unique perspective on how patients feel based on their lived experiences, which can offer direction for future improvements to the patient-provider interactions that take place within healthcare systems.

**Subject Category**

Social Science Categories: Anthropology

**Faculty Sponsor Department**

Anthropology

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Melanie Medeiros

**103 • The Effects of Gentrification on Minority Health and Wellbeing in New York City**

Maya Nunez

**Abstract**

Gentrification, which can be defined as “a process in which formerly under-resourced, neighborhoods experience reinvestment and in-migration of increasingly affluent new residents”, is a multi-level phenomenon that has been linked with negative resident health outcomes, specifically among minority groups (Tulier et al., 2019, 1). Attempts to reduce health inequalities have resulted in increased research on the relationship between gentrification and health (Tuiler et al., 2019, 1). Although scholars have been able to identify the several benefits and costs of gentrification on minority health, there are significant challenges to studying this relationship.

Current scholarship has demonstrated that a negative relationship exists between gentrification and health, especially for low-income minority groups; however, scholars agree that massive gaps in the literature surrounding this relationship need to be addressed and this requires coming up with a better measurement for gentrification. Doing so “may be necessary for the implementation of public health policies impacting gentrifying neighborhoods” (Smith 2020, 854). My research is motivated to better understand the relationship between gentrification and minority health. I will conduct data analysis and semi-structured interviews with Geneseo student minorities who live in NYC and have experienced gentrification in some way, shape, or form. I will ask questions to see how their experiences with gentrification have shaped their health and overall well-being.

**Subject Category**

Social Science Categories: Anthropology

**Faculty Sponsor Department**

Anthropology

**Faculty Sponsor**

Melanie Medeiros

**265 • The Effects of Biomedicalization on Maya Midwives**

Jillian DeMaria

**Abstract**

Traditional birthing assistants (TBA) have been used to assist many women in various cultures with at-home childbirth. In Latin America, especially in traditional Maya communities, the use of TBAs has a very historical and cultural significance. Midwives, also known as comadronas, are said to have been called upon by divine supernatural powers to become midwives for their communities. Comadronas are considered to be spiritual beings who can predict

pregnancies, interpret signs within births, and foresee the future of the child. However, practices surrounding pregnancy, childbirth, and postpartum care have changed due to the increase in biomedicalized care within several areas of Latin America. This study explores the circumstances that have led to an increase in the use of hospital births with biomedical practitioners and a decrease in at-home births with TBAs. The purpose of this study is to examine factors surrounding decisions to experience pregnancy, childbirth, and postpartum care in traditional versus biomedical contexts. Interviews of mothers of young children living in two Yucatec villages, Coba and Sahcab Mucoy, provide data for this study. Comparisons are made between pregnancy related decisions in Coba, which has transitioned to a cash economy, and Sahcab Mucoy, which has retained a more traditional subsistence economy.

**Subject Category**

Social Science Categories: Anthropology

**Faculty Sponsor Department**

Anthropology

**Faculty Sponsor**

Kristi Krumrine

**274 • Biomedicalization's Effect on Traditional Yucatec Mayan Reproductive Practices & Medicinal Plant Use**

Jordan Moore

**Abstract**

In this study, I will examine Yucatec Maya women's experiences with the reproductive cycle regarding medicinal plant use as well as traditional cultural practices and beliefs. Medicinal plant use in general is still very prevalent in rural communities of Yucatan, Mexico due to the lack of biomedical healthcare accessibility, transportation, and costly fees of care. Maya women and traditional birth attendants use medicinal plants throughout the female reproductive cycle as needed to manage pain, inflammation, and for prevention against culturally important illnesses. Mayan alternative plant practices have begun to be implemented into the biomedical healthcare system within the past few decades in search of new pharmaceuticals as well as cultural accommodation. During pregnancy, childbirth, and the postpartum period Maya mothers follow strict traditional dietary guidelines and lifestyles, such as the "hot" and "cold" food system which is one of the most prominent beliefs observed in the Yucatan. Various cultures around the world adhere to similar practices and beliefs during the pre-, peri-, and postnatal periods, such as pregnant mothers in parts of Asia, the Middle East, and Europe. To emphasize the use of traditional cultural reproductive practices, I will conduct a cross-cultural comparison of the foundations of these beliefs as well as how they differ in this study.

**Subject Category**

Social Science Categories: Anthropology

**Faculty Sponsor Department**

Department of Anthropology

**Faculty Sponsor**

Kristi Krumrine

**247 • An Intersectional Approach to Time Poverty: A Pilot Study of Time Poverty and Black Women's Perceived Health Based on Semi-Structured Interviews**

Lauriane Ngaya Fonkou

**Abstract**

The term "time poor" describes people disproportionately burdened by responsibilities and inflexible work schedules resulting in little to no discretionary time. Time poverty was brought to my attention via the social media app TikTok where Black women creators expressed how time poverty affects them. Given that Black women are an especially

vulnerable population in terms of health, I became curious about the relationship between time poverty and Black women's health. However, the existing sociomedical science literature on time poverty does NOT adequately account for Black women's subjectivity because the research considers mediators of class OR gender OR race but does not consider these factors intersectionally. For research to adequately understand the connection between time poverty and Black women's health, an intersectional approach is needed in which gender race AND class are considered synergistically, with each social identity intensifying the health impacts of the other. To that end, I will conduct a qualitative pilot study using individual semi-structured interviews to identify patterns of themes related to Black women's intersectional social identity, perceived health, and time poverty.

**Subject Category**

Social Science Categories: Anthropology

**Faculty Sponsor Department**

Anthropology

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Lee Pierce

**BIOLOGY****174 • Does Male Display Behavior in an Ant-Mimicking Spider Depend on Context and Affect Female Response?**

Julia Brzezicki, Marlena Ridley, Julia Cappiello

**Abstract**

*Myrmarachne formicaria* is a species of ant-mimicking jumping spider native to Eurasia that was first noticed in the United States in 2001. These spiders get their name from their ant-like body forms and movement of their two forelegs to appear like antennae. They are also sexually dimorphic, with the males having enlarged chelicerae (jaws) that extend out from the front of their face. Males that encounter each other engage in displays that include faceoffs (facing one another and pacing back and forth), putting their abdomens to the side, opening their chelicerae, and even attacking/jabbing at one another. These male displays are usually initiated as a territorial defense mechanism or as they compete for a possible mate. Our experiment was designed to determine whether the intensity and frequency of the male-male behavioral displays were affected by the presence of a female and whether the female showed evidence of a preference for either male. We ran 13 trials in a circular arena divided into three compartments and recorded the interactions of the males before and after adding the female. Each pair of males differed in size by 1 mm or less. Videos were analyzed to quantify the behaviors observed in each trial and compare displays in the absence and presence of females. Female behaviors were also interpreted to see if they showed a preference for the male that prevailed during the trial. The results help us to see how context influences the nature and outcome of male display behavior.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

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Jennifer Apple

**163 • Timing of Use of Artificial Nests by Exotic Mason Bees**

Stephen Hoare, Rachel Williams, Kaitlyn Latorre

**Abstract**

Solitary bees are a vital part of ecosystems due to their role in pollination of crops and native flowering plants. Some solitary bees, mason bees and leafcutter bees, use hollow cavities to rear their brood. Availability of above ground nesting sites is vital to their success. To promote these beneficial bees, people have set out artificial cavities for them to use. Unfortunately, exotic mason bees are outnumbering native mason bees in the eastern United States and may also benefit from these supplemental nest sites. In Spring 2020 boxes of hollow tubes for cavity-nesting bees were established at locations across SUNY Geneseo to support native bees and survey bee diversity. When tubes were dissected in spring 2021 and adult bees were allowed to emerge, we discovered many to be exotic. The increasing abundance of exotic mason bees is likely depressing native mason bee populations. Could artificial nesting sites be set out in a way that supports native bee species without supporting exotics? As we know exotic mason bees emerge very early in the spring, we compared occupation of artificial nest tubes set out later in spring 2021 to those set out earlier in spring 2020. Repeated bee bowl surveys were also conducted in the spring and summer to determine timing of exotic bee activity. We also determined relative abundance of the two exotic mason bee species. These results suggested that artificial nest tubes should be set out later in the spring to avoid supporting exotic mason bees.

### **Subject Category**

Science and Mathematics Categories: Biology

### **Faculty Sponsor Department**

Biology

### **Faculty Sponsor**

Jennifer Apple

## **85 • Developing Resources for Assessing Genetic Diversity in a Non-native Ant-mimicking Spider**

Cassidy Mills

### **Abstract**

The ant-mimicking spider *Myrmarachne formicaria* (Salticidae) is a species native to Eurasia and was first identified in North America in 2001. It has since been found in many locations in the Northeast including New York, Pennsylvania, Ohio, Ontario, and more recently as far as Chicago. Little is known about its introduction to North America and how it has dispersed since. By characterizing the mitochondrial and nuclear genetic diversity of this species, we can learn about its introduction history and dispersal patterns. Previous sequencing of two mitochondrial genes, CO1 and ND1, from 27 specimens collected from 14 localities in New York, Pennsylvania, and Ohio yielded no genetic polymorphisms. Comparisons with sequence data in GenBank for other salticid species have shown that within-species divergence in the mitochondrial DNA ND1 region is found in other spiders, so *M. formicaria*'s lack of variation is likely unusual. The nuclear ribosomal ITS2 gene region was also sequenced but gave ambiguous results suggesting the need for more specific primers. Our current data are consistent with a single invasion of *M. formicaria* from one source locality, but data from additional loci and samples would help to confirm this conclusion. Our research is shifting to RNA sequencing to discover more informative gene regions for comparison. We are fine-tuning methods for extracting high-quality RNA from *M. formicaria* and a related non-mimic spider. By analyzing RNA sequence data, we can identify genes that harbor more genetic variation or discover single sequence repeats useful for population genetics analysis.

### **Subject Category**

Science and Mathematics Categories: Biology

### **Faculty Sponsor Department**

Biology

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Jennifer Apple

## **143 • Distribution and Phenology of Nonnative *Myrmarachne formicaria* in its Native and Invaded Range**

Eliana Ontiveros-Oberg

### Abstract

*Myrmarachne formicaria* are ant-mimicking jumping spiders native to Eurasia and North Asia which likely utilize protective mimicry to avoid predation. In 2001, they were first sighted in North America and are spreading throughout the Northeast US and Ontario. To learn more about the species in its native range, I conducted a series of data analyses on its geographic distribution and phenology using data from the Global Biodiversity Information Facility (GBIF) database. GBIF compounds global species occurrence data from local and foreign databases, including iNaturalist. Most observations in Europe were recorded in France, Switzerland, and Belgium and were concentrated at low elevations. I constructed species distribution models to determine locations we can expect to find *M. formicaria* across Europe as reported collection data is irregular. Chi-square tests suggest differences in seasonality between Europe and North America: in May and July, there were relatively more observations in Europe than North America, while North America had relatively more observations in August and September than did Europe. Chi-square tests also showed differences in the seasonality of female and male observations. In North America, the number of male and female sightings as reported on iNaturalist peaked in August and June, respectively, while in Europe, sightings of both sexes peaked in June. These differences in phenology may be associated with true biological differences in these spiders in their native and invaded ranges, or with the quality and intensity of observation and collection data, but nonetheless provoke further exploration into *M. formicaria*'s distribution and habits.

### Subject Category

Science and Mathematics Categories: Biology

### Faculty Sponsor Department

Biology

### Faculty Sponsor

Jennifer Apple

## 257 • Localization of the Sonic the Hedgehog (Shh) protein in Zebrafish retinas

Levi Miller, Mackenzie Pitcher, Jack Barbosa

### Abstract

Unlike most vertebrates, zebrafish possess the unique ability to regenerate organ tissues and retinas when damaged. Understanding this regenerative process could be the key to assisting in preventing and healing damaged retinal cells in humans. Zebrafish can regenerate damaged retinal cells when proliferating progenitor cells re-enter the cell cycle and then differentiate into new retinal cells. The differentiation of these cells is highly regulated by many signaling pathways. One such pathway is the Hedgehog (Hh) signaling pathway. It has been shown that Sonic Hedgehog protein (shh) of the Hh pathway plays a significant role in the differentiation of progenitor cells during embryotic development and retinal healing in zebrafish. Localization of the shh protein can help us better understand where the shh protein is expressed in healthy retinas and then in damaged retinas. Analyzing the differences in location among samples can help identify which regions of the retina are predominantly regulated by shh.

### Subject Category

Science and Mathematics Categories: Biology

### Faculty Sponsor Department

Biology

### Faculty Sponsor

Travis Bailey

## 255 • Investigating why the gef mutant zebrafish retinal cells die prematurely

Christopher Jung, Mason Moon

### Abstract

The purpose of this experiment is to find out what is causing the cell death in retinal cells in gef mutants. Gef is the gene name for small eye mutants. Tp53 was proposed to kill cells that were mutant in chaf1b. The Tp53 gene is known to cause apoptosis in cells that have DNA damage. Because the gef allele is a non-functional allele of chaf1b, then gef mutants that also have a tp53 mutation would be expected to have normal eyes. This suggests that mutations in chaf1b cause other genetic changes that lead to cell death. We are expecting that there are other gene changes that are affecting the eye sizes and premature cell death in these cells. We are going to look at the gene expressions of both wild-type and mutants to find out the differences and what is causing premature cell death. We will work to separate the retinal cells from other cells in the embryos. We are using embryos since we can isolate the gene and harvest the cells before they die. This might help us to treat eye disease in humans in the future

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Travis Bailey

**199 • Chaf1b Protein in gef Mutant Zebrafish**

Laura Ulrich, Brianna Donlon, Choeyang Choku, Jacqueline Maloney

**Abstract**

Zebrafish embryos that are homozygous for gef mutant alleles experience a small-eye phenotype and are hypothesized to have decreased levels of the Chaf1b protein. This could be detected by anti-Chaf1b antibodies in a western blot. This western blot will be performed using Chaf1b morpholino 3 dpf embryos, wild type 3 dpf embryos, and gef mutant embryos 3 dpf. Embryos inoculated with Chaf1b morpholino serve as a negative control. This was then compared to the positive control of wild type zebrafish embryos, whose western blot was expected to have normal levels of Chaf1b. Proteins isolated from a gef mutant were then be analyzed and compared to the control proteins to determine the levels of the Chaf1b protein in the mutant. Future research can expand on the in vitro role of Chaf 1b in multicellular organisms and this protein's significance in regeneration.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

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Travis Bailey

**254 • Fluorescent In-Situ Hybridization in Zebrafish with the Neurod4 Gene**

Brynn Johnson, Lin Kai Ye

**Abstract**

Zebrafish are used as a model organism within experimental retinal research due to the developmental process of their eyes being similar to that of humans. This developmental process consists of apoptosis triggering the muller glial cells within the retina causing proliferation of progenitor cells. Similarities between the retinal development of zebrafish and that of humans, has led to the further exploration of the transcription factor neurod4 which may be of importance throughout the process of neuronal development. Not much is known about neurod4 but it is hypothesized to have a correspondingly important impact on human neuronal development. Due to a lack of research around neurod4, this study looks to analyze how the expression of the neurod4 transgene zebrafish compares to the expression of the endogenous gene. Endogenous gene expression can be visualized through the use of green fluorescent protein (GFP) as

its absorption of blue light results in emittance of GFP that allows for visualization. It is hypothesized that the transgene will share the same activity as the promoter found on neurod4, showing that the transgene is able to exhibit the same expression as the endogenous gene. Additionally, if the endogenous gene's function is knocked down, the cell should not be able to stimulate new growth as it is deleterious to the cell. Labeling of the neurod4 gene can be observed through Fluorescence in situ hybridization (FISH) which will be implemented in this study. FISH will allow detection of mRNA presence and its expression.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

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Travis Bailey

**209 • Increasing Dominance of Cyanobacteria in Conesus Lake**

Laura Ulrich, Matthew Blauvelt, Dean Ivanovski, Kaitlin Murphy

**Abstract**

Cyanobacteria are the leading cause of harmful algae blooms (HABs) in lakes, often producing toxins that damage the equilibrium of the native community structure. Phytoplankton community data collected during the summer season since 1972 indicate that cyanobacteria populations have been increasing in Conesus Lake. There is less evidence on whether these trends extend into the late summer and autumn. Microscopic analysis was performed on samples collected in September and October 2021, to identify the species of phytoplankton present in each sample and their relative abundance. Results of this evaluation indicated an increase in the presence of cyanobacteria in September of 2021 even compared to the same time period in 2020. With the blue-green algae comprising 55.9% of the phytoplankton community on September 5th and 39.6% on September 19th, more than a 25.0% increase from 2020. The dominant species of cyanobacteria were *Anabaena* and *Lyngbya*. Cyanobacteria decreased by October as waters cooled, with their abundance declining to 10.3% on 10/28/21. Diatoms became the dominant group in late September and October samples with the relative abundance of colonies ranging from 35.4% to 88.0%. The dominant species of diatoms were *Aulacoseira* and *Fragillaria*. Diatoms (another major group of phytoplankton) have higher success rates in cooler waters, explaining why they may be more prevalent in cooler months preceding fall turnover. The findings of our study supported that cyanobacteria dominance persisted into Summer 2021.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

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Isidro Bosch

**102 • Creating a 3D Biomechanical Model of the Forelimbs of a Weakly Flighted Bird**

Michaela Hall

**Abstract**

Tinamous are ground-dwelling birds that inhabit the neotropical regions of Central and South America. They are the only flightless ratites, the group of primitive flightless birds including ostriches and emus. Their flight muscles are well developed, but while they are capable of flight, it is not preferred. They only do so rapidly and for short periods of time, as they have a low circulation rate which is insufficient for sustained activity. The study of the functional morphology and musculature of their forelimbs can help us understand morphological consequences of the loss of flight in ratites. To

do this, we created 3D models of the bones of the forelimb from computerized tomography scans using the software Avizo and mapped the musculature of the forelimbs onto these models using Photoshop. Following this, the models of the bones will be used to create a 3D musculoskeletal model of the forelimbs in order to assess how the musculature of the forelimb reflects the weak flight capabilities of these birds. By analyzing the forelimbs of the tinamou, we can study the relationship between the musculature, bones, and function in this group of birds, which can provide insight on the evolution of flightlessness.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Sara Burch

**55 • Forelimb morphology and function of *Raptorex kriegsteini* (Dinosauria: Theropoda)**

Alexandria Scotti

**Abstract**

*Raptorex kriegsteini* is a bipedal species of predatory dinosaur that belongs to the clade Tyrannosauridae. A *Raptorex* skeleton 3 meters in length was discovered in the northeast region of China, and it was estimated to be a 5 or 6 year old adult. One of the unique morphological features of this taxon is the forearm. Similar to *Tyrannosaurus rex*, the forelimbs of *Raptorex* are very small in proportion to the rest of their body in comparison to those of other nonavian theropods. In order to investigate the potential function of the limb of this taxon, an analysis of the forelimb morphology was undertaken, including a reconstruction of the forelimb musculature in advance of creating a three-dimensional musculoskeletal model of the limb. Computerized tomography (CT) scans of the bones were used to create virtual 3D images of each element. A previous reconstruction of the forelimb musculature of *Tyrannosaurus rex* was used as a guide to determine the sites of muscle attachments on each part of the forelimb of *Raptorex*, and the locations for these attachment sites were marked on the virtual models using Adobe Photoshop. These muscle maps will be used in the next phase of this study, in which we will articulate the bones using Maya software to have a complete 3D model of the forelimb and begin adding virtual muscles to analyze the function of the forelimb.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Sara Burch

**139 • Musculature of the Bizarre Forelimb of the Alvarezsaurid *Mononykus Olecranus* (Dinosauria: Theropoda) and its Implications for Digging**

Jada Smith

**Abstract**

*Mononykus olecranus*, from the Late Cretaceous of Mongolia, was a small, nonavian theropod dinosaur belonging to the clade Alvarezsauria. Some have hypothesized that derived members of this clade may have had an insectivorous diet, and might be specialized as ant or termite eaters, due to the unusual morphology of the forelimb. The forelimbs of *Mononykus* are distinctly stunted in size with only one digit and claw on each hand. In order to investigate the hypothesis that these forelimbs were used in digging, we completed the first muscular reconstruction of the forelimbs of *Mononykus*. Previous muscular reconstructions of the early theropod *Tawa hallae* and the ceratosaur *Majungasaurus*

*crenatissimus* were used as a foundation and combined with an analysis of homologous osteological correlates found in *Mononykus* to develop a phylogenetically-informed muscle reconstruction. Comparisons with the myology of more basal taxa allowed us to identify modifications in the forelimb that improve the leverage of a number of muscles acting on the shoulder, elbow, and wrist. *Mononykus* exhibits an enlarged posteroventral process of the scapulocoracoid along with a massive olecranon process of the ulna. The humerus of *Mononykus* possesses a projecting deltopectoral crest and internal tuberosity, and expansion of the ectepicondyle. The modifications identified in the forelimb musculature in this taxon suggest enhanced movement of the arm and claw with increased stabilization of the joints, which is consistent with the hypothesis that *Mononykus* used its remarkably reduced forelimbs for digging or scratching when foraging for insects, similar to extant insectivorous diggers like the pangolin.

### Subject Category

Science and Mathematics Categories: Biology

### Faculty Sponsor Department

Biology

### Faculty Sponsor

Sara Burch

## 66 • Feeding Morphology of Deep-Sea Demersal Fishes

Ryan Bohlen, Chryssanthi Tzetzis

### Abstract

Deep-sea inhabitants survive high pressure, limited food availability, lack of sunlight, and cold temperatures. These deep-sea conditions have spurred adaptations that allow organisms to fill an array of niches. For example, distinctive feeding modes and jaw morphologies enable organisms to utilize the food resources available in their environment. Here, we investigate feeding biomechanics in deep-sea fishes across three families of fishes, the rattails (Macrouridae), snailfishes (Liparidae), and cutthroat eels (Synphobranchidae). Each of these families exist in abundance and occupy important ecological roles in their environment. We compare jaw morphologies and mechanics between families to gain insights into feeding mode, including ram feeding, suction feeding, and manipulation. Mechanical advantage, measured here, is the ratio of the output force to the input force, indicative of the total force applied by an apparatus (like a set of jaws). High mechanical advantages in the jaws indicate greater force transmission, characteristic of fishes that manipulate prey, while low mechanical advantage indicates greater velocity transfer, common to suction feeders. We compare tooth shape between the oral jaws and the pharyngeal jaws, the latter of which aid in prey processing. Members of the Synphobranchidae family had a lower mechanical advantage in their oral jaws, indicating their scavenging feeding mode requires a lower force transmission than active prey capture and manipulation. Macrourids had larger pharyngeal jaws than their liparid counterparts, suggesting that pharyngeal jaw size is a function of prey type. This research helps characterize ecological roles and describe the organismal interactions that govern the deep sea.

### Subject Category

Science and Mathematics Categories: Biology

### Faculty Sponsor Department

Biology

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Mackenzie Gerringer

## 217 • Frequency and Temporal Shifts of Calling Insects in Local Grasslands

Mackenzie Bancroft, Dana Moukaled

### Abstract

Anthropogenic noise is an ever increasing factor affecting the communication of insect populations. Recent assessments of insect populations suggest significant decline in abundance and diversity across the globe. These assessments have not included western New York, so it is important to gain an understanding of the insect populations in our local habitats and how they are adapting to increasing levels of anthropogenic noise. One non-invasive way to sample insect populations is to record acoustic signals used by these animals. Acoustic recordings gathered from a local grassland during september 2019 will be analyzed to determine if the previously determined most abundant insect species, Sphagnum Ground Cricket (*Neonemobius palustris*), Carolina Ground Cricket (*Eunembius carolinus*), and the Striped Ground Cricket (*Allonemobius fasciatus*), alter their calling behavior to avoid call masking through shifting temporal patterns, or using frequency niche partitioning to communicate within their species. We will be using Raven Pro software to analyze the first two minutes of recordings made every hour between two and six pm, and for each recording, we will determine an index of chorus size of each species identified based on the criteria in the Wisconsin Frog & Toad survey, as well as the frequency and length of calls. This research will expand our knowledge about how New York State species communicate in local grassland habitats.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

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Kristina Hannam

**145 • Impact of Road Traffic Noise on Frog Vocalization Patterns**

Robert Colbath, Micah Hosley

**Abstract**

The impacts of anthropogenic activity, including noise pollution, have been linked to a global decrease in amphibian species. Male frogs produce species-specific vocalizations in the spring and summer seasons at breeding sites to attract mates. Previous studies suggest noise pollution, namely traffic noise, has an impact on these vocalizations. This study examines acoustic recordings from six known frog breeding sites within the Genesee Valley in New York. The acoustic recordings collected during June 2019 were analyzed using the Raven Pro software to determine species richness, population density, and patterns of calling behavior for each species at these sites. We aim to understand species' use of available habitats in noisy and quieter areas, and vocalization patterns of three local frog species: Northern Gray Treefrog (*Dryophytes versicolor*), Bullfrog (*Lithobates catesbeianus*), and Green Frog (*Hylarana erythraea*). The data collected will expand upon knowledge regarding frog breeding patterns in roadside and other habitats in New York State. This study addresses the following questions: how are chorus sizes different across the sites? Is there an association between the amount of road noise and chorus sizes? How does road noise affect frequencies used in Green Frog vocalizations?

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

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Kristina Hannam

**97 • Changes in Bat Activity Levels With Differing Weather Patterns on the SUNY Geneseo Campus**

Peyton Mackey

**Abstract**

Bat species within the order Chiroptera act as important predators of insects in North American ecosystems. Bats locate insect prey by emitting high frequency calls from their nose and mouth. This frequency is too high for humans to hear which makes studying them difficult (Maryland Dept Natural Resources). Two studies: in 2018 (Loce & Mann) and 2021 (Licata & Mackey) used acoustic recording to reveal the presence of bats at different habitats on the SUNY Geneseo campus. The current study was conducted to determine whether the difference in bat activity levels between years could, in part, be due to different weather patterns in 2018 & 2021. The weather variables used in this study, temperature, percent humidity, wind speed, and rain were taken from a weather station located on the campus. We predict that different weather patterns impact the abundance and diversity of bats and their prey on campus from year to year.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

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Kristina Hannam

**277 • Calling Behavior of Singing Insects**

Dana Moukaled, Mackenzie Bancroft

**Abstract**

Anthropogenic noise is becoming an increasingly important issue in insect communication. Insect populations have been shown to be declining in number and diversity over the world, according to recent studies. Because these studies haven't covered western New York, it's crucial to learn more about the insect populations in our area and how they're adjusting to rising levels of anthropogenic noise. Recording the acoustic signals used by insects is a non-invasive approach to sample insect populations. Acoustic recordings from a local grassland during September 2019 will be analyzed to see if the previously identified most abundant insect species, *Neonemobius palustris*, *Eunembius carolinus*, and *Allonemobius fasciatus*, alter their calling behavior to avoid call masking by shifting temporal patterns and utilizing niche partitioning to communicate within their species. We'll use Raven Pro to analyze insect calls in the recording and figure out what frequencies and times these species call most frequently. This research will add to our understanding of how New York State animals communicate in grassland settings.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Kristina Hannam

**134 • Overexpression of the *Neurospora crassa* Transcription Factor *fsd-1* Inhibits Mating**

Hannah M. Smith, Kaitlyn Gera

**Abstract**

The filamentous fungus *Neurospora crassa* can undergo both asexual and sexual reproduction. However, little is known about the molecular mechanisms that regulate the *N. crassa* sexual development cycle. Previous research has shown that deletion strains of the transcription factor *fsd-1* have delayed development of female reproductive structures and are sterile. *fsd-1* is transcribed into three different transcripts, which differ by the length and intron/exon structure of their 5' untranslated region, and these transcripts vary in expression level during the life cycle. The goal of this project is

to phenotypically characterize the reproductive ability of strains overexpressing *fsd-1*, for each of the three transcripts, and we hypothesize that *fsd-1* overexpression will affect the reproductive ability of these strains. Analysis of the reproductive abilities of *fsd-1* overexpression strains showed that these strains can produce spores, but that spores do not germinate. Specifically, overexpression of *fsd-1* transcript 1 and 2 resulted in no ascospores produced, while transcript 3 strains did shoot ascospores. However, we could not recover ascospores with the overexpression genotype for any of the strains overexpressing *fsd-1*. In addition, characterization of the changes in transcriptional expression caused by *fsd-1* overexpression will give us insight into the *fsd-1* regulon. Using Illumina RNA sequencing, we mapped the genome-wide transcriptional changes that occur as a result of *fsd-1* overexpression. Our RNAseq and phenotype experiments revealed that *fsd-1* regulates processes including melanin synthesis, cell wall formation, and ascospore viability, and plays a key role in sexual development.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Elizabeth Hutchison

**141 • Investigating Complementation of *divIVA* in the Large Bacterium *Epulopiscium sp.* Type B**

David Morrison

**Abstract**

*Epulopiscium sp.* type B (“*Epulopiscium*”) is an unusually large gram-positive bacterium that lives symbiotically in the guts of surgeonfish. Like other gram-positive bacteria, the *Epulopiscium* genome encodes for a protein called DivIVA. DivIVA is found at the cell poles where it prevents FtsZ ring formation, and loss of *divIVA* results in unequal cell division. *Epulopiscium* cannot be cultured in the lab, so to gain insight into *divIVA* function we expressed the *divIVA* gene in a related gram positive bacterium, *Bacillus subtilis*. To examine whether *divIVA* from *Epulopiscium* could complement a *B. subtilis* *divIVA* loss-of-function mutation, we used microscopy to visualize the cell membrane, cell septum (FM1-43 stain), and the nucleoid (DAPI stain). In addition, these strains were grown with (1) no inducer, (2) supplemented with IPTG, (3) supplemented with xylose, or (4) both IPTG and xylose. Specifically, IPTG induces the native copy of *B. subtilis* *divIVA* while xylose induces the ectopic copy of *divIVA*. Images of strains were then analyzed and cell lengths were obtained using ImageJ. Results showed that no complementation is observed when *Epulopiscium* *divIVA* is expressed via xylose induction, and these strains look similar to strains with no ectopic copy of *divIVA* or an empty plasmid at the ectopic locus, which both served as negative controls. Furthermore, if both *Epulopiscium* *divIVA* and wild-type *Bacillus subtilis* *divIVA* are expressed simultaneously, the resulting cell strains are unaffected and look wild type. This means that there are no detrimental interactions between the *Epulopiscium* *divIVA* and the *B. subtilis* *divIVA*.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Elizabeth Hutchison

**196 • Identifying Additional DNA and RNA Binding Domains Within the Reverse Transcriptase (RT) Domain of R2Bm**

Andrew Kareeparampil, Hima Chakka

**Abstract**

Retrotransposable elements are selfish DNA elements that replicate within a host genome through an RNA intermediate. Long Interspersed Elements (LINEs), found in most eukaryotic genomes, are among the most abundant retrotransposable elements found in the human genome, accounting for over one-third of our DNA. Our study focuses on R2, a LINE element encoded from *Bombyx mori* (R2Bm) that specifically inserts into the 28S rRNA genes. The R2Bm has been exclusively used to study the biochemical steps by which R2 integrates into the host genome, known as target primed reverse transcription (TPRT). In TPRT, one subunit of the R2Bm, bound to the 3' end of its own RNA transcript, binds upstream of the target site and cleaves the bottom strand. The 3' OH end generated by the cleavage reaction is then used to prime reverse transcription of the RNA. A second R2 subunit bound to the 5' end of its own RNA transcript binds downstream of the insertion site and cleaves the top DNA strand, using the released 3'OH to prime second-strand DNA synthesis. There is little known on which R2 domain serves as a binding site for the 5' and 3' ends of the RNA transcript. We hypothesize that the R2 protein's thumb and finger 6a regions respectively serve as potential sites for RNA and DNA binding. The aim of this study was to optimize the expression and purification of the thumb and finger 6a mutant R2 proteins to identify additional nucleic acid binding domains of R2Bm.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Varuni Jamburuthugoda

**211 • Ultrapotent Corticosteroid Clobetasol Slows the Growth and Metabolism of UMSCV-4**

Daneal Retta, Gianna Minnuto

**Abstract**

Vulvar cancer occurs on the outer surface area of female genitals. It is very rare, occurring in fewer than 20,000 US cases per year and accounting for nearly 6% of cancers of the female reproductive organs. Vulvar lichen sclerosis is a rash of the female genitalia characterized by swelling, itching, and irritation. The ultrapotent corticosteroid, clobetasol is often used to treat lichen sclerosis however there is some concern that ultrapotent corticosteroid treatment could promote carcinogenesis. Our lab has been characterizing the response of the vulvar cancer cell line, UMSCV-4, to clobetasol treatment. The results of cell counts and MTT assays suggest clobetasol causes these cells to enter a state of quiescence or dormancy. Interestingly UMSCV-4 cells that were exposed to clobetasol for weeks and then removed from the drug (referred to as UMSCV-4 LT) no longer showed this decreased cell growth when re-exposed to clobetasol.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Jani Lewis

**135 • Felidae Prey Preference and Skull Morphology: How Do Sabertooth Cat Skulls Compare Against Their Extant Relatives?**

Bryce Currier

**Abstract**

The family Felidae (i.e., cats) is composed entirely of hypercarnivores—animals who are solely adapted for consuming prey. As a result of this, the skull morphology of felids is highly conserved across species with some deviations to

accommodate the difference in relative prey size selection. Generally, felids can be broken down into small prey, large prey, and mixed prey specialists. The purpose of this research was to use geometric morphometrics to quantify the differences in skull shape between felid species based on prey size specialization and to use those findings as a baseline for comparison with the extinct felid *Smilodon fatalis* (sabertooth cat). This was accomplished by comparing consistent features on several felid skulls as landmarks. Through principal component analysis, I found that *S. fatalis* followed the same general trends in skull morphology as other large prey specialists. However, *S. fatalis* was found to have morphology more similar to *Felis catus* than some large prey specialists. This is intriguing because *Felis catus*, the domesticated cat, is a small prey specialist and the similarities between *S. fatalis* may lead to further inquiry into the lifestyle of this extinct predator.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Jacob McCartney

**198 • The Impact of DNA Methyltransferase on Bacterial Growth in E. Coli**

Jessica LoPresti

**Abstract**

The Dcm protein (DNA cytosine methyltransferase) catalyzes the process of DNA methylation, a process that has a large role in the regulation of gene expression in cells. The Dcm protein methylates at the second C at the 5'CCWGG3' site. The specific consequences of this methylation are not known. We have been studying DNA methylation in *E. coli* by using two different measures of growth. The first experiment was a growth curve using absorption spectroscopy of wild-type *E. coli* and *E. coli* with a Dcm knockout gene at a temperature stressor of 42°C. We tracked the growth over eight hours, after first growing cultures at 37°C since the bacteria had no difference in growth at that temperature. The second experiment used the same methods, but instead of the wild-type bacteria, a Dcm knockout strain with a Dcm plasmid added back in via genetic complementation was used. We also plated overnight cultures of the wild-type *E. coli* and Dcm knockout strains to utilize another mechanism to measure growth. It was found that the wild-type *E. coli* strain grew at the fastest rate of the four strains. This raises some questions regarding the significance of the Dcm gene, as the bacteria grows fastest when the Dcm gene has been present in the protein from start to finish. If the Dcm gene can withstand the high temperature stressors, we may be able to explore how the protein in bacteria may react to other stressors, and dissect possible medical and pharmaceutical implications.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Kevin Militello

**179 • Analysis of KAP Survey Data to Help Understand The Main Practices that Contribute to the Incidence of Schistosomiasis Among School-aged Children in Ghana**

Queenie Adams, Grace Barnum

**Abstract**

Schistosomiasis, also known as bilharzia, is a neglected tropical disease (NTD) that is more prevalent in tropical areas including Africa, South America, and the Caribbean. The WHO estimates that 90% of people who require treatment for

schistosomiasis infections live in Africa. Our study focuses on data acquired from a small, marginalized community on the outskirts of the capital city of Accra in Ghana. Our sample includes individuals, both male and female, aged 8-26. The data was collected using KAP survey methods between 2016-2018. KAP surveys focus on analyzing knowledge, attitudes, and practices surrounding certain diseases. This method produces quantitative and qualitative results that help us to understand the impact of schistosomiasis not just on the community, but also on the culture. This data can be used to develop areas of research for healthcare and health education. The main questions we aimed to answer were how many children and young adults have knowledge of schistosomiasis, how do they perceive the parasite, what and how many high-risk behaviors do they participate in, and what preventative measures do they engage in? We also aimed to answer questions about water and hygiene within the village. No results or conclusions can be presented at this time as we are still analyzing data.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Susan Bandoni Muench

**120 • Schistosome Infections Affect on Hemoglobin in Ghana**

David Marx, Wai Cheung Tung

**Abstract**

Schistosomiasis is a parasitic infection that affected nearly 237 million people worldwide in 2019, Africa, Asia, and South America are the most affected regions. Adult Schistosomes consume red blood cells in the human bodies, which may lead to anemia. Data were acquired from blood, stool, and urine samples of school children in the highly affected community of Tomefa in Accra, Ghana over the course of 6 years. Hemoglobin, eggs of *Schistosoma mansoni* and *S. haematobium* were recorded. Anemic levels of hemoglobin were observed at high levels throughout the community regardless of infection status. Anemia is endemic within Ghana with around 47% of the country affected. Possible correlation between hemoglobin levels and Schistosome infections is investigated through a longitudinal study. Initial analysis using t-tests indicated no significant correlation between infection status and hemoglobin level. This indicates that hemoglobin levels are not highly influenced by infection status as it is by other factors such as micronutrient deficiency.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Susan Bandoni Muench

**215 • Determining the Function of MHC Class I in *Xenopus laevis* Using CRISPR/Cas9 Gene Editing**

Sarah Eckl, Keely Glasheen

**Abstract**

The MHC Class I protein plays a critical role in the immune system of *Xenopus laevis*. This protein functions in the determination between self and non-self. The MHC Class I protein is an important immune gatekeeper identifying foreign pathogens and ensuring that infected cells are killed by CD8 T cells. Also, it's important to ensure that normal cells are not attacked by the immune system. In *Xenopus laevis*, it has been shown that MHC Class I molecules are found

active in adult frogs, but have not been detected in tadpoles even though they are immunocompetent. We are interested to see if MHC Class I is critical for immune function in *Xenopus* tadpoles despite low to undetectable levels. By knocking out the MHC Class I gene in tadpoles we aim to determine its function. To do this, we utilized the CRISPR/Cas9 gene-editing tool. Cas9 creates a break in the dsDNA at the location of the gene by using specific guide RNAs, and the cell attempts to fix the break. This leads to mutations in the gene sequence that will inactivate the gene. We have generated multiple transgenic tadpoles using two sets of guide RNAs and are currently in the process of extracting DNA from both transgenic and control samples. We will use DNA sequencing to verify the successful knockout of the MHC Class I gene and will generate more transgenic animals to monitor the effects of gene inactivation on the phenotype of individual tadpoles.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Hristina Nedelkovska

**98 • Evolutionary Genomics of Meiotic Drive in *Teleopsis. whitei***

Reghan Meek

**Abstract**

Meiotic drive violates the fundamental law of segregation, changing the allele inheritance pattern from 50% to 100%. An extreme sex-ratio meiotic drive (SR) trait is an X-linked selfish genetic element that causes the carrier males to produce mostly female offspring. The presence of this trait has been identified in two stalk-eyed fly species; *Teleopsis whitei* and *Teleopsis dalmanni*. Recent research suggests that despite *T. whitei*'s and *T. dalmanni*'s close evolutionary relationship, the mechanism of the SR trait might occur differently. Research also suggests there are fewer genomic differences between standard (ST) and SR *T. whitei* males. Together, these findings suggest that the SR trait has independently evolved over time. Through bioinformatic methods and differential expression (Desq2) analyses in R (R 4.1.3 binary for macOS), *T. whitei* whole genome and RNA sequence data were analyzed to identify the differential gene coverage and expression between ST and SR males. A total of 16 RNA genes were determined to be significantly differentially expressed ( $p < 0.05$ ) for the SR trait. The location and function of these *T. whitei* genes were then determined based on prior *T. dalmanni* data. To confirm and extend these preliminary findings, 14 additional *T. whitei* genomic data sets are being aligned to determine what gene(s) and mutation(s) may be responsible for meiotic drive in *T. whitei*; and whether these gene(s) are the same in *T. dalmanni*. These results will elucidate whether the SR trait in *T. whitei* has independently evolved.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Josephine Reinhardt

**259 • What factors shape Geneseo students' perceptions of scientists?**

Syndou Cisse, Mouhamad Berte

**Abstract**

The lack of diverse representation of identities in science is linked to reduced success of students from historically excluded groups. In particular, common science textbooks have little to no diversity in citations of scientists and

depictions of identities. In our study, our goals were to learn how Geneseo students view scientists, and what factors affect their views. We hypothesized that students in the STEM fields would have different views from non-STEM students. We also hypothesized that a student's identity (gender, race/ethnicity) would also impact their views. We selected two introductory biology textbooks used at Geneseo, and examined 6 topics for the identities of scientists cited and depictions of people in corresponding chapters. We found that the textbooks had little diversity in citations or images of people, or no depictions of people at all. We also constructed a survey to ask Geneseo students about their perceptions of scientists, along with questions to identify the factors that could influence these perceptions. Both STEM and non-STEM majors completed our survey. Results may inform our understanding of what leads to feelings of inclusion or exclusion. Our work underscores the importance of increasing diverse representation in science to reflect all people who contribute to the field. In our presentation, we discuss ideas for curricula that teach that there is not just one type of person who can be a scientist.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Suann Yang

**235 • Academic Experiences of SUNY Geneseo Students During the COVID-19 Pandemic**

Miranda Fanara, George Konstantinou

**Abstract**

The COVID-19 pandemic caused many colleges across the US to abruptly change their instructional modes from in-person learning to hybrid and online formats, and many students had difficulties with this transition. The extent of the disruptions to learning and transitioning back to in-person learning for SUNY Geneseo students is not fully known. Our research examines how students viewed their academic experiences during the pandemic semesters from Spring 2020 to Spring 2021, compared to Fall 2021. For these semesters, we created a voluntary and anonymous survey asking Biology majors and related minors to compare their perceptions of course difficulty, ways they received help, and academic confidence. We analyzed their responses using Chi-Squared and Fisher's Exact tests of independence. Through our statistical analysis, we were surprised to detect only one association, between course difficulty and confidence in one's grade. However, most students who had higher grade confidence typically rated course difficulty neutral or difficult. Our results also showed that students did perceive courses to be more difficult from Spring 2020 to Spring 2021, and many students did not favor the option of receiving help from their professors. To help us further understand the learning disruptions experienced by the pandemic, we have created another survey for the Fall 2021 semester asking similar questions about student self-efficacy, however we have added a new focus on student mental health.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Suann Yang

**88 • Neighborhood Competition Models of Co-occurring Invasive and Native Species**

Karissa Michel, Kaitlin Murphy

**Abstract**

Invasive species can co-occur with native species, with varying effects on the community of native species. Invasive species may outcompete native species or have a facilitative (positive) effect. Ecological models are useful for understanding these varied effects, but models that examine the pairwise relationships are challenging to construct for an entire community. Neighborhood competition models have the potential to address this challenge. In our study, we focus on tree species of invaded forest communities. Being long-lived and stationary, tree species allow for repeat-censuses of stem diameter (DBH), and can be used to examine the growth of trees in relation to the invasive or native status of neighbors. To study the effect of trees on each other, we utilize the forestecology package in the R Programming Environment. The forestecology package applies a spatially-explicit, statistical approach to analyzing interspecific neighborhood competition. We tested the feasibility of using this approach with tree census data from Harvard Forest. We plan to apply these methods to tree census data from the Smithsonian Conservation Biology Institute. We expect to find varying relationships, but invasive species will have more negative effects on native species than vice versa. Utilizing neighborhood competition models to quantify the range of effects that invasive species have on native species can help tailor ecological management strategies for specific forest communities. Our study expands our abilities in measuring the effects of the invasion of specific and unique forests to prioritize conservation resources effectively.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Suann Yang

**202 • The Effects of Deforestation on Yellow Fever Virus Transmission**

Meghan Sheridan

**Abstract**

Deforestation is increasingly associated with the transmission of zoonotic viruses, such as Malaria in South America and Ebola in Africa. Increasing rates of deforestation may cause viral transmission to accelerate. In this study, I asked how deforestation and other factors may interact to affect transmission of Yellow Fever virus. For example, deforestation in areas with higher precipitation may have different effects on animal hosts and mosquito vectors of the Yellow Fever virus compared to areas with lower precipitation. In addition, more densely-populated countries could have increased transmission compared to less densely-populated countries. Also, the ability to successfully treat viral transmission may be tied to economic indicators such as gross domestic product (GDP). To test how all of these factors affect the number of yellow fever cases in different countries in South America and Africa, I obtained data from the Global Forest Watch, Centers for Disease Control, and the World Health Organization. I used the R Programming Environment and qGIS for statistical and spatial analysis of the data. My results show that some countries, such as Argentina and Uganda, display some of the highest levels of deforestation and precipitation along with some of the highest Yellow Fever virus cases. This finding may be due to populations of mosquitoes that are either displaced or moved closer to human populations. The effects of population density and GDP will be discussed. Future studies could focus on various other types of viruses and how public health in different communities is affected as a result.

**Subject Category**

Science and Mathematics Categories: Biology

**Faculty Sponsor Department**

Biology

**Faculty Sponsor**

Suann Yang

**BIOMATHEMATICS**

## 132 • Modeling Influenza Dynamics

Abigail Shafer

### Abstract

Today, influenza seems to be a common illness. Following the 1918 influenza pandemic, the virus never fully disappeared. Between 2018-2019 and 2020-2021, nearly all infections consisted of type A or B. The goal of this study was to discover why one type may have more drastic effects on a population than the other. To do so, a network-based SIR (susceptible, infectious, recovered) model was developed to simulate 10,000 people residing in a community. Researchers have found that for every one individual who becomes infected with type A, they will, on average, go on to infect 1.5 other individuals with influenza. Someone infected with type B will, on average, infect 1.8 others - a value known as  $R_0$ . These two spread rates were then tested across a range of small-world networks. We found that type B consistently infected more people than type A due to its higher  $R_0$  value. Multiple tests were run on a small-world network where the average path length between individuals was continuously shortened (people moved closer together.) This was found to increase the overall percentage of infected individuals within both types of influenza. The number of type B infections were found to be about double those of type A when each was run with the same network structure. Based on our results, increasing path lengths would most likely be the best way to reduce influenza infections within a specified population.

### Subject Category

Science and Mathematics Categories: Applied Mathematics

### Faculty Sponsor Department

Biology

### Faculty Sponsor

Gregg Hartvigsen

## CENTER FOR COMMUNITY

## 21 • Evaluating Leadership Development Programming: The Impact of COVID-19

Matthew DeSimone, Emma Stelley

### Abstract

This study examined undergraduate students' perceptions of the Geneseo Opportunities for Leadership Development (GOLD) workshops at SUNY Geneseo before and after the COVID-19 Pandemic. Specifically, this project examined which items in the GOLD Evaluation (GE;  $\alpha = .727$ ; 7-items) significantly predicted variance in students' overall experience scores. Data were collected from undergraduate students ( $N = 559$ ) using an online post-workshop survey.

Before COVID-19, all bivariate correlations between the GE composite score and GE items were statistically significant ( $p < .01$ ) ranging from weak ( $r = .225$ ) to strong ( $r = .693$ ) associations with students' overall experience score. After COVID-19, all bivariate correlations between the composite score and GE items remained statistically significant ( $p < .01$ ) ranging from weak ( $r = .179$ ) to strong ( $r = .757$ ) associations with students' overall experience scores. These analyses identified differential associations at both the composite score and item level in the GE before and after COVID-19. Following these findings, two univariate regressions were calculated which revealed differences in the variance explained by the GE composite score on the students' overall experience scores before, Adjusted  $R^2 = .412$ ,  $F(1, 68) = 49.344$ ,  $p < .001$ , and after COVID-19, Adjusted  $R^2 = .443$ ,  $F(1, 251) = 204.381$ ,  $p < .001$ . To more thoroughly understand the variance explained by the GE composite score, hierarchical multiple regression models employing GE items were calculated. The models revealed the differential effects of the GE items on students' overall experience scores with GOLD. The findings offer insights into the conditions needed for professional development programming in the post-COVID world.

### Subject Category

Interdisciplinary and Other Categories: Other

**Faculty Sponsor Department**

Center for Community

**Faculty Sponsor**

Nicholas Palumbo

**38 • Benefits and Motives of Student-Athletes in a Leadership Development Program**

Morgan Michalski

**Abstract**

It can be argued that leadership and athletics go hand in hand. However, there is still little research on Leadership Development Programs within collegiate athletics. This mixed-methods study examined leadership development and the motivations for joining a Leadership Development Program (LDP) at SUNY Geneseo. The two central research questions examined: (1) What are student-athletes motives for joining the LDP? (2) And to what extent are student-athletes developing leadership skills through the LDP?

After participating in the LDP, assessments of student-athletes retrospective self-perceptions revealed a 26% increase in their confidence leading others. There was also a 21% increase in self-awareness and a 17% increase in independence. When comparing their current leadership skills to student-athletes not in the LDP, student-athletes in the LDP rated themselves 24% higher on their confidence leading others and 19% higher on their independence.

In addition, qualitative analyses of focus group data revealed three emergent themes related to joining the LDP: (a) influence of upperclassmen, (b) desire for leadership development opportunities, and (c) service to others. From these thematic findings, students involved in the LDP describe being motivated to join the LDP because they desire to help others, improve their leadership, and follow in the footsteps of juniors and seniors on their respective teams.

Together, these findings support the importance and value of LDPs in collegiate athletics. This research emphasizes the need for more leadership development programming, which student-athletes desire to obtain. Limitations and recommendations to be discussed.

**Subject Category**

Interdisciplinary and Other Categories: Other

**Faculty Sponsor Department**

Center for Community

**Faculty Sponsor**

Nicholas Palumbo

**22 • Business Students' Perceptions of Personal Development Programming: The Role of COVID-19**

Emma Stelley, Matthew DeSimone

**Abstract**

This study examined undergraduate students' perceptions of the School of Business (SoB) Professional Development (PD) workshops at SUNY Geneseo before and after the COVID-19 Pandemic. Specifically, this project examined which items in the SoB PD Evaluation (SPE;  $\alpha = .889$ ; 7-items) significantly predicted variance in students' overall experience scores. Data were collected from undergraduate students ( $N = 559$ ) using an online post-workshop survey.

Before COVID-19, all bivariate correlations between the SPE composite score and SPE items were statistically significant ( $p < .01$ ) ranging from weak ( $r = .356$ ) to strong ( $r = .702$ ) associations with students' overall experience score. After COVID-19, all bivariate correlations between the composite score and SPE items remained statistically significant ( $p < .01$ ) ranging from moderate ( $r = .440$ ) to strong ( $r = .668$ ) associations with students' overall experience scores. These analyses identified differential associations at both the composite score and item level in the SPE before and after

COVID-19. Following these findings, two univariate regressions were calculated revealing differences in the variance explained by the SPE composite score on the students' overall experience scores before, Adjusted R<sup>2</sup>=.461, F(1, 68)=58.145, p<.001, and after COVID-19, Adjusted R<sup>2</sup>=.547, F(1, 251)=303.659, p<.001). To better understand the variance explained by the SPE composite score, hierarchical multiple regression models employing SPE items were calculated. The models revealed the unique and differential effects of the SPE items on students' overall experience scores. The findings offer insights into the optimal conditions for professional development programming in the post-COVID world.

### **Subject Category**

Interdisciplinary and Other Categories: Other

### **Faculty Sponsor Department**

Center for Community

### **Faculty Sponsor**

Nicholas Palumbo

## **RESIDENCE LIFE**

### **267 • How Might We Increase Financial Literacy Amongst College Students**

Riley Kawola, Victoria Brzezinski, Grace Quagliana, Abigail Owens

#### **Abstract**

My group wanted to explore how we might increase financial literacy amongst students; the Financial Literacy and Education Commission (FLEC), recognizes the need for increased financial literacy among college students due to all the financial responsibilities they face. Through their research, they emphasized to readers that knowing your audience, providing relevant and timely information, building motivation, allowing easy access to well-known resources, and giving constant support are some of the best ways to handle teaching financial literacy. To understand the financial literacy of Geneseo students, we developed a survey that addressed the overall comfortability with finances. We received 656 responses from students of all years. This survey illustrated that Geneseo students are most confused about loans, investing, and budgeting. 43% of students claimed that they were not taught financial literacy and 77% of students reported that they believe a course would be beneficial. Interestingly, students expressed wanting to know more than the bare minimum of finances by looking into bigger topics, such as retirement. We searched for resources offered on campus and found that there is a gap in information that is actively made available to students. We, therefore, developed an easily accessible website to provide students with basic tips, information, and resources. We aim to get others involved in our website and eventually embed it into other Geneseo webpages. Additionally, we would like to see faculty incorporate financial literacy into more classes. Looking ahead, we suggest developing an online course module for students.

#### **Subject Category**

Interdisciplinary and Other Categories: Other

#### **Faculty Sponsor Department**

Residence Life

#### **Faculty Sponsor**

Meg Reitz

### **269 • Sensory Room Pilot at SUNY Geneseo**

William Neuschwender, Guadalupe Alicea, Simon Kane, Lauren Martin, Mollie McMullan

#### **Abstract**

With campus counselors experiencing an overload of cases, particularly in response to the Covid-19 pandemic, it is clear that there needs to be alternate mental health resources available to students who are not able to see a counselor for any reason. Moreover, research from prior studies indicates that students underutilize counseling services. However, rather than seek for new ways to convince students to engage in the services they're provided, it may be more beneficial to create a new means of support, such as the establishment of sensory rooms. Our project began with researching the availability of mental health resources across multiple campuses, as well as identifying how utilized or underutilized those resources are by students. We had to ask ourselves what we, as students, wanted to see on campus in order to improve student mental health. Once we had a good foundation of research to fall back on, it was imperative to identify what items best suit sensory rooms as well as establish the proper place for such a room. We will need to collect data in regards to the benefit of sensory rooms, but anticipate positive results. The creation of sensory rooms may be a helpful and cost-effective way to improve student mental health. However, there needs to be more research into the effect of sensory rooms among young adults, particularly college students.

**Subject Category**

Social Science Categories: Sociology

**Faculty Sponsor Department**

Residence Life

**Faculty Sponsor**

Meg Reitz

**CHEMISTRY, BIOCHEMISTRY AND GEOCHEMISTRY****146 • Testing the Integrity of Calcium Phosphate Bioactive Cement through Various Methods of Drying**

Dean Ivanovski, Jack Donaldson, Matthew Chudy, Nobah Islam, Emily Rennells

**Abstract**

Autografting is the most effective method used for supplementing and replacing bone. Autografting is a risky procedure because of its invasive nature. When performing the procedure of autografting, one needs to remove small sections of bone to use as a stimulant at the fracture site. This study is made to design an alternative method to replace autografting. In our study, we used pig fibula as a model to compare the properties of our novel cement which is Calcium Phosphate based. Calcium Phosphate Cement (CPC) is ideal because it is a biocompatible bone substitute composed of Hydroxyapatite (HA), which constitutes a major component of human bone. The Hydroxyapatite will serve as the base ingredient for the cement. The cement allows for the successful osseointegration and the initiation of bone growth. This term, our efforts were focused on exploring various drying methods that would produce cement with the greatest integrity. The method of drying that yielded the cement with the greatest integrity included heating, to simulate body temperature, followed by the addition of a layer of water as well as a parafilm covering before being left to dry.

**Subject Category**

Science and Mathematics Categories: Biochemistry

**Faculty Sponsor Department**

Chemistry

**Faculty Sponsor**

Barnabas Gikonyo

**44 • Increasing Biodiesel Algal Lipid Density by Manipulating Glycerol Levels in Algal Growth Mediums**

Samantha Ross, Lauren Saggese, Aiden Williams, Alex Lazaro, Denise Ferreira

### Abstract

To many, algae are the pesky product of eutrophication in local lakes and ponds. In the laboratory, algae is a promising competitor for renewable resources of biodiesel.

Algae is versatile in the way that it ingests a notable amount of carbon emissions from the atmosphere. These emissions are then converted into energy-dense lipids, which can be harvested and transformed into biofuel. Despite the advantages, the amount of lipid yield is not significant enough to be considered a worthwhile option. Before the fuel industry can accept algae farming as a worthy alternative to fossil fuels, the reason for harvesting must be maximized further. Our purpose aims to make algal lipid extraction more efficient by determining the ideal growing conditions of the algae species *Chlorella Vulgaris*. Our research explores ways to effectively quantify and compare the algal lipid yield to the various controlled algal growth media and environments. Particularly, testing involves a) the interconnectivity between different algal lipid density and growing mediums and b) the effects, if any, of glycerol. The algal media used were BG-11(algal culture medium) and BBM (Bold's basal medium). Initial data suggested that density growth was higher when grown in the glycerol and BBM mixture. The results obtained with further experimentation are presented hereafter.

### Subject Category

Science and Mathematics Categories: Chemistry

### Faculty Sponsor Department

Chemistry

### Faculty Sponsor

Barnabas Gikonyo

## 23 • Pretreatment and Fiber Decomposition Analysis of *Cannabis sativa L*

Sarah Schmidlin, Lily Connerton, Edwin Hugh

### Abstract

Hemp, along with marihuana, are subspecies of *Cannabis sativa L*. The two differ in chemical constituent levels of delta-9-tetrahydrocannabinol (THC) and cannabidiol (CBD). Hemp contains 0.3% THC, compared to marijuana's THC content of 17.1%, allowing it to be a safe and compelling biomass for investigation. Hemp is one of the fastest growing plants and its refined products have immense commercial value, including biofuels, biodegradable plastics, textiles, dietary supplements, paper, clothing, and much more. Construction and manufacturing applications have also been seen to include hemp to strengthen their composite products. Hemp is a high yielding, sustainable, and environmentally friendly crop due to its various qualities, and has the potential to yield valuable raw materials for a great number of applications. Our research evaluates the pretreatment of hemp as well as the comparative analysis of the fiber content with the goal of determining the suitability and the potential use of an ionic liquid-based pretreatment (1-Butyl-3-methylimidazolium chloride) for the breakdown of hemp lignocellulosic biomass.

### Subject Category

Science and Mathematics Categories: Chemistry

### Faculty Sponsor Department

Chemistry

### Faculty Sponsor

Barnabas Gikonyo

## 241 • Investigating the Promise of Lignocellulosic Biofuels: Rice Husks as a Non-Human Feedstock

Dineen Vogler, Valerie Lepore

**Abstract**

The Earth has endured years of damage caused by an overuse of fossil fuels. To combat the damage, biofuels have become of interest as an alternative energy source. Biofuels represent an economical and often overlooked alternative to fossil fuels. Efforts have been geared toward the use of food sources such as corn as a 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 project focuses on the use of one of the most abundant and readily available biomass, rice husks as 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're cheap if not free, and they have the power to curb greenhouse gas emissions. One of the greatest challenges in conversion of feedstock into biofuel is how to break the biomass down; a process termed pretreatment. For this project, a unique class of solvents, ionic liquids, are employed in the pretreatment process. An ionic liquid (1-Butyl-3-methylimidazolium chloride) was used for the pretreatment of the rice husks to yield glucose. The amount of glucose obtained is then quantified using refractometry, and DNS analyses. From this, it is then possible to determine how efficient rice husks are as second generation biofuel. The results are presented and discussed herewith.

**Subject Category**

Science and Mathematics Categories: Chemistry

**Faculty Sponsor Department**

Chemistry

**Faculty Sponsor**

Barnabas Gikonyo

**245 • Bioethanol Production: Glucose Testing and Quantification using DNS analysis and Addition Analytical Methods** ✂

Dineen Vogler

**Abstract**

The search for alternative ways to create a more sustainable and environmentally friendly source of energy, other than fossil fuels, has been ongoing for many years. Particularly, the production of biofuels has become of interest. First generation biofuels were of interest as they curb greenhouse gas emissions, unlike fossil fuels. However, first generation biofuels lead to the increase in food prices as they utilize food sources toward biofuel production, which negatively impacts developing countries. To mitigate this issue, second generation biofuels are a more appealing alternative. Second generation biofuels aim to not affect the food supply, as they use non-human food sources. Furthermore, second generation biofuels are relatively inexpensive and also curb greenhouse gas emissions. This project specifically focuses on the bioethanol production from rice husks, as they are abundant and free biomass. For this project, a unique class of solvents, ionic liquids, are employed in the pretreatment process. An ionic liquid (1-Butyl-3-methylimidazolium chloride) was used for the pretreatment of the rice husks to yield glucose. To determine the effectiveness of second generation biofuels derived from rice husks, glucose quantification is a necessary step. Two methods that allow for the quantification of glucose concentration are dinitrosalicylic acid (DNS) analysis and the standard addition method. Through the analysis of each method, it can be determined if DNS analysis and the standard addition method are reliable glucose quantification procedures. The results are presented and discussed herewith.

**Subject Category**

Science and Mathematics Categories: Chemistry

**Faculty Sponsor Department**

Chemistry

**Faculty Sponsor**

Barnabas Gikonyo

**100 • Targeting Telomeric and c-MYC G4 DNA as an Anticancer Approach**

Xander Michaels, Anthony Rizzo

**Abstract**

G-quadruplex (G4) DNA are non-canonical higher order DNA structures formed from guanine rich sequences, made up of stacked G-tetrads stabilized by non-Watson-Crick (Hoogsteen) base pairing and K<sup>+</sup> ions.

Early interests in G4 DNA were spurred on by the revelation that G4 was formed in telomeric DNA sequences at the end of our chromosomes. This was particularly promising given that G4 structures formed in telomeric DNA were also found to inhibit an enzyme known as telomerase, which is overexpressed (>90%) in cancer cells. Cancer cells require telomerase activity for survival and “immortality”, therefore stabilization of telomeric G4 can inhibit telomerase activity and prevent the survival of cancer cells. More recently, G4 DNA has also been shown to be overrepresented in the promoter regions of oncogenes (e.g., c-myc and ras genes) and the 5'UTR of mRNA. As a result, G4 DNA represents a viable target for possible anti-cancer therapeutic agents to treat previously “undruggable” sites such as the c-myc and ras oncogenes.

In this work, G4 structures formed at both human telomeric and c-myc sequences will be investigated by targeting/probing them using a variety of known and novel compounds. Using biophysical techniques such as fluorescent displacements assays, thermomelting, and circular dichroism (CD) spectroscopy, the binding characteristics of these compounds to G4 DNA will be investigated for their efficacy as a possible anti-cancer therapeutic strategy.

**Subject Category**

Science and Mathematics Categories: Biochemistry

**Faculty Sponsor Department**

Chemistry

**Faculty Sponsor**

Ruel McKnight

**114 • Extraction of total RNA to explore the role of miRNA in Zebrafish stress response**

Samantha Dumitrescu, Ashley Felber, Eli Barbour

**Abstract**

MicroRNAs, or miRNAs, are small endogenous RNAs that have been observed to affect the expression of genes with functions ranging from development to apoptosis. Considering their broad range of participation in biological functions, they should be further studied. The purpose of our study is to explore the potential role of miRNAs in mediating environmental stress-related responses in zebrafish. Given the increasing impact of global climate change, we believe it would be informative to understand the role of miRNAs in the long-term adaptation of populations of zebrafish under increasing temperature, acidification and nutrient loss. To investigate changing zebrafish miRNA expression, we raised a group of zebrafish under normal conditions and a group of zebrafish (C) under environmentally stressful conditions (E). Within a period of thirty days, we harvested tissue samples from the zebrafish and then extracted total RNA from the samples in order to examine the steady state levels of pre-selected miRNAs by Reverse Transcription-PCR (RT-PCR). Here, we report on the results and evaluation of the method used to isolate total RNAs for use in our future studies.

**Subject Category**

Science and Mathematics Categories: Biochemistry

**Faculty Sponsor Department**

Chemistry

**Faculty Sponsor**

Salvador Tarun

**112 • Purifying Total RNA to Explore the Role of piRNAs in Zebrafish Stress Response**

Alex Jakubiak, Lily Qian, William Chen

### **Abstract**

Tuna fish plays a significant economic and environmental role and contributes at least \$40 billion annually to the global economy, but climate change has been rendering tuna populations particularly vulnerable to rising ocean temperatures and acidification. Recent studies have shown the emerging role of noncoding RNA (ncRNAs) such as piRNA in stress response and transgenerational inheritance. In order to assess the potential role of piRNA in tuna population's response to climate stress, we use the zebrafish as a laboratory model to identify piRNAs whose steady-state levels change in response to conditions mimicking global climate change stress: elevated temperature, decreased pH and reduced nutrient availability. Additionally, single nucleotide polymorphisms (SNPs) in piRNA could be used as biological markers for predicting and determining which populations of zebrafish and tuna are under environmental stress. In order to understand how specific piRNAs are involved in the stress response, we will accomplish our goal through a two-pronged approach. The first approach will be focused on using pre-selected candidate piRNA to test for stress-response. The second approach will analyze the genome-wide transcriptome set of total piRNA in zebrafish samples using NERD-seq, a method that allows us to analyze piRNA more effectively at the genome-wide scale. Here we report on our effort to purify total RNA from selected tissues of stressed and unstressed zebrafish for use in quantifying candidate piRNA levels by RT-qPCR method.

### **Subject Category**

Science and Mathematics Categories: Biochemistry

### **Faculty Sponsor Department**

Chemistry

### **Faculty Sponsor**

Salvador Tarun

## **113 • Isolation of Total RNA to Explore the Role of lncRNAs in Zebrafish Stress Response**

Jacqueline Schoer, Zana Sawas, Rahul Sharma

### **Abstract**

The present global warming trend has elevated alarming stress to the aquatic ecosystems with a profound impact on fish species. Tuna serves as a reliable source of food for many different world populations. Long non-coding RNA (lncRNA) is a newly founded class of non-protein-coding RNAs, which have now increasingly been shown to be involved in a wide variety of adaptive responses to environmental stress processes. Therefore, it is essential to see how lncRNA is involved in the climate change simulated stress response of the tuna populations. To understand how lncRNA is involved in this stress response in tuna fish, we plan to use zebrafish as a model organism in the lab to identify candidate lncRNAs responsive to stress. Stress-responsive lncRNA genes in the Zebrafish will be compared to sequences in tuna fish to ultimately get a better idea of how these RNAs contribute to the genomic response to temperature, pH, and nutrient stress mimicking the environmental consequence of global warming. In this study, we attempted to isolate total RNA within harvested zebrafish organs from stressed and unstressed populations. From this, we are able to quantitatively measure through RT-qPCR the steady-state levels of pre-selected lncRNAs based on reports from other organisms. Successful candidate lncRNAs will be used in the future to aid wild tuna fish populations in the Philippines and to further analyze their adaptations to natural-occurring climate change stressors.

### **Subject Category**

Science and Mathematics Categories: Biochemistry

### **Faculty Sponsor Department**

Chemistry

### **Faculty Sponsor**

Salvador Tarun

## 200 • A Model for Nano-Scale Spherical Surface Coverage and Protein Corona Formation By Amyloidogenic Peptides

Stephanie Afonso, Emily Benton, Emily Wynne, Luis Carillo Rubio

### Abstract

The conformation of three amyloidogenic peptides; amyloid beta 1–40 ( $A\beta_{1-40}$ ), alpha synuclein ( $\alpha$ -syn), and beta-2-microglobulin ( $\beta_{2m}$ ) are closely associated with the process of causing neurodegenerative diseases. Use of a peptide adsorbed gold nano-particle system allowed us to investigate the interactive segment of each peptide responsible for peptide-peptide networking, which is crucial to initiate the formation of an oligomer and leads to fibrillogenesis. The adsorption orientation of the amyloidogenic peptides on the nano-gold colloid spherical surface was explained by simulating how much area of the metal surface was covered by the peptides. The nano size dependence of  $\Theta$  was linearly correlated with available spacing between adjacent peptides,  $S_d$ , which were approximated as prolates. For  $A\beta_{1-40}$  and  $\alpha$ -syn, the 2nd layer was more included as  $S_d$  increased. In contrast,  $\beta_{2m}$  was found to gyrate over the gold surface as  $S_d$  increased, creating a partially positive ( $\delta^+$ ) region and repelling the extra  $\beta_{2m}$  from the surface. Based on the trend found in an experimentally extracted  $\Theta$  as a function of  $S_d$ , optimized charge distribution of  $A\beta_{1-40}$  and  $\alpha$ -syn were concluded to be negative partial charge ( $\delta^-$ ) region that was covered by the positive partial charge ( $\delta^+$ ) region. However,  $\beta_{2m}$  may have a relatively large and/or distributed  $\delta^+$  region with a small portion of  $\delta^-$  at the one end of a prolate. The characterization made in this work confirmed current understandings on the formation of the protein corona over nanoparticles.

### Subject Category

Science and Mathematics Categories: Chemistry

### Faculty Sponsor Department

Chemistry

### Faculty Sponsor

Kazushige Yokoyama

## 133 • Attempt of Protein Coated Au Colloid Sol-Gel Sample Formation

Stephanie Afonso, Emily Benton, Isaac Hanson, Marc Fazzolari, Emily Wynne

### Abstract

Sol-gel is the preparation of polymers from a liquid to a network structure called “gel” through the use of liquid precursors. In this experiment, the use of silica containing sol-gel in order to trap gold nanoparticles with either Amyloid Beta peptide, which is related to Alzheimer's Disease, or SARS-CoV-2 spike protein is being tested. A liquid precursor for sol-gel which can then later be used to trap the gold colloid in the gel has been successfully made. Silica sol-gel is useful for these specific experiments because it can then be used with either the peptide or the spike protein and analyzed using the UV-VIS Spectrophotometer or Raman imaging microscope. The next step would be to find the best way to use the precursor and make the gel with the gold colloid to be analyzed using these methods.

### Subject Category

Science and Mathematics Categories: Chemistry

### Faculty Sponsor Department

Chemistry

### Faculty Sponsor

Kazushige Yokoyama

## 208 • The Characterization of Chemical Components of Tin Slag and Maya Pottery Samples Through Raman Spectroscopy

Victoria Taylor, Emily Benton

### **Abstract**

SUNY Geneseo has recently purchased a Raman spectrometer in order to quantitatively study the chemistry of the individual phases of samples. The spectrometer is able to examine the changes in bonding environments in both mineral and pottery samples. In particular, the Raman spectrometer was used to study Bronze Age tin slag associated with the Adirondacks in order to determine the connection between color and chemistry. This experiment consisted of determining the necessary settings on the Raman spectrometer in order to examine the desired qualities. The goal was to be able to distinguish between the various inclusions and components in a given sample of tin slag to determine possible environmental impacts. In addition to tin slag samples, Maya pottery samples were also studied with the goal of identifying the components. Raman spectroscopy is particularly useful in the study of pottery samples because it allows for quick and non-destructive quantitative examination. The final goal of this project is to identify differences between stylistic types and the geological locations where various samples of pottery were made.

### **Subject Category**

Science and Mathematics Categories: Chemistry

### **Faculty Sponsor Department**

Chemistry

### **Faculty Sponsor**

Kazushige Yokoyama

## **191 • Investigation of $\beta$ 2-microglobulin networking over gold-nanoparticles surfaces**

Theresa Lam, Jennie Dworkin

### **Abstract**

While there are strong concerns and interests about the impact of  $\beta$ 2-microglobulin ( $\beta$ 2m) amyloids in the human body, no detailed investigation of an initial networking process of  $\beta$ 2m has been fully characterized. Our group has established a schematic method to investigate the peptide-peptide networking by controlling the protein conformation through external pH condition change over nano-gold particle surfaces. The protein conformation change was indirectly monitored by the peak shift of the SPR (Surface Plasmon Resonance) absorption band of the gold colloids coated with  $\beta$ 2m. Particularly, the red-shift of the band peak indicates the formation of the gold colloid aggregates due to the interaction between the  $\beta$ 2m or a formation of an oligomer. By a gradual insertion of  $\beta$ 2m to the bare gold colloids under the acidic condition (pH  $\sim$ 4), the formation of the aggregates was monitored as a function of  $\beta$ 2m concentration. For the core diameter of the gold colloid  $d = 10$  nm, a gradual increase of the aggregates was observed until it reached the asymptote value. On the other hand, for  $d = 100$  nm, the asymptote was achieved at a much lower concentration exhibiting a step-function-like feature. The difference in the mechanism may be attributed to the contact range between gold colloids and free  $\beta$ 2m monomers. The gold colloid with a larger diameter could have a higher cross-section to adsorb  $\beta$ 2m resulting in the aggregation at the relatively lower concentration of  $\beta$ 2m.

### **Subject Category**

Science and Mathematics Categories: Chemistry

### **Faculty Sponsor Department**

Chemistry

### **Faculty Sponsor**

Kazushige Yokoyama

## **236 • The River Project**

Ryan Lehning, Victoria Taylor

### **Abstract**

A plot of land North of the University of Rochester is occupied by an abandoned oil refinery, in dangerous proximity to the Genesee River. Our goal is to determine if the Vacuum oil refinery site is contributing to the pollution of the Genesee River. To accomplish our goal, our team, headed by Dr. Yokoyama and Nick LaGamba, will collect samples from the river area and subject them to testing.

**Subject Category**

Science and Mathematics Categories: Geochemistry

**Faculty Sponsor Department**

Chemistry

**Faculty Sponsor**

Kazushige Yokoyama

**194 • Protein Corona Formation by SARS-CoV-2 Spike Protein Over Nano-Gold Colloids and Reversible Aggregation**

Zichao Lin, Alexander Seram, Christopher Lembo

**Abstract**

The SARS-CoV-2 alpha spike protein over the nano-gold colloid was investigated under the pH change between pH~3 and pH ~11. The acidic condition (i.e., pH~3) exhibited a sign of aggregation through unfolded conformation of RBD (Receptor Binding Domain) segment of a spike protein. As the pH was repeatedly altered between acidic (~pH 3) and basic (~pH 11), the aggregation was quasi-reversibly formed at ~pH3 and deformed at ~pH 4. However, a definite conformation and exact adsorption orientation was not assigned yet. The conformational change was examined and compared to the case by omicron-spike protein, and reversible conformational change was observed. The addition of ACE2 to the spike protein coated 50 nm gold colloid showed two stages of conformational change implying there was a sign of two different sets of conformational change before and after roughly 25 minutes once spike protein was exposed to pH 4 condition. This was followed by a conformational change forming an aggregate at basic condition. This work demonstrated that the aggregation process of nanoparticles with SARS-CoV-2 protein corona was controlled by an external pH change.

**Subject Category**

Science and Mathematics Categories: Chemistry

**Faculty Sponsor Department**

Chemistry

**Faculty Sponsor**

Kazushige Yokoyama

**197 • Investigation of the Nano-size Dependent Affinity of the SARS CoV-2 Spike Protein to the Gold-Colloid**

Jack Santariello, Joshua Thomas, Alexander Seram, Zi Chao Lin

**Abstract**

An initial stage of viral infection by SARS-CoV2 was induced by a conformational change of the spike protein (s-protein). In order to understand the behavior of the s-protein and its conformational change, a template to solely investigate the s-protein is required. Our group attempted to adsorb the s-protein to the gold nanoparticle surface, and to characterize the behavior as a function of core nano-particle size (i.e., diameter; d). As the pH was externally decreased, the red shift of the gold colloid SPR (Surface Plasmon Resonance) absorption band peak position was observed. Compared to the case of bare gold colloids, the gold colloid with  $d \geq 50$  nm exhibited a drastic red shift at relatively higher pH conditions. By hypothesizing that a red-shift was due to the

formation of the gold colloid aggregates through the interaction between s-protein, we concluded that higher affinity to the s-protein was found for gold colloids with  $d \geq 50$  nm.

**Subject Category**

Science and Mathematics Categories: Chemistry

**Faculty Sponsor Department**

Chemistry

**Faculty Sponsor**

Kazushige Yokoyama

**201 • Nano-size Dependent Protein Corona Formation by SARS-CoV-2 Omicron Spike Protein Over Gold Nano-Colloid and Reversible Aggregation**

Jack Santariello, Theresa Lam

**Abstract**

The adsorption process of SARS-CoV-2 omicron spike protein to the nano-gold colloid surfaces was examined by monitoring the surface plasmon resonance (SPR) band shift of gold-nano particles ranging between diameters of  $d = 10$  to 100 nm. The externally changed pH between 3 and 11 at 25 oC initiated a reversible formation of the gold colloid aggregates, where formation/deformation of the aggregates were monitored by red/blue shift of the peak of the SPR band. There was no sign of reversible aggregation for  $d = 10, 15,$  and 20 nm. A clear undulation of the peak shift corresponding pH hop between pH  $\sim 3$  and  $\sim 11$  was confirmed for  $d > 30$  nm. This degree of the reversibility was compared to previously reported SARS-CoV-2 alpha spike protein coated gold colloid. It was concluded that Omicron spike protein possesses a similar low affinity for gold nano particle  $d < 20$  nm and possesses the higher affinity to the gold nanoparticles of  $d > 30$  nm. However, the Omicron spike protein conformation was presumed to be more denatured compared to the SARS-CoV-2 alpha spike protein

**Subject Category**

Science and Mathematics Categories: Chemistry

**Faculty Sponsor Department**

Chemistry

**Faculty Sponsor**

Kazushige Yokoyama

**242 • Monitoring the Temperature Dependent Affinity of  $\alpha$ -SARS-CoV-2 Spike Protein to Gold-Colloid using pH Hopping Technique**

Jack Santariello, Theresa Lam, Jackson Hays, Emily Benton, Isaac Hanson, Emily Wynne, Marc Fazzolari, Luis Carillo Rubio

**Abstract**

Based on a previous study of the Amyloid  $\beta$  peptide, it was found that conformation of a protein changed with external pH condition change. Our group tested the conformational change of the SARS-CoV-2 spike protein (S-protein) using pH hopping technique. The S-protein initiates an immune response after human angiotensin converting enzyme (ACE2) attaches to receptor binding domain (RBD) of S-protein. A spectroscopic measure of the aggregation of the S-protein to gold colloid was observed using surface plasmon resonance (SPR). The pH hopping experiment was performed at 15, 25, 36°C to test for a possible temperature effect. It was found that the wavelength of absorption had a positive correlation to increasing temperature for temperatures from 15 to 36°C. Further work will be done to test the affinity of the S-protein to gold-colloid at 5°C and 45°C using this model.

**Subject Category**

Science and Mathematics Categories: Chemistry

**Faculty Sponsor Department**

Chemistry

**Faculty Sponsor**

Kazushige Yokoyama

**187 • Investigation of Zinc Metal Ion Effect on Amyloid Beta Protein Structure**

Veronica Szygalowicz, Rachel Hirschkind, Kia Haering

**Abstract**

Amyloid Beta-Peptide (1-40) is a protein linked to the initial stages of Alzheimer's and Parkinson's diseases, with aggregation of this peptide contributing to the development of these diseases. Previous research has revealed favorable attachment of A $\beta$ (1-40) to the surface of gold nanoparticles, with the peptides forming a protein station that is able to interact with other such protein stations in solution. Such a station may be instrumental in creating a device that can attract A $\beta$ (1-40) in humans before a serious degeneration into Alzheimer's disease occurs. Additionally, some metal cations, such as calcium, copper or zinc, may also interact with amyloidogenic peptides and inhibit further progress in fibrillogenesis, the development of these polypeptide chains that are associated with the neurodegenerative disease. However, no clear studies have yet been conducted on this topic. Consequently, our research group decided to investigate whether the addition of Zn<sup>+2</sup> ions into a solution of A $\beta$ (1-40) and gold nanoparticles had any effect on the aggregation of peptides. Using an experimental procedure whereby the pH of solution was alternated between highly basic and highly acidic, with UV-Vis spectroscopy used to measure the aggregation of peptides, it appears that the Zn<sup>+2</sup> ions do indeed have an effect on the aggregation and folding of these peptides, with the presence of Zn<sup>+2</sup> ions preventing complete reversibility of the folding of A $\beta$ (1-40).

**Subject Category**

Science and Mathematics Categories: Chemistry

**Faculty Sponsor Department**

Chemistry

**Faculty Sponsor**

Kazushige Yokoyama

**188 • SERS for in situ investigation of Alzheimer mouse brain**

Joshua Thomas, Windsor Ardner

**Abstract**

This is the first report on the amyloid fibril interacting with gold colloid nanoparticles (diameter- ; ,d ~80 nm) monitored through the Surface Enhanced Raman Scattering (SERS). The Long Evan's Cohen's Alzheimer's disease rat model was used and the hippocampus was extracted and processed with and without gold nanoparticles. The middle section of the hippocampus was selected and examined for any sign of fibril that was confirmed of having amyloid beta (A $\beta$ <sub>1-40</sub> or A $\beta$ <sub>1-42</sub>). The SERS imaging exhibited an existence of the formation of gold colloidal aggregates with enhanced Raman signal, thereby implying the significant interaction between amyloid oligomers and gold nano-particle hippocampal section surfaces. The detectable fiber-like segment from within the hippocampal sections seemed to have a high correlation with the location of the formation of gold colloid aggregates, indicating that the terminal form of a fibril may remain in the hippocampal section containing highly interactive portions (i.e., oligomeric conformations) to cause such aggregation of A $\beta$ <sub>1-40</sub> or A $\beta$ <sub>1-42</sub> es.

**Subject Category**

Science and Mathematics Categories: Chemistry

**Faculty Sponsor Department**

Chemistry

**Faculty Sponsor**

Kazushige Yokoyama

**192 • Identification and Classification of Changes in Protein Expression and Localization Associated with Epithelial to Mesenchymal Transitions in Human Vulvar Carcinomas after Exposure to the Glucocorticoid Analog, Clobetasol**

Jennie Dworkin, Julia Malinchak, Kia Haering

**Abstract**

It has been well established that decreases in cellular adhesions are associated with progression of squamous cell carcinomas to a malignant state. We have found that clobetasol treatment of A431 cells results in the initial loss of E-cadherin preceded by the gain of vimentin expression. Our system provides an inducible model to study this process. During clobetasol induced EMT in the A431 cells the expression of vimentin increases, but the cells do not lose expression of their cytokeratin molecules. Using Raman spectroscopy, we can identify key changes in metabolites associated with EMT between the A431 cells that respond to clobetasol and those that do not. In addition, we can identify earlier time points indicative of changes induced by clobetasol that lead to EMT. Comparison of the untreated and treated cells using Raman spectroscopy will allow us to identify EMT of the clobetasol treated cells much earlier than we are now capable of doing using detection of E-cadherin and vimentin expression by immunofluorescence microscopy. Ultimately this will aid us in dissecting out the signaling pathway between clobetasol and loss of E-cadherin/gain of vimentin expression as well as identify characteristics that enable some cells to escape clobetasol induced EMT. Comparing the results found from these cells with cells expressing only cytokeratins or vimentin, respectively, can then be used for insight into how each influences the cellular architecture in cases where these subcellular molecules are coexpressed, namely in cells undergoing an epithelial to mesenchymal transition.

**Subject Category**

Science and Mathematics Categories: Biochemistry

**Faculty Sponsor Department**

Chemistry and Biology

**Faculty Sponsors**

Kazushige Yokoyama and Jani Lewis

**COMMUNICATION****94 • Rethinking Goffman for post-gender media; a rhetorical-content analysis of Billie's *Project Body Hair***

Kelsey Dux

**Abstract**

This study is a rhetorical analysis of the advertisement "Project Body Hair" produced by the shaving company Billie. Past research on advertisements relied on a binary system: man/woman as strict and biologically determined rather than fluid and performed. This traditionally gendered approach used masculinity to define femininity, constructing femininity as inherently non-agential. In response, the current study significantly revises the traditional gender advertising coding schemes to understand how gender performance in post-gender advertisements navigates the relationship between femininity and agency.

**Subject Category**

Social Science Categories: Communication

**Faculty Sponsor Department**

Communication

**Faculty Sponsor**

Lee Pierce

**286 • Perceived Barriers to Black and Asian Solidarity: A Pilot Study of Internalized Racial Oppression and Perspective-Taking.**

Josephine Wu

**Abstract**

Cross-racial solidarity between Asian and Black communities in the U.S. needs increased mutual understanding. Research has limited knowledge of intergroup relations and how these groups perceive each other. Research suggests that one barrier is internalized racial oppression (IRO), but doesn't consider IRO in intergroup contexts. This qualitative pilot study uses semi-structured interviews to identify patterns of themes related to intergroup IRO perspective-taking and perceived barriers to Black-Asian solidarity.

**Subject Category**

Social Science Categories: Communication

**Faculty Sponsor Department**

Communication

**Faculty Sponsor**

Lee M. Pierce

**CENTER FOR INTEGRATIVE LEARNING****82 • Turning Geneseo-area Leftover into Sustainable Meals **

Natsuki Takata

**Abstract**

This January, I began a community-based enterprise to promote food justice and climate action by making a space where people can communicate with food suppliers and get inspired to cook sustainably. In the U.S., 30-40% of food supplies go unconsumed every year. In New York State, 41.3 % of these come from residential areas and 15.4% from farms. Conducting interviews with local farmers around Geneseo, I found that small farms lack the labor force to sell their excess produce while consumers including students desire access to healthier meals.

In order to address this gap, I am creating a social enterprise: making food packages from leftovers/extras generated by local farms and selling them at the farmers' market while educating customers about nutrition and sustainable recipes. Through four key elements of marketing - product, price, promotion, and place - I am creating a niche that differs from other food suppliers in a socially and environmentally responsible way. With a small but strong relationship with farmers, improving accessibility and affordability of healthy meals while reducing food waste in Geneseo. This Student Ambassadorship Project is made possible by generous funding from Edward Pettinella '73.

**Subject Category**

Interdisciplinary and Other Categories: Ambassadorship

**Faculty Sponsor Department**

Center for Integrative Learning

**Faculty Sponsor**

Lytton Smith

## GEOGRAPHY

### 223 • Fast Fashion Impacts on Climate Change and Sustainable Fashion Blog

Grace Dempsey

#### Abstract

This presentation is on the research I have been collecting about the fast fashion industry, its carbon footprint and impact on climate change with supply chains, and how media have an obligation to now teach sustainability and conscious consumerism. I have created a public blog site on sustainable fashion that condenses the research into a more engaging type of discussion with pictures, data, and advice on how to shop sustainably. The blog also talks about the impacts of influencers and their “clothing hauls” and how the media pushes fashion trends with shorter lifespans. The goal of the site is to motivate people to take action in their communities, families and their own lives. I hope to inspire my readers and call to mind the dangers behind unsustainable shopping and what it does to our earth.

#### Subject Category

Interdisciplinary and Other Categories: Environmental Studies

#### Faculty Sponsor Department

Geography

#### Faculty Sponsor

Colleen Garrity

### 224 • MWBE Certification: Where Policy Still Struggles to Create Equity

Clara Mooney

#### Abstract

Minority-owned businesses have long faced discriminatory barriers preventing them from accessing a variety of markets compared to their White counterparts. To address this issue, various levels of governance have passed Minority and Women-Owned Business Enterprise (MWBE) policies designed to encourage equal opportunity by promoting MWBEs to become certified and participate in state contracting. However, a literature review indicates that, despite the intention of these policies, this procurement process still fails to holistically include MWBEs. This poster will investigate themes regarding how MWBEs are still experiencing exclusion in efforts to highlight areas to improve for more just policies. Firstly, excessive requirements and limitations can be incongruous with the social and cultural elements central to the MWBE experience. This can result in potential candidates underutilizing the certification and, when they are used, revenue may even be further deferred from small and minority-owned firms. Secondly, feedback on the structure and delivery of MWBE policies indicates poor user-experience as MWBEs often struggle to network and access technical assistance. Thirdly, while policymakers increasingly understand how one’s race and gender produce diverse perspectives on discriminatory barriers and effective solutions against them, it is revealed in the literature that MWBEs still desire their complex situations be better understood and addressed to ensure equitable outcomes for and between MWBEs. Lastly, I will examine how market mechanisms play a role in inhibiting sustainable and equitable solutions to exclusion.

#### Subject Category

Social Science Categories: Political Science

#### Faculty Sponsor Department

Geography

#### Faculty Sponsor

Jessica Gilbert

### 234 • Modeling cellular reception throughout Letchworth State Park, New York State

Marcie Hogan

### **Abstract**

Letchworth State Park (LSP) in western New York State is famous for its picturesque gorge along the Genesee River. However, due to its topography the park experiences patchy cellular service across its 58.4 square-kilometer area. This project modeled cellular service coverage throughout LSP to better understand its relative strength and spatial coverage. Viewshed analysis in ArcGIS Pro software was used with gridded elevation data and the locations of cellular towers to create a model that estimated how many cellular towers were within line-of-sight at each location throughout the park. Previous studies have suggested that viewshed analysis is a viable method for modeling the strength of cellular networks, as it can model the presence of a line-of-sight from an observer to a receiver. The model predicted that roughly 65% of the park has no service, which includes areas encompassing many of the park's most popular locations. Generally speaking, the northern portion possesses the best cellular service while the inner canyon possesses no service. The information on cell phone coverage from this study is valuable for both park management and park goers, as phone service is potentially important for emergency management when considering the popularity of some of the park's remote but visited locations.

### **Subject Category**

Social Science Categories: Geography

### **Faculty Sponsor Department**

Geography

### **Faculty Sponsor**

Steven Tulowiecki

## **184 • Mapping Different Climbing Types by State in the United States**

Victoria Taylor

### **Abstract**

The sport of rock climbing involves the climbing of rock faces, especially with the aid of ropes and special equipment. The sport has been ever growing since the late 1800's, and its popularity was marked by its debut in the 2020 Summer Olympics. This project assessed geographic patterns of rock climbing and its many styles in the US currently. In the climbing world, many different styles of climbing exist, such a traditional climbing (brings protective gear to arrest falls), sport climbing (uses permanent anchors on the wall), bouldering (small boulders without ropes) and top rope climbing (anchored in from above). A spatial database was created using GIS software to record the number of each style of climb per state, which was then used to map the spatial patterns of each climbing style. Data was collected from The Crag, an online database of rock-climbing locations and venues across the world. Using maps and descriptive statistics, spatial patterns of different styles of climbing across the country were determined. In the US, the most common style of climbing was bouldering, while the least common was top roping. The top states for rock climbing overall were Colorado and California, whereas the states least popular for rock climbing were Nebraska and Louisiana. This project found that rock climbing is a highly regionalized activity within the US.

### **Subject Category**

Social Science Categories: Geography

### **Faculty Sponsor Department**

Geography

### **Faculty Sponsor**

Stephen Tulowiecki

## **131 • Primary Loss to Write-In Victory: A District-Based Analysis of the 2021 City of Buffalo Mayoral Election**

Alexander Maccallini

### **Abstract**

The 2021 mayoral election for the City of Buffalo, New York was unprecedented in the city's history. That year's Democratic Primary saw India Walton, a union-backed progressive upstart, upset the incumbent Mayor Byron Brown. Brown, having served in consecutive terms since 2005, promptly embarked on a write-in campaign. His rhetoric during the campaign echoed fears of moderates and conservatives towards criminal justice reform and economic equity. In the general election, Brown pulled off an unprecedented write-in victory over Walton. This research will examine the circumstances of this election, by analyzing factors that made each candidate's campaign successful. Data on election results will be sourced from the Erie County Board of Elections, and data on racial composition of the city, by tract, will be sourced from 2020 U.S. Census Bureau. The research will find that while Walton benefited from strong mobilization of votes in the primary, Brown was able to succeed in mobilizing the white mail-in vote.

### **Subject Category**

Social Science Categories: Geography

### **Faculty Sponsor Department**

Geography

### **Faculty Sponsor**

Darrell Norris

## **29 • Improving Urban Resilience Through Green Infrastructure and Equity in the Rust Belt City of Detroit, Michigan**

Gabrielle Neubert

### **Abstract**

Within the Great Lakes, Rust Belt cities such as Detroit, Michigan have begun a movement towards sustainability and urban resilience by increasing the amount of green infrastructure, which will improve equity standards across their urban landscapes. Detroit is a post-industrial city currently facing "numerous resilience challenges including a weak economic base, high poverty and vacancy rates, and aging infrastructure" (Meerow & Newell, 2017). Detroit can optimize its infrastructure to increase both green infrastructure and social equity, therefore increasing the city's urban resilience for a sustainable future. Urban ecosystems are always evolving, however, if cities like those in the Rust Belt cannot evolve, their infrastructure becomes redundant, vacancies increase, economic activities decline, and social problems result from this cycle (Williams, 2021).

Using spatial data, quantitative data, and qualitative data, I will uncover patterns of equity associated with green space and green infrastructure in Detroit. Spatial datasets include the Tree Equity Score from American Forests, Detroit neighborhood boundaries, and Detroit's 2021 green stormwater infrastructure project locations. Qualitative data includes an in-depth literature review, recent news articles about stormwater infrastructure in Detroit, and Detroit's first Climate Action Plan to analyze Detroit's progress on green infrastructure and sustainability. Locating areas that are not equitably served with sustainable infrastructure will show where Detroit may need to direct their attention to combat inequalities related to sustainability initiatives.

### **Subject Category**

Interdisciplinary and Other Categories: Urban Studies

### **Faculty Sponsor Department**

Geography

### **Faculty Sponsor**

Jennifer Rogalsky

## **58 • An Evaluation of the Equity of Greenspace in Buffalo Neighborhoods**

Emma Ranney

### **Abstract**

A wealth of studies indicate that access to greenspace is correlated with increased health and well-being; therefore, access to greenspace is an important component of urban sustainability as it touches the areas of “good health and well-being” and “reduced inequalities,” two of the United Nations’ Sustainable Development Goals. This study seeks to understand the degree to which greenspace within the city of Buffalo, N.Y. is equitable. I will examine this by comparing greenspace acreage, quality (via amenities), and safety (via crime statistics) to each neighborhood’s per capita income, poverty rate, and racial composition. I expect the results of this case study to align with previous findings, which reveal that neighborhoods with low incomes, high poverty rates, or large minority populations typically have less quality greenspace than their wealthy, white counterparts. Buffalo is the second largest city in the state and has one of the most renowned park systems in the nation; however, if these parks are not accessible to all of the city’s residents, they are not truly sustainable, which could have important ramifications beyond the city in question. If Buffalo’s park system is not equitably contributing to all residents’ health and well-being despite being one of the most lauded park systems in the country, then it is likely that other cities are falling short in this area of urban sustainability as well, but if the city’s greenspace is equitable, then Buffalo could be a model for other cities to emulate when designing or improving greenspace.

### **Subject Category**

Interdisciplinary and Other Categories: Sustainability Studies

### **Faculty Sponsor Department**

Geography

### **Faculty Sponsor**

Jennifer Rogalsky

## **150 • Mapping the History of Human Population and Development in Global Biodiversity Hotspots, 1000 to 2000 CE**

Emily Keenan

### **Abstract**

Biodiversity (biological diversity) refers to the diversity of all life on Earth, including ecosystems and species. Currently, 36 areas globally are classified as biodiversity hotspots, defined as a region that contains high biodiversity levels that are also threatened by human population and development. The specific requirements for this classification follow two criteria: it hosts 1,500 endemic vascular plants, and at most 30% of its area is covered in original native vegetation present. This research maps the history of biodiversity hotspots with respect to changes in human population and land use from 1000 to 2000 CE. Results show that the biodiversity hotspots faced a major increase in pressure from human population from 1800 to 2000 CE. New Caledonia, a biodiversity hotspot in the South Pacific Ocean, is the least threatened hotspot as the percentage of undeveloped land has been consistently 100% from 1000-2000 CE. Sundaland and Indo-Burma, in Southeast Asia, are two of the most threatened hotspots since the population drastically increased from 3,339,947 to 203,272,736 and from 8,082,816 to 330,874,368 respectively between 1000-2000 CE. The Western Ghats and Sri Lanka hotspot is the most threatened when examining the percentage of undeveloped land since it stayed consistently at 0.18% between 1000 to 1800 CE and then decreased to 0.04% in 2000 CE.

### **Subject Category**

Social Science Categories: Geography

### **Faculty Sponsor Department**

Geography

### **Faculty Sponsor**

Stephen Tulowiecki

## 105 • A Study in the Growth and Popularity of K-pop Globally Through the Success of BTS from 2013-2021

Kimberly Mistretta

### Abstract

The purpose of this project is to spatially analyze the growth in the popularity of K-pop globally from 2013-2021. As a case study, I focus on the success of K-pop boy group BTS. K-pop, also known as Korean pop, is a genre of music that originated in South Korea that combines different styles of music such as pop, rock, and hip-hop. BTS is a popular and award-winning K-pop boy group that debuted in 2013 under HYBE Cooperation, formerly known as Big Hit Entertainment. Data were collected from websites such as Google Trends, chartmasters.org, billboard.com, ibighit.com, metlifestadium.com and other venue's websites, on K-pop Google search frequencies, and BTS album and tour sales from 2013-2021. The data were collected and organized in Excel then inputted into QGIS to create maps to analyze spatial and temporal patterns in album sales, ticket sales, and google searches. The results show the areas where K-pop has become popular, as well as where BTS has become successful. For example, BTS album sales dominate Asia with about a total of 23,645,000 sales leaving Asia to make up a little under half of BTS's total album sales. The results also show that BTS's ticket sales in the United States have contributed to well over half of BTS's total ticket sales in 2021, while in 2013 US sales didn't even make up half of total ticket sales.

### Subject Category

Social Science Categories: Geography

### Faculty Sponsor Department

Geography

### Faculty Sponsor

Stephen Tulowiecki

## GEOLOGICAL SCIENCES

### 152 • Industrial Slag of Ausable Forks

Ellie Costanza, Catharina Hogle

### Abstract

Ausable Forks is a town in Clinton County in the North-East corner of New York. This area of New York has a history of mining iron ore and smelting it for industrial purposes, this process generates a material called slag. Slag is the waste material left behind after smelting ore, commonly iron. Slag is usually found in areas where heavy mining and smelting occurred. Eight slag samples were taken from areas around the smelting facilities in Ausable Forks, New York with the goal to better understand and analyze the minerals present in the samples. The majority of the slag from Ausable Forks is dark gray in color and dense. Many have bladed crystals and stretched vesicles. Evidence of iron oxidation is present on most of the samples and is focused on droplets of iron or pervasive. Two samples were selected and prepared differently due to inclusions of white material. All samples were crushed to a fine powder and analyzed with x-ray diffraction (XRD) to identify their mineral makeups. The samples contained large crystals dominated by olivine, and the white inclusions within some samples were large crystals of quartz.

### Subject Category

Science and Mathematics Categories: Geological Sciences

### Faculty Sponsor Department

Geological Sciences

### Faculty Sponsor

Dori Farthing

## 77 • Ironville Slag

Molly Smearing, Danielle Cox

### Abstract

Slag samples from Ironville, NY were analyzed to determine their mineral makeup. Slag is the byproduct that results from smelting, an industrial process used to separate a pure metal from an ore. A variety of samples were studied, and they range in their appearance from purple and blue glass, to gray and red vesicular material. All samples were crushed to a fine powder using a ball mill and then analyzed with the x-ray diffractometer (XRD). Glass was a main component of half of the samples we studied. The other half contained glass as well as crystalline materials. The crystals/minerals that were observed belonged to the pyroxene family as well as pure iron. Perhaps the most surprising analysis was discovering the presence of crystalline materials in a highly vesiculated sample.

### Subject Category

Science and Mathematics Categories: Geological Sciences

### Faculty Sponsor Department

Geological Sciences

### Faculty Sponsor

Dori Farthing

## 62 • Thermal Demagnetization of Siltstone Cores from the Scottsville Basin, Virginia

Connor Curley

### Abstract

The Scottsville Basin in VA is one of many extensional basins that are thought to have formed in Triassic due to the opening of the Atlantic Ocean as Pangea broke up. A lack of both fossil record and volcanic ash layers in the basin have made it difficult for age dating. Given that the traditional and previous methods were inconclusive, our approach was to try and use the orientation of the remanent magnetization to determine the age of deposition. The AGICO JR6-A Spinner Magnetometer, AGICO MFK-1A Kappbridge, and a Schonstedt Model TSD-1 Thermal Specimen Demagnetizer were utilized for thermal demagnetization of 42 siltstone cores. Paleomagnetic data was displayed individually on stereo nets, vector component demagnetization diagrams, and intensity vs. temperature plots. Overall, the magnetic signal shows a general declination to the NE with a moderate inclination. The mean plots of higher temperature steps demonstrate a closer orientation to the assumed NE, and lower temperatures oriented to the NW. Data from the magnetic susceptibility analysis shows constant susceptibility up until temperatures exceeding 575°C. The trials with the six additional cores confirmed laboratory mineral growth at temperatures starting at 575°C. The scattered distribution of data suggests that demagnetization of these samples does not provide a clear and defined age for deposition of sediment within the basin. Furthermore, this experiment plotted a pole position, not within the North American polar wander curve. This suggests that there are multiple magnetization components, and our experiment does not isolate a depositional remanent magnetization.

### Subject Category

Science and Mathematics Categories: Geophysics

### Faculty Sponsor Department

Geological Sciences

### Faculty Sponsor

Scott Giorgis

## 56 • Preliminary paleomagnetic analysis of the Sandfell laccolith, Iceland

Johnathan Lockwood, Michael Andrus

**Abstract**

Paleomagnetic data can be used to determine the orientation of Earth's magnetic field in the past. The rhyolitic Sandfell laccolith, Iceland is the cooled remains of a large body of magma that is thought to have been emplaced over a short period of time. It occurred when magma intruded between two layers creating a mushroom-shaped igneous formation beneath the surface. Due to the brief period of time in which the laccolith was emplaced, work was conducted to detect and determine significance of paleomagnetic signatures in the rock unit. These paleomagnetic signatures would indicate the usefulness of continued study of the laccolith and the best methods of testing. Prior successful studies have been conducted on this rock unit using other magnetic tests, suggesting that this unit has some consistent magnetic signature. In order to determine which method would successfully define a paleomagnetic signature, thermal demagnetization and alternating current demagnetization were applied to the same sample. The experiment consisted of taking six cores and splitting them into two groups of three. One group of samples were incrementally placed in a demagnetization oven up to 700°C. After each increment, measurements were taken using the spinning magnetometer and the Kappenbridge to test remnant magnetization and magnetic susceptibility. The other group was analyzed with the alternating field demagnetizer and the magnetic remnant was measured with the spinning magnetometer. The alternating current method had successful results suggesting it is the proper method for testing paleomagnetic signatures in the Sandfell laccolith, Iceland.

**Subject Category**

Science and Mathematics Categories: Geophysics

**Faculty Sponsor Department**

Geological Sciences

**Faculty Sponsor**

Scott Giorgis

**246 • Gravimetric Detection of Subterranean Fuel Tanks**

Jeffrey Kucerak, Max Mendiola

**Abstract**

Non-intrusive geophysical imaging is a major source of information used in a variety of applications, including environmental and construction surveys. This imaging has long been successfully performed through several techniques such as ground-penetrating radar and seismic tomography. In this work, we collected and analyzed data with a spring based gravimeter to explore the variation in gravity across two subterranean fuel tanks used by Facilities here at the College. We began by establishing a base station for comparison, then measured the gravity relative to that base station at ten points along a thirty meter line. When viewed in relation to the expected gravitational value of an undisturbed subsurface, negative anomalies were visible at locations where the tanks are stored, which is consistent with what would be expected from a subterranean space that was less dense than the surrounding ground. Three separate analyses were performed, with varying results. The horizontal position of the pair of fuel tanks was derived with sufficient accuracy, but determining their dimensions and depth was less successful. Nevertheless, these results were promising. Expanding our surveyed points from a single line to a two dimensional grid would be the next logical step with this research.

**Subject Category**

Science and Mathematics Categories: Geophysics

**Faculty Sponsor Department**

Geological Sciences

**Faculty Sponsor**

Scott Giorgis

**84 • Using Thermal Demagnetization to Date Diabase Dike, Scottsville Basin, VA**

Joshua Yanuck, Kaylee Rains, Jonathon Lockwood

### **Abstract**

The purpose of this project was to determine the age of a diabase dike intrusion in Virginia using paleomagnetism. Previous attempts to date this intrusion using alternating field demagnetization were unsuccessful. Ten samples of this intrusion were run through thermal demagnetization to measure the orientation of the dike's primary magnetization. The specimens were put through a series of heating steps in a paleomagnetic oven. After each heating step, data was collected for the samples' magnetic orientation and magnetic susceptibility. Results indicated the magnetic susceptibility gradually decreased as the experiment progressed, signifying a lack of magnetic mineral growth during heating. The data suggested that this dike had a consistent, reproducible magnetic signal. A reasonable age of emplacement of approximately 160 Ma was also identified. This experiment shows that thermal demagnetization was a great technique for identifying a rock sample's magnetic signal. While this technique may not work on all specimens, it is still a useful tool and should be utilized on similar samples. Future projects should analyze dike samples from many different locations in Virginia to determine if the results presented here are an accurate estimation of the age of this rock sample.

### **Subject Category**

Science and Mathematics Categories: Geological Sciences

### **Faculty Sponsor Department**

Geological Sciences

### **Faculty Sponsor**

Scott Giorgis

## **231 • Water chemistry analysis of the Genesee River**

Konnor O'Bara

### **Abstract**

The Genesee River flows from New York's Southern Tier through the city of Rochester. This rural-to-urban fluvial path allows for the delineation of potential anthropogenic impacts on the water chemistry. In this study, six locations along the Genesee River were sampled for chloride, nitrate, phosphate, pH, and total alkalinity using LaMotte water monitoring kits on-site. Measurements were acquired in March 2022 after a snowstorm and rain event, when runoff over surficial topography tends to be higher. Although by small amounts, the nitrate, phosphate, chloride, and alkalinity all increased along the river's course, from rural-to-urban settings. All values were within the ranges expected for the river, suggesting minimal anthropogenic impact on these criteria. The results of this study allow for a greater understanding of the Genesee River's water quality, as well as winter to spring seasonal differences.

### **Subject Category**

Science and Mathematics Categories: Geological Sciences

### **Faculty Sponsor Department**

Geological Sciences

### **Faculty Sponsor**

Amy Sheldon

## **232 • Green Roof Pilot at SUNY Geneseo**

William Neuschwender, Reydaliz Torres Lopez, Brendan Reilly, Isabella Demeo, Micah Ford, Alex Silato, Skylar Lumadue, Brendan Pigott

### **Abstract**

We examine the efficacy of green roof structures as a means of addressing sustainability initiatives at SUNY Geneseo. Green roofs are affordable and easily maintainable structures that reduce carbon output and serve to insulate

structures, resulting in decreased expenses. We propose building a green roof structure on campus to test the effectiveness of green roofs in the Finger Lakes region. Some factors we intend to test on the green roof include average rainfall/snowfall, water runoff, wind speed, temperature, and structural degradation. By doing this, we intend to prove that green roofs could serve as a feasible approach to the campus' pledge to become carbon free by 2040 while also considering cost efficiency, maintenance, and climate-specific needs. Factors that could inhibit our work include the limited timescale of the data-measuring period, resulting in limited sample size.

**Subject Category**

Science and Mathematics Categories: Biophysics

**Faculty Sponsor Department**

Geological Sciences and Chemistry

**Faculty Sponsor**

Amy Sheldon and Eric Helms

**76 • The Phosphate Concentration of the North and South Basins of Conesus Lake: Archiving Anthropogenic and Agricultural Land Use Practices**

Emily Abbati, Kaitlyn Gerstler, Julia Rogerson, Griffin Rose

**Abstract**

The study aims to address anthropogenic effects specifically land use practices, and how they influence sediment chemistry of Conesus Lake. Conesus Lake records past agricultural practices that has encouraged continual remediation and monitoring since the introduction of invasive taxa and harmful cyano-algal blooms in the mid-1990s. Piston and bolivia cores were collected from the north and south basins to evaluate the sedimentology and agricultural influence on the lake ecosystem. Cores were collected from the deep regions of the south basin (17 meters deep) and the north basin (11 meters). Both cores yielded over 100cm of sediment. Cores were split, imaged, and analyzed for magnetic susceptibility and XRF using a multi-sensor core logger. Sediments were subsampled and processed for phosphate concentration and total organic carbon at regular intervals. The phosphate concentration was determined using a photometer for the north and south deep basins, 20 samples of differing depths were taken from each core. Preliminary results indicate a significant sedimentological change towards the recent in which organic content and grain size increases towards the upper 40-50 cm. The north basin shows overall lower concentrations of phosphate in comparison to the south. The south basin shows dramatic increase in phosphate concentrations starting 85cm from the surface that persists up to 25cm from the surface. 25cm towards the recent show decreasing phosphate levels that indicate current remediation efforts are working. From this study we hypothesize that phosphate delivery is more concentrated in the south due to higher sediment transport and more delivery systems.

**Subject Category**

Science and Mathematics Categories: Geological Sciences

**Faculty Sponsor Department**

Geological Sciences

**Faculty Sponsor**

Jacalyn Wittmer Malinowski

**226 • A Study of Sedimentation Rate and Elemental Trends in the North and South Basins of Conesus Lake, Western New York**

Kaitlyn Gerstler, Emily Abbati, Julia Rogerson, Griffin Rose

**Abstract**

Conesus Lake is the westernmost finger lake and is categorized as a mesotrophic lake, documenting the introduction of invasive taxa throughout the 20th century, along with ongoing remediation that started in the late 1990's. Piston cores

were collected from the deep regions of the north and south basins, resulting in 145.5 cm of core in the north basin (at 11.13 m water depth) and 121 cm core in the south basin (at 16.68 m water depth). Both cores were split, imaged, and analyzed using a Geotek multi-sensor core logger at Syracuse University. X-Ray Diffraction and smear slide analysis was done on both cores to compare the mineralogy.

The geohistorical record is a valuable tool to evaluate environmental and ecological changes that can be used as tools for conservation and restoration and remediation. This study sets out to document the difference between the north and south basins of Conesus Lake in western New York and its potential reasons for said differences. Conesus Lake was selected for this study because there are clear differences in the north and south basins. The two basins receive different amounts of input and from sources that come from different land uses in the watershed, as the south basin has more residential areas and the north basin has more agricultural areas. This research compares the mineralogy and elemental trends of the north and south basins to provide information about past anthropogenic impact and how remediation efforts can be improved.

### **Subject Category**

Science and Mathematics Categories: Geological Sciences

### **Faculty Sponsor Department**

Geological Sciences

### **Faculty Sponsor**

Jacalyn Wittmer Malinowski

## **258 • An Investigation Of Diatom Morphometry And Population In The Sedimentary Archive Of Conesus Lake In Western New York.**

Griffin Rose

### **Abstract**

Understanding anthropogenic impacts on lacustrine environments has become increasingly important due to the scale of human influence on lake ecosystem health. This research is focused on characterizing the sedimentological history of Conesus Lake in Livingston County, western New York. Conesus is a mesotrophic lake currently undergoing remediation in response to water quality issues, proliferation of introduced and invasive species, and recent appearances of cyanobacterial blooms. The purpose of this research is to investigate the health of Conesus Lake by characterizing diatom samples from sediment cores. These cores should capture pre-European colonization, pre-Industrial practices, and pre-Remediation signals archived in the sediment. If remediation efforts have been effective then we should see a shift in diatom samples associated with mesotrophic conditions and a general increase in size. Diatoms are known to be sensitive to lake health and climate, and have been used as paleoclimate indicators. Sediment from cores collected in Conesus lake was digested and provided samples of well preserved benthic and planktonic diatom frustules, analyzed for aspect ratio and genus level identification with Scanning Electron Microscopy. Frustule size for diatom genus such as *Stephanodiscus* and *Aulacoseira* can be used to interpret trophic conditions and track environmental changes. Analysis of these diatom genus for frustule size and aspect ratio was compared to core depth to describe any significant changes in diatom populations over time. These diatom samples were used in conjunction with ongoing research to characterize the environment and describe the health of Conesus lake over the last 300 years.

### **Subject Category**

Science and Mathematics Categories: Geological Sciences

### **Faculty Sponsor Department**

Geological Sciences

### **Faculty Sponsor**

Jacalyn Wittmer Malinowski

## **159 • Diatoms as Climate Proxies for the Thermal History of Conesus Lake**

Al Tejera, Kaitlyn Gerstler, Griffin Rose, Emily Abbati, Julia Rogerson

### **Abstract**

Single-celled algae known as diatoms can be preserved as fossils in Conesus Lake and provide insight into paleoenvironments through their unique sensitivity to temperature, pH, and nutrient levels. Lack of research done on the benthic diatom assemblages—creatures who live at the bottom of the lake floor—of Conesus Lake leaves a deficit of knowledge about pre-colonial lake temperatures and their trends. This study is an analysis of a lake core of the southern portion of Conesus Lake collected by the Finger Lake Research Group. The core is estimated to be about 300 years old. Based on diatom genera abundance in 20 samples from the core, mathematical formulas based on the preferred water temperature of known diatoms revealed average temperatures of the lake at the individual sample level and genus level. Average temperature preferences of diatom genera were gathered from pre-existing literature and used to calculate a thermal history of the lake. Towards the surface, the mean temperature increased, indicating a warming trend. The samples showed an average increase of 2.87°C since circa 1700. However, the air temperature of Livingston County did not show significant correlation with the calculated sample temperatures from the core despite both having general increases towards the present. This study reinforces the idea of climate change on a small scale. Lakes more radically respond to changes in atmospheric temperature compared to an ocean, which make them a comparable model for the climate crisis. Diatoms, despite their microscopic size, provide significant evidence for an ever-warming climate.

### **Subject Category**

Science and Mathematics Categories: Geological Sciences

### **Faculty Sponsor Department**

Geological Sciences

### **Faculty Sponsor**

Jacalyn Wittmer Malinowski

## **276 • Determination of Age of *Ilymatogyra arietina*, *Ostera*, Cretaceous of Texas, Through Counting of Growth Lines**

Lucas Glomb, Devon Underwood

### **Abstract**

Our group hypothesized that by counting the growth lines on *Ilymatogyra arietina*, an extinct oyster species from the Cretaceous, we could determine an accurate age of each oyster in question. We examined four specimens of this species using the assumption that the wider growth line sets represented annual growth while the thinner, less pronounced lines represented monthly growth sets. On average, there were twelve thinner growth line sets within each thicker growth line set. Using this as our proxy, we counted all the growth lines visible at 100x and 400x magnification on specimens utilizing a dissecting microscope and scanning electron microscope. Total growth lines were divided by twelve to determine an age in years for each specimen. Using this method, we determined our specimen set to contain oysters ranging from 2.5-4.5 years old, comparable to the modern oyster *Crassostrea virginica* (Atlantic Oyster), which have a lifespan anywhere from 6-15 years. Our *Ilymatogyra arietina* specimens were all within 1 cm, so a larger sample size would help determine a broader range of the species average life span.

### **Subject Category**

Science and Mathematics Categories: Geological Sciences

### **Faculty Sponsor Department**

Geological Sciences

### **Faculty Sponsor**

Jeff Over

## **LANGUAGES AND LITERATURES**

## 43 • Identifying Barriers and Seeking Solutions for Latinx and Hispanic Students in Higher Education

Gabrielle Joseph

### Abstract

Latinx and Hispanic students face barriers in higher education, including but not limited to; a lack of institutional and familial support, financial hardship, and societal stereotypes. As such, systemic and institutional changes must occur and be consistent in order for Latinx and Hispanic students to attain academic success. Therefore, this presentation intends to explore the experiences of Latinx and Hispanic students in higher education, specifically those in SUNY Geneseo. In order to qualify student experiences, virtual interviews were conducted with various members of the student body. Additionally, in qualifying procedures in place and solutions in process at SUNY Geneseo, Christie Smith, Admissions Counselor, was interviewed. Outside evidence was collected from relevant scholarly articles and journals and compared to experiences in the SUNY Geneseo student body. Student solutions were also accounted for and used to outline systemic changes for the betterment of Latinx and Hispanic students' academic experiences in SUNY Geneseo.

### Subject Category

Interdisciplinary and Other Categories: Latin American Studies

### Faculty Sponsor Department

Languages and Literatures

### Faculty Sponsor

Wesley Costa de Moraes

## BUSINESS ADMINISTRATION

## 25 • How Might ESG Transform the Global Market?

Christian Chin, Jocelyn Haines

### Abstract

Environmental, Social, and Corporate Governance (ESG) is an increasingly popular method used by investors to screen for potential investments that align with their personal values. It's primary purpose is to implement a common set of standards to measure the impact of business investments from an environmental, societal, and moral basis in addition to mitigating risk. An increase in international demands for rapid action to combat the effects of climate change has prompted the United Nations 2021 Climate Change Conference (COP26) to call for billions of dollars to be spent on climate finance as 130 countries have pledged to attain carbon neutrality by 2050.

Setting up our research through a global lens, we chose to analyze the ESG markets of the United States, China, Germany, Brazil, Australia and Nigeria because they have the highest gross domestic product (GDP), or economic strength, of their respective continents and are most likely to have accurate reporting. Recent studies have shown that sustainable investing outperforms traditional investing in the long-run, taking into account unexpected events such as the COVID-19 pandemic. While every country does not have mandatory ESG reporting, the majority of large corporations publish voluntary reports of their practices in conjunction with broader marketplace trends. This leads us to believe that implementing ESG on a global scale, keeping in mind regional differences, will ultimately lead to more sustainable economies and increase their long-term GDP, thereby improving the livelihoods of their citizens.

### Subject Category

School of Business Categories: Business Administration

### Faculty Sponsor Department

Languages and Literatures

### Faculty Sponsor

Jasmine Tang

## FRASER LIBRARY

### 61 • Enhancing the Classroom Environment through the Imaginarium and TERC Internship

Valerie Groccia, Hannah Johnston, Charis Law

#### Abstract

The classroom environment is a critical component to a student's success. We want to create an environment where students feel accommodated and comfortable to learn and grow. While we continue to navigate an ever-changing world of education, it has become apparent that the way we organize our classroom to reach students needs to evolve, as well. Throughout our time as the Imaginarium and Teacher Education Resource Center (TERC) interns, we have recognized similarities when trying to connect with members of the SUNY Geneseo Ella Cline Shear School of Education. We have spent the 2021-2022 academic school year researching and developing ways to cultivate an inclusive classroom environment, focusing on access and collaboration for education students to grow as a student and future educator.

#### Subject Category

School of Education Categories: Early Childhood/Childhood Education

#### Faculty Sponsor Department

Library

#### Faculty Sponsor

Becky Leathersich

## MATHEMATICS

### 111 • Farm Planning Optimization

Charlie Kenny

#### Abstract

A thorough planning stage must be utilized prior to the start of the season in order for a farm to make a profit. Using the crops currently in production at the local Fallbrook Farms, this project focuses on how to best utilize the planning stage of farm building in order to maintain both profitability and desirability. An optimization technique is used to determine the optimal selling price of each plant based on a profit of 0% and 50%. The determining factors for the function are cost, based on labor hours and the price of seeds, and profit, based on a single plant's yield and the amount of plants that can fit in a 6,000 inch bed. The calculated selling price is then compared to the market value in order to determine if the projected price is reasonable. From there, a planting season can be forecasted using the derived profitability, the growth rate, and how many can be planted within the allotted bed during a 12 month period. The function used in this project can easily be altered to include other determining factors based on the farm's needs.

#### Subject Category

Science and Mathematics Categories: Mathematics

#### Faculty Sponsor Department

Mathematics

#### Faculty Sponsor

Ahmad Almomani

### 238 • Using Mathematical Modeling to Create a New Pyramidal Compost Bucket Design

Elizabeth Klosko

### **Abstract**

SUNY Geneseo's campus has a compost collecting program where students, faculty, and staff can empty their compostable items into bins which are emptied weekly. However, the bins release a putrid scent when opened, deterring SUNY Geneseo community members from using them. A phenomena commonly known as Pyramid Power claims that the pyramid shape, when exactly scaled to the size of the Great Pyramid of Giza, has properties that, once compostable items are put under it, can limit the growth of microorganisms and therefore reduce the foul smell. Using a 3-D printing device, we will scale and print the pyramid to the size of the current compost buckets. Then, we will test if microorganism growth and foul scent is decreased inside the pyramid shape as compared to inside the current compost bucket design.

### **Subject Category**

Science and Mathematics Categories: Mathematics

### **Faculty Sponsor Department**

Mathematics

### **Faculty Sponsor**

Ahmad Almomani

## **PHYSICS AND ASTRONOMY**

### **20 • Calculating the E-Field Inside a Time-of-Flight Detector**

Michael Fabrizio, Noah Helburn

### **Abstract**

Research is underway at SUNY Geneseo's Low Energy Ion Facility (LEIF) with the goal of understanding material composition using Rutherford backscattering spectroscopy (RBS) techniques. Low energy ions are well suited to understanding the elemental composition of targets also fabricated within the same facility. Time-of-Flight (TOF) spectroscopy may be used to analyze materials to a high degree of precision and for a relatively low cost-basis. Many parts within a TOF detector are biased to some voltage to attract the backscattered alpha particles. The resulting electric fields inside the TOF detector could potentially deflect alpha particles away from their intended target. Computational models have been built to determine the extent of alpha deflection within the chamber and give predictive measurements for the expected alpha flight time.

### **Subject Category**

Science and Mathematics Categories: Physics

### **Faculty Sponsor Department**

Physics and Astronomy

### **Faculty Sponsor**

Kurtis Fletcher

### **27 • Time-of-Flight Spectrometer Experimental Campaign**

Noah Helburn, Michael Fabrizio

### **Abstract**

A Time-of-Flight Spectrometer has been developed at SUNY Geneseo utilizing low energy ions, usually 50 keV alpha particles, for use in target surface analysis. Predicting the energy loss of these ions after elastically scattering off the target as well as traveling through a carbon foil is imperative to the function of the spectrometer. Several computer programs such as a Two-Body-Kinematics-Calculator and SRIM (Stopping Ranges of Ions in Matter) are used to calculate

this predicted energy loss. An experimental campaign was conducted using a Tantalum target with 10 different path lengths to measure the energy loss of the alpha particles and determine the actual thickness of the carbon foil. Previous energy loss calculations had neglected the transit time for electrons emitted from the carbon foil and detected by the channeltron electron multiplier that serves as the start detector. A new calculation takes this into account, improving the consistency of the calculations. With this modification, the predicted final energy of the alpha particles agrees with the measured value by less than 0.018 keV.

**Subject Category**

Science and Mathematics Categories: Physics

**Faculty Sponsor Department**

Physics and Astronomy

**Faculty Sponsor**

Kurtis Fletcher

**243 • Deflection of Light in the Equatorial Plane of a Kerr Black Hole**

Robert Sinesi

**Abstract**

Series expansions for the bending angle of light in the equatorial plane of a Kerr black hole are given for the strong and weak deflection limits with various values of the spin parameter ranging from low to high spin. From the exact bending angle expression, with no known analytical solution, we get series approximations for the bending angle in terms of the impact parameter of the incident light ray. Analytical expressions allow us to derive and connect to other results relating to images formed due to gravitational lensing. Specifically, the asymmetry that arises in the spin-dependent shifts in image positions can be predicted by the analytical expansions. We apply our results for the case of a galactic supermassive black hole to predict asymmetric angular positions of relativistic images on either side of the lens. The possible observation of the asymmetric image shifts with telescopes can only be predicted with the perturbative expansions in the strong deflection regime.

**Subject Category**

Science and Mathematics Categories: Physics

**Faculty Sponsor Department**

Physics and Astronomy

**Faculty Sponsor**

Savitri Iyer

**204 • Rapid Evaporation of Activated Material for Detector Testing**

Margaret Graney, Zach Ehret

**Abstract**

We are designing a system for the testing of a detector of the product of a fusion reaction, where the product has a short half-life (roughly one second). Our system uses a vacuum chamber to isolate the rapid heating of a coated tungsten filament by passing a large current (up to 100 amperes) through the filament. This evaporates the coating into the detector that is being tested. I am working to improve this system, which was previously driven by a car battery. Capacitors have replaced the car battery, to allow for greater control of the energy delivered to the filament. A relay starts the discharge suddenly. By discharging the capacitors with various initial charges (and voltages) through the filament, we measure the temperature of the filament as a function of time with an infrared pyrometer. As another improvement, we will mount the electrical feedthrough on a new rotary flange for the vacuum chamber. During tests, the coating is made radioactive by an accelerator beam. Rotation will allow us to expose more than one filament during one experimental run. This reconfiguration will require the design of extension rods to position the filaments in front of the beam.

**Subject Category**

Science and Mathematics Categories: Physics

### **Faculty Sponsor Department**

Physics and Astronomy

### **Faculty Sponsor**

James McLean

## **73 • Paschen's Law Plasma Demonstration Chamber**

Vizma Leimanis

### **Abstract**

I am building a plasma chamber apparatus to demonstrate Paschen's Law by showing plasma arcs between electrodes in a vacuum chamber. A minimum breakdown voltage is needed to spark a plasma between two electrodes in a gas. Paschen's Law relates this breakdown voltage to the pressure  $p$  of the gas and the length  $d$  of the gap between the electrodes. There exists an optimal product  $p \times d$  which minimizes the breakdown voltage, which is roughly  $(7.5 \text{ cm}) \times (10^{-4} \text{ atm})$  in air. Three pairs of electrodes with different gap lengths will be shaped like a ladder. They will be connected in parallel so that the same voltage is applied across all of them. The gap lengths were chosen to contrast the optimal conditions, with two of the gaps corresponding to larger breakdown voltages. The vacuum chamber consists of a bell jar and raised base-plate to contain the electrodes. This chamber is connected to a vacuum pump, pressure gauge and regulator, and electrical contacts to the ground and high voltage. This plasma chamber will be usable for educational purposes and is portable.

### **Subject Category**

Science and Mathematics Categories: Applied Physics

### **Faculty Sponsor Department**

Physics and Astronomy

### **Faculty Sponsor**

James G. McLean

## **71 • Using a $^{64}\text{Cu}$ Source to Test SLICS**

Nicole Gindling

### **Abstract**

The short-lived isotope counting system (SLICS) being built for the OMEGA laser facility at LLE requires short-lived radioisotopes, such as  $^{64}\text{Cu}$ , for testing and calibration purposes. Using the SUNY Geneseo neutron howitzer, which contains a Plutonium-Beryllium (Pu-Be) source,  $^{63}\text{Cu}$  was bombarded with water moderated thermal neutrons to produce  $^{64}\text{Cu}$  via the  $^{63}\text{Cu}(n,\gamma)$  capture reaction. The 12.7 hour half-life of  $^{64}\text{Cu}$  allowed it to be transported to Houghton College where its signature was measured as a possible background to  $^{66}\text{Cu}$  used in future "exploding wire" experiments to simulate detection of radioisotopes produced in ICF implosion.

### **Subject Category**

Science and Mathematics Categories: Applied Physics

### **Faculty Sponsor Department**

Physics and Astronomy

### **Faculty Sponsor**

Stephen Padalino

## **81 • Messier 41 Open Star Cluster Study**

Darren D'Arcy, Bailey Filer, Jersey Hutchins, Noah Longshore, Luise Shay, Daniel Ornelas

### **Abstract**

Using images of star cluster M41 taken by the WIYN (Wisconsin, Indiana, Yale, NOAO) 0.9 meter telescope in Kitt Peak National Observatory, a five-color photometric analysis is presented. This study determines age, metallicity, reddening and distance of the cluster. Specialized software was used to create a Point Spread Function (PSF) for the stellar light profile of each star in every frame. Stellar magnitudes were measured and averaged within the five filters (U, B, V, I, R) in order to create a master catalog for all the cluster's stars. The photometric analysis was put onto the standard system by adjusting data to fit with Arlo Landolt's Catalog (L92), thus allowing for efficient parameter calculations necessary for study.

### **Subject Category**

Science and Mathematics Categories: Physics

### **Faculty Sponsor Department**

Physics and Astronomy

### **Faculty Sponsor**

Aaron Steinhauer

## **214 • Using Red Giant Spectroscopy to Compute the Interstellar Reddening of Open Cluster NGC 2194**

Daniel Ornelas

### **Abstract**

The colossal distances between planet Earth and astronomical objects significantly affects the starlight which our telescopes receive. It is necessary that we first quantify and account for these influences before carrying out scientific research in order to ensure the accuracy of our results. The purpose of this research was to calculate the interstellar reddening of stellar cluster NGC 2194 in order to prepare for future observation. The metallicity of this cluster was determined by measuring Fe absorption lines in the spectra of Red Giant cluster members. Techniques for acquiring stellar temperatures were developed by means of adjusting graphed abundances vs excitation potential. Finally, interstellar reddening was arrived upon via comparisons of photometrically computed B-V colors to theoretical prediction.

### **Subject Category**

Science and Mathematics Categories: Physics

### **Faculty Sponsor Department**

Physics and Astronomy

### **Faculty Sponsor**

Aaron Steinhauer

## **POLITICAL SCIENCE AND INTERNATIONAL RELATIONS**

### **108 • Covert for Consumers?: Understanding Motivations for US Covert Action in Latin America**

James McGlynn

### **Abstract**

What was Cold War era covert intervention meant to accomplish for the United States? Was US covert action simply meant to address security concerns, or was there more to the story? Drawing from the expectations of post-Marxist theories, I form two hypotheses. First, that the US sought to maintain existing trade relationships under threat from

leftist regimes, but failed due to the destabilization of targeted states both politically and economically. Second, that the US aimed to preserve the stability of capitalism in Latin America by bringing "modernizing" regimes to power through covert action. Using an OLS-PCSE model, I confirm both of my hypotheses. States targeted by US covert action saw a decrease in trade as a percentage of GDP, accompanied by a substantial increase in strike activity that serves as evidence of deepening economic instability. In regards to the US' second goal, modernization, I find that states targeted by covert action saw substantial decreases in agricultural employment that serve as evidence of a move towards industrial capital accumulation.

**Subject Category**

Social Science Categories: Political Science

**Faculty Sponsor Department**

Political Science and International Relations

**Faculty Sponsor**

Andrew Hart

**110 • Polarization of Immigration in United States Politics**

Darbie Burke

**Abstract**

Immigration in today's political atmosphere is a polarizing issue. Many people have incorrect information about immigration and I will be exploring what these misconceptions are and trying to find out the issues that are polarizing. I will also explore the relation between party identification and people's feeling towards immigration. Do people's feelings about immigration cause them to vote a specific way or does their party loyalty affect how they feel about immigration? These questions are some that I will try and explore in my presentation.

**Subject Category**

Social Science Categories: Political Science

**Faculty Sponsor Department**

Political Science and International Relations

**Faculty Sponsor**

Jeffrey Koch

**228 • Literature Review: The Increasing Politicization of the Supreme Court**

Jackson Diamond

**Abstract**

Many recent events involving the Supreme Court—such as the confirmation hearing of Justice Brett Kavanaugh, Justice Amy Comey Barrett, and Justice Ketanji Brown Jackson—the correspondence between Justice Clarence Thomas's wife and President Trump's Chief of Staff Mark Meadows, and older events such as the decision to end the recount of the 2000 election caused me to wonder if the Supreme Court has become increasingly politicized. This project will investigate Supreme Court politicization by providing a thorough review of the literature surrounding this topic. To investigate the factors that have led to more partisanship in the Supreme Court, I will review literature that looks into the factors that affect presidential nominations of justices and how senators vote and act in confirmation hearings as well as other factors that affect how Supreme Court justices vote. I will also review research that identifies differences in the voting patterns of Supreme Court justices due to the politicization of the Court. Finally, I will review literature that spells out the effects the politicization of the Court has already had on America, as well as possible future consequences of further politicization of the Court. This will culminate in a summary of my findings from the review of various sources on these subjects.

**Subject Category**

Social Science Categories: Political Science

**Faculty Sponsor Department**

Political Science and International Relations

**Faculty Sponsor**

Jeffrey Koch

**129 • Political Partisanship Impact on United States COVID-19 Policy**

Ashley Gilmore

**Abstract**

Using data from multiple different studies, I will be examining the impact that political partisanship had on policy implementation in the United States during the COVID-19 pandemic. Due to a consensus in the United States that polarization has continuously increased since 2016 I will be investigating if the worldwide pandemic has increased polarization, or if there is a general falsity among the United States public. Furthermore, the impact of this perceived rise in polarization on the necessary implementation of policies during the pandemic will be investigated further. A perceived partisan polarization in the United States did have an impact on policy during the COVID-19 pandemic at local and national levels.

**Subject Category**

Social Science Categories: Political Science

**Faculty Sponsor Department**

Political Science and International Relations

**Faculty Sponsor**

Jeffrey W. Koch

**248 • The Invisible Polarization of Social Media**

Cyntia Hicks

**Abstract**

Social media is ingrained into our society. According to surveys conducted by the Pew Research Center in 2021, an average of about seven in ten Americans use social media platforms. The use of these platforms is not limited to a specific age group, race, gender, income, or education. Social media is boundless in what it can be used for. It is a place to connect with family, interact with friends, keep up with sports, our favorite artists, watch funny videos as well as keep up with politics and current events all over the world. With the ability to do so much at our fingertips as well as the ability to curate our social media feeds often with the assistance of an algorithm that shows you everything you like, it is hard to see the connections between our polarization and the content in which we interact with every day. In this presentation, I intend to remove the invisibility cloak that covers the polarization that social media creates.

**Subject Category**

Social Science Categories: Political Science

**Faculty Sponsor Department**

Political Science and International Relations

**Faculty Sponsor**

Jeffrey Koch

**230 • Rural Class Consciousness and its Impact on American Public Policy**

Mattie Klein

**Abstract**

The rural identity and class consciousness of populations making up the American public represent salient opinions that have direct effects on public policy. The saliency of the middle-class, rural identity made apparent through retrospective voting has seen a new widening in the rural-urban divide. This identity has promoted a wave of populism and exclusionary policies that has defined the previous era of American public policy and continues to be effective today. This presentation will explore how we can further define the idea of rural consciousness and how that identity has been and can be wielded to influence both domestic and foreign policy.

**Subject Category**

Social Science Categories: Political Science

**Faculty Sponsor Department**

Political Science and International Relations

**Faculty Sponsor**

Jeffrey Koch

**233 • The Importance of Academic Freedom in the Classroom**

Elizabeth Lesser

**Abstract**

Academic freedom is essential to the foundation of any education. Allowing an environment and format for the exchange of ideas can create and develop the opinions of students, and even professors. In order for students to learn, all ideas must be understood, and more importantly, it allows for new ideas to develop. Academic censorship challenges the development of society and can infringe individuals' personal autonomy, although it is important to note that there is a line with freedom of speech in the classroom. Speech that derails from an educational purpose and is simply offensive should never be tolerated. There has to be a balance struck between the necessity of academic freedom and also professional accountability in order for education goals to be met. Although some freedom of speech should be suppressed, academic censorship in addition, should have its limits. This poster will examine the general strengths and weaknesses, the controversial nature and formal governmental/political policies pertaining to academic freedom.

**Subject Category**

Social Science Categories: Political Science

**Faculty Sponsor Department**

Political Science and International Relations

**Faculty Sponsor**

Jeffrey Koch

**118 • Confirmation Biases Relationship to Social Media and Public Opinion; is There Hope for American Democracy?**

Nicole Losurdo

**Abstract**

Our political world has intersected with multiple dimensions of each individual's life as our country becomes more partisan. Confirmation bias explains that people desire to seek, perceive, prioritize, and remember information that validates or reinforces one's prior attitudes or beliefs, which is the foundation of the growing partisanship. Social media has made an increased appearance in the political realm, and as public opinion has become heavily divided, confirmation biases are only strengthened. My research is intended to probe deeper into this idea to better understand the relationship between confirmation bias, public opinion, and social media and how this relationship impacts our political world and our democracy as a whole. Suppose people continue to search for specific answers to reinforce their

personal beliefs. In that case, public opinions grow steadily negative, and social media is a platform for partisanship and hatred to flourish what hope is there for American democracy.

**Subject Category**

Social Science Categories: Political Science

**Faculty Sponsor Department**

Political Science and International Relations

**Faculty Sponsor**

Jeffrey Koch

**219 • An American Track Record**

Jacob Radigan

**Abstract**

Determinants of political participation (voting)

In the 2020 election we had the highest number of American voters get down to the polls or cast their mail-in ballots than we have in 120 years of our democratic system. Nonetheless, 80 million eligible Americans refused to carry out a civic right, and what our forefathers would consider a civic duty. While our system still works without the 80 million votes, is it unquestionably hindered by their absence. While reasons array from disinterest in politics to a hatred for the system there remains a need to encourage 80 million people to vote for the President. According to research, education is in not the only factor in civic engagement, although a large portion of non-voters on average obtain less education than voters. Natural forces such as location of birth, income of your parents and the color of your skin undoubtedly shape minds subjectively which will cause correlations, but I dare not say causations. Is there something that can be done to motivate 80 million people to cast a vote and if so, is it actually plausible in the given political and social climate we find ourselves in? That is to say, it is highly unlikely the 28th Amendment will be to require all citizens over the age of 18 to vote.

**Subject Category**

Social Science Categories: Political Science

**Faculty Sponsor Department**

Political Science and International Relations

**Faculty Sponsor**

Jeffrey Koch

**89 • Group Identities in American Politics**

Theo Rose

**Abstract**

Derived from the expansive field of political psychology, group identities represent a salient subject in the matter of American politics. Group identities occur across a wide range of sociodemographic factors, including income, gender, race, and partisanship, to name a few key examples. Upon establishing group identities, people make notable political alignments in accordance with their groups. This paper will consider the psychological underpinnings of peoples' group identifications and provide an illustration of how they ultimately manifest themselves in American politics, largely by considering how they create candidate, policy, or ideological preferences.

**Subject Category**

Social Science Categories: Political Science

**Faculty Sponsor Department**

Political Science and International Relations

**Faculty Sponsor**

Jeffery Koch

**148 • The Effect of Religion on Group Empathy**

Spencer Stone

**Abstract**

Group Empathy is the empathy felt by one group toward an out-group, even though these groups may be directly competing for resources. Group Empathy Theory predicts that those with a higher Group Empathy Index, or GEI, will be more understanding and supportive of the struggles and discrimination faced by the out-group. In turn, they are more likely to show support for policies that strengthen civil rights.

What is the effect of religion on group empathy? Group empathy is shown to have beneficial impacts on equal rights and an understanding of the out-group. It is especially important for group empathy to be strong in a highly diverse nation such as the United States. Different groups report different level of group empathy, and this has massive implications on policy and election results.

This poster will focus on the actual and perceived levels of group empathy held by the religious. The United States is a heavily religious nation, and so it is important to examine the impact of these commonly held religious beliefs on group empathy. Religious people are perceived to have higher group empathy, both by themselves and others. Those with higher empathy are more likely to engage in prosocial behaviors. This poster will attempt to analyze the differences in the driving factors of prosocial behavior among the religious and nonreligious.

**Subject Category**

Social Science Categories: Political Science

**Faculty Sponsor Department**

Political Science and International Relations

**Faculty Sponsor**

Jeffrey Koch

**140 • Why Third Party's are Important in American Politics.**

Ben Valade

**Abstract**

Third Parties very seldom win any sort of election, especially over presidential elections. Most believe that the only reason that third parties are even on ballots is to play spoiler over the other candidates in an attempt to decrease their votes. However, third party members are exactly what the United States needs right now as we live in such a polarized society that we can't seem to agree on anything. With a better introduction towards third party systems and allowing them to be more televised and spread throughout the media can allow citizens to open up to more and new ideas and possibly but an end towards such polarized world.

**Subject Category**

Social Science Categories: Political Science

**Faculty Sponsor Department**

Political Science and International Relations

**Faculty Sponsor**

Jeffrey Koch

**75 • Evangelical Christianity in American Politics**

Luke Wollweber

### **Abstract**

This presentation will go over some of the history of evangelical Christianity in the United States and how it has grown to become a real force in American Politics and culture. Topics include the moral crusade spearheaded by President Reagan, the growth of for-profit churches, the proliferation of Evangelical Christian media, and evangelical interests groups and how they currently impact American Politics.

### **Subject Category**

Social Science Categories: Political Science

### **Faculty Sponsor Department**

Political Science and International Relations

### **Faculty Sponsor**

Jeffrey Koch

## **268 • Systemic Racism in America**

Sara Corbett

### **Abstract**

Systemic Racism in the United States has been an issue in the modern times. I will talk about why it is an issue and why it is occurring.

### **Subject Category**

Social Science Categories: Political Science

### **Faculty Sponsor Department**

Political Science and International Relations

### **Faculty Sponsor**

Jeffrey Koch

## **270 • Effects of Media on Partisanship in American Politics**

Robert Williams

### **Abstract**

Social media and news hold the most important role in the American political world. Contemporary media consumption has led to a drastic increase in polarization in the American people. This has occurred not only through the partisan nature of current media itself but also through the way in which people are consuming media. People staying in their own groups and not straying to any other media sources feed into this partisanship. This combination of partisan media and single-minded viewership patterns is what leads to this increase in polarization. I will look at the division in news media, the targeting of content in social media, and who the consumers of the two are. In the end, I will also go over potential solutions and ways that the cycle can be remedied.

### **Subject Category**

Social Science Categories: Political Science

### **Faculty Sponsor Department**

Political Science and International Relations

### **Faculty Sponsor**

Jeffery Koch

## **PSYCHOLOGY AND NEUROSCIENCE**

### **83 • Empathy for Humans, Empathy for Nature, Connection to Nature: A Serial Mediation Predicting Environmental Intentions**

Liz Haley, Shania Yang, Grace Holzman

#### **Abstract**

Tam (2013) found that Dispositional Empathy for Nature (DEN) and Connection to Nature (CNS) serve both as mediators and predictors in mediational analyses with Environment Intentions (EI) as the outcome variable. However, it is unclear what predicts DEN and CNS. Mayer and Frantz (2004) suggested that components of human empathy predict CNS. Furthermore, it seems reasonable that empathy for humans might also predict DEN. In addition, the human altruism literature indicates Perspective Taking (PT) and Empathic Concern as antecedents for empathy. Therefore, we tested a serial mediation model using these two empathic measures as predictors and distal mediators with DEN and CNS as proximal mediators to predict EI (i.e., Perspective Taking (PT) as a predictor and Empathic concern (EC), DEN and CNS as mediators (in that order) and EI as the outcome variable). Moreover, we predicted that all relations would be positive. Results supported the full serially mediated model. Additionally, EC and CNS as mediators offer a concise path, but exclude DEN. This implies that the ability to take another's perspective leads to more positive environmental intentions (EI) via increased empathy for other humans, which then increases dispositional empathy for nature and connectedness to nature. Theoretical implications are discussed.

#### **Subject Category**

Social Science Categories: Psychology

#### **Faculty Sponsor Department**

Psychology

#### **Faculty Sponsor**

Jim Allen

### **86 • Personal Distress Moderates the Relationship Between Connection to Nature and Environmental Intentions**

Grace Holzman, Liz Haley, Shania Yang

#### **Abstract**

Connection to Nature (CNS), defined as feeling a belongingness to the natural world, predicts environmentally friendly behaviors because humans are more likely to feel concerned about the environment if they perceive it as part of their self-identity (Mayer & Franz 2004). However, it is unclear whether this relation is ever moderated. We predicted that dispositional Personal Distress from another person's suffering would weaken or eliminate the relation between CNS and environmentalism. Participants were 169 students from a medium sized public liberal arts college in western New York. They completed an online survey that assessed Connection to Nature, Personal Distress, Environmental Intentions, and Socially Desirable Responding which were used in this analysis, all of which were assessed on seven-point scales. Consistent with predictions, PD moderated the relation between CNS and Environmentalism such that the relation was weaker for participants who were high in personal distress. Theoretical and practical implications are discussed.

#### **Subject Category**

Social Science Categories: Psychology

#### **Faculty Sponsor Department**

Psychology

#### **Faculty Sponsor**

Jim Allen

## 142 • Working Memory, Locomotor Activity, and Neuronal Density in Old Mice Fed a Ketogenic Diet

Jennifer Bodzon, Raj Patel, Sean McBride, Elizabeth Burke, April Rowell, Kyra Cao

### Abstract

The ketogenic diet (KD), is a high-fat, low-carb diet which has recently become popular as a way to improve memory and cognitive function. There is little research done on the benefits of KD and to what extent it benefits memory function. We modeled the effects that KD has on performance of old mice during a working memory task and locomotor activity. As a control, half of the mice were fed normal chow, while the other half were fed KD. In experiment 1, the Barnes Maze was used to assess working memory. Using spatial cues, the mouse escapes to a target hole located in the Maze, and each day the target location is changed. KD mice showed a lower latency to escape and a tendency to make fewer mistakes. To detect if there were diet-induced differences in activity, experiment 2 utilized a 1hr locomotor test at the start of the diet period (baseline) and again at the end of the diet period (KD) but found no differences between mice on KD and mice fed a normal diet. In experiment 3, we used a cresyl violet stain to assess neuronal density in regions of the brain involved in memory, that included the prefrontal cortex and hippocampus, where higher density was hypothesized to be found in KD mice. Overall, we investigated one potential mechanism for our findings that show KD improves working memory performance without affecting locomotor activity. Results support the potential for using KD as a treatment for disorders with memory impairments.

### Subject Category

Science and Mathematics Categories: Neuroscience

### Faculty Sponsor Department

Psychology

### Faculty Sponsor

Allison Bechard

## 205 • The Effects of a Ketogenic Diet on Alcohol Consumption in a Mouse Model

Julia Hoyt, Edwin Hugh, Tucker Landwehr, Julie Perrone, Betina Popnikolova, Matthew Shin, Lindsey Toole, Lucia Verelli, William Widarsono

### Abstract

Ketogenic diets are characterized by a reduction in carbohydrates and relative increase in the proportions of proteins and fats. Research on the ketogenic diet (KD) as a potential treatment option for many conditions such as Alcohol Use Disorder (AUD) are currently being studied. Binge drinking, intermittent and heavy use of alcohol, is associated with increased problem and risk-taking behaviors, and is often a precursor of AUD. Therefore, a non-invasive diet-based therapeutic intervention to reduce binge drinking could be useful. In the present study, we aimed to investigate if introduction of KD will decrease alcohol consumption in mice. The hypothesis was that mice that are introduced to KD will drink less alcohol. The results indicated that KD did have an effect on alcohol consumption, as mice on the KD diet drank significantly less over time. We assessed the persistence of this beneficial effect by retesting subjects 3 weeks after all mice were returned to a regular chow diet. Results did not support a long-term effect of the KD diet. This suggests that KD may be an acute therapeutic treatment option to reduce binge drinking. Findings should now be replicated and conducted with larger sample sizes that can assess male and female differences.

### Subject Category

Social Science Categories: Psychology

### Faculty Sponsor Department

Psychology

### Faculty Sponsor

Allison Bechard

### 130 • The Effect of an Adenosine Receptor Agonist on Stereotypy in Mice

Shannon McElderry, Matt Shin, Macy Kuebler

#### Abstract

The prevalence of neurodevelopmental disorders, such as Autism Spectrum Disorder (ASD), is rising in the United States. A symptom of ASD is stereotypic behaviors, invariant movement patterns serving no apparent function. Despite interference with daily routines and functioning, effective treatment for stereotypic behaviors is lacking. The ketogenic diet (KD) has previously been used to treat epilepsy, and new evidence shows the effectiveness of KD in treating ASD. Although the mechanisms by which KD is working are still unknown, adenosine, a neuromodulator important in energy regulation, has been suggested to play a key role. Here, we used a population of older stereotypic FVB mice from a previous study investigating the effects of KD on stereotypic circling to assess the effect of an adenosine 2A (A2A) receptor agonist. Mice remained in their previously assigned diet groups and were again fed KD or standard diet (SD) for three weeks. Stereotypic behavior was assessed weekly, and weeks 2, 3, and 4 included the administration of the A2A receptor agonist. At baseline, repetitive circling was decreased in mice previously fed KD compared to SD, showing a persistent benefit of KD on repetitive behavior. Administration of the A2A receptor agonist reduced spinning each week in all mice, and differences due to diet were found only on week 2. Results support that an A2A receptor agonist reduces repetitive behavior but does not synergistically interact with KD. Future studies need to replicate findings with a larger sample size that can investigate sex as a factor.

#### Subject Category

Science and Mathematics Categories: Neuroscience

#### Faculty Sponsor Department

Psychology

#### Faculty Sponsor

Allison Bechard

### 250 • Effects of a Ketogenic Diet on the Stereotypy and Sociability of Model Mice

Julie Perrone, Sean McBride, Aadam Mirza

#### Abstract

The Ketogenic (KD) diet is a high-fat, low-carb diet that has been used as an effective treatment for disorders such as epilepsy and other brain disorders characterized by repetitive behaviors. In this experiment, we explore the effects of KD on the sociability of stereotypic mice using a 3-chambered social assay. Moreover, due to the lack of literature on estrous cycles' interactions, we also examine the relationship, if any, between these variables and the estrous cycles of our female mice. Further research will explore the mechanism to which KD affects stereotypy and sociability as well as its relationship with the estrous cycle.

#### Subject Category

Social Science Categories: Psychology

#### Faculty Sponsor Department

Psychology

#### Faculty Sponsor

Allison Bechard

### 115 • Transgenerational Effect of a Ketogenic Diet on Stereotypic Behavior

Isabel Ross

#### Abstract

Stereotypic behaviors are repetitive, restricted movements that serve no function. They are a symptom of many human neurological disorders and are diagnostic for Autism Spectrum Disorder (ASD). These abnormal repetitive behaviors can be dangerous and debilitating for the affected individual and can reduce their quality of life. Previous studies have shown that the Ketogenic Diet (KD) has been effective in treating epilepsy, and more recently has been shown to be effective in reducing the behavioral symptoms of ASD. In our own lab, mice with a stereotypic motor phenotype of repetitive circling behavior are used as a model for stereotypic behavior in ASD. KD has previously been shown to reduce circling behavior in this strain of mice. In this study, I investigated the benefits of KD on repetitive behavior to see if they can be passed down to untreated offspring. I hypothesized that parents fed KD will have offspring with reduced stereotypic behavior compared to mice whose parents received a normal diet. Overall, I found that KD reduced repetitive behavior in the parents but not the offspring. However, results were based on a small number of litters due to limitations in breeding only a few females. Future studies are needed to confirm a lack of epigenetic transmission of diet-induced effects on repetitive circling from parent to offspring.

**Subject Category**

Science and Mathematics Categories: Neuroscience

**Faculty Sponsor Department**

Psychology

**Faculty Sponsor**

Allison Bechard

**101 • Emotion Regulation and Cannabis Use Motives**

Hannah Christopher

**Abstract**

Young adults who use substances have been shown to struggle with emotion regulation, while those who struggle to regulate positive emotions also have greater drug misuse and severity. Motives to use drugs or alcohol have also been tied to substance use problems, with coping motives being the most significantly associated with the worst use related outcomes. Emotion regulation is motivated by the achievement of desired emotional states, yet there is little research so far, considering the ways in which emotion regulation and motives are associated with each other. This study aims to assess the ways in which emotion dysregulation may be associated with cannabis use problems as measured by the Marijuana Motives Measure. Participants were college students (N=75) who completed an online survey for credit in a psychology course. Pearson Product Moment Correlations were used to assess the relationship between DERS-18 overall scores and MMM subscales; as well as the relationship between DERS-18 overall scores and ERQ subscales. Due to coping, enhancement and conformity motives showing negative use related outcomes, it was hypothesized that overall DERS-18 scores would positively correlate with the enhancement, coping and conformity subscales of the MMM, as well as the suppression subscale of the ERQ. Overall DERS-18 scores were predicted to negatively correlate with the social, and expansion subscales of the MMM, as well as the reappraisal subscale of the ERQ. Uncovering the relationship between emotion dysregulation and cannabis use motives will provide greater information on the way these concepts interact to affect use related outcomes.

**Subject Category**

Social Science Categories: Psychology

**Faculty Sponsor Department**

Psychology

**Faculty Sponsor**

Whitney Brown

**193 • How Cannabis-Related Attitudes Affect Cannabis Use Frequency**

Bri Wellenzohn, Trystan Melas

**Abstract**

In recent years, the recreational and medical use of cannabis has become increasingly popular, and a wide discussion of cannabis' beneficial attributes has accompanied this. In 2021, New York State legalized the recreational use of cannabis, becoming the fifteenth state to do so. With this rise in the discussion about and legalization of cannabis, it is important to understand how attitudes toward cannabis affect cannabis use. Uncovering how individuals think about, feel about and perceive cannabis allows insight into why individuals are using cannabis and how often. Participants were college students (N = 75; Age = 19.1, SD = 1.9) studying psychology at SUNY Geneseo. Participants completed a survey of their cannabis use frequency and varying attitudes toward cannabis. Specifically, semantic differential scales measured affective (e.g. "Cannabis use makes me feel..."), cognitive (e.g. "Medical cannabis is...") and global components of attitudes (general beliefs toward cannabis-related topics) (Breckler & Wiggins, 1989; Crites et al., 1994). Attitude importance was measured by assessing how personally important cannabis-related topics are to participants (Holbrook et al., 2016). Cannabis use frequency was measured via nine items from the Daily Sessions, Frequency, Age of Onset, and Quantity of Cannabis Use Inventory (DFAQ-CU; Cutler & Spradlin, 2017). Preliminary results suggest there to be consistent significant correlations between the cognitive subscale of attitude structure and frequency of cannabis use. Future analyses will investigate which components of attitude structure most influence cannabis use frequency. Future cannabis use research should include measures of attitude importance and structure.

**Subject Category**

Social Science Categories: Psychology

**Faculty Sponsor Department**

Psychology

**Faculty Sponsor**

Whitney Brown

**16 • Sibling and Friend Conflict From Childhood to Adolescence**

Jasmine Haug, Marina Rabideau, Isabelle Cook, Clara Rowles, Hailey Niles, Adele Beltrani, Trystan Melas

**Abstract**

As part of a longitudinal study, we examined sibling and friend conflicts in semi-structured closed-field situations in early childhood, middle childhood, and adolescence. The pattern of similarities and differences between sibling and friend conflicts shifted over time, as sibling and friend relationships became increasingly similar in symmetry, intimacy, and familiarity.

**Subject Category**

Social Science Categories: Psychology

**Faculty Sponsor Department**

Psychology

**Faculty Sponsor**

Ganie DeHart

**19 • The Role of Family in Latinx College Students' Developing Identities**

Cassidy Jones-Goucher, Daniella Quiroz, Jillian DeMaria, Sol Rivera, Annabella Vargas, Nicholas Palumbo, Ganie DeHart

**Abstract**

This phenomenological research examined the interaction between sibling relationships and culture in Latinx college students. Thematic analysis revealed participants identifying strongly with Latinx culture describe the importance of inter-familial dialogue and roles in their identity development, while parental expectations and values drove identity development in participants with less cultural exposure.

**Subject Category**

Social Science Categories: Psychology

### **Faculty Sponsor Department**

Psychology

### **Faculty Sponsor**

Ganie DeHart

## **17 • Prosocial Interactions Among Same and Mixed Sex Dyads in Pre-School**

Cassidy Kamean, Samantha Rosenberg

### **Abstract**

As part of a study of engineering play, preschoolers' prosocial behavior was examined during a construction task with peers. Prosocial behavior is defined as behavior intended to benefit the partner or the relationship. The rate and type of prosocial behavior varied, depending on the gender make-up of the dyads. The study explored how the degree of prosociality within dyads engaged in engineering play sessions is related to the process and outcome of their play. We examined the rate and types of prosocial behavior the preschoolers engaged in, with particular attention to the role of gender in their prosociality. We expected that: (1) same-gender dyads would show higher rates of prosocial behavior, and (2) the types of prosocial behavior exhibited would vary between pairs of girls, pairs of boys, and mixed-gender pairs. As part of a study of preschoolers' engineering play, 120 children in several Pre-K programs in predominantly rural communities were videotaped while engaged in a construction task with a partner, using blocks. Fifty-one dyads were same-gender (29 male, 22 female) and 9 mixed-gender. Same-gender dyads produced far higher rates of prosocial behavior overall. Overall, pairs of boys showed higher rates of prosocial behavior. Our results suggest that gender composition makes a difference in the rate and type of prosocial behavior in preschool dyads. Girl dyads were more likely to engage in prosocial behaviors that directly contributed to harmonious completion of the task; boys were more likely to engage in behaviors that were prosocial but not necessarily on task.

### **Subject Category**

Social Science Categories: Psychology

### **Faculty Sponsor Department**

Psychology

### **Faculty Sponsor**

Ganie DeHart

## **78 • Siblings' Perceptions of Their Relationship in Adolescence and Early Adulthood**

Marina Kiesling, Bahadır Erol, Betina Popnikolova, Isabelle Cook

### **Abstract**

For most people, sibling relationships endure longer than parent-child relationships, friendships, or romantic relationships, and there is evidence they continue to be important throughout the lifespan. However, research on sibling relationships has been concentrated in childhood and adolescence; we know relatively little about sibling relationships in early adulthood or about the extent to which they show continuity from earlier phases of development. As part of a longitudinal study of sibling and friend relationships, we examined siblings' perceptions of their relationship in adolescence and early adulthood. Twenty-five sibling pairs completed questionnaires about their relationship during late adolescence and early adulthood. The adolescent questionnaire was an age-adjusted questionnaire developed for use in the longitudinal study; it included five scales (Asymmetry, Intimacy, Prosocial/Harmony, Relational Aggression, and Conflict). The questionnaire used during the early adulthood phase of the study as the Adult Sibling Relationship Questionnaire (Stocker et al., 1997); it included 12 scales (Similarity, Intimacy, Quarreling, Affection, Antagonism, Admiration, Emotional Support, Competition, Instrumental Support, Domination, Acceptance, and Knowledge). During both adolescence and early adulthood, the more positive dimensions (i.e., Intimacy, Prosocial/Harmony, Similarity, Affection, Admiration, Emotional Support, Acceptance, and Knowledge) were positively intercorrelated. Similarly, the more negative dimensions (i.e., Relational Aggression, Conflict, Quarreling, and Dominance) were positively intercorrelated. Positive and negative dimensions were negatively intercorrelated at both ages. There were also

significant correlations across the two ages, with adolescent intimacy and prosocial/harmony predicting positive relationship qualities in early adulthood and adolescent conflict and relational aggression predicting some negative qualities in early adulthood.

**Subject Category**

Social Science Categories: Psychology

**Faculty Sponsor Department**

Psychology

**Faculty Sponsor**

Ganie DeHart

**127 • Chinese-American Sibling Relationships: The Role of Age, Culture, and Responsibilities on Identity Development**

Terry Lei, Elena Cheung, Katharine Martin, Lauren Martin

**Abstract**

This qualitative study examines the sibling relationships of Chinese-American college students. A thematic analysis led to the emergence of three themes. The findings revealed the unique role of age in sibling relationships and the distinct sibling-specific responsibilities influencing identity development within Chinese-American culture.

**Subject Category**

Social Science Categories: Psychology

**Faculty Sponsor Department**

Psychology

**Faculty Sponsor**

Ganie DeHart

**183 • 7-Year-Olds' Associative and Cooperative Play with Sibling and Friends**

Haley Peck, Claire Shroder, Maya Dengler, Natalie Knox, Dhavan Brahmabhatt, Abigail Harrington

**Abstract**

As part of a longitudinal study, we examined rates of associative and cooperative play in 7-year-olds' interactions with siblings and friends during free play, a construction task, and a board game. Associative play consists of mutual social engagement, but without a common goal. Cooperative play involves more intense social engagement—a joint activity with a common goal. The nature of their social engagement depended on their relationship with their play partner, the task at hand, and gender. Our group wanted to examine what task facilitated the most cooperation. We hypothesized that construction would be most effective at getting the participants to work together. However, our experiences in coding videos made us consider this more seriously. Our examination of our data showed that construction did not facilitate cooperation. Also since middle childhood friendships are typically more intimate and harmonious than sibling relationships; we anticipated that friends would spend more time in associative and cooperative play than siblings. As expected, on all three tasks, friends engaged in more associative and cooperative play than siblings. These findings will help us as we continue to examine relationships in our data.

**Subject Category**

Social Science Categories: Psychology

**Faculty Sponsor Department**

Psychology

**Faculty Sponsor**

Ganie DeHart

### **36 • Acculturation, Cultural Preservation, and Identity Development: An Analysis of African Immigrant Sibling Dynamics**

Luiza Perez Ortiz, Elise Miller, Beula Akande, Selena Pham, Jacqueline Johnson

#### **Abstract**

This research examines African immigrant emerging adults' concepts of sibling relationships to contextualize the nature and relevance of cultural preservation, identity development, and acculturation. Our four participants (N=4) were female college students, ages 18-24, of African descent, with one sibling minimum. Participants were recruited through word of mouth and through the African Student Association. Participants answered ten semi-structured questions in online individual interviews (via Zoom©). Transcripts were transcribed and coded by groups of at least two researchers for accuracy and credibility. Grounded in interpretive phenomenological approach (Smith & Shinebourne, 2012), in vivo coding and exploratory coding were applied to all of the transcribed data (Saldana, 2013). Codes were analyzed using thematic analysis (Braun & Clarke, 2006). As a credibility measure during the analytic process, negative cases were identified that refuted emergent themes (LeCompte & Goetz, 1982).

Following analyses, three primary themes were revealed in the data. Factors of identity formation highlights the contribution of familial and sibling relationships to the development of individuality. Cultural preservation places emphasis on community and religious environment in supporting cultural retention. Lastly, awareness of racial identity in the United States is learned through interactions with siblings, peers, and media outlets. Our secondary themes (familial and sibling dynamics influence acculturation, education and language influence on acculturation, and impacts of socioeconomic status on acculturation) highlight various elements at play when discussing the acculturation process.

#### **Subject Category**

Social Science Categories: Psychology

#### **Faculty Sponsor Department**

Psychology

#### **Faculty Sponsor**

Ganie DeHart

### **180 • Gender and Mitigation in 7-Year-Olds' Assertive and Affiliative Language with Siblings and Friends**

Emily Salvemini, Aria Elling, Taylor Dagostino, Lindsey Isenberg, Stefani Teglash

#### **Abstract**

As part of a longitudinal study, 7-year-olds' use of assertive and affiliative language was examined during three play tasks with siblings and friends. Research on gender differences in children's use of affiliative and assertive language has focused primarily on naturalistic observation of interactions with same-gender peers. Studies (e.g. Leaper & Ayres, 2007) have suggested that boys use more assertive language than girls do, and that girls use more affiliative language. However, it seems likely that gender differences in affiliative/assertive language use may be more complex when partner and interaction context are considered. Based on previous findings in our lab, we expected that gender differences would be more pronounced during interactions with friends than during interactions with siblings, and that the degree to which a task fostered assertive or affiliative behavior might also make a difference. Within the longitudinal study, 7-year-olds' use of assertive and affiliative language was examined during three distinct play interactions with siblings and friends. Seventy-eight white, middle-class 7-year-olds were videotaped doing three tasks: playing with a toy village or train set (Free Play), playing a board game (Game), and playing with pieces to copy a model (Construction). Transcripts of these sessions were coded for the presence of assertive and affiliative utterances. Assertive utterances were defined as those used primarily to accomplish a goal, whereas affiliative utterances were those intended primarily

to establish or maintain contact with others. Girls' and boys' use of assertive and affiliative language varied differentially, depending on task and partner.

**Subject Category**

Social Science Categories: Psychology

**Faculty Sponsor Department**

Psychology

**Faculty Sponsor**

Ganie DeHart

**220 • The Role of Gender Equality on Sexual Assault**

Sofia Flaten, Grace Miller, Isabella Robles, Jordan Rice, Phoebe Maxwell

**Abstract**

Rape is a highly gendered crime, understood to be driven by power due to gendered sex roles supporting male domination and female exploitation (e.g., Brownmiller, 1975). Indeed, rape culture is inherently tied to power; scholars suggest rape cultures are those which are male-dominated and male-governed environments. Recent work using secondary data, however, challenged this assumption, finding that greater numbers of sexual assaults occurred in environments in which men held less power (Gravelin et al., unpublished). Our work seeks to empirically explore this finding and determine the impact of relative power between men and women on evaluations of acceptance for sexual violence and safety in reporting sexual violence. Specifically, through random assignment participants are either led to believe that men have greater social power relative to women, women have greater social power relative to men, or serve as a control. All participants then complete a series of assessments including evaluations of acceptance of sexual violence and feelings of safety in reporting a sexual assault. We expect to find that when women are portrayed as in power, men will be more accepting of sexual violence whereas women will feel greater safety in reporting. Conversely, rates of acceptance of sexual violence will be the same for men in the male power and control conditions, while feelings of safety in reporting among women may decrease. Data collection is ongoing but suggests a potential reconsideration of the acceptance of sexual violence scale, as the current floor effect indicates a social desirability bias in responding.

**Subject Category**

Social Science Categories: Psychology

**Faculty Sponsor Department**

Psychology

**Faculty Sponsor**

Claire Gravelin

**107 • Ambient Belonging Cues in Digital Spaces**

Benjamin Tucker, Rachel Denzler, Kathryn Wallace, Daniel Regan

**Abstract**

Belonging is a basic human need with substantial impact on overall health and well-being (e.g., Baumeister & Leary, 1995). The presence of ambient identity cues, socially symbolic objects that communicate stereotypes about group members inhabiting a given environment, can powerfully impact perceptions of belonging and interest (Cheryan et al., 2009). Much of the existing work on ambient belonging has focused on racialized or gendered domains and has predominantly assessed cues present in physical spaces (e.g., Cheryan et al., 2009; Davies et al., 2002). The current work seeks to examine differential cues that may be barriers to prospective undergraduate students' interest in colleges and universities in a digital sphere via institutions' home pages.

A stratified random sample of four-year institutions in the US were selected to ensure adequate representation of institutions serving non-white and gender-specific populations. Trends found from both linguistic analysis (via Linguistic

Inquiry and Word Count, Pennebaker et al., 2001) and thematic assessment suggest that gender-specific colleges are using more cues geared toward the gender of the institution, while majority-serving institutions are using more diversity cues compared to minority-serving institutions. Increased diversity cues may be found in majority-serving institutions because minority-serving institutions are primarily minorities and belongingness could be assumed. Given the critical link between belonging and academic achievement and retention (Brannon & Lin, 2021; Suhlmann et al., 2018), it is important to gain a better understanding of how cues differ across institutions and their impact on prospective students.

**Subject Category**

Social Science Categories: Psychology

**Faculty Sponsor Department**

Psychology

**Faculty Sponsor**

Claire Gravelin

**151 • The Benefits and Implications of Eye Movement Desensitization and Reprocessing Therapy on Post-Traumatic Stress Disorder**

Cally Issidoridis, Sarah Schmitt

**Abstract**

Post-traumatic Stress Disorder (PTSD) has become increasingly common in the United States and globally over the past few decades, causing distress in many individual's lives. Because of the increase in diagnoses, researchers have been aiming to better understand the mechanisms through which these individuals experience PTSD symptoms and find intervention strategies that have potential to ameliorate their subjective well-being. Of the plethora of interventions discovered, Eye Movement Desensitization and Reprocessing (EMDR) therapy has been found to be extremely effective in resolving a variety of symptomatology associated with cognitive deficits in PTSD, leading to evidence that it can be used as an effective treatment for the disorder. This literature review will discuss specific mechanisms through which EMDR has been found to be helpful, like its use of bilateral stimulation, as well as implications that this therapy may have for future generations.

**Subject Category**

Social Science Categories: Psychology

**Faculty Sponsor Department**

Psychology

**Faculty Sponsor**

Michael Lynch

**221 • Tetrahydrocannabinol impairs pup retrieval and compromises maternal care in the Long-Evans rat.**

Emma Carlson, Eric Teboul, Charlene Canale, Harper Coleman, Christy Angeliu, Karissa Garbarini, Vincent Markowski

**Abstract**

Cannabinoid drugs such as tetrahydrocannabinol (THC) have acute effects, as well as withdrawal symptoms that can have adverse effects on a mother's ability to care for her offspring. The purpose of this study was to determine the effects of THC on maternal care in laboratory rats. We hypothesized that THC exposure would impair pup retrieval behavior, an important prerequisite for nest maintenance and feeding. To examine this, rat dams were administered 0, 1.25, 2.5, 5, or 10 mg/kg THC and their pup retrieval was recorded 1hr later. Videos were scored by blind observers and tracking software was used to quantify locomotor activity during the 20min tests. Preliminary results indicate that THC

impairs and in some cases, eliminates pup retrieval in a dose-dependent fashion. These findings have important implications for human mothers who are ingesting THC during the neonatal period.

**Subject Category**

Science and Mathematics Categories: Neuroscience

**Faculty Sponsor Department**

Psychology

**Faculty Sponsor**

Vincent Markowski

**225 • Tetrahydrocannabinol compromises maternal nest maintenance and nursing behaviors in the Long-Evans rat.**

Lindsey Toole, Danielle Roemer, Lauren Mac Taggart, Alana Aga, Vincent Markowski

**Abstract**

The legalization of marijuana for recreational use in New York State implies that it is a safe drug that has been thoroughly screened for developmental and neurotoxic effects. The current study examined the hypothesis that the most potent cannabinoid, tetrahydrocannabinol (THC), could negatively affect neonatal development by compromising maternal care. To examine this, female rats were administered 0, 1.25, 2, 5, or 10mg/kg THC while caring for their newborn litters. A surveillance camera was used to record their behaviors in the home cage, 24/7, from birth through postnatal day 5. Our preliminary analysis focused on the behaviors performed 1 hour prior to and 2 hours following the daily THC dose. We found evidence of maladaptive self-directed maternal behaviors such as stereotypical tail-chasing as well as maladaptive pup-directed behaviors. Pups were scattered throughout the cage and buried in cage bedding rather than gathered in a nest. In some cases, neglect was severe, leading to litter attrition. These data suggest that even low doses of THC can disrupt the interactions between a maternal caregiver and her newborn, during a period that is critical for brain and social development.

**Subject Category**

Science and Mathematics Categories: Neuroscience

**Faculty Sponsor Department**

Psychology

**Faculty Sponsor**

Vincent Markowski

**227 • Developmental exposure to tetrahydrocannabinol produces motor and somatosensory deficits in rats**

Cassidy Jones-Goucher, Zachary Rissman, Anna Hendricks, Vincent Markowski

**Abstract**

Tetrahydrocannabinol (THC) is the primary psychoactive ingredient in marijuana, one of the most commonly used recreational drugs in the world. With growing legalization, many mothers are consuming THC during pregnancy and many teens are using the drug. Further research is needed to understand the effects that THC has on both direct consumers, such as adolescents, and indirect consumers, such as fetuses. Current studies suggest that in-utero and adolescent exposure to THC can produce various physiological and behavioral impairments. The present study aimed to identify potential psychomotor effects of prenatal and juvenile exposure to THC. Long-Evans rat pups were assigned to two cohorts: prenatal exposure (dams received an oral dose of THC from gestational day 1 to postnatal day 21) and juvenile exposure (pups received an oral dose of THC from postnatal day 21 to postnatal day 40). A three-part motor battery—consisting of grip strength, somatosensory reflex, and motor coordination tests—was conducted throughout the lifespan at juvenile, young adult, middle age, and old age periods. Developmental THC exposure significantly

increased somatosensory reflex latency time along a dose response curve in both male and female rats but had no effect on grip strength capabilities. Motor coordination followed a reverse dose-response curve for juvenile animals, but a normal dose-response curve for young adult animals. Altered mechanisms of the cannabinoid receptor type-1 (CB1R) system, including GABA and dopamine responses, may explain some of the motor abnormalities observed in this toxicological study.

**Subject Category**

Science and Mathematics Categories: Neuroscience

**Faculty Sponsor Department**

Psychology

**Faculty Sponsor**

Vincent Markowski

**237 • Tetrahydrocannabinol produces locomotor hyperactivity and disrupts circadian rhythmicity in pregnant or nursing Long-Evans rats.**

Joey Morgan, Anna Hendricks, Vincent Markowski

**Abstract**

Studies have demonstrated that exposure to cannabis during development impairs cognitive processes in humans, as well as locomotor activity and learning in animals. This extends to pregnant women and those caring for newborns. The legalization of marijuana can confer an underestimation of the effects of the more potent cannabinoids such as tetrahydrocannabinol (THC). This can lead to increased in utero exposure and postnatal exposure via breastfeeding. Newborns can also be affected if maternal care is compromised during an acute high. The current study used VitalView software and cage-top infrared activity monitors to quantify the effects of a range of THC doses on activity and circadian rhythms in pregnant or lactating rats. Our preliminary results found that control animals maintain relatively similar activity levels prior to and after dosing. THC-dosed animals show increased activity after dosing. The increased activity comes at the expense of nesting and maternal care behaviors. Applying the findings of this study clinically will serve a future goal of properly educating the public to prevent the detrimental effects of marijuana use on children.

**Subject Category**

Science and Mathematics Categories: Neuroscience

**Faculty Sponsor Department**

Psychology

**Faculty Sponsor**

Vincent Markowski

**278 • Tetrahydrocannabinol Compromises Maternal Nest Maintenance and Nursing Behaviors in the Long-Evans Rat**

Lindsey Toole, Danielle Roemer, Lauren Mac Taggart, Alana Aga

**Abstract**

The legalization of marijuana for recreational use in New York State implies that it is a safe drug that has been thoroughly screened for developmental and neurotoxic effects. The current study examined the hypothesis that the most potent cannabinoid, tetrahydrocannabinol (THC), could negatively affect neonatal development by compromising maternal care. To examine this, female rats were administered 0, 1.25, 2, 5, or 10mg/kg THC while caring for their newborn litters. A surveillance camera was used to record their behaviors in the home cage, 24/7, from birth through postnatal day 5. Our preliminary analysis focused on the behaviors performed 1 hour prior to and 2 hours following the daily THC dose. We found evidence of maladaptive self-directed maternal behaviors such as stereotypical tail-chasing as well as maladaptive pup-directed behaviors. Pups were scattered throughout the cage and buried in cage bedding rather

than gathered in a nest. In some cases, neglect was severe, leading to litter attrition. These data suggest that even low doses of THC can disrupt the interactions between a maternal caregiver and her newborn, during a period that is critical for brain and social development.

**Subject Category**

Science and Mathematics Categories: Neuroscience

**Faculty Sponsor Department**

Psychology Department

**Faculty Sponsor**

Vincent Markowski,

**138 • Perceived Power in Close Peer Relationships: Associations with Self-Esteem**

Ashlyn Harvey, Hannah Dougherty, Liam Marino, Lindsay Merenda

**Abstract**

Although college students' peer relationships are generally found to be egalitarian (Furman & Buhrmester, 1992), not all are. People tend to be more satisfied in a same-sex friendship with an equal power distribution than one with an unequal power distribution (Veniegas & Peplau, 1997). Inequality in romantic relationships is associated with self-esteem (Galliher et al., 1999). The present study examined the associations between the power dynamics in close same-sex friendships, other-sex friendships, and romantic relationships with several dimensions of self-esteem. Our results indicated that perceived power in romantic relationships had the strongest associations with self-esteem, particularly in terms of overall self-worth and aspects of achievement.

**Subject Category**

Social Science Categories: Psychology

**Faculty Sponsor Department**

Psychology

**Faculty Sponsor**

Karen Mooney

**90 • The Effects of Signing On The Production Effect**

Lucia Verrelli, Madelyn Campbell, Carolyn Merced, Brooke Witherow

**Abstract**

Memory is an important aspect of our lives and is important to incorporate memory techniques into our lives to help us remember things better. The production effect is the simply finding that words read aloud are better remembered than words read silently. This is a very helpful memory technique, but currently cannot be extended to those who do not use a spoken language, such as those who use sign language. In this study, we start to examine the effect of signing on the production effect using students in the ASL III class at SUNY Geneseo. We used three different online studies, each with a study phase and a recognition test phase. For the first experiment, participants saw a word in either blue or yellow and had to sign the word or read it silently depending on which color was assigned to the condition. They then had to label the words as old or new in the recognition test phase. For the second experiment, the only difference from the first was that participants had to label the word as sign, silent, or new during the recognition test phase. The third experiment involved participants producing two words in spatial arrangement from each other depending on which color was assigned to the condition and then had to place the words into the correct position during the test phase. The data showed a production effect in both the signing condition and the aloud condition meaning memory was enhanced when signing compared to read silently.

**Subject Category**

Social Science Categories: Psychology

**Faculty Sponsor Department**

Psychology

**Faculty Sponsor**

Jason Ozubko

**213 • Take Your Time, Don't Rush: The Impact of Framing on Comprehension and Action**

Megan Clancy, Lily Connerton, Samantha Harris, Ashlee Kuzemchak, Gaetan Louis, Natalie Riccardi, Thomas Skinnider, Charlotte Sutphin

**Abstract**

People speak more naturally in a negatively framed way than a positively framed way. Negatively framed sentences/phrases (e.g. don't hesitate) require more cognitive resources than their positive counterparts (Beltrán et al., 2019). There has been little research on the effect of double-negatives in everyday language. The question as to whether double-negatives will affect responses to situations, and affect aspects of comprehension, the experience of threat, and tone is investigated in the current study. Further, the performance on a word task is analyzed in terms of the time it takes for completion of the task when given positively or negatively framed instructions and terms. In the past study, we evaluated how participants would respond to email messages within a 2 (positive/negative frame) x 2 (threatening/non-threatening) factorial design. It was observed that participants found negative threatening messages to be more concerning, and have a less positive tone. In the future study, we will evaluate how quickly participants can complete a word search task with a 2 x 2 factorial design. In our word search completion task, we expect those who read instructions in the double negative in addition to negatively framed terms to finish the word puzzle in more time. We also expect that when the instructions and terms are framed the same way, there is potential of a faster completion time. Given that double negatives have a significant effect on cognitive resources and may influence responses, their effects should be considered in daily life.

**Subject Category**

Social Science Categories: Psychology

**Faculty Sponsor Department**

Psychology

**Faculty Sponsor**

Matthew Pastizzo

**45 • Understanding Underrepresented Students' Experiences with Microaggressions on a Predominantly White College Campus**

Joelmy Acevedo, Abigail George, Katrina Saylor

**Abstract**

Research on microaggressions has identified three main types of microaggressions experienced by members of underrepresented groups on college campuses. Researchers have identified similarities and differences between groups in the types of microaggressions experienced and the outcomes associated by these experiences that have implications for students' success and well-being. Different personal and institutional strategies have been found to help buffer targets when experiencing microaggressions. Our study was designed to understand how identity impacts the experiences of microaggressions, their implications, and the types of support that would be most helpful against the experiences of microaggressions on a predominantly White, heterosexual campus.

Undergraduate students were recruited to participate in an interview study addressing experiences of underrepresented students regarding campus climate and microaggressions. Forty-three students completed in-depth interviews lasting approximately 30-40 minutes over Zoom. Participants first completed a demographic questionnaire. Interviews addressed two major themes: student experiences with the campus climate and microaggressions. Frequency of each theme across transcripts were noted, examining prevalence/frequency of each theme by identity.

Important themes and patterns emerged: Students reported all three types of microaggressions, with microinsults being the most common. Three major categories of outcomes emerged (emotional/psychological, social/self, behavioral), with emotional being most common. Two major categories of recommended support emerged (effective allyship behaviors: speaking out, taking action; institutional changes: more BIPOC and LGBTQIIA+ faculty/staff representation, alignment of values with structure, accountability). Patterns by identity are discussed.

### **Subject Category**

Social Science Categories: Psychology

### **Faculty Sponsor Department**

Psychology

### **Faculty Sponsor**

Monica Schneider

## **SOCIOLOGY**

### **216 • Changing Perceptions of Reproductive and Sexual Health: A Qualitative Content Analysis of the *New York Times* (1960 vs. 2020)**

Sara Rule

#### **Abstract**

Popular approaches to and understandings of reproductive and sexual health have changed greatly over the course of history. The changing quality of our collective perceptions of these topics is largely owed to the way in which news sources frame issues involving reproductive and sexual health. Comparing *New York Times* articles published in 1960 to those published in 2020, this research aims to analyze the role the media plays in framing certain practices involved in the maintenance of reproductive and sexual health and the claim of one's bodily autonomy, as well as how this role has changed over time. Findings of this research suggest that the approach the media has taken in reporting on issues of reproductive and sexual health has progressed within this 60-year span, growing away from the application of a negative connotation to these issues, which aimed to hinder their relevance, and adopting a more educational and informational approach, which, instead, highlights their relevance. By doing so, we gain a greater understanding of how certain practices become aligned with or separated from widely accepted illustrations of reproductive and sexual health, and how popular discourse surrounding topics of sex has evolved.

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Social Science Categories: Sociology

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## **WOMEN'S AND GENDER STUDIES**

### **69 • All Girls to the Front: An Analysis of Exclusionary Practices and Discrimination in the Riot Grrrl Movement**

Anna Mallia

#### **Abstract**

The Riot Grrrl movement of the 90's paved the way for women to enter punk spaces that they had been historically barred from, as well as created a distinctly new form of punk music that combined feminism, marxist ideals, and

alternative aesthetics. This movement is often associated with third wave feminism, however it should be noted that many women of color, including Asian and Black women, felt excluded from this movement. While a unique and exciting, culturally progressive music scene emerged from this movement, most of the bands and people associated with this movement are white, cisgender women— forcing the question as to how radical this movement actually was. A 1992 *Newsweek* article described the movement as "young, white, suburban and middle class." This presentation will address both the challenges and faults the Riot Grrrl movement presented for non-white, non-cisgender women and highlight the successes of women of color involved in the movement that have been glossed over and gone unacknowledged for too long. I will also discuss the way feminist punk functions in 2022, analyzing the impact of digital feminism making it easier than ever to create and share feminist thought and music.

**Subject Category**

Interdisciplinary and Other Categories: Women's and Gender Studies

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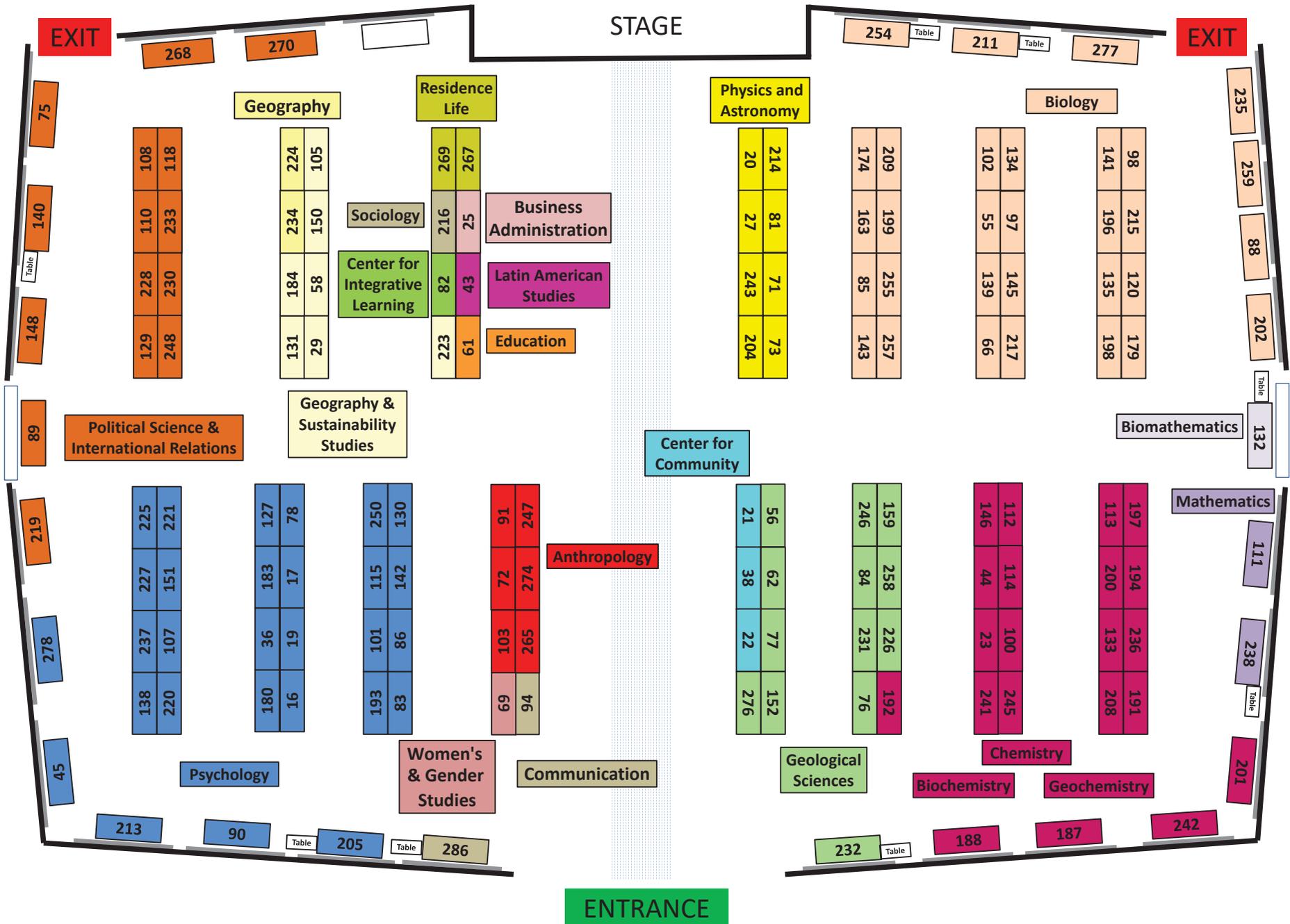
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# GREAT Day 2022 Poster Locations



Posters are grouped by department/topic and are identified by abstract submission number