

# Skidmore College



**FACULTY STUDENT SUMMER RESEARCH PROGRAM**

**SUMMER 2023**

**FINAL PRESENTATIONS**

**AUGUST 3, 2023**

**Faculty Student Summer Research Program  
Summer 2023**

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(In Alphabetical Order by Faculty Name)	

Since 1989, Skidmore College’s Faculty Student Summer Research Program has given students a singular opportunity to work one-on-one with a faculty member. For periods ranging from five to ten weeks, students work with faculty on original research in disciplines ranging from biology to management and business, including classics and geosciences. Hands-on research with a faculty member allows students to become part of the research enterprise in a way that both complements and informs regular class work. In some cases, the collaborative research forms the basis for a senior’s honors thesis or can lead to published articles in a peer-reviewed academic journal. Long-term, participation can help students gain admission to graduate schools and research careers. Skidmore alumni who have continued their education in graduate school have reported that experience as researchers has given them distinct advantages as scholars. For summer 2023, there are 104 students and 49 faculty members engaged over 66 collaborative research projects from 21 different disciplines funded by the Faculty Student Summer Research program, external grants, the S3M Program, indirect cost funds, start-up funds, and other funding sources.

## **Funding Sources for Faculty Student Summer Research Programs**

### **ALUMNI, FAMILY, AND FRIENDS**

**Patricia Brennan '74**  
**Marlene Oberkotter Fowler '61**  
**Ralph Garboushian '92**  
**Stephanie and Steven Kasok, Parents '16**  
**Jim Lippman and Linda Friedman Lippman '82**  
**Richard A. Mellon '87**  
**Judy Reed Smith '68**  
**Margaret Williams Page '43**  
**Tina and David Wilson P'25**  
**Mr. and Mrs. Kenneth Woodcock, Parents '96**  
**Axelrod-Porges Scholars**

Established in 2006 by Felicia Axelrod '62 and Robert Porges to support faculty-student teams in the area of the sciences

#### **Schupf Scholars**

Established in 2008 by Sara Lubin Schupf '62 to support summer faculty-student research with a preference given to students pursuing projects in the STEM disciplines. Schupf Scholars are selected beginning the summer after their freshman or sophomore year. Schupf Scholars may access additional funding for travel to meetings and conferences as well as for research supplies and expense during their continuing research with faculty during their academic career at Skidmore.

#### **Weg Scholars**

Established in 2010 by Carol Little Weg '64 and Ken Weg and awarded with a preference for students pursuing projects in the sciences and social sciences.

### **FOUNDATIONS AND GRANTS**

**The Camille and Henry Dreyfus Foundation**  
**Caney Fork Farms**  
**The GKV Foundation**  
**Andrew W. Mellon Foundation**  
**Meridian Institute**  
**The National Institutes of Health**  
**The National Science Foundation**  
**The Senft Family Fund**  
**The Skidmore Scholars in Science and Mathematics (S3M) Program**

## **The Schupf Scholars Program**

Each year the Schupf Scholars Program funds students to participate in the Faculty Student Summer Research Program and to continue that research with their faculty mentor in the ensuing academic year. The Schupf Scholars Program focuses on science, technology, and mathematics, and pays special attention to interdisciplinary projects and to female students in fields where women are underrepresented. Each year these scholarships will provide students and a faculty partner with up to \$10,000 for research beginning the summer after their freshman or sophomore year and continuing through the following academic year. Schupf Scholars will be able to use additional funding for travel to meetings and conferences as well as for research supplies and expenses during their continuing research with faculty during their academic career at Skidmore.

Trustee Sara Lee Schupf '62 established the \$1.1 million scholarship fund for student research in an endeavor to inspire, cultivate, and support students' interest in science, because she sees it as an excellent avenue for exercising critical thought and shaping the progress of an idea from theory to practice. She says: this is what a Skidmore education is all about—getting involved in the process of discovery, which includes the satisfaction of success, failure, and mentorship. More broadly the Schupf Scholars Program seeks to help light an accessible pathway to science research and science career preparation. With such an early start on intensive research and continued work into their junior or senior year, Schupf Scholars will be well equipped to move on to graduate or professional school in the sciences.

### **2023-24**

Cassie Davidson, '25  
Maddy Fung, '25  
Mary Harbison, '26  
Jordan Jones, '26  
Jonathan Kasper, '26  
Ally Mujica, '25  
Cole Wilson, '26

### **2022-23**

Zoe Gleason, '25  
Natasha Machera '25  
Sophie McCullough, '25  
Hanna Nally, '24  
Sarah Sinnot, '24

### **2021-22**

Emily Luo, '23  
Elizabeth Miller, '23  
Nich Nearyrat Phalkun, '24  
Elizabeth Scholer, '24  
Sarah Varua, '24

### **2020-21**

Selina Almasarwah, '23  
Sarah Finnegan, '22  
Heather Ricker, '22

### **2019-20**

Anna Carhart, '22  
Rachel Carrock, '22  
Katie Rinaolo, '22  
Jiayue Hong, '21  
Saana Teittinen-Gordon, '22  
Molly Cole, '21  
Katie Yan, '22

### **2018-19**

Acadia Connor, '21  
Katherine Johnson, '20  
Angelina Leonardi, '20  
Claudia Mak, '20  
Julia Danischweski, '20  
Ella Long, '20  
Jazmin Sepulveda, '20

### **2017-18**

Beatriz Chavez, '18  
Gabriella Gerlach, '19  
Kyla Johnson, '20  
Samantha Kenah, '19  
Yutong Li, '19  
Suzanne Zeff, '20

### **2016-2017**

Claudia Bennett-Caso '19  
Alexandra Cassell '19  
Erin Mah '19  
Erin Maloney '18  
Emily O'Connor '19  
Kari Rasmussen '18

### **2015-2016**

Kelly Cantwell, '18  
Jillian Greenspan, '17  
Katherine Shi, '18  
Deborah Kim, '18  
Talia Stortini, '18  
Hannah Schapiro, '17  
Meggie Danielson, '17

### **2014-2015**

Jaya Borgatta, '16  
Meti Debela, '16  
Glenna Joyce, '16  
Jenny Zhang, '16  
Stephanie Zhen, '16

### **2013-2014**

Melanie Feen '16  
Michele Fu '15  
Kelly Isham '16  
Angelica Newell '15  
Rafaella Pontes '15

### **2012-2013**

Jennifer Harfmann '14  
Rafaella Pontes '15  
Kara Rode '15  
Carol Wu '14

### **2011-2012**

Tim Brodsky '13  
Andrea Conine '13  
Brenda Olivo '14  
Kathryn Stein '13

### **2010-2011**

Rebecca Connelly '12  
Ava Hamilton '12  
Caroline Loehr '12  
Taylor Moot '13

**Faculty Student Summer Research Program**

**Schedule of Final Research Presentations**

**Thursday, August 3, 2023**

9:00 am – 9:20 am Coffee, Fruit, Yogurt, Muffins

9:20 am – 10:20 am Oral Presentations

**ROOM A**

**QUANTIFYING PATTERNS OF METHANE GAS EMISSION AND PRODUCTION IN AN ADRIDONACK PEATLAND**

Isabelle Blais, 2024

Kurt Smemo, Associate Professor, Environmental Studies and Sciences Program

**SECURING MOBILE FERTILITY APP DATA USING MULTI-PARTY COMPUTATION**

Zander Chown, 2025

Aarathi Prasad, Associate Professor, Computer Science

**AN (ALMOST) ALL-SKY GALAXY ENVIRONMENT CATALOG**

Jonathan Kasper, 2026; Emmy Plage, 2025; Angel Guinazu, 2026; Jacob Lord, 2024;

Shakohentehtha Elijah, 2026; Trayce Reeves, 2024; Jocelyn Elphick (Saratoga HS)

Mary Crone Odekon, Professor, Physics Department

**ROOM B**

**EDITING THORNTON WILDER'S NONFICTION WRITINGS**

Alice Barrett, 2023; Mary Timmons, 2025

Joseph Cermatori, Associate Professor, English Department

**THE SOIL IS ALIVE: THE CONVERGENCE OF PERMACULTURE AND WICCA**

Jane Schreibman, 2024

Eliza Kent, Professor, Religious Studies Department

**SISTERHOOD OF THE TRAVELING WITCH: WHERE TRANS WOMEN STAND IN THE CRAFT**

Cameron Pittl, 2024

Eliza Kent, Professor, Religious Studies Department

**LEARNING LADINO: A STEPPINGSTONE FOR FURTHER RESEARCH**

Olivia Berenson, 2024

Murat Yildiz, Assistant Professor, History Department

**ROOM C**

**COMEDY KILLS: RACIALIZED VIOLENCE IN THE WAKE OF LAUGHTER**

Aaron Shellow-Lavine, 2023

Beck Krefting, Professor, American Studies Department and Director of the Center for Leadership, Teaching, and Learning

**INVESTIGATION OF THE CURRENT PRACTICES AND UNDERSTANDING OF INCLUSIVE TEACHING IN HIGHER EDUCATION**

Ilena Berro Pizzarossa, 2024; Kayla Melendez, 2026

Juliane Wuensch, Assistant Professor, World Languages and Literatures Department

**EVALUATION OF THE SUPPORT SYSTEMS ECOMAP FOR LGBTQ2S+ BIPOC YOUTH**

Divine Perez, 2024; Sofia Iacobucci, 2024

June C. Paul, Assistant Professor, Social Work Department

10:35 am – 11:45 am Poster Presentations Session 1

**ROOM A**

**THE MARGINALIZATION OF SMALLHOLDER FARMERS IN INDONESIA**

Rebecca Hagopian, 2024

Feryaz Ocakli, Associate Professor, Political Science Department

**FACULTY SATISFACTION WITH PROFESSIONAL AND PERSONAL LIFE BALANCE BEFORE THE COVID-19 PANDEMIC AND DURING ITS IMMEDIATE AND INTERMEDIATE STAGES**

Lola Bessis, 2024

Catherine White Berheide, Professor, Sociology Department

**LANGUAGE AND MUSIC IN THE EARLY INFANT AUDITORY ENVIRONMENT**

Maggie Besthoff, 2024

Erica Wojcik, Associate Professor, Psychology Department

Dominique Vuvan, Associate Professor, Neuroscience Program and Psychology Department

**PHOTOSENSITIZATION OF NO<sub>2</sub> BY 4-BENZOYL BENZOIC ACID: A MODEL SYSTEM FOR THE DAYTIME FORMATION OF NITROUS ACID (HONO) IN THE MARINE BOUNDARY LAYER**

Román Montenegro, 2024; Sofia Chihade, 2026; Rachel Scholl, 2026

Juan G. Navea, Professor, Chemistry Department

**AM EFFECT OF A KEY NEGATIVELY CHARGED RESIDUE MUTATION ON THE BINDING PATHWAY OF SH3 DOMAIN COMPLEX AND Arka PEPTIDE**

Oluebube Onwuzulu, 2024; Alex Arata, 2025

Elliot J. Stollar, Professor University of Liverpool, UK

K. Aurelia Ball, Associate Professor, Chemistry Department

**ROOM B**

**SYNTHESIS AND CHARACTERIZATION OF A NEW SUPEROXIDE DISMUTASE MIMETIC WITH ROBUST STABILITY IN AQUEOUS SOLUTION**

Cormac Feeley, 2025

Steven T. Frey, Associate Professor, Chemistry Department

**CATALYTIC ISOTOPIC-LABELING OF NITROGEN-CONTAINING COMPOUNDS**

Ethan J. Percival, 2026

Jessada Mahatthananchai, Assistant Professor, Chemistry Department

**CATALYTIC ISOTOPIC-LABELING OF CHEMICAL COMMODITIES**

Wells C. Larsen, 2025

Jessada Mahatthananchai, Assistant Professor, Chemistry Department

**SPECTROSCOPIC STUDY OF O(3P) REACTIONS WITH CHEMISORBED HYDROCARBONS IN NON-THERMAL PLASMAS**

Rachel Hambuchen 2026

Juan G. Navea, Professor, Chemistry Department

**SPECTROSCOPIC STUDY OF O(3P) REACTIONS WITH CHEMISORBED PINENE**

Jordan Jones, 2026

Juan G. Navea, Professor, Chemistry Department

**THE INTERACTION OF CAFFEINE TREATMENT AND SLEEP PROMOTING SIGNALS ON SLEEP IN *DROSOPHILA MELANOGASTER***

Lara Strunk, 2024

Chris Vecsey, Associate Professor, Neuroscience Program

**ROOM C**

**DEVELOPMENT OF A PAPER-BASED DEVICE FOR THE DETECTION OF ASPARTAME**

Cole Wilson, 2025

Kimberley Frederick, Professor, Chemistry Department

**DETECTION OF MERCURY IN COSMETICS USING PAPER-BASED MICROFLUIDIC CHIPS**

Anh-Tai Huynh, 2026

Kimberley Frederick, Professor, Chemistry Department



**ATMOSPHERIC MOBILITY OF IRON FROM SIMULATED COMBUSTION PARTICLES**

Olivia Kazanjian, 2024; Rachel Hambuchen, 2026  
Juan G. Navea, Professor, Chemistry Department

**SYNTHESES OF BIOMIMETIC CATALYSTS FOR NOVEL ISOTOPIC-LABELING REACTIONS**

Andrew K. Shen, 2025  
Jessada Mahatthananchai, Assistant Professor, Chemistry Department

**CATALYTIC ISOTOPIC-LABELING OF HYDROCARBON COMPOUNDS**

Will Hoerle, 2024  
Jessada Mahatthananchai, Assistant Professor, Chemistry Department

11:45 am-12:45pm Lunch Murray Aikins Dining Hall

12:55pm – 1:45pm Oral Presentations Session 2

**ROOM A**

**MINIMAL EXTERNALISM AND WHITE BIAS**

Marley Schmidt, 2023  
Susan Blake, Visiting Assistant Professor, Philosophy Department

**SELF-DEFENSE: BLACK FEMINIST APPROACHES TO VIOLENCE**

Raven Jade Villa, 2023  
Dr. Gabriella Friedman, Mellon Post-Doctoral Fellow, Black Studies Program

**TALKING TO THE DEAD: BESSIE JONES AND GULLAH/GEECHEE RELIGIO-CULTURAL PRACTICE**

Maelcum Thayer, 2023  
Malik Raymond, Mellon Post-Doctoral Fellow, Black Studies Program

**ROOM B**

**THE POLITICAL AND ETHICAL IMPLICATIONS OF GENETICALLY-MODIFIED BIOWEAPONS**

Tony Mota, 2024  
Yelena Biberman, Associate Professor, Political Science Department

**FOOD INSECURITIES AMONG PERSONS WITH DISABILITIES IN ETHIOPIA**

Sonam Lhazin, 2025  
Smriti Tiwari, Associate Professor, Economics Department

## **THE IRISH IN THE CAPITAL DISTRICT – ORAL HISTORY PROJECT**

Mary Kate Murphy, 2026

James J. Kennelly, Professor, Management and Business Department

### **ROOM C**

#### **NEUROPHYSIOLOGICAL INDICES OF FLOW IN DANCE IMPROVISATION**

Grace Burnett, 2024

Dominique Vuvan, Associate Professor, Psychology Department

#### **LIMB AND SEX-SPECIFICITY IN NEAR-INFRARED SPECTROSCOPY-DERIVED INDICATORS OF MUSCLE METABOLISM: EFFECTS OF ACUTE DIETARY ORAL CAPSAICIN**

Lauren M Greaves, 2023

Steve Ives, Associate Professor, Health and Human Physiological Sciences Department

#### **DOES EXPOSURE TO ENVIRONMENTAL WILDFIRE SMOKE AFFECT CARDIOVASCULAR AND PULMONARY FUNCTION AT REST AND DURING EXERCISE?**

Oliver Blum, 2023

Steve Ives, Associate Professor, Health and Human Physiological Sciences Department

1:50-3 pm Poster Presentations Session 2

### **ROOM A**

#### **PERCEPTION OF SENSE OF BELONGING AND ACADEMIC FACTORS AMONG BLACK WOMEN ATTENDING PWIS**

Cadence Trach, 2024; Syre Zenon, 2024

Kelly Gross, Visiting Assistant Professor, Social Work Department

#### **INTEGRATING EXPERIMENT AND THEORY TO INVESTIGATE THE BINDING OF NO<sub>2</sub> IN ORGANIC PHOTSENSITIZERS: A DAYTIME PATHWAY FOR THE FORMATION OF ATMOSPHERIC NITROUS ACID (HONO)**

Sofia Chihade, 2026; Rachel Scholl, 2026

Juan G. Navea, Professor, Chemistry Department

#### **PHOTOOXIDATION OF NONANOIC ACID IN ORGANIC INTERFACES AND THE EFFECT OF RELATIVE HUMIDITY AND PH**

Elizabeth Scholer, 2024; Sofia Chihade, 2026

Juan G. Navea, Professor, Chemistry Department

#### **CHARACTERIZATION OF A BIO-COMPOSITE PREPARED BY IMMOBILIZATION OF TRIAZINE HYDROLASE ON LAYERED DOUBLE HYDROXIDE PARTICLES**

Sarah Sinnott, 2024

Steven T. Frey, Associate Professor, Chemistry Department

**EXPLORING THE BOB ROSS EFFECT: A PSYCHOPHYSIOLOGICAL INVESTIGATION**

Elena Shostak, 2024

Steve Ives, Associate Professor, Health and Human Physiological Sciences Department

**ROOM B**

**EXAMINATION OF HOW SLEEP-PROMOTING NEURONS INTERACT WITH STARVATION AND SLEEP DEPRIVATION IN *DROSOPHILA MELANOGASTER***

Eve Waldron, 2025

Christopher Vecsey, Associate Professor, Neuroscience Program

**DETECTING PHOSPHATE IN SOIL**

Gavrielle Gordon, 2026

Kimberley Frederick, Professor, Chemistry Department

**DETECTION OF NITRATE IN SOIL USING PAPER MICROFLUIDIC DEVICES**

Mary Harbison, 2026

Kimberley Frederick, Professor, Chemistry Department

**SKIDTOK: A NEW SOCIAL MEDIA APP FOR CHILDREN**

Cassie Davidson, 2025; Maddy Fung, 2025

Aarathi Prasad, Associate Professor, Computer Science Department

**EFFECTS OF DIFFERENT BLUE LIGHT INTENSITY ON SLEEP IN *DROSOPHILA MELANOGASTER***

Aaliyah J. Peralta, 2024; Ryan R. Chipperfield, 2025

Christopher G. Vecsey, Associate Professor, Neuroscience Program

**ROOM C**

**DOES MOUSE CHRONOTYPE PREDICT ALCOHOL CONSUMPTION?**

Yutian Feng, 2025

Bernard Possidente, Professor, Biology Department

**THE DEFAULT BOUNDARIES OF CHILDREN'S MORAL CIRCLES**

Gabriella Modesti, 2024

Lisa Chalik, Visiting Assistant Professor, Psychology Department

**EFFECT OF SALT ON A PEPTIDE SH3 INTERACTION**

Jorge Cardoso, 2026; Ally Mujica, 2025

K. Aurelia Ball, Associate Professor, Chemistry Department

**EFFECTS OF PHOSPHORYLATION AND RESIDUE CONFORMATION ON THE COMPACTNESS OF THE RNA POLYMERASE II CTD DOMAIN**

Will Barr, 2024

K. Aurelia Ball, Associate Professor, Chemistry Department

**MUTANT ATXIN-1 DISRUPTS MITOCHONDRIAL MEMBRANE POTENTIAL  
(MMP) DYNAMICS: IMPLICATIONS FOR SPINOCEREBELLAR ATAXIA TYPE 1**

Ada Glynn, 2024

Sarita Lagalwar, Associate Professor, Neuroscience Department

## PROJECT ABSTRACTS

(In alphabetical order by professor's last name)

### **EFFECTS OF PHOSPHORYLATION AND RESIDUE CONFORMATION ON THE COMPACTNESS OF THE RNA POLYMERASE II CTD DOMAIN**

Will Barr, 2024

K. Aurelia Ball, Associate Professor, Chemistry Department

Intrinsically disordered proteins (IDPs) are critical participants in many important cellular processes. Conformational changes of residues within IDPs can affect their dynamics and thus modulate their binding activity. Additionally, the activities of certain proteins, such as the disordered C-terminal domain (CTD) of RNA Polymerase II, may also be modulated by reversible phosphorylation. The CTD consists of an evolutionarily conserved repeated heptad (Tyr1-Ser2-Pro3-Thr4-Ser5-Pro6-Ser7). Gaussian-accelerated molecular dynamics was used to analyze the effects of Ser5 phosphorylation and changes in proline conformation on the Asn variant of the CTD. We determined that phosphorylation of Ser5 in all heptads increased the turn character of proximal residues and induced *cis* conformations in Pro6. Additionally, phosphorylation resulted in a significant increase in the mean radius of gyration.

### **EFFECT OF SALT ON A PEPTIDE SH3 INTERACTION**

Jorge Cardoso, 2026; Ally Mujica, 2025

K. Aurelia Ball, Associate Professor, Chemistry Department

Intrinsically disordered peptides (IDPs) lack stable structures and are crucial in cellular processes like signaling, regulation, and assembly. We use computational methods to study IDP interactions with SH3 domains, common in eukaryotes. ArkA, an IDP, binds to this domain in a process aided by electrostatic interactions between charged residues. Previous studies from our lab have shown that high salt concentrations destabilize the AbpSH3-ArkA binding pathway by disrupting these interactions. We performed molecular dynamics simulations on the fully bound state of AbpSH3 and ArkA with a high salt concentration (800 mM) to compare effects on bound complex flexibility and electrostatic interactions. Overall, high salt concentrations had little effect on the bound state of AbpSH3-ArkA, which suggests that salt has a larger effect on binding than unbinding.

### **EFFECT OF A KEY NEGATIVELY CHARGED RESIDUE MUTATION ON THE BINDING PATHWAY OF SH3 DOMAIN COMPLEX AND ArkA PEPTIDE**

Oluebube Onwuzulu, 2024; Alex Arata, 2025

Elliot J. Stollar, Professor University of Liverpool, UK

K. Aurelia Ball, Associate Professor, Chemistry Department

SH3 domains are common protein domains found across all forms of life and serve important functions in cell signaling and cytoskeletal regulation. Previous experimental results have shown that cellular processes are mediated by interactions between protein. It has been observed that protein charges are crucial in the binding of a protein. In this computational experiment, we mutated a charged residue on the SH3 domain and used molecular dynamics simulations to compare the interaction between the domain and a disordered peptide ArkA with and without this mutation. Contrary to our expectations, mutating the central peptide residue did not change the

binding interaction when compared to the wild-type simulations. The study has helped us understand that by mutating the residue the interaction is not fully affected.

## **THE POLITICAL AND ETHICAL IMPLICATIONS OF GENETICALLY-MODIFIED BIOWEAPONS**

Tony Mota, 2024

Yelena Biberman, Associate Professor, Political Science Department

Humans have not just cracked the genetic code – the programming language of life on Earth. They are also rapidly acquiring the power to manipulate it with ease. Artificial intelligence-enabled biotechnology is transforming the very nature of power by giving humans unparalleled influence over their nature. Rapidly accelerating breakthroughs in life sciences generate thrilling possibilities for alleviating suffering and the climate crisis. They are also generating civilization-ending capabilities that, unlike nuclear power, can be widely accessible. What can and should be done to manage the threats accompanying the rapid advances in biotechnology? Drawing on analyses of government documents, scientific reports, interviews, and secondary sources on debates surrounding AI and biotechnology, we explore the benefits and drawbacks of the open-source approach. Our preliminary conclusion is that the open-source approach offers the most ethical and secure policy path forward.

## **MINIMAL EXTERNALISM AND WHITE BIAS**

Marley Schmidt 2023

Susan Blake, Visiting Assistant Professor, Philosophy Department

This paper challenges the mainstream epistemological tradition which fails to take the implications of white bias into account. Without considering white bias, traditional epistemology cannot give an accurate description of belief acquisition and justification. Drawing from the works of social epistemologists such as Charles Mills, Jose Medina, Kristie Dotson, and Miranda Fricker, who identify how prejudiced beliefs influenced by white arrogance and epistemic vices create false and distorted understandings about race, we argue that a single belief that involves giving reduced credence to racially marginalized groups is formed on the basis of prejudice is not justified. Such unjustified beliefs undermine the justification of other beliefs formed on the basis of this belief. There might be two people with access to identical mental states (with regard to content) where one set of beliefs could be formed on the basis of prejudice, and the other is not. Henceforth, since one of these two sets of beliefs is not justified, then relations between mental states and the world are a factor in their justification.

## **EDITING THORNTON WILDER'S NONFICTION WRITINGS**

Alice Barrett, 2023; Mary Timmons, 2025

Joseph Cermatori, Associate Professor, English Department

This summer, student researchers Alice Barrett and Mary Timmons assisted Professor Joseph Cermatori in reviewing and preparing for publication seventy-nine texts by the American playwright and novelist Thornton Wilder (1897–1975). The philological process involved careful study of Wilder's unpublished notebooks, handwritten manuscripts, typewritten drafts, and previously published works — all available to the researchers in digital form. The team sought out, transcribed, corrected, and edited the materials to prepare a comprehensive volume of Wilder's *Collected Nonfiction*, which will include approximately one hundred entries, and which will double the number of Wilder's nonfiction writings available in print. This volume will shed

new light on Wilder as a writer of nonfiction prose, and will be beneficial to scholars, theater artists, and non-specialist readers interested in Wilder's work.

### **THE DEFAULT BOUNDARIES OF CHILDREN'S MORAL CIRCLES**

Gabriella Modesti, 2024

Lisa Chalik, Visiting Assistant Professor, Psychology Department

Social groups lay the foundation for an individual's behavior toward, and beliefs about, those around them. To explore how this process unfolds, in the present study, we investigated how young children act toward ingroup members, outgroup members, and people whose group membership is ambiguous. We assigned children to one of two made-up groups of people and gave them an opportunity to share resources with a recipient who was an ingroup member, an outgroup member, or whose group membership was unknown. In one condition, the intergroup context was made salient, and in another condition, the intergroup context was not made salient. Children gave more resources to ingroup members than to both outgroup members and ambiguous individuals, but only when the intergroup context had been made salient.

### **DEVELOPMENT OF A PAPER-BASED DEVICE FOR THE DETECTION OF ASPARTAME**

Cole Wilson, 2025

Kimberley Frederick, Professor, Chemistry Department

Aspartame has recently moved into the public eye as a possible carcinogen when consumed in large amounts. Though more investigation is needed, there are groups that need to know of the presence of aspartame, such as phenylketonurics. The goal of this project is to develop a color-based test for measuring the quantity of aspartame in artificial sweeteners. We determined the range of concentrations we can analyze and any possible interferences from other compounds. Wax printed paper devices were successfully used 46 days after creation when vacuum sealed. Future work on this project includes developing the detection potential of aspartame in sodas and other drinks.

### **DETECTION OF MERCURY IN COSMETICS USING PAPER-BASED MICROFLUIDIC CHIPS**

Anh-Tai Huynh, 2026

Kimberley Frederick, Professor, Chemistry Department

Unregulated levels of mercury continue to be a prominent issue in the cosmetic field. A wide range of skin-lightening products are known to use mercury in their formulations due to its bleaching effect. However, long-term exposure to mercury can lead to many serious illnesses like neurological abnormalities, dermal rashes, and kidney failure. Therefore, we are developing a simple technique to detect mercury in skin-lightening products using paper-based microfluidic chips. Mercury levels will be analyzed using an app that utilizes the smartphone camera to detect the changes in color based on the concentration of mercury present. The goal is to make the test for mercury safe and easy to perform so that consumers can test their own skin-care products at home.

## **DETECTING PHOSPHATE IN SOIL**

Gavrielle Gordon, 2026

Kimberley Frederick, Professor, Chemistry Department

The excessive use of fertilizer in US agriculture leads to increased phosphate runoff into water bodies, causing eutrophication and harming marine life due to algae overgrowth. Our goal is to design a microfluidic paper chip that detects soil phosphate levels in the part-per-million range. Farmers can utilize this tool to monitor and adjust fertilizer usage for optimal efficiency, preventing overfertilization. Soil mixed with vinegar is added to two stacked chips which chemicals have been deposited on, causing the bottom chips to turn a vibrant blue proportionate to the phosphate concentration. The microfluidic assay currently detects 0.5-30mg/L of phosphate in soil. Future goals include chemical stability improvement, enabling transport and storage, and validation with various soil types.

## **DETECTION OF NITRATE IN SOIL USING PAPER MICROFLUIDIC DEVICES**

Mary Harbison, 2026

Kimberley Frederick, Professor, Chemistry Department

Eutrophication occurs when excess nutrients create unimpeded growth of aquatic algae and plants that decompose to produce life-threatening hypoxic environments for animals. To reduce eutrophication caused by nutrient runoff on farms, farmers must correctly assess the amount of fertilizer needed for their soil. This can be done by analyzing potassium, nitrogen, and phosphorus levels in soil. The aim of the research was to create an inexpensive and portable microfluidic device that exhibits a color gradient that correlates to the amount of nitrate in the soil deposited on it and is measured using cell phone technology. Factors in producing products for public use including longevity of the device, storing conditions, and user accessibility were considered, and the device was tested with different soils to ensure consistency.

## **SYNTHESIS AND CHARACTERIZATION OF A NEW SUPEROXIDE DISMUTASE MIMETIC WITH ROBUST STABILITY IN AQUEOUS SOLUTION**

Cormac Feeley, 2025

Steven T. Frey, Associate Professor, Chemistry Department

Superoxide ion ( $O_2^-$ ), a byproduct of respiration, can cause inflammation, heart disease, and certain cancers at elevated levels in the body. Superoxide dismutase (SOD) is an enzyme that detoxifies  $O_2^-$ . Manganese compounds can act as mimetics of SOD to reduce abnormal levels of  $O_2^-$  brought on by disease processes. To be useful, these compounds must be stable in aqueous solution. We have synthesized and purified a compound designed to bind  $Mn^{2+}$  (DPDEA) with 4 nitrogen and 2 oxygen atoms. Characterization of DPDEA was achieved via  $^1H$  and  $^{13}C$  NMR, and GC-MS. Potentiometric titrations demonstrated that the MnDPDEA complex is very stable in aqueous solution, and cyclic voltammetry indicates the redox potential of MnDPDEA is in the range of SOD and other effective SOD mimetics.



## **CHARACTERIZATION OF A BIO-COMPOSITE PREPARED BY IMMOBILIZATION OF TRIAZINE HYDROLASE ON LAYERED DOUBLE HYDROXIDE PARTICLES**

Sarah Sinnott, 2024

Steven T. Frey, Associate Professor, Chemistry Department

Triazine hydrolase (TrzN) is an enzyme that degrades atrazine, an herbicide with dangerous health implications. Our goal is to immobilize TrzN on layered double hydroxide (LDH) particles to produce a stable bio-composite that retains enzymatic activity and can be used to remediate atrazine-contaminated water. LDH was synthesized by a reaction of aluminum chloride and magnesium chloride in an aqueous solution containing sodium hydroxide. The LDH was characterized by X-Ray diffraction, scanning electron microscopy, and atomic absorption spectroscopy. The LDH was then treated with TrzN enzyme in a buffered solution to produce the bio-composite which was washed repeatedly and collected by centrifugation. Reaction of the LDH/TrzN bio-composite with atrazine demonstrated retention of enzymatic activity. The loading capacity of TrzN on LDH has also been examined.

## **SELF-DEFENSE: BLACK FEMINIST APPROACHES TO VIOLENCE**

Raven Jade Villa, 2023

Gabriella Friedman, Mellon Post-Doctoral Fellow, Black Studies Program

From Celia murdering her owner in the 17th century to recent events like Carlisha Hood armed self-protection during an altercation, Black women's use of violence has the potential to transform contemporary debates about "stand your ground laws," politically inflected violence, and the meanings and ethics of self-defense. Theories of necessary violence like those of Fanon, Newton, Williams, Guevarra, and others have advocated for the use of violence to combat oppressive systemic structures. However, until recently, analysis of gender has been absent from these discourses. How have Black women responded to violence and in what ways have they used violence? Are Black women afforded self-defense—within the legal system, and within philosophical discourses about the ethics of violence? Using Black feminist thought as the principle theoretical framework, this research includes historical and contemporary accounts of Black women's resistance to elaborate and highlight their relationship to and tactics around self-defense and necessary violence.

## **PERCEPTION OF SENSE OF BELONGING AND ACADEMIC FACTORS AMONG BLACK WOMEN ATTENDING PWIS**

Cadence Trach, 2024; Syre Zenon, 2024

Kelly Gross, Visiting Assistant Professor, Social Work Department

Our study is examining the perception of belonging and academic implications in Black womxn at traditionally PWIs. Recruitment occurred at public and private institutions in NYS. Focus groups were held and participants defined belonging, discussed how their sense of belonging at a PWI influenced their academic success, and how Black womxn at traditionally PWIs cope with belonging/not belonging. Participants were also encouraged to share their socioeconomic status, generational status in regard to college/ university attendance, and academic success/ setbacks, as it helped inform their definition and perception of belonging. First round structural coding shows Black womxn have a sense of belonging in specific instances with faculty, staff and peers and that they seek support from their community.

## **EXPLORING THE BOB ROSS EFFECT: A PSYCHOPHYSIOLOGICAL INVESTIGATION**

Elena Shostak, 2024

Steve Ives, Associate Professor, Health and Human Physiological Sciences Department

We sought to compare the effects of watching the soothing Bob Ross versus streaming news on cardiovascular health and mood. Eighteen young ( $21 \pm 1$  yrs.,  $n=9$  male) healthy participants ( $2 \pm 0.1$  m,  $69 \pm 18$  kg) were assessed for blood pressure (BP), heart rate variability (HRV), and profile of mood states (POMS) before and after watching an episode of Bob Ross (BR) or the control condition (News) matched for time ( $\sim 27$  mins). POMS score decreased significantly after BR ( $26 \pm 21$  vs.  $18 \pm 25$ ,  $p < 0.05$ ), but not after News. There were no significant differences between average HRV ( $p = 0.064$ ), pre and post systolic BP ( $p = 0.999$ ), and other BP variables within the experimental and control conditions, respectively. Bob Ross reduces overall mood disturbance, though appears to exert little influence on the cardiovascular system.

## **DOES EXPOSURE TO ENVIRONMENTAL WILDFIRE SMOKE AFFECT CARDIOVASCULAR AND PULMONARY FUNCTION AT REST AND DURING EXERCISE?**

Oliver Blum, 2023

Steve Ives, Associate Professor, Health and Human Physiological Sciences Department

The association between poor air quality and cardiovascular health is well-documented. However, direct investigations are needed on the effect of brief environmental wildfire smoke (WS) exposure on cardiovascular function. We investigated the effect of  $>3$  days environmental WS exposure on cardiovascular and pulmonary function at rest and during handgrip exercise. In a non-randomized, crossover pilot study, four healthy adults ( $n=4$ ,  $25 \pm 6$ yr) were assessed after 3 days of WS and after 3 days of good air quality. Resting peripheral and estimated central blood pressures were unaffected by WS. Microvascular oxygenation during handgrip exercise trended lower ( $p = 0.146$ ,  $\eta^2_p = 0.559$ ) with WS exposure. These preliminary findings suggest an effect of brief environmental wildfire smoke exposure on microvascular function during exercise, even in healthy individuals.

## **LIMB AND SEX-SPECIFICITY IN NEAR-INFRARED SPECTROSCOPY-DERIVED INDICATORS OF MUSCLE METABOLISM: EFFECTS OF ACUTE DIETARY ORAL CAPSAICIN**

Lauren M, Greaves, 2023

Steve Ives, Associate Professor, Health and Human Physiological Sciences Department

Assessing muscle metabolism is essential in understanding and treating metabolic disease. Near-infrared spectroscopy (NIRS) is a novel approach. We aimed to investigate acute dietary capsaicin treatment on muscle metabolism using NIRS-derived tissue deoxygenation rates ( $DeO_2$ ) and to assess limb or sex-specificity. Forty-five young healthy men ( $n=25$ ,  $21 \pm 4$ yr) and women ( $n=20$ ,  $20 \pm 1$ yr) ingested either placebo or capsaicin, in a counterbalanced, single-blind, placebo-controlled, crossover design. Vascular occlusion was used to determine  $DeO_2$  (%/s) in the flexors and vastus lateralis. There was a significant limb ( $-2.31 \pm 1.34$  vs.  $-1.78 \pm 1.22$ %/s,  $p = 0.007$ ,  $\eta^2_p = 0.19$ ); sex ( $p = 0.005$ ,  $\eta^2_p = 0.203$ ) effect on  $DeO_2$ . Capsaicin treatment does not appear to induce changes in  $O_2$ -dependent metabolism in muscle, however, apparent limb and sex specificity in such NIRS-derived assessments exist.

## **THE IRISH IN THE CAPITAL DISTRICT – ORAL HISTORY PROJECT**

Mary Kate Murphy, 2026

James J. Kennelly, Professor, Management and Business Department

This is a pilot project to record and preserve the living history of Irish immigrants in the Capital District/North Country region. We recorded, digitized, and transcribed a series of interviews with Irish immigrants who have settled in this area. The interviews focused on informants' recollections of their lives in Ireland, their reasons for emigrating to America, and their impressions and experiences in their new home. Although the primary purpose of this project was essentially the *creation* of history, we noted the recurrence of common themes, particularly the freedom, diversity, openness and opportunity that these immigrants found in America. Ultimately, our goal is to make these recordings and transcriptions accessible to scholars with an interest in Irish-American history and culture through creation of a suitable archive.

## **THE SOIL IS ALIVE: THE CONVERGENCE OF PERMACULTURE AND WICCA**

Jane Schreibman, 2024

Eliza Kent, Professor, Religious Studies Department

Neopaganism has integrated the practice of permaculture into ritual connecting practicing individuals to the Earth Mother and all living and nonliving things contiguous in time and space. This project explores the emergence of Neopaganism in a milieu of counter-cultural social movements during the 1970s and examines its solutions to modern problems of overconsumption. I argue that permaculture serves a function: the practical application of theology to a pressing problem, exemplifying Neopaganism's dynamic and constantly re-interpreted radical response to modernity. The spiritual and environmental practice of permaculture is embodied spiritual ritual, calling on participants to shift their worldview to a sustainable holistic cosmology that recognizes how the Earth is alive and deserving of attentive, loving care.

## **SISTERHOOD OF THE TRAVELING WITCH: WHERE TRANS WOMEN STAND IN THE CRAFT**

Cameron Pittl, 2024

Eliza Kent, Professor, Religious Studies Department

Queer communities are joining neo-pagan movements like Wicca to practice a spirituality, unburdened by traditional views on gender. And yet, generational conflicts within the movement make that difficult because of Wicca's roots in radical feminism, particularly evident in the women-only Dianic lineage. Previous studies attest to community-based strife surrounding the inclusion of transgender individuals in women-only spaces. Building on this scholarship through digital source analysis, I highlight the employment of Wiccan theology as a shield to justify the exclusivity of sacred feminine rites, such as women's mysteries. This shield propels the extremes of religion and the literalistic interpretations of rituals. The use of religiously charged gender-based language and notions of physicality separate Wiccans who promote gender essentialism and Wiccans who promote an inclusive narrative.

## **COMEDY KILLS: RACIALIZED VIOLENCE IN THE WAKE OF LAUGHTER**

Aaron Shellow-Lavine, 2023

Beck Krefting, Professor, American Studies Department and Director of the Center for Leadership, Teaching, and Learning

This project aims to examine the relationship between the explicit (violent) maintenance of racial hierarchies and the simultaneous development of implicit supporting social structures, in this case forms of comedic entertainment. We ask: In what ways have comedic discourses been used to both normalize and weaponize racialized violence throughout US history? What can these discourses, and audience reception of such performances, reveal about the embedding of racist ideologies in widely shared forms of amusement? We examine the parallel histories of racialized violence and development and institutionalization of comedic forms -- such as minstrelsy (1840s-50s), vaudeville (1880s-90s), stand-up (1970s-80s), and contemporary comedy in the age of media convergence (2000-2020s) -- which have all assisted in the normalization of violent, racialized, social control.

## **MUTANT ATXIN-1 DISRUPTS MITOCHONDRIAL MEMBRANE POTENTIAL (MMP) DYNAMICS: IMPLICATIONS FOR SPINOCEREBELLAR ATAXIA TYPE 1**

Ada Glynn, 2024

Sarita Lagalwar, Associate Professor, Neuroscience Program

Spinocerebellar Ataxia Type 1 (SCA1) is a progressive neurodegenerative disease primarily affecting cerebellar Purkinje neurons, characterized by an abnormal expansion of CAG repeats within the coding region of the ataxin-1 (ATXN1) gene. Recent published work supports the interaction between mutant polyQ-expanded ATXN1 and mitochondrial proteins involved in apoptosis, oxidative phosphorylation (OXPHOS), membrane composition, and mitochondrial gene transcription. Work in our lab has further found that mitochondrial dysfunction is associated with SCA1 in mice models and in vivo application of the OXPHOS substrate succinic acid ameliorates Purkinje cell neurodegeneration and cerebellar behavioral deficits. Human cerebellar-derived cellular models of SCA1 reveal gross mitochondrial morphological, locational and compositional abnormalities, along with increased oxidative stress and metabolism. In these models, succinic acid treatment and mitochondrial-specific antioxidants reduce the effects of oxidative stress. Here we characterize in vitro physiological deficits in our cellular models through live cell imaging of mitochondrial membrane potential. Since high energy-demanding cerebellar Purkinje cells bear the brunt force of the pathology, mitochondria emerge as potential targets for therapeutic intervention to alleviate the symptoms and pathology of the disease.

## **SYNTHESES OF BIOMIMETIC CATALYSTS FOR NOVEL ISOTOPIC-LABELING REACTIONS**

Andrew K. Shen, 2025

Jessada Mahatthananchai, Assistant Professor, Chemistry Department

Isotopic labeling is an important tool in chemistry and chemical biology, as it is often used in the synthesis of new medicinal agent, as well as in structure elucidation of organic and biological compounds. Through modular synthetic approach, our research goal is to prepare a series of safe and easy-to-handle biomimetic catalysts with different electronic properties that are able to catalyze a variety of mild and direct isotope labeling via simple hydrogen-deuterium exchange reactions.

## **CATALYTIC ISOTOPIC-LABELING OF HYDROCARBON COMPOUNDS**

Will Hoerle, 2024

Jessada Mahatthananchai, Assistant Professor, Chemistry Department

Methods for incorporating deuterium, which is a stable isotope of hydrogen, are essential for usages as tracers or analytical standards to elucidate reaction mechanisms and understand biological pathways. These methods can also find application in the modification of medications for treatment of diseases. Typically, methods for incorporating deuterium are multi-step and wasteful. In our research, we examined a library of commercially available biomimetic catalysts to attempt simple hydrogen-deuterium exchange reactions on a variety of inexpensive hydrocarbon compounds.

## **CATALYTIC ISOTOPIC-LABELING OF NITROGEN-CONTAINING COMPOUNDS**

Ethan J. Percival, 2026

Jessada Mahatthananchai, Assistant Professor, Chemistry Department

Isotopic labeling is useful for both synthetic and medicinal chemistry, as it is often used in microanalysis, elucidation of reaction mechanisms and as contrast agent. Typical methods for incorporating deuterium — a stable, naturally occurring isotope of hydrogen — rely on wasteful and inefficient oxidation-state manipulation. Our research goal is to harness the reactivity of biomimetic catalysts to develop a direct and efficient isotopic-labeling reaction via hydrogen-deuterium exchange. In the work, we examined the viability of this reaction on nitrogen-containing compounds commonly used in organic synthesis.

## **CATALYTIC ISOTOPIC-LABELING OF CHEMICAL COMMODITIES**

Wells C. Larsen, 2025

Jessada Mahatthananchai, Assistant Professor, Chemistry Department

Since its discovery in 1932, deuterium, as an isotope of hydrogen, has found many applications in organic chemistry due to stronger carbon-deuterium bond compared to carbon-hydrogen bond. For medical chemistry, this property can prolong a molecule's effective lifetime in the body, potentially allowing less dosage administration. Our research aims to find new ways for biomimetic catalysts to selectively incorporate deuterium onto desired functional group of common chemical commodities that can serve as platform for syntheses of medicinal agents.

## **SPECTROSCOPIC STUDY OF O(3P) REACTIONS WITH CHEMISORBED PINENE**

Jordan Jones, 2026

Juan G. Navea, Professor, Chemistry Department

In this study, we used a non-thermal plasma, state-of-the-art reactor to monitor the reaction of oxygen free radicals with pinene chemisorbed on alumina. Vibrational spectroscopy allows for in-situ investigation of the reaction. Our primary goal is understanding the heterogeneous oxidation of volatile organic compounds (VOC) in the atmosphere, achieved through a method preventing plasma-phase partitioning by adsorbing alpha-pinene onto alumina, enabling non-thermal plasma processing at room temperature with O(3P). Here we show the oxidation process of a common VOC coating a component of mineral dust.

## **PHOTOOXIDATION OF NONANOIC ACID IN ORGANIC INTERFACES AND THE EFFECT OF RELATIVE HUMIDITY AND PH**

Elizabeth Scholer, 2024; Sofia Chihade, 2026

Juan G. Navea, Professor, Chemistry Department

Light-absorbing organic chromophores are abundant in the ocean and can partition to sea spray aerosol (SSA), which form when waves break or when bubbles burst. These chromophores can induce a photosensitized oxidation of fatty acids, which are also present in SSA. This research used a gravimetric and vibrational spectroscopy instrument to investigate the photooxidation of nonanoic acid, a fatty acid commonly found in SSA, in the presence of complex organic photosensitizers. Thin films containing a photosensitizer [4-benzoylbenzoic acid (4BBA), 4-imidazolecarboxaldehyde, humic acid, and marine chromophoric dissolved organic matter (mCDOM)] and nonanoic acid were exposed to simulated solar light to analyze the amount of oxidation that occurred in daytime vs. nighttime. The effects of humidity and pH were also investigated for 4BBA.

## **SPECTROSCOPIC STUDY OF O(3P) REACTIONS WITH CHEMISORBED HYDROCARBONS IN NON-THERMAL PLASMAS**

Rachel Hambuchen, 2026

Juan G. Navea, Professor, Chemistry Department

Over the last two decades, non-thermal plasma chemistry technology has been challenged by its inability to have both high selectivity and high product yield. In this study, we present a new non-thermal plasma method: a non-invasive in situ IR monitoring system that provides an increase in control over a reaction's progress, ensuring a high yield of the desired chemical reaction. This new method was employed to investigate the oxidation of 1-hexene and cyclohexane adsorbed onto alumina. Spectroscopic in situ analysis of the reactions was used to determine kinetic properties and mass spectrometry ex situ analysis was used to determine the identity and quantity of products

## **INTEGRATING EXPERIMENT AND THEORY TO INVESTIGATE THE BINDING OF NO<sub>2</sub> IN ORGANIC PHOTOSENSITIZERS: A DAYTIME PATHWAY FOR THE FORMATION OF ATMOSPHERIC NITROUS ACID (HONO)**

Sofia Chihade, 2026; Rachel Scholl, 2026

Juan G. Navea, Professor, Chemistry Department

Our laboratory recently proposed previously unexplored pathways leading to atmospheric nitrous acid (HONO) formation. These pathways involve the interaction of adsorbed nitrogen dioxide (NO<sub>2</sub>) with photosensitizers in dissolved marine organic matter, and depend on pH and chloride ions (Cl<sup>-</sup>). Experiments exploring this mechanism use a dual Fourier-Transform IR (FTIR) system to measure gas production from photosensitizer 4-benzyl benzoic acid (4BBA) exposed to light and NO<sub>2</sub>. Analysis shows that the loss of NO<sub>2</sub> yields HONO, among other nitrogenous gases. Computational calculations were carried out with protonated and deprotonated 4BBA, to mimic the varying pH characteristics of the marine atmosphere. These studies confirm multiple modes of interaction between NO<sub>2</sub> and NO<sub>3</sub> with 4BBA, with binding sites in the carboxylic acid and keto groups of 4BBA.

## **PHOTOSENSITIZATION OF NO<sub>2</sub> BY 4-BENZOYL BENZOIC ACID: A MODEL SYSTEM FOR THE DAYTIME FORMATION OF NITROUS ACID (HONO) IN THE MARINE BOUNDARY LAYER**

Román Montenegro, 2024; Sofia Chihade, 2026; Rachel Scholl 2026  
Juan G. Navea, Professor, Chemistry Department

Sea spray aerosols in the marine boundary layer, containing marine chromophores is known to photo reduces NO<sub>2</sub> into atmospheric nitrous acid (HONO). In the presence of light HONO rapidly dissociates into nitrogen monoxide (NO) and hydroxyl radicals (OH) which drive many atmospheric processes. Although HONO disassociates under light a maximum concentration is found at midday suggesting a pathway for HONO formation in the presence of light. Presented here is a proxy of marine chromophore dissolved organic matter, 4-benzoyl benzoic acid (4BBA) and its ability in converting adsorbed NO<sub>2</sub> into HONO in conditions similar to the ones found in the marine boundary layer and an analysis of the kinetic formation of HONO.

## **ATMOSPHERIC MOBILITY OF IRON FROM SIMULATED COMBUSTION PARTICLES**

Olivia Kazanjian, 2024; Rachel Hambuchen, 2026  
Juan G. Navea, Professor, Chemistry Department

Over the last two decades, combustion particles significantly contributed to the iron deposition flux in the marine boundary layer. Because iron is a key plankton nutrient, this flux can have an impact in biogeochemical cycles. Recent work by our group suggests that the composition of these particles, in particular light-sensitive components, enhances the mobility of bioavailable iron. Yet, the complex mineralogy of combustion particles makes it difficult to fully understand the role of composition in the overall environmental iron flux. Here, we used a controlled model of combustion particles in TiO<sub>2</sub>-anatase doped and grafted with iron and copper. The particles were introduced to an acidic (pH 2) environment to mimic the atmospheric processing of combustion particles. To investigate the effect of light in iron leaching from combustion particles, three variations of samples were tested: (1) iron doped within the crystal structure of TiO<sub>2</sub>, (2) iron on the surface of the particles, and (3) a combination of the doped and surface iron.

## **AN (ALMOST) ALL-SKY GALAXY ENVIRONMENT CATALOG**

Jonathan Kasper, 2026; Emmy Plage, 2025; Angel Guinazu, 2026; Jacob Lord, 2024; Shakohentehtha Elijah, 2026; Trayce Reeves, 2024; Jocelyn Elphick (Saratoga HS)  
Mary Crone Odekon, Professor, Physics Department

Our research focuses on testing hypotheses for how the universe evolved from an almost uniform distribution of diffuse hydrogen to complex galactic structures. Our project builds on previous work by creating a database of galaxy environments that covers nearly the entire sky. We are able to study the entire sky by using infrared light which, unlike visible light, can penetrate the milky way galaxy that we are embedded in. Using the Python programming language, we developed code that describes galaxy environments in several ways, and we looked to see how galaxy properties depend on their environment. So far, our results have been consistent with findings from other researchers and we anticipate seeing subtle effects that others have not seen yet.

## **THE MARGINALIZATION OF SMALLHOLDER FARMERS IN INDONESIA**

Rebecca Hagopian, 2024

Feryaz Ocakli, Associate Professor, Political Science Department

A significant portion of the global food supply is produced by smallholder farms operated by rural families in the global south, often trapped in vicious poverty cycles. This trend is reflected in Indonesia, where smallholder farmers' interests have been consistently marginalized, contributing a layer of instability to an already vulnerable food system. Regimes across a large ideological range have repeatedly failed at reform, implementing unsustainable agricultural intensification and expansion, especially of rice paddies, rather than comprehensively addressing smallholder farmers' concerns. Farmers have made predominantly unsuccessful attempts to preserve customary law in agriculture, clashing with influential powers, which have shifted across time. The essence of the farmers' plight has remained constant, despite evolution in circumstances, demonstrating how Indonesia's colonial legacy continues to define its agricultural sector.

## **EVALUATION OF THE SUPPORT SYSTEMS ECOMAP FOR LGBTQ2S+ BIPOC YOUTH**

Divine Perez, 2024; Sofia Iacobucci, 2024

June C. Paul, Assistant Professor, Social Work Department

LGBTQ2S+ BIPOC youth are often victims to rejection, disenfranchisement, and a lack of sense of belonging which becomes an obstacle when it comes to obtaining and accessing relationships and resources that are safe, supportive, and affirming to who they are. There are limited resources to aid practitioners understand and evaluate levels of support among these youth. In our research, Assistant Professor in social work Dr. June Paul along with Sofia Iacobacci & Divine Perez part of the class of 2024 evaluate ecomapping as a practice framework for working with LGBTQ2S+ youth.

## **DOES MOUSE CHRONOTYPE PREDICT ALCOHOL CONSUMPTION?**

Yutian Feng'25

Bernard Possidente, Professor, Biology Department

People whose rest-activity cycle peaks later in the day (late chronotype) consume more alcohol than morning types. This association may be caused by a circadian clock-mediated biological mechanism, or an interaction between chronotype and social behaviors specific to humans. We examined this association in mice to determine if mice display a similar association. Time of peak running-wheel activity was used as a measure of "chronotype". Mice were tested for alcohol consumption and preference with both water and alcohol for five days where they could choose between them. Correlations among circadian chronotype, alcohol consumption and preference were not different from zero. We conclude that human elevated alcohol consumption and preference with late chronotype is a function of social behavior and does not have a biological basis.



## **SECURING MOBILE FERTILITY APP DATA USING MULTI-PARTY COMPUTATION**

Zander Chown, 2025

Aarathi Prasad, Associate Professor, Computer Science

Our prior research showed that users of fertility and period-tracking apps were concerned about their fertility data being disclosed to law enforcement without their consent. Our research goal this summer was to design and build a privacy-preserving app to address this issue. To do this, we used Shamir secret sharing to securely store the data on two servers and the user's device so that the user's data cannot be reconstructed without both servers and the user working together. This talk will review the system design, explain the secure multi-party computation concepts used to guarantee privacy, and explain how the Virtual Ideal Functionality Framework (VIFF) was used to implement secure multi-party computation.

## **SKIDTOK: A NEW SOCIAL MEDIA APP FOR CHILDREN**

Cassie Davidson, 2025; Maddy Fung, 2025

Aarathi Prasad, Associate Professor, Computer Science Department

Kids have increasingly started using social media at earlier ages. And in recent years, big social media companies have been under scrutiny for questionable data privacy practices. With the rise of these issues, the concern about children's data privacy and online safety is important to address. Many mobile apps designed for kids lack the design principle of including opinions from kids themselves. This summer project focuses on designing and developing a social media app for kids that includes privacy and safety features that kids want. We spent the past few weeks learning frameworks like React Native and gaining an understanding of database management to create a functional social media app that is targeted for kids.

## **TALKING TO THE DEAD: BESSIE JONES AND GULLAH/GEECHEE RELIGIO-CULTURAL PRACTICE**

Maelcum Thayer, 2023

Malik Raymond, Mellon Post-Doctoral Fellow, Black Studies Program

Scholarship on the Gullah/Geechee community of the Georgia Sea Islands and what has been called the Gullah/Geechee Corridor has centered a primitivist view of their culture that emphasizes 'Africanisms' over the significance of the history of specific cultural practices that are threatened by gentrification and commodification. Through LeRhonda S. Manigault-Bryant's book *Talking to the Dead* and interviews conducted with Bessie Jones-- a folk singer, member of the Georgia Sea Island singers, and recipient of the [National Endowment for the Arts National Heritage Fellowship](#) at Yale-- Dr. Raymond and I locate the significance of themes of nature, geography, religion, and storytelling to understanding the ongoing need for preservation of Gullah/Geechee heritage that looks toward futurity using the past.

## **QUANTIFYING PATTERNS OF METHANE GAS EMISSION AND PRODUCTION IN AN ADRIDONACK PEATLAND**

Isabelle Blais, 2024

Kurt Smemo, Associate Professor, Environmental Studies and Sciences Program

Increasing atmospheric methane concentrations are a primary driver of climate change, making understanding natural methane sources a global research priority. Using a laser-based portable gas

analyzer and automated flux chambers we measured gas fluxes in an Adirondack peatland. Peat samples were incubated to determine methane production rates and methanogenic pathways. Carbon dioxide fluxes were related to predicted patterns in vegetation, light availability, and topography, while methane emissions were associated with topography and vegetation. Our results suggest potential production is a poor predictor of emissions. Carbon stable isotopes revealed greater methane production potential was associated with a greater proportion of acetoclastic versus hydrogenotrophic methanogenesis. Overall, our findings reinforce the view that natural methane sources are sensitive to environmental change, creating uncertainty for modeling future climate scenarios.

## **FOOD INSECURITIES AMONG PERSONS WITH DISABILITIES IN ETHIOPIA**

Sonam Lhazin, 2025

Smriti Tiwari, Associate Professor, Economics Department

Disability is a known factor that contributes to food insecurity. However, little is known about the relationship between food insecurity and disability and this topic remains underexplored, especially in developing countries where it is highly prevalent. This study sheds light on the status of food insecurity among persons with disabilities in Ethiopia. Using data from the Living Standards of Measurement Study for socioeconomic activities in Ethiopia, this study conducts regression analysis to understand how disability impacts various household food security measures across three waves. The results reveal a consistent and significant correlation between disability and food insecurity.

## **EXAMINATION OF HOW SLEEP-PROMOTING NEURONS INTERACT WITH STARVATION AND SLEEP DEPRIVATION IN *DROSOPHILA MELANOGASTER***

Eve Waldron, 2025

Christopher Vecsey, Associate Professor, Neuroscience Program

The three main aspects of fruit flies' life involve eating, sleeping, and reproducing. Take away one of those key aspects of life, and there is a chemical imbalance in the brain that can influence sleep patterns. This project investigated short neuropeptide F (sNPF), a neuromodulator associated with promotion of sleep and feeding, and how sNPF signaling affects overall sleep in the presence of other stressors. sNPF-producing neurons were activated optogenetically with Chrimson, an ion channel excited by red light. It was found that sNPF activation allowed the flies to increase sleep, counteracting the wake-promoting effects of both starvation and sleep deprivation. Future studies will examine the activation of sNPF with flies that have not had a chance to reproduce.

## **THE INTERACTION OF CAFFEINE TREATMENT AND SLEEP PROMOTING SIGNALS ON SLEEP IN *DROSOPHILA MELANOGASTER***

Lara Strunk, 2024

Chris Vecsey, Associate Professor, Neuroscience Program

Caffeine is a widely used drug in humans to promote wakefulness, but it is unknown how caffeine interacts with sleep-promoting signals in the brain. Caffeine also promotes nighttime wakefulness in the fruit fly *Drosophila melanogaster*, and there are several sleep-promoting signals in flies, including the short neuropeptide F (sNPF). Thus, in this study we examined how caffeine treatment interacted with sleep promotion from optogenetic activation of sNPF neurons. We found that the caffeine treatment group was less affected by the activation of sNPF neurons. Future studies will look at replicating this current study with other wake-promoting drugs like carbamazepine.

## **EFFECTS OF DIFFERENT BLUE LIGHT INTENSITY ON SLEEP IN *DROSOPHILA MELANOGASTER***

Aaliyah J. Peralta, 2024; Ryan R. Chipperfield, 2025

Chris Vecsey, Associate Professor, Neuroscience Program

Electronic device usage introduces our population to potential sleep disturbances due to abnormal exposure to light. In particular, many of these electronics are known to emit a significant amount of blue-rich light. We developed a custom-made LED grid box to control color and intensity. Our experiments consisted of exposing flies with normal vision and white-eyed mutants to various blue light intensities. We found that exposing flies to low and medium-intensity blue light after white light decreased nighttime sleep. High-intensity blue light demonstrated the same effect but more intensely. Future studies should continue experiments on flies with mutations to different light sensor molecules to determine how the detection of light color affects sleep regulation.

## **NEUROPHYSIOLOGICAL INDICES OF FLOW IN DANCE IMPROVISATION**

Grace Burnett, 2024

Dominique Vuvan, Associate Professor, Neuroscience Program

Flow, or being “in the zone”, is a state of heightened awareness, where the conscious mind suspends, and work seems effortless. Improvisatory dance presents quite the paradox for flow: intense focus is needed to perform intended movements, but cognitive release is necessary to move spontaneously and freely. This study will assess the impact of formal training on experiences of flow during dance improvisation using portable electroencephalography (EEG). This neurophysiological technique allows for the quantitative measurement of mental states, like flow, by looking at their correlation with certain frequencies of brain activity. It is predicted that experiences of flow and alpha-band power will increase over time, after receiving formal dance improvisation training.

## **INVESTIGATION OF THE CURRENT PRACTICES AND UNDERSTANDING OF INCLUSIVE TEACHING IN HIGHER EDUCATION**

Ilena Berro Pizzarossa, 2024; Kayla Melendez, 2026

Juliane Wuensch, Assistant Professor, World Languages and Literatures Department

The research team worked alongside the Skidmore Working Group on Accessible and Inclusive Teaching and Learning. Their work was divided between three subgroups and the presentation will focus on themes that emerged between these three data sets. The Reading Group developed an annotated bibliography on existing scholarship concerning inclusive and accessible teaching, the Data Group processed and analyzed quantitative and qualitative data from students, faculty, staff, and administrative and governance committees, and the Institutional Comparison group compiled language and policies from peer, aspirant, and disruptor institutions. The goal of this work is to better support and incentivize inclusive teaching practices and improve the learning environment for the Skidmore community.

## **LANGUAGE AND MUSIC IN THE EARLY INFANT AUDITORY ENVIRONMENT**

Maggie Besthoff, 2024

Erica Wojcik, Associate Professor, Psychology Department

Dominique Vuvan, Associate Professor, Neuroscience Program and Psychology Department

This research project aims to investigate the early infant auditory environment in terms of language, music, and their interaction using the Mendoza Music corpus (Mendoza & Fausey, 2018), which contains full-day naturalistic audio recordings of 35 infants at home in the U.S. We were interested in a subset of recordings that contained solo live singing. The current research consisted of three sub-projects. First, we created a timeline of language and music milestones in children in-utero to age seven. Second, we segmented the audio files by identifying word onsets in the singing. Finally, Matlab and RStudio were used to extract chroma pitch data for each clip in the corpus. Future research will combine these two methods to retrieve musical data from each word and thus describe the ways that music and language input combine in early infancy.

## **LEARNING LADINO: A STEPPINGSTONE FOR FURTHER RESEARCH**

Olivia Berenson, 2024

Murat Yildiz, Assistant Professor, History Department

This presentation will focus on the learning process of Ladino, an Ottoman-Jewish language used by Sephardic Jewry, and why I have learned it, and the challenges I faced while learning this new language. This is part of a learning process that will continue into the year to aid Professor Yildiz in his research of various sources from the early 20th century Ottoman Empire to examine the coverage of Sports and the Mayleccabi Games, a topic he is exploring in the book he is currently writing.

**Faculty Student Summer Research Program**

**Schedule of Final Research Presentations**

**Friday, June 30, 2023**

9:00 am – 9:20 am Coffee, Fruit, Yogurt, Muffins

9:20 am – 10:20 am Oral Presentations

**ROOM A**

**SKIDMORE ARCHAEOLOGICAL COLLECTION NATIVE AMERICAN GRAVES PROTECTION AND REPATRIATION ACT (NAGPRA) RESEARCH**

Maggie McCurdy, 2024

Siobhan Hart, Associate Professor, Anthropology Department

**ARCHAEOLOGICAL EXPLORATION OF THE DENTON HOMESITE USING GROUND-PENETRATING RADAR, METAL DETECTION, AND SUBSURFACE EXCAVATION**

Shey Feng, 2024; Aimee Holland, 2025

Siobhan Hart, Associate Professor, Anthropology Department

***LYMANTRIA DISPAR*'S EFFECT ON TREE MORTALITY IN THE LAKE GEORGE WATERSHED**

Kaitlin Katirachi, 2024; Kate Manor, 2024

Charlie Bettigole, GIS Center Director, GIS Center for Interdisciplinary Research

**MODELING RECREATION POTENTIAL IN SKIDMORE'S NEW LANDS**

Hunter Wasser, 2023

Charlie Bettigole, GIS Center Director, GIS Center for Interdisciplinary Research

**ROOM B**

**PRE-PRODUCTION DRAMATURGY: *THE COURAGE TO RIGHT A WOMAN'S WRONGS* BY 16TH-CENTURY SPANISH PLAYWRIGHT ANA CARO DE MALLÉN**

Reyn Ricafort, 2025

Lisa Jackson-Schebetta, Associate Professor, Theater Department

**WORK AND LABOR IN POST-SOCIALIST CHINA**

Bowen Bao, 2024

Xiaoshuo Hou, Professor, Sociology Department and Asian Studies Program

**INDIVIDUAL DIFFERENCES IN LYRIC FOCUS**

Julia Cannistraro, 2024

Dominique Vuvan, Associate Professor, Psychology Department

**ROOM A**

**STUDYING THE BEHAVIOR OF METAL RESISTANT BACTERIA UNDER DIFFERENT CONDITIONS**

Mia Lan Sheng Townsend, 2024; Fiker Tesfaye Tadesse, 2026; Yv'Richard Jusma, 2026  
Sylvia McDevitt, Associate Professor, Biology Department

**WHO SUPPORTS TEACHING U.S. CHILDREN ABOUT RACE AND RACISM IN SCHOOLS? THE ROLE OF RACE DEVELOPMENT BELIEFS**

Heba Salman, 2025  
Leigh Wilton, Associate Professor, Psychology Department

**ASSESSING THE INFLUENCE OF LITHIUM ON A PHASE DELAY OF THE CIRCADIAN CLOCK CAUSED BY A LIGHT PULSE SIMULATING SUNSET IN FRUIT FLIES**

Yiwen Su, 2026  
Bernard Possidente, Professor, Biology Department

**RESURRECTION OF ANCESTRAL ASPARTYL-tRNA SYNTHETASES**

Lindsey Han, 2025  
Kelly Sheppard, Associate Professor, Chemistry Department

**ROOM B**

**HOW HIGH AND LOW INTENSITY LIGHT COLOR AFFECTS SLEEP AND RHYTHMS IN *DROSOPHILA MELANOGASTER***

Ryan Chipperfield, 2025  
Chris Vecsey, Associate Professor, Neuroscience Program

**RAINBOW STATIC MASTERMIND**

Ella Theoharis, 2026  
Kirsten Hogenson, Assistant Professor, Mathematics and Statistics Department

**BIOCHEMICAL AND STRUCTURAL CHARACTERIZATION OF STARCH EXCESS4 FROM ZEA MAYS**

Murphy Alcantara, 2024; Sarah Sinnott, 2024  
Madushi Raththagala, Assistant Professor, Chemistry Department

**THE MIND'S EYE IN READING: THE RELATIONSHIP BETWEEN THE IMAGEABILITY EFFECT AND VISUAL IMAGERY IN A LEXICAL DECISION STUDY**

Hayley Yun, 2024; Sophia Pajakowski, 2024  
Rebecca Johnson, Professor, Psychology Department

**ROOM A**

**MOLECULAR ANALYSIS OF METAL RESISTANT PROKARYOTES NEAR HISTORICALLY POLLUTED SITES IN SARATOGA COUNTY**

Grace Coale, 2025; Sayuri Pfeiffer, 2026

Sylvia Franke McDevitt, Associate Professor, Biology Department

**WHO CARES ABOUT DIVERSITY? HOW PERCEIVERS SPONTANEOUSLY CONSTRUCT MENTAL REPRESENTATIONS OF PEOPLE WHO ADVOCATE FOR RACIAL EQUITY**

Aliza Nazir, 2023

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***B. ANTHRACIS* INDIRECT PATHWAY FOR ASPARAGINYL-TRNA FORMATION**

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**PURIFICATION OF THE *BACILLUS SUBTILIS* TRANSAMIDOSOME COMPONENTS**

Yutian Feng, 2025

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**ROOM B**

**MORPHOLOGICAL EFFECTS OF PHYTOCANNABINOID EXPOSURE DURING EMBRYONIC DEVELOPMENT IN ZEBRAFISH**

Sophie Gilbert, 2024

Jennifer Bonner, Associate Professor, Biology Department

**AN ANALYSIS OF THE ATTITUDES AND RELATIVE PREFERENCES OF UTILITY-SCALE SOLAR ENERGY NEIGHBORS IN UPSTATE NEW YORK**

Emma Lloyd, 2025; Anna Kieffer, 2026

Karen Kellogg, Professor, Environmental Studies and Sciences Program

**ANTIRACISM IN CHILD DEVELOPMENT: ANALYZING OUR OWN RACED PLAY EXPERIENCES**

David Salinas, 2025; Sophie Levy, 2025

Laurie Rabinowitz, Assistant Professor, Education Studies Department

**INVESTIGATING THE INFLUENCE OF LEUCOKININ ON SLEEP AND BEHAVIOR IN *DROSOPHILA MELANOGASTER***

Ariana Tucker, 2024

Christopher Vecsey, Associate Professor, Neuroscience Program

## PROJECT ABSTRACTS

(In alphabetical order by professor's last name)

### **MODELING RECREATION POTENTIAL IN SKIDMORE'S NEWLANDS**

Hunter Wasser, 2023

Charlie Bettigole, GIS Center Director

Skidmore College recently acquired a parcel comprising over 500 acres of forest and wetland. Since then, little investigation of the property has taken place. Through a combination of geospatial analysis and ground truthing (field work), this research has created a wholly original body of maps to better understand the character of the study area. Indeed, the Newlands parcel holds immense value for access to diverse ecosystems, study of wilderness areas, and recreational trail construction. Included in this project are proposals for three trails that could improve student access for educational and recreational purposes. It should be noted that a vehicle-accessible route to the edge of Skidmore's property does not yet exist—this should be a focus of future endeavors in opening the Newlands to the Skidmore community.

### **LYMANTRIA DISPAR'S EFFECT ON TREE MORTALITY IN THE LAKE GEORGE WATERSHED**

Kaitlin Katirachi, 2024; Kate Manor, 2024

Charlie Bettigole, GIS Center Director, GIS Center for Interdisciplinary Research

Since being introduced to the northeastern US, *Lymantria dispar*, commonly known as the spongy moth, has naturalized into native ecosystems. However, cyclical spongy moth outbreaks can lead to severe defoliation of hardwood forests, and repeated leaf-loss can pose serious threats to tree and forest health. 2021 and 2022 saw explosions in spongy moth populations and consequently defoliation, and using daily, high-resolution, multispectral satellite imagery from Planet, we mapped the extent of defoliation around the Lake George watershed and identified field locations to gather observational data. Combining analytical and observational data allowed us to compare defoliation to several covariates (including soil and forest composition, slope, and aspect), and will help to better our understanding of forest mortality and management for future spongy moth infestations.

### **MORPHOLOGICAL EFFECTS OF PHYTOCANNABINOID EXPOSURE DURING EMBRYONIC DEVELOPMENT IN ZEBRAFISH**

Sophie Gilbert, 2024

Jennifer Bonner, Associate Professor, Biology Department

As Western decriminalization and popularity amongst wealthier, white populations spreads, so has acceptance of *Cannabis sativa* as a therapeutic in Western medicine. There are still large gaps in scientific knowledge of the endogenous biological cannabis mechanisms. The aim of this research was to observe the morphological and anatomical effects of cannabis exposure during embryonic development of *Danio rerio*. Motor neuron morphology and gross anatomy were examined following chronic and acute exposure. At low chronic and acute dosages (0.05%), no significant gross anatomical or morphological differences were observed. At high chronic dosages (0.2%), dorsal-ventral and muscular development abnormalities were evident in all specimens, suggesting that normal cellular signaling is being severely interrupted. High chronic doses were also found to be lethal past 24 hours of treatment.



## **SKIDMORE ARCHAEOLOGICAL COLLECTION NAGPRA RESEARCH**

Maggie McCurdy, 2024

Siobhan Hart, Associate Professor, Anthropology Department

The Native American Graves Protection and Repatriation Act (NAGPRA) is a law that requires institutions that receive federal funds to report and potentially repatriate Indigenous human remains and certain items. I conducted research on archeological collections from four sites in Saratoga County to update Skidmore's NAGPRA summaries and inventories, which make the items in the collection known to Indigenous groups so they may request repatriation. Using archival sources including collector records, archeological field notes, and maps, I created a history for over 100 objects and established provenience information to be shared with tribes in NAGPRA consultation. This contributes to NAGPRA compliance work, but also to our ethical obligation to attempt to return belongings and ancestors taken from Indigenous sites without permission from cultural descendants.

## **ARCHAEOLOGICAL EXPLORATION OF THE DENTON HOMESITE USING GROUND-PENETRATING RADAR, METAL DETECTION, AND SUBSURFACE EXCAVATION**

Shey Feng, 2024; Aimee Holland, 2025

Siobhan Hart, Associate Professor, Anthropology Department

The Denton Homesite, located in the northwestern portion of Skidmore College's Northwoods, was once part of an 18<sup>th</sup> century farmstead and sprawling 19<sup>th</sup> century estate. Using ground-penetrating radar (GPR), metal detection, and subsurface excavation, we furthered understandings of past land use and life through the recovery of artifacts and documentation of buried architectural features. In June 2023, we examined artifact density around a well feature with four metal detection transects. Five GPR transects were completed to identify potential underground architectural features, and subsurface excavation investigated several GPR anomalies. Overall, we recovered over 300 artifacts and identified the termination of a buried brick wall feature likely dating to the 19<sup>th</sup> century occupation of the site.

## **RAINBOW STATIC MASTERMIND**

Ella Theoharis, 2026

Kirsten Hogenson, Assistant Professor, Mathematics and Statistics Department

Rainbow static Mastermind is a game where a player tries to guess a secret sequence of  $n$  distinctly colored pegs. The player submits a list of guesses and they receive two pieces of feedback per guess: the number of correct colors in the correct positions and the number of correct colors in the wrong positions. To win, the player must correctly determine the secret code based on this feedback. Mastermind is a well-studied game with applications to artificial intelligence, data security, and bioinformatics. In the static version, researchers typically seek a shortest list of questions which is sufficient to win the game. This summer, we found an optimal question list when  $n=2$  and identified several properties of optimal question lists when  $n=3$ .

## **WORK AND LABOR IN POST-SOCIALIST CHINA**

Bowen Bao, 2024

Xiaoshuo Hou, Professor, Sociology Department and Asian Studies Program

Since the reforms started in China in 1978, job assignment by the state has been gradually replaced by job markets. On the one hand, the shrinking state sectors have made stable, lifelong employment inaccessible to many. On the other hand, as a result of the emergence of new technologies, the expansion of higher education, and the reduced restrictions on migration, new types of employment have become available that have both increased employment opportunities and led to complex ways of managing and exploiting labor. Built on key studies in the field and ethnographic data, this project explores the implications of the informalization and precarization of the Chinese labor and the different forms of workers' resistance in the context of economic restructuring and an authoritarian developmental state.

## **THE MIND'S EYE IN READING: THE RELATIONSHIP BETWEEN THE IMAGEABILITY EFFECT AND VISUAL IMAGERY IN A LEXICAL DECISION STUDY**

Hayley Yun, 2024; Sophia Pajakowski, 2024

Rebecca Johnson, Professor, Psychology Department

Many properties of words can influence processing, including imageability (the extent to which the word evokes mental imagery). Previous studies have shown that in visual word recognition tasks, words with higher imageability ratings are easier to process than words with lower imageability ratings. The purpose of this summer project was to design and conduct a lexical decision study, the first of three experiments that will look at whether the imageability effect in reading is affected by how vivid the reader's visual imagination is. Throughout the past five weeks, our team successfully designed and coded the lexical decision study that measures participants' response times and accuracy rates and has begun running participants. Here we report the preliminary results from the data collected thus far.

## **AN ANALYSIS OF THE ATTITUDES AND RELATIVE PREFERENCES OF UTILITY-SCALE SOLAR ENERGY NEIGHBORS IN UPSTATE NEW YORK**

Emma Lloyd, 2025; Anna Kieffer, 2026

Karen Kellogg, Professor, Environmental Studies and Sciences Program

Solar photovoltaic energy is one of the most rapidly developing renewable electricity markets in the U.S., with untapped capacities for both distributed and utility-scale solar. To better understand the possible barriers to utility-scale solar implementation, we conducted a survey of Upstate New York residents near solar sites to evaluate their attitudes and energy production preferences. We modeled survey questions after a previously conducted study focused on wind energy and randomly selected approximately 20 residents from each of four distance categories (0-0.25 mi, 0.25-0.50 mi, 0.50-1.0 mi, and 1.0-3.0 mi) for 40 randomly selected utility-scale solar projects. We will combine our utility-scale survey data with the previously collected wind survey data to better understand attitudes, the factors that influence those attitudes, and participants' relative preferences for energy production.

**PRE-PRODUCTION DRAMATURGY: *THE COURAGE TO RIGHT A WOMAN'S WRONGS* BY 16TH-CENTURY SPANISH PLAYWRIGHT ANA CARO DE MALLÉN**

Reyn Ricafort, 2025

Lisa Jackson-Schebetta, Associate Professor, Theater Department

The pre-production dramaturgy for Skidmore's Fall 2023 Mainstage show addresses the question: why are we doing this play now? Examining the social, cultural, political, and literary conventions of Early Modern Spain, dramaturgy grapples with how to make a 17th-century play relevant to a 21st-century audience. Caro's play both evokes and interrogates the patriarchal and classist structures of Early Modern Spanish society. By reinterpreting the play through a moral justice narrative, examining real-life spaces of social and political transgression in 16th and 17th-century Spain, and heightening the play's theatrical elements, dramaturgy unearths possible ways to stage a text from the past to illuminate and give credence to the issues of today.

**STUDYING THE BEHAVIOR OF METAL RESISTANT BACTERIA UNDER DIFFERENT CONDITIONS**

Mia Lan Sheng Townsend, 2024; Fiker Tesfaye Tadesse, 2026; Yv'Richard Jusma, 2026

Sylvia McDevitt, Associate Professor, Biology Department

*Escherichia coli* and other bacteria are sensitive to reactive oxygen species (ROS) and soft metals, such as copper. This is exploited by protozoans and macrophages as a termination method. Bacteria have developed resistances to help with stress induced by heavy metals through systems like the CHASRI (Copper Homeostasis and Silver Resistance Island). To test the impact of metal resistance of bacteria on metabolic functions of predatorial organisms, seahorse XF technology was used to measure oxygen consumption rate (OCR) and extracellular acidification rate (ECAR) of *Dictyostelium discoideum* (used as model for macrophage) in the presence of four different *E. coli* strains harboring different copper resistance systems. In addition, killing assay was utilized to quantify the survival of *E. coli* in the presence of copper and *D. discoideum*.

**MOLECULAR ANALYSIS OF METAL RESISTANT PROKARYOTES NEAR HISTORICALLY POLLUTED SITES IN SARATOGA COUNTY**

Grace Coale, 2025; Sayuri Pfeiffer, 2026

Sylvia Franke McDevitt, Associate Professor, Biology Department

We are investigating the effect of environmental pollution on microbial communities in soil, using five soil samples taken from a riverbed with a history of heavy metal pollution from nearby manufacturing facilities in Saratoga County, NY. Ten strains of bacteria were isolated from soil sample #4. These isolates were sequenced using BLASTN software, finding the most closely related known species in the database to identify unknown strains. Isolates are being tested for heavy metal resistance to copper and zinc by measuring the highest concentration of heavy metal exposure they can survive. Extracted metagenomic DNA will be used to characterize the entirety of the microbial community, identifying the species and the abundance of heavy metal resistance genes in order to determine how historical pollution in the area has affected the local soil microbiology.

## **ASSESSING THE INFLUENCE OF LITHIUM ON A PHASE DELAY OF THE CIRCADIAN CLOCK CAUSED BY A LIGHT PULSE SIMULATING SUNSET IN FRUIT FLIES**

Yiwen Su, 2026

Bernard Possidente, Professor, Biology Department

Lithium is used to treat bipolar disorder, but its mechanism of action remains elusive. We investigated the hypothesis that lithium influences the circadian biological clock using fruit flies (*Drosophila*). It is known that lithium lengthens the circadian clock period, but its effect on the ability of light to entrain the clock to the photoperiod is not well understood. We exposed fruit flies to an evening light pulse that causes a phase delay of the clock and assessed the effect of lithium on the phase shift. As expected, the light pulse delayed the clock phase, but lithium had no effect on the phase shift. This research contributes to our understanding of the complex relationship between lithium, circadian rhythms, and the treatment of bipolar disorder.

## **ANTIRACISM IN CHILD DEVELOPMENT: ANALYZING OUR OWN RACED PLAY EXPERIENCES**

David Salinas, 2025; Sophie Levy, 2025

Laurie Rabinowitz, Assistant Professor, Education Studies Department

In exploring the topic of children's play with novice educators there is little recognition that forms of play differ across sociocultural contexts. Instead, development courses focus on how young children learn through play and highlight how shifts in a child's play may reflect cognitive development. Without interrogating how whiteness frames novice teachers' views of play, educators can misinterpret real life play that does not match mainstream cultural expectations. We analyzed an undergraduate course assignment where novice educators analyzed moments of play from their own childhoods using a cognitive lens and then considered how their own intersectional identities shaped the same moments of play. We will share excerpts from two novice educators' reflections and suggestions for how to use the assignment in another setting.

## **BIOCHEMICAL AND STRUCTURAL CHARACTERIZATION OF STARCH EXCESS4 FROM ZEA MAYS**

Murphy Alcantara, 2024; Sarah Sinnott, 2024

Madushi Raththagala, Assistant Professor, Chemistry Department

Glucan phosphatases are members of a functionally diverse dual-specificity phosphatase (DSP) family of enzymes. Plant glucan phosphatase Starch Excess4 (SEX4) binds and dephosphorylates glucans, contributing to processive starch degradation in the chloroplast at night. Despite the wealth of biochemical and structural information on SEX4, little is known about the agriculturally relevant glucan phosphatase activity. To close this gap, we explored the kinetics of Zea mays SEX4 using structure-guided mutagenesis and hydrogen-deuterium exchange mass spectroscopy. Our results suggest ways to improve catalysis for potential biotechnological applications.

## **B. ANTHRACIS INDIRECT PATHWAY FOR ASPARAGINYL-TRNA FORMATION**

Cella Sawyer, 2024

Kelly Sheppard, Associate Professor, Chemistry Department

*Bacillus anthracis*, the anthrax causing bacterium, encodes two different routes for attaching asparagine (Asn) to its cognate transfer RNA (tRNA<sup>Asn</sup>), which is an essential step in protein

synthesis and thus life. The direct route involves an asparaginyl-tRNA synthetase directly ligating Asn to tRNA<sup>Asn</sup>. The indirect route involves an archaeal non-discriminating aspartyl-tRNA synthetase (ND-AspRS) attaching aspartate (Asp) to tRNA<sup>Asn</sup>. The Asp-tRNA<sup>Asn</sup> is then amidated by GatCAB to form Asn-tRNA<sup>Asn</sup>. The three macromolecules (the archaeal ND-AspRS, tRNA<sup>Asn</sup>, and GatCAB) form the transamidosome to synthesize Asn on tRNA<sup>Asn</sup>. Components of the transamidosome are being purified to characterize the indirect pathway under various conditions. The goal of this research is to understand the indirect route of *Bacillus anthracis* and why it acquired an archaeal ND-AspRS.

## **PURIFICATION OF THE *BACILLUS SUBTILIS* TRANSAMIDOSOME COMPONENTS**

Yutian Feng, 2025

Kelly Sheppard, Associate Professor, Chemistry Department

In the bacterium *Bacillus subtilis*, there are two distinct pathways for attaching asparagine (Asn) to its transfer RNA, an essential step in protein synthesis. In the direct pathway, Asn is attached to tRNA<sup>Asn</sup>. In the two-step pathway Asn is synthesized on tRNA<sup>Asn</sup> via the transamidosome: a complex between ND-AspRS, tRNA<sup>Asn</sup>, and GatCAB. I am working on purifying components of the transamidosome, testing their binding together, and characterizing the transamidosome's activity under different conditions. I hypothesize that the transamidosome enables *B. subtilis* to synthesize Asn-tRNA<sup>Asn</sup> under conditions it wouldn't be able to otherwise. This work will further our understanding of the transamidosome's role in the *B. subtilis* life cycle and will be a useful comparison to the pathway in pathogenic strain of Bacilli like *Bacillus anthracis*.

## **RESURRECTION OF ANCESTRAL ASPARTYL-tRNA SYNTHETASES**

Lindsey Han, 2025

Kelly Sheppard, Associate Professor, Chemistry Department

Protein synthesis is essential for life and requires the correct pairing of amino acids to their cognate transfer tRNA by aminoacyl-tRNA synthetases. Many prokaryotes lack an AsnRS to directly attach Asn to tRNA<sup>Asn</sup>. Instead these organisms use a non-discriminating AspRS to attach Asp to tRNA<sup>Asn</sup> and GatCAB to amidate the Asp to Asn. Organisms with an AsnRS often have a discriminating AspRS (D-AspRS) that only attach Asp to tRNA<sup>Asp</sup>. How that specificity evolved from a bacterial ND-AspRS is unknown. To address, we phylogenetically modeled the last common ancestor of D-AspRS and an ND-AspRS. We report on the overproduction, and purification of the ancestral enzymes to study how specificity evolved. The work will provide insight into the evolution of life and tools for synthetic biology.

## **HOW HIGH AND LOW INTENSITY LIGHT COLOR AFFECTS SLEEP AND RHYTHMS IN *DROSOPHILA MELANOGASTER***

Ryan Chipperfield, 2025

Chris Vecsey, Associate Professor, Neuroscience Program

Poor sleep is a prevalent complaint today, which is in part attributed to our easy access to artificial light, especially after dusk. Light is a very important regulator of daily sleep rhythms as its prevalence can inhibit melatonin production. Also, the intensity and color of light may have different effects on the body and mind. The purpose of this research was to see the effects of how high and low intensity light could affect sleep in fruit flies (*Drosophila melanogaster*). Here, we report that low intensity blue light (without statistical analysis) has an effect on fruit fly sleep

patterns. As well, medium intensity light (with analysis) showed that red light and blue light inhibits sleep. High intensity light studies could not be finished fully.

### **INVESTIGATING THE INFLUENCE OF LEUCOKININ ON SLEEP AND BEHAVIOR IN DROSOPHILA MELANOGASTER**

Ariana Tucker, 2024

Christopher Vecsey, Associate Professor, Neuroscience Program

Sleep and feeding are both universal physiological processes that impact an organism's health and homeostasis. Starvation can suppress sleep, but the mechanisms by which these processes influence each other are unknown. This project investigated leucokinin (Lk), a neurotransmitter associated with feeding and sleep suppression in starved states, and how Lk's activation affects behavior and sleep. Lk neurons were activated with Chrimson, an ion channel excited by red light, and acute behavior and sleep were analyzed. It was found that Lk activation induced proboscis extensions but did not influence sleep. Future studies should look at how sNPF, a sleep-promoting neurotransmitter, interacts with Lk signaling pathways.

### **INDIVIDUAL DIFFERENCES IN LYRIC FOCUS**

Julia Cannistraro, 2024

Dominique Vuvan, Associate Professor, Psychology Department

The Music and Cognition Lab has been developing a valid way to measure an individual's lyric focus. Lyric focus refers to how much a person processes the lyrics versus other musical aspects when they listen to songs. Previous work in the lab developed a 19-item Lyric Focus Questionnaire (LFQ), and we are now developing a validation task to show evidence that it measures what it's supposed to. This summer, data from a validation task conducted in the Spring 2023 semester was analyzed. This data suggested there is potential for developing a better task to validate the LFQ. Literature research on narrative structure in music and reading comprehension helped us develop a new validation task that will be finalized and conducted in the fall semester.

### **WHO SUPPORTS TEACHING U.S. CHILDREN ABOUT RACE AND RACISM IN SCHOOLS? THE ROLE OF RACE DEVELOPMENT BELIEFS**

Heba Salman, 2025

Leigh Wilton, Associate Professor, Psychology Department

Children benefit from learning about race and racism. Yet, many U.S. adults (especially conservatives) oppose teaching U.S. schoolchildren about contemporary racism. We tested whether a novel factor--adults' lay beliefs about child race development--also predicts support of race-education policies. Adults ( $N=427$ ) estimated when U.S. children develop certain race-related capacities, which we compared to scientific estimates for age of onset. Political orientation ( $\beta=.47$ ) and racial bias ( $\beta=.45$ ) were the greatest predictors of race-education support. However, race lay belief also predicted support ( $\beta=.15$ ; all  $ps > .001$ ); people who more accurately estimated when children develop race biases more strongly supported race-education policies. These data suggest an intervention (race development education) to encourage support for developmentally-appropriate education about race in U.S. schools.

# **WHO CARES ABOUT DIVERSITY? HOW PERCEIVERS SPONTANEOUSLY CONSTRUCT MENTAL REPRESENTATIONS OF PEOPLE WHO ADVOCATE FOR RACIAL EQUITY**

Aliza Nazir, 2023

Leigh Wilton, Associate Professor, Psychology Department

People categorize others into social groups (e.g., race, gender), and various factors (e.g., clothing, ancestry) can influence these judgments. However, research has not explored spontaneous inferences about a person's identity based on different attitudes and approaches towards race relations. Participants ( $N=1104$ , 2 studies) read an "employee's" expressed agreement or disagreement with one of two approaches towards race relations: bridging intergroup relations or disrupting the racial hierarchy. Then, they described the employee's identities in their own words. Coding analyses (all  $Kappas > .89$ ) indicate that individuals who endorse either bridging or disrupting approaches were described as more likely to be Black, female-identifying, young, and liberal (all  $ps > .001$ ). These data suggest that perceivers have identity-based mental representations of people engaged in racial equity work.