# Skidmore College


## FACULTY STUDENT SUMMER RESEARCH PROGRAM

## SUMMER 2025

**FINAL PRESENTATIONS**
**JULY 31, 2025**

**Faculty Student Summer Research Program**
**Summer 2025**

## ***Index***



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 chemistry to political science, from social work to music. 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. The collaborative research forms the basis for a senior's honors thesis or can lead to conference presentations or 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 2025, there are an all-time high of 122 students and 66 faculty members engaged over 104 collaborative research projects from 27 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

**Felicia Axelrod-Porges ‘62**
**Patricia Brennan ‘74**
**Michael Brodney ‘94**
**Patricia Fehling and Denise Smith P‘25**
**Marlene Oberkotter Fowler ‘61**
**Stephanie and Steven Kasok P‘16**
**James and Linda Lippman ‘82**
**Richard A. Mellon ‘87**
**Michael Rose ‘90**
**Sara Lee Schupf ‘62**
**Carolyn Little Weg ‘64**
**Christina and David Wilson ‘25**
**Kenneth and Dorothy Woodcock, P‘96**
**Zankel Family Foundation**

### FOUNDATIONS AND GRANTS

**American Heart Association**
**Henry Dreyfus Teacher-Scholar Awards Program**
**Florida Department of Environmental Protection**
**Andrew W. Mellon Foundation**
**National Science Foundation**
**Sherman Fairchild Foundation**
**Skidmore Scholars in Science and Mathematics (S3M) Program**
**TomKat Ranch Educational Foundation**

**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.

**2025-26**
Abbey Grandin '28
Ashley Gutierrez Gastelu '27
Sarah Hailey '27
Maki Matsuoka '28
Anna Rader '28
Sydney Rice '28
Roberta Taylor-Smith '28
Hayes Van Dis '28
AJ Woods '27

**2024-25**
Sofia Chihade, '26
Katelyn Corpuz, '26
Isabelle Crampton, '26
Gavi Gordon, '26
Olivia Gottschall, '26
Kristyn Kirton, '27
Krista Longo, '26
Natalie O'Neill, '26
Claire Stone, '26
Lily Watson, '27
Sophia Witkon, '27

**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, July 31, 2025**

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

9:20 am – 10:10 am Oral Presentations

## ROOM A

**THE FUTURE OF QUANT INVESTING**
Will Devall, 2026 and Rumi Schemmerer, 2026
Matt Lucas, Harder Chair, Management & Business Department

**THE DEVIL'S ADVOCATE: RELIGIOUS FREEDOM IN THE UNITED STATES**
Callahan Mainzer, 2026
Adam Tinkle, Associate Professor and Director, MDOCS

**RESEARCHING AND ANNOTATING THE WORLD OF THORNTON WILDER**
Juliana Brueckner, 2027
Joseph Cermatori, Associate Professor, English Department

## ROOM B

**SIMULATING THE STRONG FORCE WITH NEURAL NETWORKS**
Jack Biggins, 2026
Anthony Ashmore, Assistant Professor, Physics Department

**INVESTIGATING GAMMA ZERO FOR S1 AND SU2 SYMMETRIES**
Camille Paradis, 2026
Christopher Seaton, Professor, Mathematics and Statistics Department

**DECOLONIZING SOCIAL WORK WITH REFUGEE COMMUNITIES: PRIORITIZING "OTHER" WAYS OF KNOWING**
Suleiman Lailati, 2028
Neil Bilotta, Assistant Professor, Social Work Department

## ROOM C

**PAPER BOMBS AND PSYCHOLOGICAL WARFARE: ANALYSIS OF CHINESE AND AMERICAN PROPAGANDA LEAFLETS DURING THE KOREAN WAR**
Amanda Middleton, 2026
Joowon Park, Associate Professor, Anthropology Department

**UNCONSTITUTIONAL CHANGES IN GOVERNMENT: LEGITIMIZING LEADERSHIP**
Justin Pollard, 2027
Emmanuel Balogun, Associate Professor, Political Science Department

**AWAKENING ACTION OR POISONING PROGRESS? EXPLORING RACISM-CONSCIOUS ENVIRONMENTAL FRAMES IN THE ERA OF COLORBLINDNESS**
Mia Barnes, 2026 and Caroline Ettinger-DeLong, 2026
Harrison Schmitt, Assistant Professor, Psychology Department

10:15– 11:00 am Poster Presentations Session 1

## ROOM A

**CITIZENSHIP UNDER WATCH: NAVIGATING DEMOCRACY AND SECURITY IN SOUTH ASIA**
Adya Sehgal, 2026
Yelena Biberman-Ockali, Associate Professor, Political Science Department

**WHY ARE PEOPLE MOVING OUT OF CALIFORNIA? THE POSSIBILITY OF INTERSTATE WHITE FLIGHT**
Sofia O'Brien, 2026
Amon Emeka, Associate Professor, Sociology Department

**STREAMLINED SYNTHESIS OF BENZIMIDAZOLONE DERIVATIVES VIA OXIDATIVE C-H AMINATION AND SUZUKI COUPLING SEQUENCE**
Deirdre Stockdill, 2027
Patrick Jokiel, Visiting Assistant Professor, Chemistry Department

**KETIMINE SYNTHESIS VIA "FRUITFUL" GREEN CHEMISTRY REACTIONS**
Arel Rivera, 2027
Beatrice Kendall, Teaching Professor, Chemistry Department

**EFFECT OF PROLINE ISOMERIZATION ON THE BINDING PATHWAY BETWEEN THE ABP1P SH3 DOMAIN AND THE INTRINSICALLY DISORDERED PROTEIN ARKA12**
Sydney Rice 2027
K. Aurelia Ball, Associate Professor, Chemistry Department

## ROOM B

**FROM FARM TO FUME HOOD: SUSTAINABLE IMINE SYNTHESIS AND REDUCTION USING FRUIT JUICE AND CARROTS**
Jude Remenar, 2027
Beatrice Kendall, Teaching Professor, Chemistry Department

**EXERCISE INTENSITY THRESHOLDS AS PREDICTORS OF MAJOR ADVERSE CARDIOVASCULAR EVENTS: A SYSTEMATIC REVIEW**
Lucy Brekke, 2027
Edgard Soares, Visiting Assistant Professor, Health and Human Physiological Sciences Department

**EFFECTS OF TOPIRAMATE ON CIRCADIAN ACTIVITY RHYTHMS IN MICE**
Lila Schabacker, 2026; Annika Fougli, 2026; Jordan Diamond, 2027; Jayden Perez, 2028; Nicole Sylvestri, 2027
Bernard Possidente, Professor, Biology Department and Neuroscience Program

**BOX MODELING OF THE PHOTOCHEMICAL FORMATION OF ATMOSPHERIC NITROUS ACID (HONO)**
Ben Pollara, 2028; Sofia Chihade, 2026; Lily Watson, 2027
Juan G. Navea, Professor, Chemistry Department

**OXIDATION OF VOLATILE ORGANIC COMPOUNDS USING NON-THERMAL OXYGEN PLASMAS**
Maki Matsuoka, 2028 and Rachel Hambuchen, 2026
Juan G. Navea, Professor, Chemistry Department

## ROOM C

**CANNABIDIOL DOSE RESPONSE AND INDUCED DEFECTS IN ZEBRAFISH EMBRYOS**
Declan Keefe, 2026 and Audrey Bowen, 2027
Jennifer Bonner, Associate Professor, Biology Department and Neuroscience Program

**GENETIC RESCUE OF NEUROMUSCULAR DEVELOPMENT AND CONNECTIVITY MODULATED BY DIP-α AND DPR10 IN DROSOPHILA MELANOGASTER**
Claire Christie, 2028
Christopher G. Vecsey, Professor, Neuroscience Program

**BIPEDAL LOCOMOTION IN QUADRUPEDAL ROBOTS USING REINFORCEMENT LEARNING**
Hamza Mustafa, 2027
Wenlu Du, Assistant Professor, Computer Science Department

**DEVELOPMENT OF AN ACCESSIBLE AND RAPID TEST TO DETECT REDUCING SUGARS IN BEVERAGES USING µPADS**
Sarah Hailey, 2028
Kimberley Frederick, Professor, Chemistry Department

**THE SYNTHESIS AND CHARACTERIZATION OF A NOVEL MANGANESE (II) SUPEROXIDE DISMUTASE BIOMIMETIC INCORPORATING A DIAZA-MACROCYCLE WITH PYRIDYLMETHYL GROUPS**
Holden Caney, 2027
Steven Frey, Associate Professor, Chemistry Department

11:00-11:45 am Poster Presentations Session 2

## ROOM A

**EXPLORING NOCICEPTION IN FRUIT FLY LARVAE**
Kai Norman, 2027
Jennifer Bonner, Associate Professor, Biology Department
Christopher G. Vecsey, Professor, Neuroscience Program

**COMPARISON OF THE PROPERTIES OF TWO MANGANESE (II) COMPLEXES WITH CROWN ETHER-BASED LIGANDS AS SUPEROXIDE DISMUTASE MIMETICS**.
Hanyu Ruan, 2027
Steven T. Frey, Associate Professor, Chemistry Department

**TRAUMATIC BRAIN INJURY AND KETAMINE'S IMPACT ON *DROSOPHILA MELANOGASTER'S* CIRCADIAN RHYTHM AND SLEEP**
Annika Fougli, 2026 and Lila Schabacker, 2026
Bernard Possidente, Professor, Biology Department

**GAUSSIAN-ACCELERATED MOLECULAR DYNAMICS SIMULATIONS OF THE PROTEIN COMPLEX VCBC**
Anna Rader, 2028
K. Aurelia Ball, Associate Professor, Chemistry Department

**DEVELOPING MICROFLUIDIC ANALYTICAL DEVICES FOR ANTIOXIDANT DETECTION**
Arin Eang, 2028 and Jean Tavarez, 2027
Kimberly Frederick, Professor, Chemistry Department

## ROOM B

**CHARACTERIZING SLEEP REGULATING sNPF-NEURONS IN THE VENTRAL NERVE CORD OF DROSOPHILA MELANOGASTER**
Oliver Moi, 2028
Christopher G. Vecsey, Professor, Neuroscience Program

**KINETICS AND THEORETICAL INSIGHTS INTO THE INTERFACE REACTIONS OF ADSORBED HYDROCARBONS WITH O(3P) GENERATED BY NON-THERMAL PLASMA**
Rachel Hambuchen, 2026
Juan G. Navea, Professor, Chemistry Department

**THE EFFECTS OF DIETARY CAPSAICIN ON MOVEMENT-INDUCED HYPEREMIA**
Isabella Harelick, 2026
Stephen Ives, Professor, Health and Human Physiological Sciences Department

**INTERACTION BETWEEN ATAXIN-1 AND THE MITOCHONDRIA IN SPINOCEREBELLAR ATAXIA TYPE 1 (SCA1) THROUGH CONFOCAL MICROSCOPY**
Abigale Glasman, 2026
Sarita Lagalwar, Professor, Neuroscience Program

**EFFECT OF ZINC SUPPLEMENT AND GENETIC DISPOSITION ON THE MOUSE GUT MICROBIOME**
Kieran Jenkins, 2026
Sylvia McDevitt, Associate Professor, Biology Department

## ROOM C

**PEEKABOO BLUR: FACE BLURRING CLOTHING FOR KIDS**
Samia Mayssan, 2028
Aarathi Prasad, Associate Professor, Computer Science Department

**C-H/ARYL AMINATION-DRIVEN SYNTHESIS OF UREA-BASED N-HETEROCYCLES**
Xiaoran Liu, 2026
Patrick Jokiel, Visiting Assistant Professor, Chemistry Department

**THE EFFECT OF ROAD SALT RUNOFF ON AMPHIBIAN FUNGAL DISEASE**
Lee Cohn, 2027 and Janu Dreher, 2027
Emily Le Sage, Assistant Professor, Biology Department

**SKID-CHAT: A RETRIEVAL-AUGMENTED AI ASSISTANT FOR SMARTER ANSWERS AT SKIDMORE**
AJ Woods, 2027
Wenlu Du, Assistant Professor, Computer Science Department

**CHARACTERIZATION OF THE DIRECT ROUTE FOR *B. SUBTILIS* ASN-tRNA$^{ASN}$ FORMATION**
Ella Tuxbury, 2027
Kelly Sheppard, Professor, Chemistry Department

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

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

## ROOM A

**COMPUTING THE HILBERT MEASURE FOR ROTATIONAL LIE GROUPS**
Belle Roberge, 2027
Christopher Seaton, Professor, Mathematics and Statistics Department

**FRONTLINE VOICES: PRACTITIONERS SERVING LGBTQ+ BIPOC YOUTH IN A CLIMATE OF DISCRIMINATORY LEGISLATION AND MESSAGING**
Von Richardson, 2026 and Anyeliza Gonzalez, 2025
June Paul, Associate Professor, Social Work Department

**SURVIVOR STRENGTHS: PERCEPTIONS OF PARENTING AMONG YOUTH EXPOSED TO INTIMATE PARTNER VIOLENCE (IPV)**
Melanie Yaeger, 2026 and Natalie Accurso, 2026
Johanna Reiter, Assistant Professor, Social Work Department

## ROOM B

**CONTINUING A HISTORY OF SERVICE AND COLLABORATION**
Jonah Cadorette, 2026
Charlotte D'Evelyn, Assistant Professor, Music Department

**WORKING WITH A TIGHT-KNIT COMMUNITY**
Justin Cepeda, 2028
Charlotte D'Evelyn, Assistant Professor, Music Department

**PRESERVATION, CONSERVATION, AND CONTINUATION**
Tommy Troesch, 2026
Charlotte D'Evelyn, Assistant Professor, Music Department

1:45-2:30 pm Poster Presentations Session 3

## ROOM A

**ADAPTIVE TRAFFIC SIGNALS: REINFORCEMENT LEARNING MEETS BROADWAY STREET FOR THE FIRST TIME**
Azizul Hakim, 2026
Wenlu Du, Assistant Professor, Computer Science Department

**SYNTHESIS OF A NOVEL TRIPYRIDYL CYCLAM LIGAND FOR THE FORMATION OF STABLE MANGANESE(II) COMPOUNDS**
Brandon Yomtov 2027
Steven T. Frey, Associate Professor, Chemistry Department

**COMPETITION EXPERIMENTS IN OXIDATIVE C-H AMINATION. SYNTHESIS OF DIVERSELY SUBSTITUTED N,N DIARYL UREA SUBSTRATES**
Sofia Lombardo, 2027
Patrick Jokiel, Visiting Assistant Professor, Chemistry Department

**PREVALENCE OF METAL RESISTANT BACTERIA NEAR PAPER MANUFACTURING SITES**
Ashley Gutierrez, 2028
Sylvia McDevitt, Associate Professor, Biology Department

**ASSESSING THE EFFECTS OF CONSERVATION PRATICES ON GARLIC QUALITY AND SOIL CARBON ON A SMALL VEGETABLE FARM**
Jenna Loveman, 2027
Kristofer Covey, Associate Professor, Environmental Studies and Sciences Department

## ROOM B

**DEVELOPING MICROFLUIDIC PAPER DEVICES FOR LOW-COST ANALYSIS OF CREATININE ASSAY**
Roberta Taylor-Smith, 2028
Kimberley Frederick, Professor, Chemistry Department

**EXPANDING THE *E. COLI* GENETIC CODE WITH PYROGLUTAMATE**
Abbey Grandin, 2027
Kelly Sheppard, Professor, Chemistry Department

**RETROSPECTIVE EVALUATION OF NCAA DIVISION III ATHLETE RECOVERY FROM COVID-19 USING INSTITUTIONAL PROTOCOLS: IMPACT OF ACUTE EXERCISE**
Kyle Heise, 2026
Stephen Ives, Professor, Health and Human Physiological Sciences Department

**REDUCING CARROTS: NOT JUST FOR RABBITS**
Slade Rice, 2027
Beatrice Kendall, Teaching Professor, Chemistry Department

**EXERCISE INTENSITY THRESHOLDS AS PREDICTORS OF ALL CAUSE AND CARDIOVASCULAR MORTALITY: A SYSTEMATIC REVIEW**
Mallory Allen, 2027
Edgard Soares, Visiting Assistant Professor, Health and Human Physiological Sciences Department

## ROOM C

**VISUALIZING SER5 PHOSPHORYLATION IN RNA POLYMERASE II CTD THROUGH CONTACT MAPS AND K-MEANS CLUSTERING**
Kian Sethi, 2026
K. Aurelia Ball, Associate Professor, Chemistry Department

**PHOTOOXIDATION ENHANCES WATER UPTAKE IN ORGANIC FILMS REPRESENTATIVE OF SEA SPRAY AEROSOLS**
Olivia Gottschall, 2026; Sofia Chihade, 2026; Elizabeth Scholar, 2024
Juan G. Navea, Professor, Chemistry Department

**HETEROGENEOUS OZONOLYSIS OF ADSORBED TERPENES**
Natalie O'Neill, 2026 and Maki Matsuoka, 2028
Juan G. Navea, Professor, Chemistry Department

**CALCIUM DYSREGULATION AND THE THERAPEUTIC POTENTIAL OF ANTIOXIDANTS IN SPINOCEREBELLAR ATAXIA TYPE 1**
Emily Lawrence, 2026
Sarita Lagalwar, Professor, Neuroscience Program

2:30-3:15 pm Poster Presentations Session 4

**ROOM A**

**DEVELOPMENT OF A LOW-COST COLORIMETRIC µPAD FOR THE ANALYSIS OF CEFTRIAXONE**
Jean Tavarez, 2027 and Roberta Taylor-Smith, 2028
Kimberley Frederick, Professor, Chemistry Department

**THE EFFECTS OF DIETARY CAPSAICIN ON VASCULAR FUNCTION IN ADULTS**
Valerie Chervinskaya, 2026
Stephen Ives, Professor, Health and Human Physiological Sciences Department

**CHARACTERIZATION OF ANCESTRAL ASPARTYL-tRNA SYNTHETASE SPECIFICITY**
Trish Tran, 2027 and Emily Serrano, 2028
Kelly Sheppard, Professor, Chemistry Department

**SYNTHESIS OF BENZIMIDAZOLONE DERIVATIVES VIA OXIDATIVE C-H AMINATION AND FUNCTIONALIZATION OF THE N-ARYL GROUP**
Charlotte Wilkes, 2027
Patrick Jokiel, Visiting Assistant Professor, Chemistry Department

**DISSECTING THE DOWNSTREAM TARGETS OF OCTOPAMINERGIC SIGNALING FOR SLEEP REGULATION IN *DROSOPHLIA MELANOGASTER***
Yiwen Su, 2026
Christopher G. Vecsey, Professor, Neuroscience Program

## ROOM B

**SYNTHESIS AND CHARACTERIZATION OF TWO NOVEL CROWN JEWEL CRYPTAND LIGANDS AND THEIR MANGANESE(II) COMPLEXES**
Kol Goldman, 2027
Steven T. Frey, Associate Professor, Chemistry Department

**INSTITUTIONAL STRATEGIZING & PROACTIVE POLICY MAKING: THE MODERN AGRICULTURAL BOOM OF BRAZIL AND ARGENTINA**
Lucas Gutierrez-Arnold, 2026
Feryaz Ocakli, Associate Professor, Political Science Department

**BINDING DYNAMICS OF ARKA-17 TO ABP1P SH3 DOMAIN WITH N-TERMINAL SIDE FILLER VARIANT**
Sophia Liras, 2028
K. Aurelia Ball, Associate Professor, Chemistry Department

**USING OXYGEN CONSUMPTION RATE AS A MEASURE OF MITOCHONDRIAL HEALTH IN AN *IN VITRO* MODEL OF SPINOCEREBELLAR ATAXIA TYPE 1**
Kayla Melendez, 2026
Sarita Lagalwar, Professor, Neuroscience Program

## ROOM C

**EFFECT OF ZINC SUPPLEMENT AND GENETIC DISPOSITION ON THE MOUSE GUT MICROBIOME**
Kieran Jenkins, 2026
Sylvia McDevitt, Associate Professor, Biology Department

**EXPLORING METHODS FOR QUANTIFYING SILVER IN NANOPARTICLE-POLY(VINYL ALCOHOL) FILMS**
Hayes Van Dis, 2028
Maryuri Roca, Associate Teaching Professor, Chemistry Department

**ABSORPTION SPECTRA OF AQUEOUS 4-IMIDAZOLECARBOXALDEHYDE: THEORETICAL AND EXPERIMENTAL INSIGHTS INTO A PROXY FOR ENVIRONMENTAL CHROMOPHORES**
Lily Watson, 2027
Juan G. Navea, Professor, Chemistry Department

**PHOTOSENSITIZED REDUCTION OF NO2 BY 4-BENZOYLBENZIOC ACID: A MODEL SYSTEM FOR THE ROLE OF ORGANIC CHROMOPHORES IN DAYTIME HONO FORMATION.**
Sofia Chihade, 2026
Juan G. Navea, Professor, Chemistry Department

## PROJECT ABSTRACTS

(In alphabetical order by professor's last name)

### SIMULATING THE STRONG FORCE WITH NEURAL NETWORKS

Jack Biggins, 2026
Anthony Ashmore, Assistant Professor, Physics Department

The strong force confines quarks inside protons and neutrons - quarks are never found in isolation. Understanding this confinement is one of the most important problems in theoretical particle physics. Unfortunately, the equations governing this force are extraordinarily difficult to solve and typically require supercomputers. Our work focused on $Z_2$ lattice gauge theory, a computationally manageable theory that also displays confinement. We used artificial neural networks to find the quantum state of this theory, extending existing two-dimensional neural network architectures to three dimensions. These "neural network quantum states" were then used to compute physical observables and to probe the phase transition where confinement emerges.

### EFFECT OF PROLINE ISOMERIZATION ON THE BINDING PATHWAY BETWEEN THE ABP1P SH3 DOMAIN AND THE INTRINSICALLY DISORDERED PROTEIN ARKA12

Sydney Rice, 2027
K. Aurelia Ball, Associate Professor, Chemistry Department

The yeast Abp1p SH3 domain is a protein domain that typically binds to proline-rich intrinsically disordered proteins (IDPs). Proline is a unique amino acid, as it is known to isomerize. ArkA is a proline rich IDP which contains the PXXP+ motif which allows it to form the Polyproline II Helix (PPII helix) secondary structure. . Molecular dynamics simulations were utilized to observe the effect of proline isomerization on the binding of the SH3 domain and ArkA. It was hypothesized that SH3 and ArkA would be unable to reach the bound state with a proline in the *cis* state. Molecular dynamics simulations revealed that despite the prolines being in the *cis* conformation, ArkA and SH3 were able to bind, without the PPII helix.

### VISUALIZING SER5 PHOSPHORYLATION IN RNA POLYMERASE II CTD THROUGH CONTACT MAPS AND K-MEANS CLUSTERING

Kian Sethi, 2026
K. Aurelia Ball, Associate Professor, Chemistry Department

Residues within the RNA Polymerase II C-Terminal Domain (CTD) are phosphorylated and unphosphorylated during transcription, but the mechanism by which phosphorylation affects the conformation remains unclear. Our project aims to understand this mechanism and how the regulation of transcription is altered. We utilized the K-means algorithm to cluster contact map data from GaMD simulations on two phosphorylated and unphosphorylated sequences. After this, we created averaged contact maps for each cluster and found their representative frames. By taking a large ensemble of conformations of the CTD and clustering our data, we are able to better visualize the most common conformations that occur in our simulations on the CTD, which will

give us more insight into the changes in the global conformation of this intrinsically disordered region.

**BINDING DYNAMICS OF ARKA-17 TO ABP1P SH3 DOMAIN WITH N-TERMINAL SIDE FILLER VARIANT**

Sophia Liras, 2028
K. Aurelia Ball, Associate Professor, Chemistry Department

The yeast AbpSH3 domain is a protein that typically binds to proline-rich intrinsically disordered proteins (IDPs), such as ArkA-17. Segment one of ArkA-17 is proline rich and therefor can bind to AbpSH3 however segment 2 has less binding affinity because it lacks proline. Molecular dynamics simulations were utilized to simulate ArkA-17 with segment 1 replaced with a GS linker and the central lysine residue at the boundary of segment 1 and segment 2, which is important for binding affinity of the peptide. Based on these results we expected the GS filler with the central lysine and segment 2 to stay fully bound. Of the simulations run 30% reached the encounter complex, while 10% reached the unbound state and 60% remained fully bound.

**GAUSSIAN-ACCELERATED MOLECULAR DYNAMICS SIMULATIONS OF THE PROTEIN COMPLEX VCBC**

Anna Rader, 2028
K. Aurelia Ball, Associate Professor, Chemistry Department

HIV-I Viral infectivity factor ($Vif_1$) is a viral protein that binds to the human antiviral protein A3F and marks it for ubiquitination. To act as a substrate for A3F, $Vif_1$ binds to Elongin B, Elongin C, and CBF-β, forming the VCBC complex. Understanding VCBC's conformational ensemble unbound to the stabilizing protein Cul5 could enable therapeutically relevant discoveries in inhibiting full assembly of the VCBC-A3F ubiquitination complex by stabilizing an alternate VCBC conformation. 3 independent 100 ns Gaussian-accelerated molecular dynamics (GaMD) simulations were run to observe conformation changes of the VCBC complex. The results suggest that VCBC is very conformationally flexible when not bound to Cul5 or A3F and that modifying the energy landscape reveals conformational changes not normally observed on a typical MD simulation timescale.

**UNCONSTITUTIONAL CHANGES IN GOVERNMENT: LEGITIMIZING LEADERSHIP**

Justin Pollard, 2027
Emmanuel Balogun, Associate Professor, Political Science Department

How do unconstitutional changes in government impact political stability? In this paper, I explore how rulers in Burkina Faso and Syria used military coups to acquire political power. The paper explores and compares the early actions of each leader, their political challengers, and their plans to revamp their political institutions in their image. This project seeks to understand how leaders who come to power through illegal means attempt to consolidate power and gain popular support among their populations.

**CITIZENSHIP UNDER WATCH: NAVIGATING DEMOCRACY AND SECURITY IN SOUTH ASIA**

Adya Sehgal, 2026
Yelena Biberman-Ockali, Associate Professor, Political Science Department

How do citizens in militarized regions of South Asia experience democracy amid pervasive surveillance and security-driven governance? Drawing on original survey data and geospatial analysis, the research explores how militarization shapes political participation, trust in institutions, and civic identity. Special attention is given to youth perspectives, revealing how everyday choices are filtered through a lens of fear, resilience, and adaptation. By integrating statistical insights with conceptual frameworks from Political Science, the study offers a data-focused yet human-centered account of democratic life in contested environments. The project contributes to broader conversations about state power, citizenship, and the paradoxes of democracy under duress. In doing so, it raises timely questions about who participates, who is protected, and who is under watch.

**DECOLONIZING SOCIAL WORK WITH REFUGEE COMMUNITIES: PRIORITIZING "OTHER" WAYS OF KNOWING**

Suleiman Lailati, 2028
Neil Bilotta, Assistant Professor, Social Work Department

Social work's ethical principles prioritize applying worldviews from across the globe. Indeed, the field of social work recommends that social workers "decolonize and indigenize" the profession to decenter mainstream, often White, Eurocentric methods. However, few studies have examined how social workers utilize and apply decolonizing approaches in research, policy, and practice. As some of the most marginalized communities across the globe, persons experiencing refugee status (PERS) require social work practices that align with their own cultures and contexts. This exploratory study examines how (a) PERS living in Vermont, (b) social service providers working with PERS, and (3) East African academics understand and apply "decolonization in practice" as it relates to social work practice, policy, and research with PERS living in the US and East Africa.

**CANNABIDIOL DOSE RESPONSE AND INDUCED DEFECTS IN ZEBRAFISH EMBRYOS**

Declan Keefe, 2026 and Audrey Bowen, 2027
Jennifer Bonner, Associate Professor, Biology Department and Neuroscience Program

Although the use of medical and recreational cannabis has been recently legalized in many states, there is a significant gap in knowledge on the ramifications of use. Our lab has shown that the entourage impairs muscle function and structure in zebrafish (Danio rerio). To understand which cannabinoids are responsible, we introduced varying concentrations of cannabidiol (CBD) to 24 hours post-fertilization (hpf) zebrafish and observed both behavioral and anatomical defects at 26 hpf and 48 hpf at a minimum of 1μg/mL CBD. These results suggest that previously observed entourage effects can be reached using just CBD, although future studies are required to determine if CBD is solely responsible for the observed defects.

**EXPLORING NOCICEPTION IN FRUIT FLY LARVAE**

Kai Norman, 2027
Jennifer Bonner, Associate Professor, Biology Department
Christopher G. Vecsey, Professor, Neuroscience Program

This study aimed to investigate nociception in *Drosophila melanogaster* larvae. We did this through two avenues. First, we tested the effects of cannabis on motor responses, following up on findings in zebrafish that cannabis exposure disrupted muscle development and movement. We raised fruit fly larvae on food containing hemp extract and tested their nociception by applying mechanical stimulation and observing their rolling responses. There was no effect of hemp extract exposure, likely due to the lack of an endocannabinoid system in *Drosophila*. Secondly, we tested nociceptive responses in flies that were designed to inhibit neurons that produce the neuropeptides short neuropeptide F (sNPF) or leucokinin (LK) when exposed to green light. We examined nociceptive responses to mechanical and chemical stimuli, and are currently compiling the results.

**RESEARCHING AND ANNOTATING THE WORLD OF THORNTON WILDER**

Juliana Brueckner, 2027
Joseph Cermatori, Associate Professor, English Department

This presentation will outline the research and development process of finalizing an anthology of Thornton Wilder's non-fiction writings for publication with a university press. Our process has primarily involved researching historical and biographical data to draft the book's endnotes. Wilder's texts mention numerous historical figures, publications, and events, many of which are not widely remembered. We will describe how we worked together to determine which references were noteworthy enough to receive annotation; sought background information about those figures and events using scholarly sources; and created brief (one-to-two-line) explanatory endnotes about their historical importance. We will also share some of the historical findings that most illuminated Wilder's lifeworld for us. Last, we will discuss our process of checking the manuscript for accuracy against Wilder's original documents.

**ASSESSING THE EFFECTS OF CONSERVATION PRATICES ON GARLIC QUALITY AND SOIL CARBON ON A SMALL VEGETABLE FARM**

Jenna Loveman, 2027
Kristofer Covey, Associate Professor, Environmental Studies and Sciences Department

Agricultural conservation techniques have been shown to increase soil organic carbon (SOC). We undertook a field experiment at Pitney Meadows Community Farm to explore the effects of tillage and compost amendments on garlic. We collected garlic from four treatment plots: tillage (T), tillage and compost (TC), minimal tillage (MT), minimal tillage and compost (MTC). We took soil samples in each plot to evaluate the SOC concentrations across treatments. We hypothesize that MTC plots will have the highest SOC and highest quality garlic due to decreased soil disturbance and increased microbial activity while TC plots will have the lowest SOC and lowest quality garlic. These data will allow us to make recommendations about conservation practices for growing garlic on small farms in the region.

**CONTINUING A HISTORY OF SERVICE AND COLLABORATION**
Jonah Cadorette, 2026
Charlotte D'Evelyn, Assistant Professor, Music Department

Skidmore College has collaborated with Kanatsiohareke Mohawk Community since its reestablishment in 1993. Through MDOC's Co-Creation Initiative, my research has been both scholarly and service-oriented, striving to continue this history of collaboration. The research was multi-faceted as I conducted archival work, utilized my skills in carpentry and woodworking, volunteered at Kanatsiohareke's Strawberry Festival, went on local field trips to museums and sacred sites, and engaged with Indigenous scholarly articles and books, including Tom Porter's *Kanatsiohareke: Traditional Mohawk Indians Return to Their Ancestral Homeland* (1998). This research is ongoing and strives to strengthen the collaborative relationship between Skidmore College and Kanatsiohareke Mohawk Community.

**WORKING WITH A TIGHT-KNIT COMMUNITY**
Justin Cepeda, 2028
Charlotte D'Evelyn, Assistant Professor, Music Department

Since 2021, Skidmore has partnered with our Indigenous neighbors in the Kanatsiohareke Mohawk Community through the MDOCS Co-Creation Initiative. Continuing this tradition of service-based work, I offered my skills and crafted a set of curtains that will be housed in a new Visitor Center at the Kanatsiohareke property in Fonda, NY. With the help of scholarly resources in Indigenous textile work (see Holler 2012, Winter 2018), my process included looking for specific pest-resistant, sturdy, insulating fabrics that will be long-lasting and serve the needs of the Visitor Center space. This project symbolizes the weaving together of these two communities — Skidmore and Kanatsiohareke — in a relationship of friendship and collaboration.

**PRESERVATION, CONSERVATION, AND CONTINUATION**
Tommy Troesch, 2026
Charlotte D'Evelyn, Assistant Professor, Music Department

This research project centers around a service-based relationship between Skidmore College and the Kanatsiohareke Mohawk Community. My work has involved digitizing analog materials collected by Mohawk elder Kay Olan, transcribing oral interviews conducted by Mohawk filmmaker Raienkonnis Edwards, and editing video footage from the Kanatsiohareke Strawberry Festival. This archival and media-based project has relied on close collaboration with Indigenous community partners and demonstrates a commitment to local knowledge and Indigenous research methodologies (see Tuhiwai Smith 1999, Anderson and Francis 2021). Our work speaks to the importance of working closely with Indigenous communities to hear and document their stories from their perspectives, respecting the dignity of their culture, history, and art.

**ADAPTIVE TRAFFIC SIGNALS: REINFORCEMENT LEARNING MEETS BROADWAY STREET FOR THE FIRST TIME**
Azizul Hakim,2026
Wenlu Du, Assistant Professor, Computer Science Department

AI-based traffic signal control using reinforcement learning (RL) remains largely experimental in the U.S., where most intersections—including those on Broadway Street in Saratoga Springs—

still rely on fixed-time systems with limited adaptability. To bridge this gap, our research takes the first step in evaluating RL at a real-world intersection on Broadway, a high-traffic corridor known for heavy congestion, pedestrian flow, and diverse vehicle types. Using SUMO, a widely adopted traffic simulator, we modeled realistic conditions, i.e., bus stops and pedestrian crossings. We explored effective state representations, carefully designed actions and reward functions, and evaluated RL performance under realistic traffic patterns. A comparative analysis among RL methods such as PPO and traditional methods was conducted to identify the effective strategy for adaptive, real-time signal optimization.

**BIPEDAL LOCOMOTION IN QUADRUPEDAL ROBOTS USING REINFORCEMENT LEARNING**

Hamza Mustafa, 2027
Wenlu Du, Assistant Professor, Computer Science Department

Quadrupedal robots are increasingly used in real-world tasks, but enabling them to also operate on two legs could significantly improve their flexibility and usefulness. This research explores how to train a quadruped robot to stand and walk bipedally using reinforcement learning. We implement the Proximal Policy Optimization (PPO) algorithm in Isaac Lab to teach a simulated Unitree Go2 robot to balance on its hind legs. The study focuses on designing reward functions that guide learning behavior and testing how combinations of these rewards affect stability and motion. Our goal is to identify simple, effective strategies for enabling bipedal locomotion on both flat and rough terrain, contributing to the development of more adaptable and capable legged robots.

**SKID-CHAT: A RETRIEVAL-AUGMENTED AI ASSISTANT FOR SMARTER ANSWERS AT SKIDMORE**

AJ Woods, 2027
Wenlu Du, Assistant Professor, Computer Science Department

This study investigates the extent to which Large Language Models (LLMs) demonstrate true semantic understanding versus reliance on surface-level statistical patterns. In the first phase, we conducted a series of semantic similarity experiments, revealing that decoder-based (e.g., GPT) models, despite their generative fluency, perform poorly on tasks requiring deep semantic discrimination. A second experiment on duplicate question detection reinforced these findings, suggesting fundamental limitations in LLMs' comprehension abilities. To address these shortcomings, we implemented a retrieval-augmented generation (RAG) framework that allows an LLM to access external information. The result is Skid-Chat, a custom GPT-4-powered chatbot designed to answer Skidmore-related inquiries by retrieving relevant documentation before generating responses. This project highlights both the limitations of current LLMs and the promise of targeted augmentation for domain-specific applications.

**WHY ARE PEOPLE MOVING OUT OF CALIFORNIA? THE POSSIBILITY OF INTERSTATE WHITE FLIGHT**

Sofia O'Brien, 2026
Amon Emeka, Associate Professor, Sociology Department

This research explores whether race plays a role in who has been leaving California in recent years-- asking if the state's changing racial composition is contributing to patterns of outmigration. As California grows more racially diverse, examining who is choosing to leave the state may uncover an interstate pattern of "White Flight." Using 2019-2023 American Community Survey data, we

analyze outmigration patterns--employing logistic regression to gauge the effects of race on the odds of outmigration from California, all else being equal. Previous findings have mainly investigated residential White Flight within metropolitan areas, with few studies focusing on interstate moves. Our initial findings suggest that White people are most likely to leave California, but race alone is not driving their exodus.

**DEVELOPMENT OF AN ACCESSIBLE AND RAPID TEST TO DETECT REDUCING SUGARS IN BEVERAGES USING µPADS**

Sarah Hailey, 2028
Kimberley Frederick, Professor, Chemistry Department

Sugary drinks contain reducing sugars such as glucose and fructose. Consuming high amounts of these added sugars is correlated with poor health outcomes, making it vital for people to know the amounts of reducing sugars in beverages. We are developing a method to detect the concentration of reducing sugars in liquids using a rapid and inexpensive test with paper microfluidic devices (µPADs), which allow people without access to scientific instruments to perform inexpensive tests. This method involves chemically creating a visual color gradient that is captured on a cell phone to detect the concentration of reducing sugars in a sample. We are focused on improving the linear range and reagent stability of dried chips and designing a 3D printed device to increase precision in image capture.

**DEVELOPING MICROFLUIDIC ANALYTICAL DEVICES FOR ANTIOXIDANT DETECTION**

Arin Eang, 2028 and Jean Tavarez, 2027
Kimberly Frederick, Professor, Chemistry Department

People consume products containing antioxidants for many health benefits, such as helping strengthen their immune system. This research will focus on testing food rich in antioxidants, such as kombucha, as it is important to consume healthy amounts of antioxidants to support the body's balance. Measuring antioxidant capacity using the FRAP (Ferric Reducing Antioxidant Power) assay in paper-based microfluidic analytical devices (µPADs) offers a rapid, low-cost, and portable solution, ideal for low-resource settings. The assay works by reducing ferric ions ($Fe^{3+}$) to ferrous ions ($Fe^{2+}$) in the presence of TPTZ (2,4,6-tripyridyl-s-triazine), forming a blue $Fe^{2}$–TPTZ complex. The intensity of the blue color is directly proportional to the antioxidant capacity of the sample. Results can be quantified visually or with smartphone images. We have determined a linear range, sensitivity, and optimized the reagents' stability to improve performance, which we hope will ensure reliable, user-friendly antioxidant testing.

**DEVELOPING MICROFLUIDIC PAPER DEVICES FOR LOW-COST ANALYSIS OF CREATININE ASSAY**

Roberta Taylor-Smith, 2028
Kimberley Frederick, Professor, Chemistry Department

Our bodies constantly produce creatinine, a byproduct of muscle metabolism, which is filtered out by healthy kidneys. Measuring creatinine levels is important for assessing kidney function and comparing biomarkers like D-lactate, an indicator of malaria. We are developing low-cost, color-based microfluidic paper analytical devices (µPADs) for detecting creatinine in urine. These devices align with the WHO's REASSURED criteria for effective diagnostics. The colorimetric response (color change) is analyzed using our cellphone images and ImageJ software. Our research

focuses on optimizing reagent stability and evaluating key performance parameters such as linear range and sensitivity. This work contributes to the broader goal of expanding access to affordable, portable diagnostic tools, especially in low-resource settings.

**DEVELOPMENT OF A LOW-COST COLORIMETRIC µPAD FOR THE ANALYSIS OF CEFTRIAXONE**

Jean Tavarez, 2027 and Roberta Taylor-Smith, 2028
Kimberley Frederick, Professor, Chemistry Department

Antibiotics, including ceftriaxone, are essential medications used worldwide to treat a variety of infections. Accurate dosing is crucial to avoid the growing threat of antibiotic resistance. However, many countries lack the infrastructure to monitor and verify proper antibiotic dosage. Microfluidic paper analytical devices (µPADs) offer a valuable solution. µPADs are low-cost, portable, and easy-to-use tools that allow users to quickly determine the concentration of a drug in a given sample. Through the analysis of ceftriaxone using µPADs, key performance metrics, including linear range, accuracy, precision, sensitivity, and selectivity, have been evaluated to enhance the device's accessibility and overall efficiency. Additionally, the µPADs have demonstrated long-term stability, maintaining consistent performance even after nearly two months of storage. This extended shelf life supports their practicality for widespread reliable use.

**SYNTHESIS AND CHARACTERIZATION OF TWO NOVEL CROWN JEWEL CRYPTAND LIGANDS AND THEIR MANGANESE(II) COMPLEXES**

Kol Goldman, 2027
Steven T. Frey, Associate Professor, Chemistry Department

Manganese(II) compounds with high aqueous stability are sought as potential antioxidant pharmaceuticals and MRI contrast agents. We have recently synthesized two new cryptand ligands, a class of compounds with cage-like structures capable of forming stable compounds with a variety of ions. To do this, we capped diaza 15- and 18-crown compounds with dimethylpyridyl groups forming what we call crown jewel ligands. These ligands were extensively characterized using NMR techniques, LC-MS, XRF, IR, and elemental analysis. We have also synthesized $Mn^{2+}$ complexes with the crown jewel ligands and characterized these structurally using X-ray crystallography. In addition to forming stable $Mn^{2+}$ complexes, the crown jewel ligands also form a complex with sodium and lithium ions which we have characterized by crystallography.

**THE SYNTHESIS AND CHARACTERIZATION OF A NOVEL MANGANESE (II) SUPEROXIDE DISMUTASE BIOMIMETIC INCORPORATING A DIAZA-MACROCYCLE WITH PYRIDYLMETHYL GROUPS**

Holden Caney, 2027
Steven Frey, Associate Professor, Chemistry Department

Superoxide anion ($O_2^{\bullet-}$), a free radical side-product generated by the mitochondria during cellular respiration, is a reactive oxygen species (ROS) that causes oxidative damage to cells. Manganese superoxide dismutase (MnSOD), a protective antioxidant enzyme, catalyzes the disproportionation of $O_2^{\bullet-}$ into molecular oxygen and hydrogen peroxide, thereby protecting cells from this toxic species. We have synthesized a novel diaza-crown ether ligand with two pyridylmethyl groups, which forms a manganese(II) complex structurally similar to the active site of MnSOD. Characterization of the ligand was achieved with $^{1}H$ and $^{13}C$ NMR, FT-IR, LC-MS, and elemental analysis. Potentiometric titrations reveal that the ligand forms a stable complex with $Mn^{2+}$ in

aqueous solution, and electrochemical and reactivity studies of the complex indicate that it is biomimetic of MnSOD.

**COMPARISON OF THE PROPERTIES OF TWO MANGANESE (II) COMPLEXES WITH CROWN ETHER-BASED LIGANDS AS SUPEROXIDE DISMUTASE MIMETICS**.

Hanyu Ruan, 2027
Steven T. Frey, Associate Professor, Chemistry Department

Superoxide dismutase (SOD) is an essential enzyme that participates in metabolic pathways that eliminate reactive oxygen species (ROS), toxic side products of respiration. SOD biomimetic compounds are of interest as potential pharmaceuticals to help eliminate abnormal levels of ROS brought on by inflammatory disease processes. We have synthesized two aza-crown ether ligands, each containing one pyridine group, along with their $Mn^{2+}$ complexes as SOD biomimetics. The ligands and their complexes have been thoroughly characterized, including structural and solution-state analyses employing a variety of spectroscopic techniques, potentiometry, X-ray crystallography, and reactivity studies. Our study reveals dramatic differences between these compounds that will inform the design of future biomimetics.

**SYNTHESIS OF A NOVEL TRIPYRIDYL CYCLAM LIGAND FOR THE FORMATION OF STABLE MANGANESE(II) COMPOUNDS**

Brandon Yomtov ‘27
Steven T. Frey, Associate Professor, Chemistry Department

Manganese(II) compounds have been targeted recently as potential antioxidant pharmaceuticals and MRI contrast agents. These compounds must be highly stable in aqueous solution to be viable. This project focused on the synthesis of a novel tripyridyl cyclam ligand. Cyclams are tricyclic compounds that form very stable complexes with metal ions. The synthetic procedure that we developed for the tripyridyl cyclam involves four steps. We have successfully achieved three of the four steps and are currently working on the final step. Following each step of the reaction, the product was purified by liquid extraction and/or column chromatography and characterized by NMR and IR. Optimization of each reaction step was achieved by changing variables such as reagents, reagent addition times, solvent choice, or purification method.

**THE EFFECTS OF DIETARY CAPSAICIN ON VASCULAR FUNCTION IN ADULTS**

Valerie Chervinskaya, 2026
Stephen Ives, Professor, Health and Human Physiological Sciences Department

Chronic intake of spicy peppers, and the active ingredient capsaicin, has been linked to reduced risk of cardiovascular disease (CVD), but how is unknown. Flow-mediated Dilation (FMD) is a test of vascular function and a bioassay for nitric oxide (NO) bioavailability, both of which relate to CVD risk. It is unknown if capsaicin improves vascular function which in turn explains the reduction in CVD. Thus, in a double-blind randomized controlled trial we determined if 6-weeks of capsaicin or placebo supplementation could improve brachial artery FMD. Using a rapid inflator cuff and duplex ultrasound, brachial diameters and blood velocity were collected at baseline and for 2 minutes of reperfusion. No significant differences in FMD have been found yet between the groups after 6-weeks of supplementation.

**THE EFFECTS OF DIETARY CAPSAICIN ON MOVEMENT-INDUCED HYPEREMIA**
Isabella Harelick, 2026
Stephen Ives, Professor, Health and Human Physiological Sciences Department

Cardiovascular disease (CVD) is the leading cause of death in the United States, affecting men and women differently, highlighting the importance of understanding vascular regulation and in both sexes. Interestingly, regular dietary capsaicin (spicy pepper) has been shown to reduce CVD, which might be due to enhanced bioavailability of the dilator nitric oxide (NO) and thus vascular function. We assessed the sex specific impacts of 6-weeks of dietary capsaicin on the hyperemic response to passive leg movement (PLM), a model that reflects primarily NO-mediated vasodilation, in a randomized controlled trial. Preliminary analyses suggest that capsaicin did not affect the hemodynamic responses in either men or women. Further exploration of sex-specific dietary strategies, including capsaicin, for vascular health should be conducted in the future.

**RETROSPECTIVE EVALUATION OF NCAA DIVISION III ATHLETE RECOVERY FROM COVID-19 USING INSTITUTIONAL PROTOCOLS: IMPACT OF ACUTE EXERCISE**
Kyle Heise, 2026
Stephen Ives, Professor, Health and Human Physiological Sciences Department

COVID-19 has been shown to cause lasting physiological effects, even in young, healthy athletes, which prompted the development of return-to play-protocols (RTP). The purpose of this study was to examine the changes in cardiovascular parameters (HR, BP, PP, RPP, $SpO_2$) during recovery of COVID-19 and whether the response to exercise can predict convalescence. HR and RPP increased significantly with exercise ($p < 0.001$), while $SpO_2$ decreased ($p < 0.001$). Post-exercise HR and baseline $SpO_2$ predicted prolonged RTP duration (HR: $\beta = –0.062$, $p = 0.008$; $SpO_2$: $\beta = –0.949$, $p = 0.024$). BP classification (normal vs elevated) did not significantly influence RTP time. These findings suggest that reduced baseline $SpO_2$ and elevated post-exercise HR may identify athletes at risk for delayed convalescence following COVID-19

**COMPETITION EXPERIMENTS IN OXIDATIVE C-H AMINATION. SYNTHESIS OF DIVERSELY SUBSTITUTED N,N DIARYL UREA SUBSTRATES**
Sofia Lombardo, 2027
Patrick Jokiel, Visiting Assistant Professor, Chemistry Department

The synthesis of N,N'-diaryl urea substrates was investigated. The protocol uses a copper catalyst and a ligand that is not commercially available. Synthesis of this ligand proved challenging, requiring extensive optimization of reaction conditions. The ligand has been formed and optimization of yield is ongoing.

**C-H/ARYL AMINATION-DRIVEN SYNTHESIS OF UREA-BASED N-HETEROCYCLES**
Xiaoran Liu, 2026
Patrick Jokiel, Visiting Assistant Professor, Chemistry Department

Two paths for the synthesis of benzimidazolone derivatives with heteroatom incorporation were explored via oxidative C-H amination/cyclization of urea derivatives. It was found that *N*-pyridyl urea derivatives were unreactive under a variety of conditions. *N*-methyl pyridyl urea derivatives were synthesized following an intensive examination of aryl amination reaction conditions.

**STREAMLINED SYNTHESIS OF BENZIMIDAZOLONE DERIVATIVES VIA OXIDATIVE C-H AMINATION AND SUZUKI COUPLING SEQUENCE**

Deirdre Stockdill, 2027
Patrick Jokiel, Visiting Assistant Professor, Chemistry Department

Benzimidazolones are a type of drug molecule with documented therapeutic effects in biological systems. As such, they are a target of interest for medicinal and synthetic chemists. Over a 10-week period, a series of benzimidazolone derivatives were synthesized. This streamlined synthesis involved the use of metal-free oxidative C-H amination to cyclize substrates, followed by C-C bond formation through Suzuki couplings to diversify the collection. This synthetic pathway is significantly more concise than the current synthetic route used in the pharmaceutical industry. Future work will submit synthesized compounds for biological screening and expand the current molecular collection to explore how the cyclization proceeds when different functional groups are present on the core.

**SYNTHESIS OF BENZIMIDAZOLONE DERIVATIVES VIA OXIDATIVE C-H AMINATION AND FUNCTIONALIZATION OF THE N-ARYL GROUP**

Charlotte Wilkes, 2027
Patrick Jokiel, Visiting Assistant Professor, Chemistry Department

The synthesis of benzimidazolone derivatives via a sequence of oxidative C-H amination and Suzuki coupling reactions was investigated. The cyclization of the N-benzyl urea substrate produced an unexpected product. Various reaction parameters were investigated to address this: base performance, reaction time, and atmosphere. By rigorously excluding oxygen, the formation of the expected product was favored. Additional studies involving a modified substrate are underway.

**KETIMINE SYNTHESIS VIA "FRUITFUL" GREEN CHEMISTRY REACTIONS**

Arel Rivera, 2027
Beatrice Kendall, Teaching Professor, Chemistry Department

A core principle of green chemistry aims to use less hazardous substances in reactions, and oftentimes these less hazardous substances are more commonplace and much more affordable than their toxic counterparts. Fruit juices have previously been found to act as effective catalysts and solvents in the synthesis of aldimines, imines formed from a primary amine and an aldehyde. Ketimines, imines formed from a primary amine and a ketone, can be used as precursors for chiral molecules, which in turn are important for drug design and function. The efficacy of using fruit juices to synthesize these ketimines was explored and analyzed.

**REDUCING CARROTS: NOT JUST FOR RABBITS**

Slade Rice ‘27
Beatrice Kendall, Teaching Professor, Chemistry Department

One of the core principles of green chemistry—designing less hazardous chemical syntheses, promotes the use of substances with minimal toxicity to human health and the environment The transformation of ketones into secondary alcohols is widely used to synthesize pharmaceutical, agrochemicals, as well as other fine complex molecules. Carrots act as a natural and sustainable reducing agent, capable of converting ketones to secondary alcohols. The reducing ability of

carrots is attributed to the ketoreductase enzyme, which facilitates enantioselective reduction. This project aims to highlight the potential of plant-based reagents to replace traditional chemical methods.

**FROM FARM TO FUME HOOD: SUSTAINABLE IMINE SYNTHESIS AND REDUCTION USING FRUIT JUICE AND CARROTS**

Jude Remenar, 2027
Beatrice Kendall, Teaching Professor, Chemistry Department

Imines are important intermediates in the synthesis of pharmaceuticals, agrochemicals, and fine chemicals, making efficient and sustainable preparation highly valuable. Their reduction to corresponding amines produce building blocks crucial in drug development. This work applies green chemistry principles to imine synthesis by using aqueous fruit juices and water as environmentally benign solvents to substitute traditional chemical solvents. Steric, electronic, and pH effects were examined under these conditions, yielding significant conversion rates. To further extend the green methodology, resulting imine products were reduced using either solvent-free conditions or carrot as the bio-based reducing agent.

**USING OXYGEN CONSUMPTION RATE AS A MEASURE OF MITOCHONDRIAL HEALTH IN AN *IN VITRO* MODEL OF SPINOCEREBELLAR ATAXIA TYPE 1**

Kayla Melendez, 2026
Sarita Lagalwar, Professor, Neuroscience Program

Spinocerebellar ataxia type 1 (SCA1) is a neurodegenerative disorder caused by a CAG repeat expansion mutation in the Ataxin-1 (ATXN1) gene. The most affected cells, the Purkinje neurons of the cerebellum, possess impaired mitochondria that produce insufficient amounts of energy. The current study aimed to optimize the Agilent Seahorse Mito Stress Test Assay. This assay was used to identify compounds that can mitigate the mitochondrial deficits seen in an *in vitro* model of SCA1. Daoy human medulloblastoma cells (Daoy) and a stably transfected SCA1 disease line of Daoy cells (82Q) were used in this assay to measure the Oxygen Consumption Rate (OCR) of the live cells, as OCR is an indicator of overall mitochondrial health. These experiments are ongoing, and the analyzed results will be presented at the Faculty Student Summer Research Presentations. Future directions include the development of an ameliorative, mitochondrial-targeted therapeutic cocktail for SCA1.

**CALCIUM DYSREGULATION AND THE THERAPEUTIC POTENTIAL OF ANTIOXIDANTS IN SPINOCEREBELLAR ATAXIA TYPE 1**

Emily Lawrence, ‘2026
Sarita Lagalwar, Professor, Neuroscience Department

Spinocerebellar Ataxia Type 1 (SCA1) is a progressive neurodegenerative disease primarily affecting the cerebellum, caused by a CAG trinucleotide mutation in the ataxin-1 gene. Emerging evidence suggests that mitochondrial dysfunction and dysregulated calcium signaling may play a significant role in SCA1 pathogenesis. The current study investigated calcium signaling dynamics in response to mitochondrial inhibitors and antioxidant treatments in control (DAOY), SCA1 model (DAOY-ATXN1[82Q]), and non-pathogenic expanded repeat (DAOY-ATXN1[A776]) human medulloblastoma-derived cell lines. Results indicate the ability of the antioxidant treatment [Mndpdea] to attenuate calcium dysregulation, even under conditions of mitochondrial stress. This highlights the potential for a protective role of antioxidants on oxidative stress pathways. Future

research will investigate the effects of antioxidant treatment in SCA1 mouse models to further elucidate its therapeutic potential for human disease.

**INTERACTION BETWEEN ATAXIN-1 AND THE MITOCHONDRIA IN SPINOCEREBELLAR ATAXIA TYPE 1 (SCA1) THROUGH CONFOCAL MICROSCOPY**

Abigale Glasman, 2026
Sarita Lagalwar, Professor, Neuroscience Program

Spinocerebellar ataxia type 1 (SCA1) is an inherited neurodegenerative disease caused by a CAG expansion in the ataxin-1 (ATXN1) gene that leads to cerebellar ataxia, dysarthria and cognitive impairment. While mitochondrial dysfunction is commonly found within numerous neurodegenerative diseases, the interaction between the mutant ATXN1 and the mitochondria is not well understood. The current study aims to determine whether an interaction is present between the mitochondria and mutated ATXN1 through immunocytochemistry (ICC) and confocal microscopy. Z-stack imaging was done on human derived medulloblastoma cells stained for ATXN1 and various mitochondrial proteins to assess the potential colocalization and distribution within the cell. This study is ongoing and quantification of the colocalization will be done to further elucidate the interaction of the mutant ATXN1 and the mitochondria.

**THE EFFECT OF ROAD SALT RUNOFF ON AMPHIBIAN FUNGAL DISEASE**

Lee Cohn, 2027 and Janu Dreher, 2027
Emily Le Sage, Assistant Professor, Biology Department

We are studying the pathogenic fungus *Batrachochytrium dendrobatidis* (Bd) as it has caused irreparable damage to hundreds of frog species. Given that stress can affect immunity, we hypothesized that a chronic stressor, road salt runoff, can increase amphibian susceptibility to Bd. In this ongoing experiment, we investigate the immune response and infection intensity of frogs after exposure to road salt. In the field, multiple amphibian species living in ponds that varied in salinity were swabbed to estimate infection intensity. In the lab, we collected antimicrobial peptides (AMP) from wood frogs which were raised in road salt treated water. AMPs are one of the strongest immune defenses amphibians have to Bd, since they are able to break down cell membranes. These results can inform better management of amphibian populations and reduce the use of pollutants such as road salt.

**THE FUTURE OF QUANT INVESTING**

Will Devall, 2026 and Rumi Schemmerer, 2026
Matt Lucas, Harder Chair, Management & Business Department

With rapid advancements in large language models (LLMs), autonomous agent systems capable of analyzing real-time market data, generating trade recommendations, and executing orders are quickly becoming a reality. Our long-term project of developing such an agent, the Kaleido Agent, hinges on the findings of our current research, which aims to determine the feasibility of AI's use as a financial advisor, as well as its reliability and operating efficiency. To evaluate these attributes, we collect data on covered call recommendations from two LLMs—Perplexity Deep Research and Chat-GPT4.1—targeting an approximate 3% return through our options trading strategy. By comparing returns generated by each LLM against our independently researched trades, we aim to identify specific areas where AI surpasses or lags behind human performance. As such, our

research investigates technical challenges posed by human error, highlights ethical implications surrounding AI usage, and creates opportunities for democratizing financial literacy, ultimately reshaping the financial landscape as we currently understand it.

**EFFECT OF ZINC SUPPLEMENT AND GENETIC DISPOSITION ON THE MOUSE GUT MICROBIOME**

Kieran Jenkins, 2026
Sylvia McDevitt, Associate Professor, Biology Department

My research investigates the correlation between Alzheimer's disease and the gut microbiome, with a focus on how dietary zinc further impacts this relationship. Prior to May, two groups of mice (WT and Alzheimer's) were divided to receive either a low-zinc or high-zinc concentrated diet and fecal samples were collected before the start of the experiment and after 4 weeks. To analyze the mice's gut microbiota, DNA was isolated from the fecal samples. 16S rDNA was PCR amplified using the 16S Barcoding Kit 24 V14 and sequenced in a flongle flow cell. This method identified and quantified the microbial species present in each sample.

**PREVALENCE OF METAL RESISTANT BACTERIA NEAR PAPER MANUFACTURING SITES**

Ashley Gutierrez, 2028
Sylvia McDevitt, Associate Professor, Biology Department

Environmental pollution from heavy metals poses serious risks to the ecosystem and public health due to their toxicity and persistence. Industrial growth and urbanization have increased heavy metal contamination in soil and water, notably in Saratoga County along Kayaderosseras Creek and Ballston Spa. This study identified nine bacterial strains isolated from sediment samples via copper-enriched cultures. Molecular characterization using 16S rDNA sequencing identified the isolates by comparing the PCR amplified sequences against the NCBI BLAST database. Additionally, whole genome sequencing was performed for six of the isolates to analyze their complete genetic profiles. The study aimed to understand the co-selection of heavy metal and antibiotic resistance in these bacteria, highlighting their potential role in bioremediation of contaminated environments.

**BOX MODELING OF THE PHOTOCHEMICAL FORMATION OF ATMOSPHERIC NITROUS ACID (HONO)**

Ben Pollara, 2028; Sofia Chihade, 2026; Lily Watson, 2027
Juan G. Navea, Professor, Chemistry Department

Nitrous acid (HONO) dissociates in the presence of light, producing up to 60% of atmospheric hydroxyl radicals (OH), the primary oxidizing species in the troposphere. Despite its short photo-lifetime, maximum concentrations of HONO are often observed at noon in the marine boundary layer (MBL), suggesting active daytime formation pathways. To investigate these processes, we conducted laboratory experiments to characterize both thermal and photochemical mechanisms of HONO formation. These results were then used to program a box model, a simplified atmospheric simulation, initiated with adsorbed nitrogen dioxide ($NO_2$) as the starting reactant. Simulated HONO formation pathways were compared to experimental observations to assess not only the model’s ability to reproduce key features of the data, but also to examine our experimental framework.

**PHOTOOXIDATION ENHANCES WATER UPTAKE IN ORGANIC FILMS REPRESENTATIVE OF SEA SPRAY AEROSOLS**

Olivia Gottschall, 2026; Sofia Chihade, 2026; Elizabeth Scholar, 2024
Juan G. Navea, Professor, Chemistry Department

Understanding how aerosol particles interact with water is essential for predicting cloud formation and Earth's radiation budget. Sea spray aerosols (SSA), produced by wave breaking or bubble bursting, originate from the sea surface microlayer (SSML), which is enriched in hydrophobic compounds such as fatty acids and light-absorbing organic matter. Yet, recent field and mesocosm studies (NSF-CAICE 2019 SeaSCAPE) show that SSAs can still act as effective cloud condensation nuclei (CCN), even when rich in hydrophobic material. To investigate this paradox, we examined how photooxidation alters the water-uptake properties of SSAs coated with nonanoic acid (a model fatty acid) and 4-benzoylbenzoic acid (a proxy for marine chromophores) under atmospherically relevant conditions. We find that photooxidation significantly increases water uptake capacity, suggesting an increase in hydrogen-bonding capacity in "aged" SSA. These results help explain how photochemical aging transforms hydrophobic marine aerosols into more effective CCN and highlight the importance of surface chemical evolution in the marine boundary layer.

**OXIDATION OF VOLATILE ORGANIC COMPOUNDS USING NON-THERMAL OXYGEN PLASMAS**

Maki Matsuoka, 2028 and Rachel Hambuchen, 2026
Juan G. Navea, Professor, Chemistry Department

Due to the low-pressure conditions required for non-thermal plasma generation, oxidation of hydrocarbons is typically limited to non-volatile compounds, which could partition into gas phase and ultimately into the plasma, leading to non-controlled reactions. To overcome this limitation, the volatile hydrocarbons were absorbed onto solid surfaces to prevent their partitioning into the plasma. Here, we expand our study to other volatile C6H12 isomers, cis-3-hexene and 3,3-dimethyl-1-butene. *In-situ* vibrational spectroscopy reveals cis-3-hexene and 3,3-dimethyl-1-butene show increased reaction rates compared to 1-hexene, along with the formation of gaseous products that were not observed in 1-hexene reactions. Theoretical modeling suggests this difference arises from greater exposure to the double bond region in the adsorbed configurations of cis-3-hexene and 3,3-dimethyl-1-butene, which is more sterically hindered than 1-hexene.

**PHOTOSENSITIZED REDUCTION OF NO2 BY 4-BENZOYLBENZIOC ACID: A MODEL SYSTEM FOR THE ROLE OF ORGANIC CHROMOPHORES IN DAYTIME HONO FORMATION.**

Sofia Chihade, 2026
Juan G. Navea, Professor, Chemistry Department

The dissociation of nitrous acid in the presence of light provides 60% of atmospheric nitric oxide and a significant amount of hydroxyl radicals, which then participate in a multitude of crucial atmospheric reactions. Despite rapidly photodissociating, recent field measurements have shown that HONO reaches maximum concentration during the daytime over the marine boundary layer (MBL). Our laboratory recently revealed a previously unknown light-initiated pathway leading to the daytime formation of HONO in the MBL. This pathway involves the reduction of adsorbed nitrogen dioxide ($NO_2$) by light-absorbing compounds in marine dissolved organic matter (m-CDOM), influenced by pH and nitrates ($NO_3^-$). Our experiments investigating this photosensitized

mechanism use a state-of-the-art spectroscopy setup to measure the production of nitrogenous gases from mimics of m-CDOM exposed to NO2.

**ABSORPTION SPECTRA OF AQUEOUS 4-IMIDAZOLECARBOXALDEHYDE: THEORETICAL AND EXPERIMENTAL INSIGHTS INTO A PROXY FOR ENVIRONMENTAL CHROMOPHORES**

Lily Watson, 2027
Juan G. Navea, Professor, Chemistry Department

Marine environments contain light-absorbing complex macromolecular systems called marine chromophoric dissolved organic matter (m-CDOM). These photoactive compounds are known to partition from the sea surface microlayer (SSML) to sea spray aerosol (SSA), undergoing significant changes in acidity. m-CDOM is known to act as a photosensitizer, opening new chemical pathways for atmospheric gases to react in the presence of sunlight. Due to its complexity, m-CDOM is difficult to study directly. Our group has proposed a known nitrogen-containing photosensitizer, 4-imidazolecarboxaldehyde (4IC), as a model for studying m-CDOM within SSA and SSML. We have, for the first time, established the complex speciation and pH-dependent optical properties of 4IC by combining computational models and experimental methods to better understand its chemical and physical properties.

**HETEROGENEOUS OZONOLYSIS OF ADSORBED TERPENES**

Natalie O'Neill, 2026 and Maki Matsuoka, 2028
Juan G. Navea, Professor, Chemistry Department

Atmospheric particles have an active surface available to adsorb organic compounds. During atmospheric transport, these organic adsorbates undergo oxidation by reacting with ozone, changing the chemical and physical properties of the aerosol particle. Yet, little is known about the mechanisms and rates of these heterogeneous atmospheric oxidations. Here, we present a state-of-the-art chamber that allows for *in-situ* spectroscopic observation of the reaction between ozone and common terpenes adsorbed on alumina, a mineral dust proxy. *In-situ* analysis was used to investigate the chemical kinetics of the oxidation process, and *ex-situ* analysis was conducted to determine the reaction products. Through a control panel, we are able to quantify ozone concentrations and determine the kinetic constant of oxidation reactions between terpenes adsorbed on alumina and ozone.

**KINETICS AND THEORETICAL INSIGHTS INTO THE INTERFACE REACTIONS OF ADSORBED HYDROCARBONS WITH O(3P) GENERATED BY NON-THERMAL PLASMA**

Rachel Hambuchen, 2026
Juan G. Navea, Professor, Chemistry Department

Ground state atomic oxygen ($O(^3P)$) offers a promising approach for transforming inert petroleum fractions into valuable starting materials. However, the low pressures required for non-thermal plasma generation often limit the reaction to non-volatile compounds, as volatile compounds can partition into the plasma phase. Adsorption of volatile compounds onto surfaces can prevent volatilization, enabling a heterogenous reaction between $O(^3P)$ and organic compounds. Here, we present a comparative study of the oxidation of adsorbed cyclohexane and 1-hexene, an approach enabling an analysis of the impact of structural features in the heterogeneous oxidation by $O(^3P)$. In situ vibrational spectroscopy of a coated-alumina surface was used to analyze the reaction

kinetics and theoretical geometry optimization of adsorbed organic compounds provided deeper insight into the interaction between plasma and surface-bound species. Our study reveals that adsorption hinders the double bond from reacting with $O(^3P)$, significantly slowing the reaction rate of alkenes.

**INSTITUTIONAL STRATEGIZING & PROACTIVE POLICY MAKING: THE MODERN AGRICULTURAL BOOM OF BRAZIL AND ARGENTINA**

Lucas Gutierrez-Arnold, 2026
Feryaz Ocakli, Associate Professor, Political Science Department

The importance of Latin American agricultural and livestock production has become exceptionally relevant to the global food supply chain in recent decades. Brazil and Argentina are the key players in this project as global leaders in the production and exportation of both Soybeans, Maize, and other agricultural commodities. Though both of these LATAM agricultural powerhouses experienced rapid growth on similar trajectories somewhat simultaneously beginning in the late 20th century. Brazil within the past 15 years has definitively positioned themselves as the dominant agricultural power in LATAM as Argentina has stagnated in terms of production and exportation while Brazil continues to grow. Through a combination of institutional strategizing, Foreign Direct Investment, and growing trade relationships, Brazil has secured itself as a principal global producer and exporter of key agricultural staples.

**PAPER BOMBS AND PSYCHOLOGICAL WARFARE: ANALYSIS OF CHINESE AND AMERICAN PROPAGANDA LEAFLETS DURING THE KOREAN WAR**

Amanda Middleton, 2026
Joowon Park, Associate Professor, Anthropology Department

During the Korean War (1950-53), many forms of psychological warfare were utilized such as propaganda leaflets, loudspeaker broadcasts, and radio messages. “Bury the enemy with paper,” ordered Frank Pace, US Secretary of State at the time. Approximately 2.8 billion of these “paper bombs” were dropped during the war from both sides. Written in Korean, Chinese, and in English, these propaganda leaflets sometimes demanded the enemy’s surrender, guaranteed security upon defection, or at times promised prosperity. As part of an ongoing study, this portion of the summer research project draws on archival data from the Library of Congress to examine the contents of these Chinese and American leaflets.

**FRONTLINE VOICES: PRACTITIONERS SERVING LGBTQ+ BIPOC YOUTH IN A CLIMATE OF DISCRIMINATORY LEGISLATION AND MESSAGING**

Von Richardson, 2026 and Anyeliza Gonzalez, 2025
June Paul, Associate Professor, Social Work Department

LGBTQ+ BIPOC youth face compounded challenges due to systemic inequities, structural racism, and the recent surge in anti-LGBTQ+ legislation and discriminatory policies targeting both LGBTQ+ individuals and communities of color. This hostile climate has intensified vulnerabilities for these multiply marginalized youth, with over 500 anti-LGBTQ+ bills introduced across U.S. states and numerous measures targeting communities of color. This project examines how practitioners in New York’s Capital District and New York City perceive the impact of such legislation and public messaging on their ability to serve this population. Through focus groups, this study explores practitioners' comfort, competency, and capacity to provide affirming and

supportive care, aiming to identify factors influencing practitioners' effectiveness and develop actionable recommendations for navigating service provision amid increasing challenges.

**TRAUMATIC BRAIN INJURY AND KETAMINE'S IMPACT ON *DROSOPHILA MELANOGASTER'S* CIRCADIAN RHYTHM AND SLEEP**

Annika Fougli, 2026 and Lila Schabacker, 2026
Bernard Possidente, Professor, Biology Department

Ketamine is a dissociative anesthetic, meaning that patients' airways and respirations are maintained during anesthesia. Ketamine has not traditionally been used to treat traumatic brain injuries (TBIs) as it was thought to increase intercranial pressure; however, recent finding shows this to be untrue and indicate that ketamine may have neuroprotective effects as well. TBIs are known to cause sleep disturbances and circadian disorders. Therefore, in our study, we used *Drosophila Melanogaster* to observe TBIs' impact on circadian rhythm, and ketamine's ability to mitigate TBI related alterations in circadian rhythm.

**EFFECTS OF TOPIRAMATE ON CIRCADIAN ACTIVITY RHYTHMS IN MICE**

Lila Schabacker, 2026; Annika Fougli, 2026; Jordan Diamond, 2027; Jayden Perez, 2028; Nicole Sylvestri, 2027
Bernard Possidente, Professor, Biology Department and Neuroscience Program

Topiramate is an anticonvulsant most commonly used to treat epilepsy. It can also be used for the management of migraine and night eating disorders. In previous experiments, topiramate was administered to fruit flies and activity levels were monitored to assess the relationship between circadian rhythms and topiramate. A trend of increased circadian free-running period was observed. To further explore this effect, topiramate was given to mice over the course of 20 days and circadian rhythm variables were monitored. While lengthened circadian free-running period was not observed, topiramate was linked to significant changes in intra-daily variability in total darkness.

**PEEKABOO BLUR: FACE BLURRING CLOTHING FOR KIDS**

Samia Mayssan, 2028
Aarathi Prasad, Associate Professor, Computer Science Department

Children cannot give informed consent to being photographed, yet their images are frequently shared online. We propose clothing that blurs a child's face in images or videos at the moment of capture. Previous work has explored passive methods like QR codes or privacy tags to communicate privacy preferences with the camera holder, which rely on their cooperation. Our system extends previous work involving infrared LEDs, which are invisible to humans but detectable by most cameras, to hinder faces in photos and videos. But our system must be safe, comfortable and not easy to remove since it is intended for children. We present an initial prototype of a wearable system that uses infrared distance sensor to detect phones nearby and infrared LEDs to blur faces.

**SURVIVOR STRENGTHS: PERCEPTIONS OF PARENTING AMONG YOUTH EXPOSED TO INTIMATE PARTNER VIOLENCE (IPV)**

Melanie Yaeger, 2026 and Natalie Accurso, 2026
Johanna Reiter, Assistant Professor, Social Work Department

This study utilizes the arts-based research method of storyboarding and semi-structured, dialogic interviews, to better understand youths' (aged 12-24) perceptions of their victimized parents' strengths in parenting while living in the context of IPV. Preliminary data analysis involved iterative, axial coding using descriptive and in vivo codes to create themes. Preliminary results revealed inherent tensions in parenting in contexts of IPV. While victimized parents relay parenting strengths in terms of a desire to physically and emotionally protect and emotionally and financially support children, with these strengths come drawbacks which impact the parent-child relationship. Data collection and analysis is ongoing.

**EXPLORING METHODS FOR QUANTIFYING SILVER IN NANOPARTICLE-POLY(VINYL ALCOHOL) FILMS**

Hayes Van Dis, 2028
Maryuri Roca, Associate Teaching Professor, Chemistry Department

Combining silver nanoparticles with materials such as poly(vinyl alcohol) can create antimicrobial coatings. In this project, we seek to establish a method for quantifying the silver contained in nanoparticle-poly films. PVP-coated, size-tuned silver nanoparticles were created and mixed with poly(vinyl alcohol), then drop-cast to form films. The solutions and films were characterized via UV-Visible spectroscopy. We quantified silver contents using X-Ray Fluorescence (XRF) before digesting the films in nitric acid and analyzing using Flam-Atomized Atomic Absorption Spectrometry (AAS). Spiking and standard addition were used to increase accuracy of AAS results. We found AAS a reliable method for quantifying silver. XRF was variable and generally less accurate. Determining a consistent method of quantifying silver is crucial for optimizing the synthesis and fabrication of nanomaterials.

**AWAKENING ACTION OR POISONING PROGRESS? EXPLORING RACISM-CONSCIOUS ENVIRONMENTAL FRAMES IN THE ERA OF COLORBLINDNESS**

Mia Barnes, 2026 and Caroline Ettinger-DeLong, 2026
Harrison Schmitt, Assistant Professor, Psychology Department

Minority communities are disproportionately exposed to environmental hazards across the United States. Our research focused on Southside Tucson, AZ, a predominantly low-income, Hispanic community exposed to Tri-chloroethylene (TCE) and 1,4-Dioxane from a nearby Superfund site for decades. Using mixed-method research, we explored the role of racism-conscious versus racism-evasive framings in residents' understandings of exposures and desires to engage in collective action. We conducted two studies: an archival study exploring dominant discourses surrounding contamination across six local news sources, and an experiment testing how racism-conscious versus racism-evasive framings of exposure can mobilize/demobilize collective action. The newspaper articles overwhelmingly contained colorblind descriptions of contamination, and we predict that racism-conscious framings will result in higher collective action intentions for exposed community members and lower intentions for White outsiders.

**INVESTIGATING GAMMA ZERO FOR S1 AND SU2 SYMMETRIES**

Camille Paradis, 2026
Christopher Seaton, Professor, Mathematics and Statistics Department

Gamma zero is a number, expressed in terms of special polynomials known as symmetric polynomials, that distinguishes between collections of symmetries, such as rotations of the plane and higher dimensional objects. Our first goal was to determine if or when the gamma zero is the same between the two collections. There is an expression used to determine if the gamma zero is decreasing that is defined in terms of a modified version of these polynomials; this can be rewritten as a combination of the unmodified polynomials. Our second goal was to explicitly determine this expression for important cases. We will present progress made on these two goals.

**COMPUTING THE HILBERT MEASURE FOR ROTATIONAL LIE GROUPS**

Belle Roberge, 2027
Christopher Seaton, Professor, Mathematics and Statistics Department

If we have points in a space we can rotate them. This is one way to visualize a mathematical object called a Lie group. There are some equations that will yield the same results when we rotate the points, these are called “invariants”. If we are integrating (“averaging”) a function of our points that is invariant under rotations, we can put our integral in terms of the invariants to reduce our number of variables; this makes the function easier to integrate. To do this we need to find a special function called the Hilbert measure, which makes these integrals equal. We will present computations of formulas for this measure for certain Lie groups.

**CHARACTERIZATION OF ANCESTRAL ASPARTYL-tRNA SYNTHETASE SPECIFICITY**

Trish Tran, 2027 and Emily Serrano, 2028
Kelly Sheppard, Professor, Chemistry Department

Protein synthesis requires accurate pairing of amino acids to their tRNAs. Many prokaryotes lack AsnRS to directly attach Asn to $tRNA^{Asn}$. They instead use an indirect pathway. A non-discriminating (ND) AspRS attaches Asp to $tRNA^{Asn}$. GatCAB then amidates Asp to form Asn-$tRNA^{Asn}$. Organisms with AsnRS have a discriminating (D) AspRS, specific for $tRNA^{Asp}$. How D-AspRS specificity evolved from ND-AspRS is unclear. We phylogenetically modelled the last common ancestor of a gamma-proteobacterial D-AspRS and ND-AspRS. Based on their sequence differences, we mutated the ND-AspRS to increase its $tRNA^{Asp}$ specificity. We overproduced, purified, and tested the specificity of wild-type and mutant AspRSs both *in vivo* and *in vitro*. This project offers insights into the evolution of AspRS specificity with potential applications in synthetic biology.

**CHARACTERIZATION OF THE DIRECT ROUTE FOR *B. SUBTILIS* ASN-$tRNA^{ASN}$ FORMATION**

Ella Tuxbury, 2027
Kelly Sheppard, Professor, Chemistry Department

In *Bacillus subtilis* there are two distinct pathways for attaching Asn to its tRNA, an essential step in translation. In the indirect pathway, the transamidosome synthesizes Asn on $tRNA^{Asn}$. In the direct pathway, Asn is attached to $tRNA^{Asn}$ using AsnRS. *B. subtilis*, also, encodes two distinct $tRNA^{Asn}$ isoaccepters, raising the possibility that each pathway may have its own tRNA. We

hypothesize that one $tRNA^{Asn}$ isoacceptor will be a better substrate for AsnRS. To test, we purified AsnRS and $tRNA^{Asn}$ isoacceptors. We are now assaying which tRNA AsnRS uses better as a substrate under different conditions. Our work will be compared to results with the indirect pathway to further our understanding of the two pathways and two $tRNA^{Asn}$ isoacceptors in the *B. subtilis* life cycle.

**EXPANDING THE *E. COLI* GENETIC CODE WITH PYROGLUTAMATE**

Abbey Grandin, 2027
Kelly Sheppard, Professor, Chemistry Department

The formation of pyroglutamate in proteins is associated with the progression of Alzheimer's diseases. In order to better understand the role of pyroglutamate in protein function, we seek to expand the genetic code of *E. coli* to incorporate pyroglutamate into proteins in response to an amber codon in a gene. Our approach is to provide *E. coli* a modified version of the archaeal tRNA dependent glutamine biosynthetic pathway to make pyroglutamate on an amber suppressor tRNA. Enhanced green fluorescent protein (eGFP) is our reporter protein to assay read-through with by the system in response to an amber codon. We report on yield of eGFP in response to an amber codon introduced into the *egfp* gene. Success of our system will be confirmed using mass spectrometry.

**EXERCISE INTENSITY THRESHOLDS AS PREDICTORS OF ALL CAUSE AND CARDIOVASCULAR MORTALITY: A SYSTEMATIC REVIEW**

Mallory Allen, 2027
Edgard Soares, Visiting Assistant Professor, Health and Human Physiological Sciences Department

As exercise intensity increases, so does energy requirement. The onset of anaerobic metabolism contribution to fulfill energy requirement during exercise is known as exercise intensity threshold (EIT). The oxygen consumption ($VO_2$) at the first EIT ($VO_2$@EIT1) has been used to predict surgical mortality risk; however, its association with mortality outside such settings lacks investigation. We conducted a systematic review on peer-reviewed studies (databases: PubMed, ScienceDirect, Web of Science) to examine the association between EITs and mortality. In 11 out of 12 included studies, a higher $VO_2$@EIT1 significantly reduced mortality risk (all cause range:10–63%; cardiovascular-related range: 23-52%). However, in four studies, the $VO_2$@EIT1 was not associated with mortality after statistically adjusting for one's maximal $VO_2$. The prognostic value of the EITs needs further research.

**EXERCISE INTENSITY THRESHOLDS AS PREDICTORS OF MAJOR ADVERSE CARDIOVASCULAR EVENTS: A SYSTEMATIC REVIEW**

Lucy Brekke, 2027
Edgard Soares, Visiting Assistant Professor, Health and Human Physiological Sciences Department

The maximum oxygen uptake (VO2) is a well-established cardiovascular (CV) risk-marker. However, the submaximal VO2 during exercise-induced metabolic changes (exercise intensity thresholds - EIT), lacks investigation. We conducted a systematic review of peer-reviewed literature to investigate the relationship between EIT and major adverse cardiovascular events (MACE). We searched PubMed, ScienceDirect, and Web of Science. We screened 3,820 articles with 38 studies meeting eligibility criteria. Every 1.0-3.5 ml/kg/min increase in the VO2 at the

first EIT, reduced MACE risk by 12-25%. In 94% of analyzed studies (n=29), VO2 at the first EIT was significantly lower (range: 1-20 mL/kg/min) in individuals with MACE and in those with more severe CV diseases. Despite EIT's potential, more studies are needed to better understand its prognostic ability for MACE.

**THE DEVIL'S ADVOCATE: RELIGIOUS FREEDOM IN THE UNITED STATES**

Callahan Mainzer, 2026
Adam Tinkle, Associate Professor and Director, MDOCS

Religious plurality in America is under threat in unprecedented ways. Government officials are increasingly seeking to impose Christianity into governmental and educational systems, raising concerns about the erosion of communal and individual rights. The battle between advocates and adversaries of religious freedom has led to intense social polarization, with individuals from differing belief systems villainized by their opposition. For his project, Callahan decided to explore attitudes about religious plurality in America by interviewing members and leaders of various religious communities and compiling the process into a documentary. His goal was to foster religious plurality and reduce social polarization on a local scale through interfaith dialogue and a co-creative documentary experience.

**CHARACTERIZING SLEEP REGULATING sNPF-NEURONS IN THE VENTRAL NERVE CORD OF DROSOPHILA MELANOGASTER**

Oliver Moi, 2028
Christopher G. Vecsey, Professor, Neuroscience Program

Short neuropeptide F (sNPF) is a neuropeptide that has been found to dramatically induce sleep in Drosophila melanogaster when its neurons are optogenetically activated. Suppressing activation of sNPF neurons in the ventral nerve cord (VNC), the fly equivalent of the spinal cord, using TSH-GAL80 significantly decreases this sleep-promoting effect. This suggests that VNC neurons play a substantial role in the production of sNPF's sleep effect. The neurons silenced by TSH-GAL80 were pinpointed and characterized by their coexpression of other neurotransmitters, laying the foundation for further research. Future experiments may investigate the development of a split-GAL4 system to target individual regions affected by TSH-GAL80 and analyze their effect on sleep. Additionally, pharmacological experiments related to sNPF-expressing neurons may inform treatments for sleep/metabolic disorders.

**DISSECTING THE DOWNSTREAM TARGETS OF OCTOPAMINERGIC SIGNALING FOR SLEEP REGULATION IN *DROSOPHLIA MELANOGASTER***

Yiwen Su, 2026
Christopher G. Vecsey, Professor, Neuroscience Program

Octopamine (OA), the invertebrate analog of norepinephrine, regulates behaviors including arousal and sleep in Drosophila melanogaster. TDC2 neurons, which synthesize OA, project to the pars intercerebralis (PI) brain region, potentially targeting insulin-producing cells (Dilp neurons) and cells producing diuretic hormone 44 (DH44). Both are implicated in sleep and circadian regulation. To assess OA's downstream targets, we activated TDC2 neurons using ATP-gated P2X2 channels and monitored calcium activity via GCaMP in brain explants. Activation triggered calcium increases in both Dilp and DH44 neurons, indicating excitatory responsiveness to OA. RNAi knockdown of Ilp2 blocked OA-induced sleep suppression, implicating Dilp neurons as key mediators of OA-mediated arousal. Our findings highlight the role of two distinct groups of

neuroendocrine PI cells in OA-mediated sleep regulation and link arousal to brain circuits that control metabolism and circadian rhythms.

**GENETIC RESCUE OF NEUROMUSCULAR DEVELOPMENT AND CONNECTIVITY MODULATED BY DIP-α AND DPR10 IN DROSOPHILA MELANOGASTER**

Claire Christie, 2028
Christopher G. Vecsey, Professor, Neuroscience Program

Neuromuscular development in the fruit fly *Drosophila melanogaster* is highly stereotyped but some of the underlying mechanisms are still unspecified. Neurons must select and recognize their targets before undergoing synaptogenesis. A network of interacting cell surface proteins, the defective proboscis extension response (Dprs) and Dpr-interacting proteins (DIPs), have been identified as critical modulators of these processes. Previous work in our lab screened for modifiers of DIP/Dpr-mediated axon targeting, and identified a region called DF7634 that rescued connections to muscle 4 in DIP/Dpr mutants. I used larval dissections, immunostaining, and fluorescent and confocal microscopy to verify these effects and extend them by examining the specific role of a candidate gene within the DF7634 region, called *Nerfin-2*, in rescuing connectivity in DIP/Dpr mutants.

**Faculty Student Summer Research Program**

**Schedule of Final Research Presentations**

**Friday, June 27, 2025**

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

9:20 am – 10:10 am Oral Presentations

## ROOM A

**SAVORING-SUPPORTED BEHAVIORAL ACTIVATION PILOT FINDINGS**
Katya Yurkovskaya, 2026 and Addie Oliphant, 2026
Lucas S. LaFreniere, Assistant Professor, Psychology Department

**POLICE INVOLVEMENT IN MENTAL HEALTH EMERGENCIES**
Brie Schaffer, 2026
Rebecca Gleit, Assistant Professor, Sociology Department

**PROJECT GREEN LIGHT: PUBLIC PERCEPTIONS OF POLICE SURVEILLANCE**
Suri Ye, 2026
Rebecca Gleit, Assistant Professor, Sociology Department

## ROOM B

**DIGITAL DIETS: FOOD AND POLITICS ON TIKTOK**
Della Huntley, 2026
Xiaoshuo Hou, Professor, Sociology Department and Asian Studies Program

**THE RISE OF THE NEW CHINESE-STYLE FASHION IN CHINA'S GARMENT INDUSTRY: THE EFFECTS OF LIVESTREAMING**
Weiqi Tao, 2026
Xiaoshuo Hou, Professor, Sociology Department and Asian Studies Program

**TEMPORAL CHANGES IN THE ECONOMIC LIVES OF INDONESIAN WOMEN**
Emma Staton, 2026
Smriti Tiwari, Associate Professor, Economics Department

## ROOM C

**KANATSIOHAREKE MOHAWK COMMUNITY ARCHIVES PROJECT & THE TREE OF PEACE SOCIETY**
Madeleine Abramson, 2027 and Andi-Grey Sheingold, 2026
Alexandra Prince, Assistant Professor, Religious Studies Department

**GROUND PENETRATING RADAR AND HISTORICAL ARCHAEOLOGY AT LAKE GEORGE BATTLEFIELD STATE PARK**
Lia Donahue, 2026 and Lauren Attwell, 2026
Siobhan Hart, Professor, Anthropology Department

**THE IMPACT OF LETTER ROTATIONS ON TRANS-SACCADIC MEMORY IN DEVELOPMENTAL DYSLEXIA**
Talia Cohen, 2025
Pablo Gomez, Associate Professor, Psychology Department

10:20 am – 11:05 am Poster Presentations Session 1

**ROOM A and HALLWAY**

**GROUNDBREAKING SOLUTIONS: EVALUATING SOIL SAMPLING METHODS FOR ACCURATE CARBON STOCK ESTIMATES IN HUDSON VALLEY FARMS**
Campbell Grey, 2027 and Ben Guarin, 2027
Kristofer Covey, Associate Professor, Department of Environmental Studies & Sciences

**RACE, TRAVEL, AND ENLIGHTENMENT CONTRADICTIONS: A COLONIAL READING OF MME LETELLIER'S MŒURS COLONIALES (1833)**
Mihranush Varzhapetyan, 2026
Catherine Talley, Assistant Professor, World Languages and Literatures Department

**BENTHIC IDENTIFICATION AND JUVENILE CORAL PREVALENCE AT FLORIDA KEYS RESTORATION SITES**
Olivia Mollo, 2026
Tory Chase, Visiting Assistant Professor, Environmental Studies and Sciences Department

**INVESTIGATING MUSIC STYLE PROCESSING THROUGH PRIMING AND EEG**
Celine Xu, 2026
Dominique T. Vuvan, Associate Professor, Psychology Department

**THE EFFECTS OF LOWER BODY NEGATIVE PRESSURE (LBNP) ON THE NEAR-INFRARED SPECTROSCOPY VASCULAR OCCLUSION TEST (NIRS-VOT)**
Meredith Georger, 2026
Stephen Ives, Professor, Health and Human Physiological Sciences Department

**EXAMINATION OF KEY CHARACTERISTICS OF TWO CROWN ETHER-BASED MANGANASE (II) COMPLEXES AS SUPEROXIDE DISUMUTASE BIOMIMETICS**
Ocean Lin, 2027
Steven T. Frey Associate Professor, Chemistry Department

**INVESTIGATING THREE-DIMENSIONAL CELL CULTURE SPHEROID MODELS FOR SPINOCEREBELLAR ATAXIA TYPE 1**
Nicolas Bedoya Agudelo, 2028
Sarita Lagalwar, Professor, Neuroscience Program

**INVESTIGATION OF GLUCAN PHOSPHATASES DURING STARCH DEGRADATION**
Erikah DeGroat, 2026 and Ava Zhang, 2028
Madushi Raththagala, Associate Professor, Chemistry Department

**"SOMETIMES PEOPLE CAN FORGET WHO THEY REALLY ARE": IMMIGRANT STUDENTS ENGAGING WITH DIVERESE TEXTS IN PREDOMINANTLY WHITE CLASSROOMS**
Sharon Xu, 2027
Jessica Somerville-Braun, Assistant Professor, Education Studies Department

**EFFECTS OF TOPIRAMATE ON SLEEP AND CIRCADIAN ACTIVITY RHYTHMS IN FRUIT FLIES**
Jordan Diamond, 2027; Lila Schabacker, 2026; Annika Fougli, 2026; Jayden Perez, 2028; Nicole Sylvestri, 2027
Bernard Possidente, Professor, Biology Department and Neuroscience Program

**BLACKNESS AND THE PROBLEMS OF REPRESENTATION IN 19TH CENTURY AMERICAN LITERATURE**
Spencer Dickson, 2027
Jamie Parra, Assistant Professor, English Department

11:10 am – 11:55am Poster Presentations Session 2

**ROOM A and HALLWAY**

**VISUALIZING REVERSIBLE STARCH PHOSPHORYLATION USING SCANNING ELECTRON MICROSCOPY**
Slade Rice, 2027 and Jude Remenar, 2027
Madushi Raththagala, Associate Professor, Chemistry Department

**EFFECTS OF DIETARY CAPSAICIN ON BLOOD PRESSURE AND ARTERIAL STIFFNESS**
Melissa Severino, 2026
Stephen Ives, Professor, Health and Human Physiological Sciences Department

**INVESTIGATE STARCH EXCESS4 GLUCAN BINDING THROUGH DIFFERENTIAL SCANNING FLUOROMETRY**
Kai Gemmell, 2028
Madushi Raththagala, Associate Professor, Chemistry Department

**ROLE OF CANNABINOID RECEPTORS IN MEDIATING CANNABIS EXTRACT-INDUCED DEFECTS IN ZEBRAFISH**
Audrey Bowen, 2027
Jennifer Bonner, Associate Professor, Biology Department

**EXPLORING SERS WITH PVP COATED SILVER NANOPARTICLES: NICOTINAMIDE VS. THIOPHENOL**
Rowan McLear, 2028
Maryuri Roca, Associate Teaching Professor, Chemistry Department

**THE EFFECT OF TRYPTOPHOL ON *BATRACHOCHYTRIUM DENDROBATIDIS GROWTH***
Lillard Preschlack, 2026
Emily Le Sage, Assistant Professor, Biology Department

**RAINBOW STATIC MASTERMIND**
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**PODCASTING THE MIDDLE EAST: A HISTORY**
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**FIRST THINGS FIRST: SERIAL LETTER PROCESSING EFFECTS**
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**EFFECTS OF AMPICILLIN AND DMSO ON SLEEP AND CIRCADIAN ACTIVITY RHYTHMS IN FRUIT FLIES**
Jordan Diamond, 2027; Lila Schabacker, 2026; Annika Fougli, 2026; Jayden Perez, 2028; Nicole Sylvestri, 2027
Bernard Possidente, Professor, Biology Department and Neuroscience Program

**SEDIMENT AND TURF ALGAE ANALYSIS AT FLORIDA KEYS RESTORATION SITES**
Hannah Fetzer, 2027
Tory Chase, Visiting Assistant Professor, Environmental Studies and Sciences Department

**ALGAE TURF SEDIMENT CHARACTERISTICS, LAND USE, AND HEAVY METAL EXTENSIONS AT FLORIDA KEYS RESTORATION SITES**
Cate Cochran, 2027
Tory Chase, Visiting Assistant Professor, Environmental Studies and Sciences Department

Noon-1 pm, Lunch in Murray Aikins Dining Hall

## ABSTRACTS

(In alphabetical order by professor's last name)

### ROLE OF CANNABINOID RECEPTORS IN MEDIATING CANNABIS EXTRACT-INDUCED DEFECTS IN ZEBRAFISH

Audrey Bowen, 2027
Jennifer Bonner, Associate Professor, Biology Department

Cannabis is widely used, yet its effects on embryonic development remain unclear, especially in prenatal exposure. Using zebrafish (*Danio rerio*) as a model, we investigated the developmental impact of hemp-derived phytocannabinoids. Embryos exposed to 0.1% hemp extract (HE) exhibited morphological defects and paralysis. To assess the role of cannabinoid receptors in these effects, we previously tested ACEA (a CB1 agonist) and AM630 (a CB2 inverse agonist) individually. We then evaluated their combined use to determine if co-treatment would enhance recovery. However, results showed that combined treatment produced similar levels of recovery as individual treatments. These findings suggest that HE-induced defects involve both CB1 and CB2 receptors, but simultaneous targeting of both does not enhance recovery compared to targeting each receptor individually.

### BENTHIC IDENTIFICATION AND JUVENILE CORAL PREVALENCE AT FLORIDA KEYS RESTORATION SITES

Olivia Mollo, 2026
Tory Chase, Visiting Assistant Professor, Environmental Studies and Sciences Department

Worldwide degradation of coral reefs due to anthropogenic stressors are pushing these vulnerable ecosystems into low ecosystem service states, where ecological feedback loops dictate recruitment bottlenecks and extremely low coral cover (e.g, <5%). This research analyzed reef benthic communities by quantifying: (a) reef benthos (2,700 photos) and (b) juvenile coral abundance (248 quadrats, each 1 $m^2$) at NOAA Mission: Iconic Reefs coral restoration sites. Results indicate algae turf (30-70% cover) dominate seascapes. Components of coral reef resiliency are prevalent with coral cover (0-20%) and juvenile abundance (0-0.8 juveniles/$m^2$), but both low. Despite extensive restoration efforts at these sites, algae turf mediates ecosystem functions and state, likely due to anthropogenic change. Harnessing coral recruitment and survival processes should guide future restoration conservation and management.

### SEDIMENT AND TURF ALGAE ANALYSIS AT FLORIDA KEYS RESTORATION SITES

Hannah Fetzer, 2027
Tory Chase, Visiting Assistant Professor, Environmental Studies and Sciences Department

Nearly 50% of coastal coral reefs are acutely threatened by sediment stress that shifts reef ecological states from coral dominated ecosystems to algae turf dominated habitats. This study quantified sediment dynamics (e.g, sediment load) and the extent of algae turfs (e.g., length and density) at NOAA Mission: Iconic Reefs. To quantify algae-coral dynamics, we focused on 72 benthic algae turf samples and (a) processed and analyzed algae turf sediments, and (b) quantified diversity metrics and calculated an epilithic algae ratio. Algae density comprised ~50% of fine-resolution diversity. Sediment load was consistent across sites with a strong correlation between algae length and sediment load and samples consisted 90% inorganic. These algae-turf sediments

represent a critical lens to the functioning and degradation pathways of coastal reefs key to effective management efforts.

**SEDIMENT CHARACTERISTICS, LAND USE, AND HEAVY METAL ANALYSIS AT FLORIDA KEYS RESTORATION SITES**

Cate Cochran, 2027
Tory Chase, Visiting Assistant Professor, Environmental Studies and Sciences Department

Coastal coral reef environments are subject to anthropogenic stressors and contaminants. While sediment load has traditionally been studied as an indicator of reef health, in-depth quantification of sediment size classes, proximal land processes, and impacts of heavy metal contamination have yet to be thoroughly investigated. Florida coral reefs represent the ideal intersection between human populations (e.g., coastal cities), coastal processes (e.g., agriculture, rivers), and degraded reef ecosystems. A majority of algae-bound sediments were <63 um indicating potential for large dispersion and adverse impacts to coral health (e.g., smothering). GIS maps integrating land use and cover provided evidence to the pathways of heavy metals contamination. Finally, a heavy metal protocol was developed comparing traditional heavy metal analysis (ICP-MS) with novel XRF techniques for rapid metal quantification.

**GROUNDBREAKING SOLUTIONS: EVALUATING SOIL SAMPLING METHODS FOR ACCURATE CARBON STOCK ESTIMATES IN HUDSON VALLEY FARMS**

Campbell Grey, 2027 and Ben Guarin, 2027
Kristofer Covey, Associate Professor, Department of Environmental Studies & Sciences

Accurate estimates of soil carbon stocks are essential for understanding the climate benefits of regenerative agriculture. Equivalent soil mass (ESM) is a newer method that provides more reliable carbon estimates than traditional bulk density approaches but depends on consistent sampling. This study tests whether a soil auger—a faster, simpler tool—can replace the standard soil core for ESM analysis. We collected paired auger and core samples at two depths (0–15 cm, 15–30 cm) across four plots on four Hudson Valley farms (128 samples total). Core samples were sieved before drying; auger samples were not. We hypothesized no overall differences in ESM estimates, though soil texture and rock content could influence results. Findings will guide best practices for accessible, accurate soil carbon monitoring in climate-friendly farming systems.

**EXAMINATION OF KEY CHARACTERISTICS OF TWO CROWN ETHER-BASED MANGANASE (II) COMPLEXES AS SUPEROXIDE DISUMUTASE BIOMIMETICS**

Ocean Lin, 2027
Steven T. Frey, Associate Professor, Chemistry Department

Superoxide dismutases (SODs) are enzymes that protects cells against superoxide ion, a toxic byproduct of respiration that is implicated in a variety of inflammatory diseases and cancer. We recently synthesized two manganese compounds using crown ether-based ligands and have begun to evaluate their potential as biomimetics of manganese-containing SOD. This summer, we performed an electrochemical analysis of the compounds and tested their reactivity toward superoxide ion. Our results demonstrate that the compounds are effective biomimetics that eliminate superoxide ion and behave electrochemically like naturally occurring SODs. They also display interested differences in their properties which are helping us understand how to design new and improved compounds with greater stability and higher reactivity.

**POLICE INVOLVEMENT IN MENTAL HEALTH EMERGENCIES**
Brie Schaffer, 2026
Rebecca Gleit, Assistant Professor, Sociology Department

The police are often the primary first responders to mental health emergencies. This project aims to provide a detailed descriptive account of how police calls related to mental health have changed over time and across geographic space. We use publicly available data from Seattle, including geo-located records of all 911 calls from 2013 through 2023, and collate these data with Census block-group level characteristics from the American Community Survey. We find that the number and proportion of mental health calls increased over time in Seattle. Most mental health calls were classified by officers as "crisis complaints" and resolved without a report written or arrest.

**PROJECT GREEN LIGHT: PUBLIC PERCEPTIONS OF POLICE SURVEILLANCE**
Suri Ye 2026
Rebecca Gleit, Assistant Professor, Sociology Department

Project Green Light began in 2016 to combat crime in Detroit, Michigan. Over 1,000 green lights flash across the city, with cameras that stream 24/7 video footage of the surrounding area to the Detroit Police Department. We used a "mixed methods" approach to determine how individuals in Detroit make sense of police surveillance. People's attitudes were patterned according to race and age, with Black individuals and older individuals the most supportive of PGL. We identify four key themes that emerge for why people support PGL: prevention, comfort, moral boundary making, and future use. While our quantitative results suggest that many people support PGL, our qualitative results reveal that many of these same Detroiters hold nuanced perspectives about police surveillance, including concerns about equity and privacy.

**THE IMPACT OF LETTER ROTATIONS ON TRANS-SACCADIC MEMORY IN DEVELOPMENTAL DYSLEXIA**
Talia Cohen, 2025
Pablo Gomez, Associate Professor, Psychology Department

Transsaccadic memory enables the visual system to maintain continuity across eye movements by storing and integrating information from sequential fixations. This study investigates the modality of transsaccadic memory by assessing whether letter identity is encoded abstractly or if low-level physical features, such as orientation, are preserved across saccades. Using rotated letters as stimuli, we further explore whether individuals with developmental dyslexia differ in their corrective saccade behavior and memory representations compared to non-dyslexic individuals. By analyzing target selection in the presence of similar foils, the study examines whether gaze correction relies more on spatial proximity or mnemonic content. Findings aim to clarify the nature of transsaccadic representations and offer new insights into the visual and cognitive mechanisms underlying reading impairments. These results have broader implications for reading research, educational strategies for dyslexia, and models of saccade-target selection.

**GROUND PENETRATING RADAR AND HISTORICAL ARCHAEOLOGY AT LAKE GEORGE BATTLEFIELD STATE PARK**

Lia Donahue, 2026 and Lauren Attwell, 2026
Siobhan Hart, Professor, Anthropology Department

Our research focused on the archaeological excavation and analysis of French and Indian War, Revolutionary War, and Indigenous deposits at the Lake George Battlefield State Park, Lake George, New York. Our primary data collection method was ground penetrating radar (GPR), which allowed us to conduct a noninvasive survey in five 20x20 meter blocks. We determined the locations for our three test units based on our analysis of possible subsurface anomalies from the GPR data. Among other cultural materials, we unearthed a clay-lined hearth feature, musket balls, animal bone, and Indigenous ceramic sherds. Examining pre- and post-colonial interactions, we interrogate history through material culture based on artifacts' three-dimensional location in excavation.

**RAINBOW STATIC MASTERMIND**

Riley Vavolizza, 2026 and Rachel Xia, 2026
Kirsten Hogenson, Associate Professor, Mathematics and Statistics Department

In the game rainbow static Mastermind, a player tries to guess a sequence of $n$ distinctly colored pegs that come in $k$ colors. The player submits a list of guesses and receives feedback about the number of correct colors in the correct positions and the number of correct colors in the wrong positions for each guess. To win, they must determine the secret code based on this feedback. Mastermind is well-studied, with applications to artificial intelligence and bioinformatics. Researchers often seek $g_r(n,k)$, the length of a shortest list of questions that is sufficient to win the game. This summer, we found a new upper bound for $g_r(3,k)$ and identified new properties of optimal question lists when $n=3$ and $n=4$.

**DIGITAL DIETS: FOOD AND POLITICS ON TIKTOK**

Della Huntley, 2026
Xiaoshuo Hou, Professor, Sociology Department and Asian Studies Program

The prevalence of social media platforms has reshaped traditional information regimes about food, with online influencers becoming authorities on nutrition and what makes a healthy lifestyle. Despite (and perhaps because of) the informal nature of this content, it has become a powerful mode for communicating politically and morally charged conceptions of food and health, as creators use their content to express deeper anxieties about the body, conventional agriculture, and identity. This project explores the ways that ideology and food content intersect and overlap in online communities through a thematic content analysis of TikTok videos posted under "natural food" and associated hashtags. The result is a complex, at times bipartisan, digital culture of eating that gives insight to broader patterns of individuality, institutional distrust, and hope for change.

**THE RISE OF THE NEW CHINESE-STYLE FASHION IN CHINA'S GARMENT INDUSTRY: THE EFFECTS OF LIVESTREAMING**

Weiqi Tao, 2026
Xiaoshuo Hou, Professor, Sociology Department and Asian Studies Program

This project explores the recent shift in China's garment industry from export-oriented manufacturing to domestic-focused branding, specifically through the case of the "new Chinese-style" fashion. Leveraging e-commerce and livestreaming platforms, this fashion style blends traditional intangible cultural heritage materials – such as handcrafted silk brocade – with modern aesthetics. The research investigates how livestreaming shapes consumers' perception of authenticity and makes emotional connections, driving impulsive purchases. By observing the interactions and marketing techniques in livestreaming, this study highlights how storytelling and digital engagement foster national pride and cultural revival, transforming fashion consumption patterns and helping niche heritage brands secure premium prices in China's contemporary garment industry.

**THE EFFECTS OF LOWER BODY NEGATIVE PRESSURE (LBNP) ON THE NEAR-INFRARED SPECTROSCOPY VASCULAR OCCLUSION TEST (NIRS-VOT)**

Meredith Georger, 2026
Stephen Ives, Professor, Health and Human Physiological Sciences Department

The NIRS-VOT is a novel method of assessing microvascular function, but the impact of sympathetic nervous system (SNS) activity on this test, such as may occur with age or disease, is unknown. Using LBNP (-20mmHg) to elevate SNS activity, we assessed the impacts on the NIRS-VOT of the forearm in healthy men and women, as we hypothesized there might be sex specificity in the effect. Further, the NIRS-VOT was performed on the right and left forearms to determine inter-arm differences. Rate of muscle reoxygenation was unaffected by LBNP (1.575±0.651 to 1.736±0.829%/s, $p=0.912$). Time to peak muscle oxygen saturation decreased with LBNP (49.382±10.150 to 45.147±11.092 seconds) and approached significance ($p=0.057$). LBNP as a model did not affect microvascular function but may increase the overall kinetics.

**EFFECTS OF DIETARY CAPSAICIN ON BLOOD PRESSURE AND ARTERIAL STIFFNESS**

Melissa Severino, 2026
Stephen Ives, Professor, Health and Human Physiological Sciences Department

Cardiovascular disease (CVD) is the leading cause of death in the United States. CVD disproportionately impacts populations depending on sex. In order to protect against CVD, it is crucial to find interventions to improve CVD risk factors. Consuming spicy peppers has been suggested to lower CVD mortality, yet the impact of dietary capsaicin on cardiovascular health in humans hasn't been examined. We assessed the sex specific impacts of six weeks of dietary capsaicin on blood pressure and arterial stiffness in a randomized controlled trial. These markers were measured using an oscillometric cuff technique with subsequent pulse wave analysis (Sphygmocor Xcel, Atcor Medical). While some sex differences were observed, treatment tended to impact subendocardial viability ratio (time*treatment, $p=0.06$), but no other significant differences were observed.

**FIRST THINGS FIRST: SERIAL LETTER PROCESSING EFFECTS**

Lucy Altman-Coe, 2026 and Amelia Hall, 2027
Rebecca Johnson, Professor, Psychology Department

The Dual Route Cascaded (DRC) model is a computational model of visual word recognition that posits two pathways involved in naming a printed word: the lexical route and the non-lexical route. Here we report the findings from a naming study to test claims of the DRC model to assess whether readers utilize a serial left-to-right decoding of letters. Readers named words that differed in their frequency, symbol-to-sound regularity, and presentation of letters. High frequency words were named faster than low frequency words, regular words were named faster than irregular words, and words presented left-to-right were named faster than those presented right-to-left. However, in contrast to the predictions of the DRC model, the serial presentation effects did not differ as a function of word type.

**SAVORING-SUPPORTED BEHAVIORAL ACTIVATION PILOT FINDINGS**

Katya Yurkovskaya, 2026 and Addie Oliphant, 2026
Lucas S. LaFreniere, Assistant Professor, Psychology Department

Mental health interventions typically target a particular symptom or disorder. However, many people experience multiple symptoms at once. This intervention--delivered via smartphone app--combines Behavioral Activation, a treatment for depression, and savoring, a practice for worry and anxiety, in order to alleviate both symptoms simultaneously. Before this intervention can be tested for effectiveness, its feasibility and acceptability must first be assessed. This study measured participants' change in anxiety, worry, and depression symptoms, affect, and positivity. Additionally, participants' acceptability and feasibility were measured. Participants were able to provide feedback. Participants found the intervention to be moderately acceptable and feasible. Their main suggestion was to expand the prompt availability. These results will be used in future studies to improve the acceptability and feasibility of the intervention.

**INVESTIGATING THREE-DIMENSIONAL CELL CULTURE SPHEROID MODELS FOR SPINOCEREBELLAR ATAXIA TYPE 1**

Nicolas Bedoya Agudelo, 2028
Sarita Lagalwar, Professor, Neuroscience Program

Spinocerebellar ataxia type 1 (SCA1) is a progressive neurodegenerative disease that causes atrophy of cerebellar Purkinje neurons due to an expansion of CAG repeats in the ataxin-1 (AXTN1) gene. Our lab currently investigates SCA1 in 2D cell models; this project evaluates cell spheroids, which serve as a 3D *in vitro* model that better mimics a physiological environment. We created spheroids of wild type (WT) and SCA1 cells, and tracked them over time through real-time fluorescence microscopy. We now report cell spheroids as a novel *in vitro* model system for studying SCA1.

**THE EFFECT OF TRYPTOPHOL ON *BATRACHOCHYTRIUM DENDROBATIDIS GROWTH***

Lillard Preschlack, 2026
Emily Le Sage, Assistant Professor, Biology Department

*Batrachochytrium dendrobatidis (Bd)* is a fungal pathogen that has caused mass die offs in amphibian populations worldwide. However, it has a quorum-sensing hormone called tryptophol which inhibits growth, preventing *Bd* from running out of resources from their host. We examined two isolates of *Bd* (JWR001 and JWR002) which were found in the same pond, but infected different frog species. We set up a 96-well plate with both isolates and measured cell growth over nine days with tryptophol as the treatment group. We conducted cell counts with a hemocytometer, took pictures of each well with a microscope, randomly measured cells using Image J, and measured optical density with a plate reader. Our goal was to identify growth pattern differences between isolates and wells exposed to tryptophol.

**BLACKNESS AND THE PROBLEMS OF REPRESENTATION IN 19TH CENTURY AMERICAN LITERATURE**

Spencer Dickson, 2027
Jamie Parra, Assistant Professor, English Department

Our project looks backward to the 19th century in search of progenitors to contemporary Black studies discourses, especially that of Afropessimist aesthetics. Afropessimism understands that only with the maintenance of Blackness as an onto-epistemic underclass (Non-Being, Negation) can the Enlightenment, and by extension Western thought, come to be. Aesthetic theorists have drawn on these ideas to highlight the central role of sense perception and the aesthetic subject in this anti-Black project. By looking at 4 writers (Hannah Crafts, Fredrick Douglass, Henry David Thoreau, and Herman Melville) as well as David Drake aka Dave the Potter, we can see that even in the 19th century, thinkers were grappling with our ability to represent the unrepresentable, to rebel against the "universal" structuring of "experience," to undermine hidden assumptions of the (aesthetic, judging) "self." Reading these artists in the light of contemporary developments reveals the long history of our current conversations and gives us new tools with which we can develop these rich and important discourses.

**EFFECTS OF TOPIRAMATE ON SLEEP AND CIRCADIAN ACTIVITY RHYTHMS IN FRUIT FLIES**

Jordan Diamond, 2027; Lila Schabacker, 2026; Annika Fougli, 2026; Jayden Perez, 2028; Nicole Sylvestri, 2027
Bernard Possidente, Professor, Biology Department and Neuroscience Program

The anticonvulsant Topiramate is commonly used to treat epilepsy and night eating disorder. Both conditions are known to cause sleep disruptions. To assess the relationship between this medication and sleep, Topiramate was administered to *Drosophila melanogaster* over the course of ten days in activity monitors. Circadian rhythm data, including activity, sleep, and biological clock period length were then analyzed. Our lab's previous findings show that Topiramate increases the period and sleep bout length in regular circadian periods. *D. melanogaster* strains with both short and long circadian periods are currently being administered Topiramate to observe its potential in regulating extreme circadian rhythms and sleep patterns.

**EFFECTS OF AMPICILLIN AND DMSO ON SLEEP AND CIRCADIAN ACTIVITY RHYTHMS IN FRUIT FLIES**

Jordan Diamond, 2027; Lila Schabacker, 2026; Annika Fougli, 2026; Jayden Perez, 2028; Nicole Sylvestri, 2027
Bernard Possidente, Professor, Biology Department and Neuroscience Program

The widely prescribed antibiotic Ampicillin falls under the penicillin class of medications and is used to treat various bacterial infections. Previous studies have implicated the gut microbiome in sleep disturbances, but few studies have explored the relationship between antibiotics, sleep, and circadian rhythms, despite antibiotics' known ability to alter the gut microbiome. Dimethyl sulfoxide (DMSO) is a common solvent used to dissolve hydrophobic compounds, including Ampicillin. In our experiment, we administered agar with Ampicillin (100 μg/mL) dissolved in DMSO, pure DMSO, and H20 to *Drosophila melanogaster* to observe Ampicillin's effect on circadian period and sleep. Pure DMSO and H20 was administered to *D. melanogaster* to ensure that any circadian effects observed may be differentiated between the treatment, Ampicillin, and solvent, DMSO.

**KANATSIOHAREKE MOHAWK COMMUNITY ARCHIVES PROJECT & THE TREE OF PEACE SOCIETY**

Madeleine Abramson, 2027 and Andi-Grey Sheingold, 2026
Alexandra Prince, Assistant Professor, Religious Studies Department

The Kanatsiohareke Mohawk community and Skidmore College have collaborated since 2021 through the MDOCS Co-Creation Initiative. Religious Studies students have contributed to this partnership by digitizing and transcribing Indigenous-produced media pertaining to the history of Kanatsiohareke and the Haudenosaunee. This decolonial project aims to preserve and share culturally significant Indigenous media, knowledge, and histories. Through these efforts, we intend to expand accessibility of Kanatsiohareke's media collection and advance the traditional teachings, ways of knowing, and histories of the Kanien'kehá:ka (Mohawk) people. In collaboration with Mohawk elder and storyteller Kay Olan, this project advanced research on the Tree of Peace Society founded by Mohawk chief Jake Swamp. In addition, we participated in service and learning activities to assist with Kanatsiohareke's annual Strawberry Festival.

**INVESTIGATION OF GLUCAN PHOSPHATASES DURING STARCH DEGRADATION**

Erikah DeGroat, 2026 and Ava Zhang, 2028
Madushi Raththagala, Associate Professor, Department of Chemistry

Starch EXcess4 (SEX4) is a site-specific glucan phosphatase required for efficient starch degradation in photosynthetic organisms. The inactive *Zea mays* (Zm) SEX4 bound to maltoheptaose has previously been determined, revealing the mechanism for C6-specificity. However, interactions between catalytically active *Zea mays* (Zm) SEX4 and starch substrate have not been determined. This study purifies and co-crystalizes –81 SEX4 from *Zea mays* (Zm) with maltoheptaose to investigate protein-substrate interactions to determine how SEX4 dephosphorylates starch. This study also aimed to explore regulatory mechanisms of SEX4. It has been previously determined that SEX4 is redox-regulated; in reduced conditions, SEX4 is active, while in an oxidized state, SEX4 is rendered inactive. This study employs biochemical assays to determine whether ATP and AMP concentrations affect SEX4 activity.

**VISUALIZING REVERSIBLE STARCH PHOSPHORYLATION USING SCANNING ELECTRON MICROSCOPY**

Slade Rice, 2027 and Jude Remenar, 2027
Madushi Raththagala, Associate Professor, Chemistry Department

Industrial starch degradation relies on extreme heat and harsh chemicals, rendering it a resource-intensive and environmentally unsustainable process. Enzyme-driven Plant starch degradation offers a greener alternative, but the mechanisms of key enzymes, such as dikinases (e.g., GWD), glucan phosphatases (e.g., SEX4), and beta-amylases (e.g., BAM3), remain unclear. This research aims to visualize starch granules undergoing enzymatic degradation in the presence of the enzymes involved. We have purified transitory starch from leaves and visualized it using scanning electron microscopy along with storage starch. BAM3-driven hydrolysis produces visible degradation, providing a comparative basis for assessing dikinase and glucan phosphatase activity. Our future findings, which include both storage and transitory starch, will be applied to improving starch breakdown for more efficient industrial applications.

**INVESTIGATE STARCH EXCESS4 GLUCAN BINDING THROUGH DIFFERENTIAL SCANNING FLUOROMETRY**

Kai Gemmell, 2028
Madushi Raththagala, Associate Professor, Chemistry Department

The interactions between the Starch Excess4 enzyme and starch granules depend on the structure and physicochemical properties of both starch and the enzyme. We performed a thermal shift assay to observe how phosphate and glucan binding increase enzyme stability. This method monitors protein unfolding through the fluorescence of Sypro dye, thereby determining the melting temperature of proteins. We have purified several protein constructs and optimized the concentrations of phosphates and maltoheptaose for the assay. Our findings demonstrate, for the first time, binding affinities between the Starch Excess4 enzyme and glucan substrates.

**EXPLORING SERS WITH PVP COATED SILVER NANOPARTICLES: NICOTINAMIDE VS. THIOPHENOL**

Rowan McLear, 2028
Maryuri Roca, Associate Teaching Professor, Chemistry Department

Surface-Enhanced Raman Spectroscopy (SERS) amplifies Raman signals using silver nanoparticles, enabling sensitive molecular detection at very low concentrations of analyte. Polyvinylpyrrolidone (PVP) is an important addition to nanoparticles as it stabilizes and controls their shape but may block analyte access to the surface of the metal, interfering with SERS signals. In this work, we seek to obtain functional SERS on PVP coated silver nanoparticles. Nanoparticles were characterized via Transmission Electron Microscopy (TEM) and UV-Visible spectroscopy to confirm morphology and plasmonic behavior. We found that thiophenol allows for more interaction with PVP coated metals with its thiol group, compared to the weaker amide group nicotinamide. Getting SERS on PVP coated silver nanoparticles is important as it allows the nanoparticles to maintain their regulated shape and stabilization.

**"SOMETIMES PEOPLE CAN FORGET WHO THEY REALLY ARE": IMMIGRANT STUDENTS ENGAGING WITH DIVERESE TEXTS IN PREDOMINANTLY WHITE CLASSROOMS**

Sharon Xu, 2027
Jessica Somerville-Braun, Assistant Professor, Education Studies Department

My study explored how fifth-grade immigrant students and their white peers engaged with representations of immigration and multilingualism in English language arts. I conducted qualitative coding of transcripts from recorded classroom observations and teacher/student interviews. I found that: (1) diverse texts provided starting places for students to share personal narratives, (2) students' connections to texts challenged simplistic understandings of windows/mirrors (Bishop, 1990), and (3) most students required teacher scaffolding to recognize issues specific to immigrant experiences, such as multilingualism, in contrast to more familiar topics (e.g., structural racism). Implications for pedagogy include providing a wide range of diverse books for students to find mirrors specific to their own experience/identity, and carefully guiding students to engage in deeper identity work (Bucholtz & Hall, 2005).

**RACE, TRAVEL, AND ENLIGHTENMENT CONTRADICTIONS: A COLONIAL READING OF MME LETELLIER'S MŒURS COLONIALES (1833)**

Mihranush Varzhapetyan, 2026
Catherine Talley, Assistant Professor, World Languages and Literatures Department

This research examines how 18th- and 19th-century French writers used stories of travel between France and its slave colonies to explore and represent race. These texts often portray white French characters learning to see and understand race differently in colonial settings or depict characters who are reracialized upon arriving in the colonies. By analyzing them, we understand better the complex construct of race and how French Enlightenment thought justified it. Within this framework, I focus on Mme Letellier's *Mœurs Coloniales* (1833), a little-known story based on her time in Guadeloupe. Through subtle reracialization, structural violence, and an ambiguous resolution, Letellier exposes the contradictions of Enlightenment thought and colonial society, offering a rare female-authored critique of race and moral failure in the French empire.

**TEMPORAL CHANGES IN THE ECONOMIC LIVES OF INDONESIAN WOMEN**

Emma Staton, 2026
Smriti Tiwari, Associate Professor, Economics Department

Over the course of two decades (2000 to 2025), Indonesia experienced a remarkable reduction in the percent of people in the country living in extreme poverty. We studied how this broader movement out of extreme poverty may have interacted with and influenced other changes in the economic lives of Indonesian women in particular. Using panel data from the Indonesian Family Life Survey (IFLS) collected in five discrete waves from 1993-2014, we looked heterogeneously at women that fell in different quintiles of the population expenditure distribution and studied changes in their employment, education, borrowing and lending habits, and decision making within the home. Through our tests, we found evidence of statistically significant changes in the economic lives of Indonesian women over the course of the surveyed years.

**INVESTIGATING MUSIC STYLE PROCESSING THROUGH PRIMING AND EEG**

Celine Xu, 2026
Dominique T. Vuvan, Associate Professor, Psychology Department

Previous studies show that listeners flexibly adapt their internalized tonal and harmonic schemas to different musical styles. For example, the V–I cadence is preferred over bVII–I in classical contexts, but this preference diminishes in rock, where bVII–I is stylistically common. In this study, we examined whether such style-specific expectations are automatically activated and influence musical judgements using a behavioral priming paradigm. Participants heard cadences (V-I or bVII-I) within classical or rock contexts and judged whether the second-to-last chord was in-tune. We also recorded event-related potentials (ERPs) using electroencephalography (EEG), focusing on the early right anterior negativity (ERAN) and P600 to examine neural responses to music-syntactic processing. This study integrates behavioral and neural approaches to better understand the cognitive mechanism underlying music perception.

**PODCASTING THE MIDDLE EAST: A HISTORY**

Dante Morse, 2026
Murat C. Yildiz, Associate Professor, History Department

As the world progresses into the digital age, so too does the art of storytelling. Within the past twenty years, podcasts have rocketed into the public eye, bringing with them countless new voices to share their passions. Everyone can make a podcast, which means everyone can express their opinion to a potentially vast audience. How, then, do we make sense of the endless narratives that podcasts spin about a topic as complicated and controversial as Middle Eastern history? Who are shaping the soundscapes of podcasts on the Middle East in the English language? What value lies in each story told? And is there a common thread between how hosts choose to podcast the Middle East?