Skidmore College

Faculty Student Summer Research Program

Summer 2024

Final Presentations
August 1, 2024
Since 1989, Skidmore College’s Faculty Student Summer Research Program has given students a singular opportunity to work one-on-one with a faculty member. For periods ranging from five to ten weeks, students work with faculty on original research in disciplines ranging from biology to management and business, including classics and geosciences. Hands-on research with a faculty member allows students to become part of the research enterprise in a way that both complements and informs regular class work. In some cases, the collaborative research forms the basis for a senior’s honors thesis or can lead to published articles in a peer-reviewed academic journal. Long-term, participation can help students gain admission to graduate schools and research careers. Skidmore alumni who have continued their education in graduate school have reported that experience as researchers has given them distinct advantages as scholars. For summer 2024, there are 114 students and 49 faculty members engaged over 73 collaborative research projects from 23 different disciplines funded by the Faculty Student Summer Research program, external grants, the S3M Program, indirect cost funds, start-up funds, and other funding sources.
Funding Sources for Faculty Student Summer Research Programs

ALUMNI, FAMILY, AND FRIENDS

Patricia Brennan ’74
Marlene Oberkotter Fowler ’61
Ralph Garboushian ’92
Stephanie and Steven Kasok, Parents ’16
Jim Lippman and Linda Friedman Lippman ’82
Richard A. Mellon ’87
Judy Reed Smith ’68
Margaret Williams Page ’43
Tina and David Wilson P’25
Mr. and Mrs. Kenneth Woodcock, Parents ’96
Axelrod-Porges Scholars
   Established in 2006 by Felicia Axelrod ’62 and Robert Porges to support faculty-student teams in the area of the sciences

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

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

FOUNDATIONS AND GRANTS

American Heart Associate
Federal Emergency Management Agency
Howard Hughes Medical Institute
Andrew W. Mellon Foundation
Meridian Institute
The National Institutes of Health
The National Science Foundation
The Skidmore Scholars in Science and Mathematics (S3M) Program
The Schupf Scholars Program

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

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

2024-25
Sofía 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 Sinnott, ’24

2021-22
Emily Luo, ’23
Elizabeth Miller, ’23
Nich Nearyrat Phalkun, ’24
Elizabeth Scholer, ’24
Sarah Varua, ’24

2020-21
Selina Almasarwah, ’23
Sarah Finnegan, ’22
Heather Ricker, ’22

2019-20
Anna Carhart, ’22
Rachel Carrock, ’22
Katie Rinaolo, ’22
Jiayue Hong, ’21
Saana Teittinen-Gordon, ’22
Molly Cole, ’21
Katie Yan, ’22

2018-19
Acadia Connor, ’21
Katherine Johnson, ’20
Angelina Leonardi, ’20
Claudia Mak, ’20
Julia Danischweski, ’20
Ella Long, ’20
Jazmin Sepulveda, ’20

2017-18
Beatriz Chavez, ’18
Gabriella Gerlach, ’19
Kyla Johnson, ’20
Samantha Kenah, ’19
Yutong Li, ’19
Suzanne Zeff, ’20
2016-2017
Claudia Bennett-Caso ‘19
Alexandra Cassell ‘19
Erin Mah ‘19
Erin Maloney ‘18
Emily O’Connor ‘19
Kari Rasmussen ‘18

2015-2016
Kelly Cantwell, ‘18
Jillian Greenspan, ‘17
Katherine Shi, ‘18
Deborah Kim, ’18
Talia Stortini, ‘18
Hannah Schapiro, ‘17
Meggie Danielson, ‘17

2014-2015
Jaya Borgatta, ’16
Meti Debela, ’16
Glenna Joyce, ’16
Jenny Zhang, ’16
Stephanie Zhen, ’16

2013-2014
Melanie Feen ‘16
Michele Fu ‘15
Kelly Isham ‘16
Angelica Newell ‘15
Rafaella Pontes ‘15

2012-2013
Jennifer Harfmann ‘14
Rafaella Pontes ‘15
Kara Rode ‘15
Carol Wu ‘14

2011-2012
Tim Brodsky ‘13
Andrea Conine ‘13
Brenda Olivo ‘14
Kathryn Stein ‘13

2010-2011
Rebecca Connelly ‘12
Ava Hamilton ‘12
Caroline Loehr ‘12
Taylor Moot ‘13
Faculty Student Summer Research Program

Schedule of Final Research Presentations

Thursday, August 1, 2024

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

9:20 am – 10:10 am Oral Presentations

 ROOM A

SURVEILLANCE IN THE CITY: EXPLORING PEOPLES’ PERCEPTIONS OF DETROIT'S PROJECT GREEN LIGHT
Emma Bedard, 2026; Stella Brown, 2026; Suri Ye, 2026
Rebecca Gleit, Assistant Professor, Sociology Department

ENVIRONMENTAL JUSTICE AND THE US MILITARY
Diva Belo, 2025
Charmaine Willis, Visiting Assistant Professor, Political Science Department

 ROOM B

ZORA NEALE HURSTON’S LIVING ARCHIVES: PRESERVING ART OF THE BLACK DIASPORA
Kayla Moody, 2025
Tammy C. Owens, Assistant Professor, American Studies Department

KANATSIOHAREKE ARCHIVES PROJECT
Cameron Pittl, 2024; Jane Schreibman, 2024
Alexandra Prince, Assistant Professor, Religious Studies Department

INDIGENEITY, MUSIC, AND ITS ACADEMIC FUTURE
Elán Stadelmann, 2024
Charlotte D’Evelyn, Assistant Professor, Music Department
ROOM C

EXPLORING THE PRODUCTION OF IMMUNOMODULATORY COMPOUNDS PRODUCED BY THE FUNGAL PATHOGEN, BATRACHOCHYTRIUM DENDROBATIDIS
Krista Longo, 2026; Michael Brennan, 2026
Emily Le Sage, Assistant Professor, Biology Department

STRATEGIZING ALGAL GROWTH: A DIVE INTO PHENOTYPIC AND METABOLIC IMPACTS OF PROPYL GALLATE
Tai Smirniagina, 2027
Neha Arora, Instructor, Biology Department

10:15–11 am Poster Presentations Session 1

ROOM A

CHARACTERIZATION AND REACTIVITY OF LAYERED DOUBLE HYDROXIDE PARTICLES IMMOBILIZED WITH TRIAZINE HYDROLASE m
Angeline Mozrall, 2026
Steven Frey, Associate Professor, Chemistry Department

CATALYTIC ISOTOPE-LABELING OF CHEMICAL COMMODITIES
Olivia Gottschall, 2026
Jessada Mahatthananchai, Assistant Professor, Chemistry Department

NOVEL HYDROGEN-DEUTERIUM EXCHANGE REACTION OF NITROGEN-CONTAINING COMPOUNDS
Andrew K. Shen, 2025; Wells C. Larsen, 2025; Mark S. Miller, 2025
Jessada Mahatthananchai, Assistant Professor, Chemistry Department

ROOM B

INVESTIGATING DYSLIPIDEMIA IN A YOUNG, HEALTHY POPULATION AND HOW IT AFFECTS CARDIOMETABOLIC HEALTH AND CVD RISK
Jillian Lang, 2024
Steve Ives, Associate Professor, Health and Human Physiological Sciences Department

DIFFERENTIAL SCANNING FLUORIMETRY AND COMPUTATIONAL STUDIES OF SEX4
Isabelle Crampton, 2026
K. Aurelia Ball, Associate Professor and Chair, Chemistry Department
Madushi U. Raththagala, Associate Professor, Chemistry Department

EXAMINATION OF HOW CARBAMAZEPINE AFFECTS SLEEP IN DIFFERENT LIGHT-CONTROLLED ENVIRONMENTS IN DROSOPHILA MELANOGASTER
Eve G. Waldron, 2025; Lara Strunk, 2024
Christopher G. Vecsey, Associate Professor, Neuroscience Program
THE FORM OF THINGS UNKNOWN
Andi-Grey Sheingold, 2026
Amy Frappier, Associate Professor, Geosciences Department

ANALYZING ENGLISH LANGUAGE ARTS TEACHER PLANNING AND INTERACTIONAL MOVES
Lucy McCulloch, 2026
Jessica Somerville-Braun, Assistant Professor, Education Studies Department

11-11:45 am Poster Presentations Session 2

DOES LAMOTRIGINE ALTER CIRCADIAN RHYTHMS FOR SLEEP AND ACTIVITY IN DROSOPHILA?
Lila Schabacker, 2026; Alex Arata, 2025; Nora Parson, 2026
Bernard Possidente, Professor, Biology Department

BACILLUS ANTHRACIS INDIRECT PATHWAY FOR ASPARAGINYL-tRNA FORMATION
Katelyn Corpuz, 2026
Kelly Sheppard, Professor, Chemistry Department

HETEROGENOUS OZONOLYSIS OF ADSORBED PINENE
Natalie O'Neill, 2026
Juan G. Navea, Professor, Chemistry Department

STUDYING THE MIND’S EYE: LEXICAL AND VISUAL IMAGERY EFFECTS IN READING
Sophie Pajakowski, 2024
Rebecca Johnson, Professor, Psychology Department

OPTIMIZING THE DETECTION OF IMMOBILIZED LYSOZYMES USING PASSIVATED GOLD NANOPARTICLES
Gavrielle Gordon, 2026
Maryuri Roca, Senior Teaching Professor, Chemistry Department

RESURRECTION OF ANCESTRAL ASPARTYL-tRNA SYNTHETASES
Lindsey Han, 2025
Kelly Sheppard, Professor, Chemistry Department
RESOCIALIZATION RESCUES DELETERIOUS SLEEP EFFECTS OF DEVELOPMENTAL ISOLATION IN DROSOPHILA MELANOGASTER
Ely S. Lettow, 2025
Christopher G. Vecsey, Associate Professor, Neuroscience Program

ROOM C

EFFECT OF SALT ON A FULLY BOUND PEPTIDE SH3 INTERACTION
Ally Mujica, 2025
K. Aurelia Ball, Associate Professor and Chair, Department of Chemistry

A DAYTIME PATHWAY FOR THE FORMATION OF ATMOSPHERIC NITROUS ACID (HONO)
Sofia Chihade 2026; Lily Watson 2027
Juan G. Navea, Professor, Chemistry Department

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

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

ROOM A

THE CONSEQUENCES OF DEPARTMENT-BASED SYSTEMS OF FACULTY EVALUATION AT SKIDMORE COLLEGE
Jazmin Ruiz Hernandez, 2027; Ilena Berro Pizzarossa, 2024.
Kimberley Frederick, Professor, Chemistry Department

EVALUATION OF THE SUPPORT SYSTEMS ECOMAP FOR LGBTQ+ YOUTH
Sofia Iacobucci 2024; Syre Zenon, 2024
June Paul, Assistant Professor, Social Work Department

5 IMAGINED WAYS IN WHICH YOUR BIRTH MOTHER CEDES YOU TO FATE & 5 IMPOSSIBLE WAYS IN WHICH YOU MEET HER AGAIN
May Braaten, 2024; Katie Mastriano, 2024
Mao Chen, Professor of Chinese, World Languages and Literatures Department

ROOM B

CURATING THE FIRST CRITICAL EDITION OF ALDOUS HUXLEY’S BRAVE NEW WORLD
Kimberly Pienkawa, 2025; Ellery Shea, 2025.
Tim Wientzen, Associate Professor and Chair, English Department
ENDEAVOURS, JOURNEYS, AND THE FRIENDS WE MADE ALONG THE WAY: TRANSCRIBING PETER BRISCOE’S EXPERIENCES ON THE FIRST VOYAGE
Amelia DeDominicas, 2026
Tillman Nechtman, Professor, History Department

A BEAUTIFUL DEFIANCE
Udo Hemmelgarn, 2025
Flagg Taylor, Associate Professor, Political Science Department

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

ROOM A

REDESIGNING THE LINUX LAB WEBSITE
Cian Schneider, 2026
Christine Reilly, Associate Professor and Chair, Computer Science Department

ATMOSPHERIC MOBILITY OF IRON FROM SIMULATED COMBUSTION PARTICLES
Lyra Flinn, 2025
Juan G. Navea, Professor, Chemistry Department

THE CO-ACTIVATION OF OCTOPAMINE NEURON AND ASTROCYTE IN DROSOPHILA MELANOGASTER
Yiwen Su, 2026
Christopher G. Vecsey, Associate Professor, Neuroscience Program

ROOM B

INVESTIGATING THE IMPACT OF SSRIs ON CARDIOVASCULAR RISK FACTORS: A CASE-CONTROL STUDY
Elena Shostak, 2024
Steve Ives, Associate Professor, Health and Human Physiological Sciences Department

IMPACTS OF SALT ON AMPHIBIAN DISEASE DYNAMICS
Ryan Thompson, 2026; Jack Lubitz, 2026; Elliott Zajac, 2027
Emily Le Sage, Assistant Professor, Biology Department

SALT DISRUPTS THE BINDING PATHWAY OF AN ArkA-abpSH3 PEPTIDE COMPLEX
Jorge Cardoso 2026; Ally Mujica 2025
K. Aurelia Ball, Associate Professor and Chair, Chemistry Department
ROOM C

ABSORPTION SPECTRA AND ELECTRONIC STRUCTURE OF AQUEOUS 4-IMIDAZOLECARBOXALDEHYDE WITH RESPECT TO pH: THEORETICAL AND EXPERIMENTAL STUDY
Lily Watson, 2027
Juan G. Navea, Professor, Chemistry Department

REGULATION OF ANTIMICROBIAL PEPTIDE SYNTHESIS IN RESPONSE TO Bd INFECTION
Thomas Tao, 2024; Ryan Thompson, 2026; Jack Lubitz, 2026; Elliott Zajac, 2027
Emily Le Sage, Assistant Professor, Biology Department

USE OF LITHIUM CHLORIDE TO TREAT ALZHEIMER’S DISEASE IN MICE
Alex Arata, 2025; Nora Parson, 2026; Lila Schabacker, 2026
Bernard Possidente, Professor, Biology Department

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

ROOM A

DETECTION OF CEFTRIAXONE USING PRINTER INK CHIPS
Kristyn Kirton, 2027
Kim Frederick, Professor, Chemistry Department

DETERMINING THE AMOUNT OF ACETYLSALICYLIC ACID IN ASPIRIN TABLETS USING A MICROFLUIDIC PAPER ANALYTICAL DEVICE
Claire Stone, 2026,
Kim Frederick, Professor, Chemistry Department

FIRST THINGS FIRST: SERIAL LETTER PROCESSING EFFECTS IN CHILDREN & ADULTS
Sylvia Lavin, 2025; Nicole Dolynuk, 2026
Rebecca Johnson, Professor, Psychology Department

ROOM B

THE EFFECT OF SELECTIVE OPTOGENETIC ACTIVATION OF DORSAL-LATERAL AND SMALL VENTROLATERAL CLOCK NEURONS ON SLEEP AND BEHAVIOR IN DROSOPHILA MELANOGASTER
Erica Li, Amherst College; Brayden Mullin, Albany College of Pharmacy and Health Sciences
Christopher G. Vecsey, Associate Professor, Neuroscience Program

CHARACTERIZATION OF THE DUAL PATHWAYS FOR B. HALODURANS ASPARAGINYL-tRNA FORMATION
Sophia Witkon 2027; Trisha Tran 2027
Kelly Sheppard, Professor, Chemistry Department
THE ETHICS OF WEAPONIZING THE GENOME
Bridget Coyer, 2025
Yelena Biberman-Ocakli, Associate Professor, Political Science Department

EFFECTS OF VARYING INTENSITY OF RED LIGHT ON SLEEP IN DROSOPHILA MELANOGASTER
Jack Mongan, 2026; Makenzie Keir, High School, 2026
Christopher G. Vecsey, Associate Professor, Neuroscience Program

ROOM C

DOES pH AFFECT PRECIPITATION OF GOLD NANOPARTICLES ON IMMOBILIZED PROTEINS?
Liam Babitz, 2026
Maryuri Roca, Senior Teaching Professor, Chemistry Department

CAN LARGE LANGUAGE MODELS BE SKEPTICAL? APPLICATION OF LARGE LANGUAGE MODELS IN FINANCIAL STATEMENT AUDITING
Lane Grey, 2026
Yueqi Li, Assistant Professor, Management and Business Department

THE EFFECT OF A DOUBLE MUTATION ON KEY NEGATIVELY CHARGED RESIDUES ON THE BOUND STATE OF THE ARKA-SH3 COMPLEX
Jaden Ali, 2027; Olubube Onwuzulu, 2024; Elliott J. Stollar, University of Liverpool
K. Aurelia Ball, Associate Professor and Chair, Department of Chemistry

CHARACTERIZATION OF TiO2 NANOPARTICLES GRAFTED WITH IRON AND COPPER
Meiirzhan Karataikyzy, 2027
Maryuri Roca, Senior Teaching Professor, Chemistry Department
PROJECT ABSTRACTS

(In alphabetical order by professor’s last name)

STRATEGIZING ALGAL GROWTH: A DIVE INTO PHENOTYPIC AND METABOLIC IMPACTS OF PROPYL GALLATE
Tai Smirniagina, 2027
Neha Arora, Instructor, Biology Department

Photosynthetic microalgae have diverse applications including biofuel production, nutraceuticals, and bioremediation. However, large scale outdoor cultivation of algae suffers from low productivity due to environmental fluctuations. Culture stress increases the production of harmful reactive oxygen species, which can be quenched with antioxidants molecules such as propyl gallate (PG). This study investigated the effects of PG on the growth and metabolism of a model alga; Chlorella vulgaris. The 72-hour cell viability assay showed a gradual decline in algal growth with increasing PG concentrations (10-100 mg/L). Interestingly, no significant changes were recorded in growth when the alga was cultivated at 20 mg/L and 60 mg/L of PG compared to control. However, alterations in the biochemical composition and pigments indicated modulation of algal metabolism in response to PG.

THE EFFECT OF A DOUBLE MUTATION ON KEY NEGATIVELY CHARGED RESIDUES ON THE BOUND STATE OF THE ARKA-SH3 COMPLEX
Jaden Ali 2027; Olubube Onwuzulu, 2024; Elliott J. Stollar, University of Liverpool
K. Aurelia Ball, Associate Professor and Chair, Chemistry Department

Intrinsically Disordered Peptides (IDPs) are peptides that lack a defined secondary structure. IDPs often bind partner proteins to help perform various cellular processes like signaling and cytoskeletal regulation. We previously used Molecular Dynamics Simulations to study the effect of singular mutations (E14Q or E17Q individually). This study simulated the bound state of a double (E14Q+E17Q) mutant to study the effect of simultaneous mutations. Overall, this experiment showed that performing a double mutation had similar effects to the E17Q mutation with an increased effect on electrostatic interactions and greater destabilization of the complex than the single mutation. Future research should focus on the binding of the double mutant to see how the binding pathway is affected by the double mutation.

SALT DISRUPTS THE BINDING PATHWAY OF AN ArkA-abpSH3 PEPTIDE COMPLEX
Jorge Cardoso, 2026; Ally Mujica, 2025
K. Aurelia Ball, Associate Professor and Chair, Chemistry Department

Intrinsically disordered peptides (IDPs), which lack stable structures, play key roles in cellular processes like signaling and regulation. IDPs, such as the yeast-derived ArkA, often bind to AbpSH3 domains, found across eukaryotes, through an intermediate encounter complex facilitated by electrostatic and hydrophobic interactions. Our study used molecular dynamics simulations to investigate the effects of salt on the binding of ArkA to AbpSH3. At high salt concentrations (800
mM), the formation of the encounter complex is disrupted, highlighting the critical role of electrostatic interactions. This research provides insights into the importance of non-specific electrostatic interactions in stabilizing key intermediate states in IDP binding pathways.

DIFFERENTIAL SCANNING FLUORIMETRY AND COMPUTATIONAL STUDIES OF SEX4
Isabelle Crampton, 2026
K. Aurelia Ball, Associate Professor and Chair, Chemistry Department
Madushi U. Raththagala, Associate Professor, Chemistry Department

Starch EXcess4 (SEX4) is a plant glucan phosphatase that is required for efficient starch degradation in plants. The structure of ligand-free SEX4 isolated from Zea mays has been previously determined, and the structural and biochemical information of SEX4 reveals how this enzyme dephosphorylates starch substrates. However, it is unclear how SEX4 interacts with substrates inside the cell. Differential scanning fluorimetry (DSF) was used to determine SEX4-substrate binding affinity from the change in protein melting temperature (ΔTm). Computational methods were also employed to study SEX4 function. Three different starting structures were identified from the Protein Data Bank (PDB) and prepared for molecular dynamics simulations. Computational methods will provide insight into the overall trends, flexibility, and compactness of the structure.

EFFECT OF SALT ON A FULLY BOUND PEPTIDE SH3 INTERACTION
Ally Mujica, 2025
K. Aurelia Ball, Associate Professor and Chair, Chemistry Department

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

THE ETHICS OF WEAPONIZING THE GENOME
Bridget Coyer, 2025
Yelena Biberman-Ocakli, Associate Professor, Political Science Department

What are the ethical challenges and opportunities stemming from the prospect of weaponizing the latest and anticipated advances in biotechnology? What are the different perspectives on “genetic weapons”? A comparative analysis across the ideological spectrum yielded the following preliminary findings. Conservative philosophers Martin Heidegger, Hans Jonas, Francis Fukuyama, and Leon Kass see humans as having inherent, God-given dignity, and manipulations of any living being going against a higher power. Liberal philosopher Micheal Sandel, on the other hand, focuses on humans losing an aspect of connection to each other. Anarchist Ted Kaczynski sees any use of modern technology as inherently destructive. Finally, Chinese military physician Guo Ji-Wei argues that genetically-engineered biotechnology could make war more “merciful” (nonlethal and reversible) through “precision injury.” The next steps are to explore the policy
options for the Unites States and the international community given the diversity of philosophical perspectives.

5 IMAGINED WAYS IN WHICH YOUR BIRTH MOTHER CEDES YOU TO FATE & 5 IMPOSSIBLE WAYS IN WHICH YOU MEET HER AGAIN
May Braaten, 2024; Katie Mastriano, 2024
Mao Chen, Professor of Chinese, World Languages and Literatures Department

The One Child Policy in China endured from 1980 to 2015 which aimed to curb the growth of the population. Enforcement of this policy ranged from financial incentive to violations of women’s health. Orphanages took in thousands of abandoned babies, most of whom were adopted internationally after China allowed for international adoption in 1991. The film 5 Ways/5 Ways explores ten scenarios that live in a Chinese American adoptee’s imagination of why a Chinese mother must give up her child and how they reunite decades later. The ten imaginations emerge from the near impossibility of a Chinese adoptee finding their birth parents due to logistical gaps in information. While preparation for the filming incorporates political, economic, cultural, and historical research, May and Katie’s film realize these implications through narrative.

INDIGENEITY, MUSIC, AND ITS ACADEMIC FUTURE
Elân Stadelmann, 2024
Charlotte D’Evelyn, Assistant Professor, Music Department

This research provides a framework on how to teach indigenous music and sound practices at Skidmore College in a way that is equitable, fair, and aligns with the values of indigenous communities. Our data was largely collected through service based exchange: digitization of archives of the Kanatsiohareke community, archival recording of festivals, and engaging with indigenous literature, all in service of the community itself. Our research methods were informed by the study of Dylan Robinson’s Hungry Listening, which forces the reader to engage with western definitions of music and research critically, within the context of colonialism and the historic oppression of Indigenous Communities. It was concluded that a class teaching indigenous sound practice should be service based, with an emphasis on collaboration and conversation.

THE FORM OF THINGS UNKNOWN
Andi-Grey Sheingold, 2026
Amy Frappier, Associate Professor, Geosciences Department

Art is an ongoing science that depends and thrives upon our continuous thirst for knowledge as a species. The process of updating as our understanding of a subject expands is an integral part of the advancement of our society. I have been working with the Geosciences Department in partnership with the Tang Teach Museum to create an exhibition to be installed in the Winter Gallery in October 2024. My research has revolved around a diorama of the Devonian Gilboa Forest that was featured in the New York State Museum 100 years ago. We have been working to create an updated diorama that features new discoveries surrounding the geological, paleontological, and paleo-botanical landscapes of the Devonian period. Alongside our updated diorama will be pieces that highlight humanity’s view and impact on the Earth as well as the concept of deep time.
DETECTION OF CEFTRIAXONE USING PRINTER INK CHIPS
Kristyn Kirton, 2027
Kim Frederick, Professor, Chemistry Department

Ceftriaxone is a common antibiotic that is used to treat both people and animals therefore is important to regulate the amount that is being used to prevent drug resistance. The goal of this work is to develop a rapid and effective method to measure the amount of Ceftriaxone in a commercial sample in environments that have inadequate equipment through the use of microfluidic paper analytical devices (μPADs) due to their size and cost. Research proceeded along two lines: a new method for producing the μPADs themselves and determining the performance of the colorimetric assay. We developed a new method for producing chips using laser printer ink to create μPADs which are more easily available and less expensive. In addition, we optimized the conditions for the quantification of Ceftriaxone using colorimetric-based cell phone detection.

THE CONSEQUENCES OF DEPARTMENT-BASED SYSTEMS OF FACULTY EVALUATION AT SKIDMORE COLLEGE
Jazmin Ruiz Hernandez, 2027; Ilena Berro Pizzarossa, 2024.
Kimberley Frederick, Professor, Chemistry Department.

This research examines the departmental nature of the teaching evaluation systems used at Skidmore College and their implications. Skidmore College has a unique commitment to departmental autonomy, which results in divergent long student evaluation forms, criteria for evaluation, and evaluation policies. While well-intended, this variability makes it so that faculty receive varying levels and quality of feedback and evaluation, depending on their department. Therefore, evaluating committees struggle to ensure fair assessments for faculty due to disparities in the content and quality of materials provided by departments. Our findings suggest both a need and a preference for standardized evaluation policies and instruments to ensure clarity and fairness in faculty assessment.

DETERMINING THE AMOUNT OF ACETYLSALICYLIC ACID IN ASPIRIN TABLETS USING A MICROFLUIDIC PAPER ANALYTICAL DEVICE
Claire Stone, 2026
Kimberley Frederick, Professor, Chemistry Department

Acetylsalicylic acid (ASA), the active ingredient in aspirin, has been found in inconsistent amounts from tablet to tablet throughout the world. When an incorrect dose of ASA is received it can have detrimental effects on the consumers health. Therefore, we made it our goal to produce an easy-to-use microfluidic paper analytical device (μPAD) that can quickly indicate how much ASA is in an aspirin tablet. Analysis of the μPAD is done by measuring color change using accessible cell phone technology. The focus of this work has been to determine the proper reagent concentrations, necessary sample pre-preparation and the micropads analytical performance. Accuracy and precision were determined through the analysis of commercial aspirin tablets.
CHARACTERIZATION AND REACTIVITY OF LAYERED DOUBLE HYDROXIDE PARTICLES IMMOBILIZED WITH TRIAZINE HYDROLASE
Angeline Mozrall, 2026
Steven Frey, Associate Professor, Chemistry Department

Triazine hydrolase (TrzN) is an enzyme that degrades atrazine, a toxic herbicide found in water supplies. The goal of our work is to immobilize TrzN on layered double hydroxide (LDH) to produce a bio-composite capable of degrading atrazine. LDH was synthesized using a known procedure and characterized by atomic absorption spectroscopy, X-ray powder diffraction, FT-IR spectroscopy and gravimetric analysis. The LDH was treated with TrzN in buffered solution, washed repeatedly and separated by centrifugation. The ability of the LDH/TrzN bio-composite to degrade atrazine was demonstrated by UV-vis spectroscopy, and its activity was examined as a function of the amount of TrzN used in the immobilization step, the amount of bio-composite used in the reaction, and pH. The stability of the bio-composite was also tested.

SURVEILLANCE IN THE CITY: EXPLORING PEOPLES’ PERCEPTIONS OF DETROIT'S PROJECT GREEN LIGHT
Emma Bedard, 2026; Stella Brown, 2026; Suri Ye, 2026
Rebecca Gleit, Assistant Professor, Sociology Department

Project Green Light began in 2016 to combat crime in Detroit, Michigan. Over 900 green lights flash across the city with cameras that stream 24/7 video footage of the surrounding area to the Detroit Police Department. Our research investigates this police surveillance and addresses what people in Detroit think of Project Green Light. We traveled to Detroit for three days of field work. We made field observations at seven different locations, used convenience sampling to survey 115 people, and conducted 15 interviews. Most participants (69.30%) had noticed the green lights prior to our survey and the vast majority (85.22%) held positive opinions towards Project Green Light. Our future work will examine further variation and sense-making in peoples’ attitudes towards surveillance.

INVESTIGATING DYSLIPIDEMIA IN A YOUNG, HEALTHY POPULATION AND HOW IT AFFECTS CARDIOMETABOLIC HEALTH AND CVD RISK
Jillian Lang, 2024
Steve Ives, Associate Professor, Health and Human Physiological Sciences Department

Dyslipidemia, or abnormal levels of lipids in the bloodstream, is associated with cardiovascular disease (CVD) risk. We evaluated the effects of dyslipidemia on cardiometabolic health in young, healthy adults. Participants were characterized as having dyslipidemia (elevated total, LDL, or low HDL cholesterol), or not, and statistically assessed to see if there were group differences in cardiometabolic health (body composition, blood pressure, vascular reactivity, and vascular stiffness). There were significant differences between groups for body composition (p<0.03, Cohen’s d>0.61), peripheral and central blood pressures (p<0.003, Cohen’s d>0.90), and vascular stiffness indicators (p<0.02, Cohen’s d>0.67), but no significant differences in macro- or micronutrient intake (p>0.17, Cohen’s d<0.41). Dyslipidemia in healthy, young adults had significant negative effects on cardiometabolic measures of health and therefore increased CVD risk.
INVESTIGATING THE IMPACT OF SSRIs ON CARDIOVASCULAR RISK FACTORS: A CASE-CONTROL STUDY
Elena Shostak, 2024
Steve Ives, Associate Professor, Health and Human Physiological Sciences Department

Selective serotonin reuptake inhibitors (SSRIs) may affect blood pressure (BP) in patients that are older or with cardiovascular disease (CVD); however, the impacts in young, healthy is unclear. We evaluated the effects of SSRI use on CVD risk factors in young, healthy adults. Using a case-control approach, controls (n=7) were demographically-matched to SSRI users (n=7), and CVD risk factors were compared (BP, heart rate variability (HRV), vascular reactivity, and lipid profile). There were no significant differences in BP outcomes (p>0.39, Cohen's d<0.48), lipid profile (p>0.22, Cohen’s d<0.09), or HRV (p>0.43, Cohen's d <0.44) between groups, except for HFpeak (p=0.04, Cohen’s d=1.26). Vascular reactivity, while ~50% lower with SSRI, was not different (p>0.21, Cohen’s d<0.81). SSRIs do not significantly alter CVD risk factors in healthy individuals.

FIRST THINGS FIRST: SERIAL LETTER PROCESSING EFFECTS IN CHILDREN & ADULTS
Sylvia Lavin, 2025; Nicole Dolynuk, 2026
Rebecca Johnson, Professor, Psychology Department

The Dual Route Cascaded (DRC) model is a computational model of visual word recognition and reading aloud that posits two pathways of going from a printed word to spoken output: the lexical route and the non-lexical route. Over the past five weeks, our team successfully designed and programmed a naming study to test claims of the DRC model, including 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. Here we report the preliminary findings on participants’ response times and accuracy rates from the data collected from both skilled and developing readers thus far.

STUDYING THE MIND’S EYE: LEXICAL AND VISUAL IMAGERY EFFECTS IN READING
Sophie Pajakowski, 2024
Rebecca Johnson, Professor, Psychology Department

Many properties of words influence processing, including imageability, or the extent to which a word evokes mental imagery. Our lab has spent the last year designing and running three experiments (a lexical decision task, naming task, and sentence reading task) to explore whether the imageability effect in reading differs across individuals who possess varying levels of visual imagery capacity. In each study, participants read words that were either low or high in imageability and either low or high in written word frequency. Here we report the findings from these three experiments designed to test whether the word imageability effect and the word frequency effect interact with one’s visual imagery capacity as measured by their score on the Vividness of Visual Imagery Questionnaire (VVIQ).
EXPLORING THE PRODUCTION OF IMMUNOMODULATORY COMPOUNDS PRODUCED BY THE FUNGAL PATHOGEN, BATRACHOCYTHRIUM DENDROBATIDIS
Krista Longo, 2026; Michael Brennan, 2026
Emily Le Sage, Assistant Professor, Biology Department

Batrachochytrium dendrobatidis (Bd) is a fungal pathogen infecting amphibians worldwide. Recent findings have identified three metabolites produced by Bd (methylthioadenosine, L-kynurenine, and spermidine) as having immunomodulatory effects during amphibian infection. The metabolites help inhibit lymphocyte growth, weakening the host’s immune response. We are studying how exposure to different treatments affects the secretion of these metabolites. For example, the quorum sensing molecule tryptophol has been shown to inhibit the growth of Bd cells, which our results have supported. However, Tryptophol's effect on the metabolites are unknown. To answer these questions Bd cell cultures were grown to obtain a supernatant that could be analyzed through liquid chromatography. Understanding what affects the production of these metabolites can help us gain insight into the coevolution of host parasite interactions.

REGULATION OF ANTIMICROBIAL PEPTIDE SYNTHESIS IN RESPONSE TO Bd INFECTION
Thomas Tao, 2024; Ryan Thompson, 2026; Jack Lubitz, 2026; Elliott Zajac, 2027
Emily Le Sage, Assistant Professor, Biology Department

Amphibians are the most threatened vertebrate group. One threat is Batrachochytrium dendrobatidis (Bd), a fungal pathogen which infects amphibian skin and causes Chytridiomycosis. Antimicrobial peptides (AMPs) are small compounds secreted through the skin as a first line of defense against disease. We treated a resistant model species (Xenopus laevis) with immune signaling molecules known as cytokines, to determine if they induce AMP proliferation. AMP secretions were collected for later quantitative analysis and swabbed to determine their Chytrid load. We will later quantify gene expression in tissue samples to determine if Chytrid alters AMP production. We predict that frogs exposed to cytokines will express more AMPs and demonstrate lower Bd loads.

IMPACTS OF SALT ON AMPHIBIAN DISEASE DYNAMICS
Ryan Thompson, 2026; Jack Lubitz, 2026; Elliott Zajac, 2027
Emily Le Sage, Assistant Professor, Biology Department

Amphibians are the most threatened vertebrate group. One threat is Batrachochytrium dendrobatidis (Bd), a fungal pathogen which infects amphibian skin and causes Chytridiomycosis. Road salt is a common contaminant in freshwater environments globally, which can be a stressor for many organisms. Previous work showed that salt exposure increases amphibian susceptibility to viral infection. To test the hypothesis that road salt exposure affects Bd infection, we exposed wood frogs (Rana sylvatica) and Bd to various salinity levels. The wood frogs were raised in prepared mesocosms and exposed to Bd one month post-metamorphosis, and fungal load was measured to determine differences in susceptibility. We predict that frogs raised in higher salinity environments will have higher Bd loads, which has implications for environmental contamination.
CAN LARGE LANGUAGE MODELS BE SKEPTICAL? APPLICATION OF LARGE LANGUAGE MODELS IN FINANCIAL STATEMENT AUDITING
Lane Grey, 2026
Yueqi Li, Assistant Professor, Management and Business Department

As large language models (LLM) are adapted to external auditing, professional skepticism exercised by LLMs when conducting financial auditing tasks is unclear. An inadequate level of professional skepticism used can lead to reduced audit quality and audit failure. In this study, we investigate ChatGPT’s performance and exercise of professional skepticism in various audit tasks with different prompts (personas) used. The responses from ChatGPT are evaluated by experienced external auditors. The persona with the most experience and high level of skepticism embodied by ChatGPT exhibits high levels of performance and professional skepticism in audit tasks. This research serves as an important step in exploring the potential to adapt LLMs in external auditing.

CATALYTIC ISOTOPIC-LABELING OF CHEMICAL COMMODITIES
Olivia Gottschall, 2026
Jessada Mahatthananchai, Assistant Professor, Chemistry Department

Since its discovery in 1932, deuterium, as an isotope of hydrogen, has found many applications in organic chemistry due to stronger carbon-deuterium bond compared to carbon-hydrogen bond. Methods for incorporating deuterium are essential for usages as analytical standards or in medicinal chemistry. Our research aims to find new ways for biomimetic catalysts to selectively incorporate deuterium onto desired functional group of common chemical commodities such as ester and alkenes that can serve as platform to synthesize valuable compounds.

NOVEL HYDROGEN-DEUTERIUM EXCHANGE REACTION OF NITROGEN-CONTAINING COMPOUNDS
Andrew K. Shen, 2025; Wells C. Larsen, 2025; Mark S. Miller, 2025
Jessada Mahatthananchai, Assistant Professor, Chemistry Department

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

A DAYTIME PATHWAY FOR THE FORMATION OF ATMOSPHERIC NITROUS ACID (HONO)
Sofia Chihade 2026; Lily Watson 2027
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 NO$_2$.

**ATMOSPHERIC MOBILITY OF IRON FROM SIMULATED COMBUSTION PARTICLES**
Lyra Flinn, 2025
Juan G. Navea, Professor, Chemistry Department

Recent studies suggest that combustion particles have a significant impact on the iron flux in the
marine boundary layer, with important consequences in biogeochemical cycles. Work done by our
group suggests that the mineral composition of these particles, especially light sensitivity,
enhances the mobility of bioavailable iron. Yet, the complexity of these particles made it
challenging to understand the overall environmental iron flux. Here, a controlled model of TiO$_2$-
anatase grafted with iron and copper was used. The particles were introduced to an acidic (pH 2)
environment to mimic atmospheric processing of combustion particles. Here, we examined
samples where the Cu and Fe were deposited on the surface of the particles. The role of surface
driven processes and minerology on iron leaching from combustion particles is discussed.

**HETEROGENOUS OZONOLYSIS OF ADSORBED PINENE**
Natalie O'Neill, 2026
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 mechanism and rates of these heterogeneous atmospheric oxidation. Here, we present a state-
of-the-art chamber that allows for in-situ spectroscopic observation of the reaction between ozone
and a pinene 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 newly constructed control panel we were able to control ozone
concentrations and determine the kinetic constant of the reaction between $\alpha$-pinene adsorbed on
alumina and ozone.
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. Here, we show the dependency of 4IC’s optical properties on pH, combining computational models and experimental methods to better understand the chemical and physical properties of the widely used photosensitizer.

ENDEAVOURS, JOURNEYS, AND THE FRIENDS WE MADE ALONG THE WAY: TRANSCRIPTION PETER BRISCOE’S EXPERIENCES ON THE FIRST VOYAGE
Amelia DeDominicas, 2026
Tillman Nechtman, Professor, History Department

Captain Cook took multiple voyages, but this presentation focuses on his first voyage on the ship Endeavour. The presentation will explore a brief history of the voyage as well as the process of transcribing the journal of Peter Briscoe, a member of Cook’s crew. Using these transcriptions, we are able to analyze the experiences had by Briscoe and the other crew members he wrote about. The transcriptions of the journals will be used in a larger project that will make the body of work surrounding Cook’s voyages more accessible to scholars. The larger project will include the rest of the crew’s journals from Cook’s other voyages, but at this point in our research, we are focusing on Briscoe.

ZORA NEALE HURSTON’S LIVING ARCHIVES: PRESERVING ART OF THE BLACK DIASPORA
Kayla Moody, 2025
Tammy C. Owens, Assistant Professor, American Studies Department

This research explores the Harlem Renaissance, a period marking collective Black creativity and intellectualism in New York City during the 1920s - 1930s. The works of author and anthropologist Zora Neale Hurston serve as the framework for understanding the importance of preserving and participating in Black art. Through an exploration of literature, visual art, and archival collections, this research analyzes the practices of the Harlem Renaissance to argue that Hurston and other figures creatively employed living archives of intellectualism. The movement's accomplishment of creating and documenting Black art provided a sense of liberation that can be presently implemented to uplift marginalized communities within the fields of art history and arts education.
EVALUATION OF THE SUPPORT SYSTEMS ECOMAP FOR LGBTQ+ YOUTH
Sofia Iacobucci 2024; Syre Zenon, 2024
June Paul, Assistant Professor, Social Work Department

LGBTQ+ youth face significant challenges accessing supportive environments due to anti-LGBTQ victimization and systemic barriers, which are exacerbated for BIPOC and trans/nonbinary youth. This project evaluates a practice tool tailored for LGBTQ+ youth, assessing support networks through surveys, interviews, and observations. The tool, created by youth and practitioners, highlight the quality and types of support crucial for identity development and resilience against bias. Research aims include exploring the tool’s accessibility and efficacy in fostering dialogue and enriching support systems. Findings aim to inform practice strategies in diverse youth settings, promoting safe, affirming environments and better outcomes. The dissemination of this study includes peer-reviewed manuscripts and presentations at LGBTQ+ research symposia, contributing to policy and practice improvements for LGBTQ+ youth.

USE OF LITHIUM CHLORIDE TO TREAT ALZHEIMER’S DISEASE IN MICE.
Alex Arata, 2025; Nora Parson, 2026; Lila Schabacker, 2026
Bernard Possidente, Professor, Biology Department

Alzheimer's disease is a major cause of fatality in elderly populations throughout the world. Interestingly, Alzheimer's disease disrupts circadian rhythms and sleep patterns, and disrupted sleep is a risk factor for Alzheimer's. Therapies that affect circadian rhythms and are neuroprotective could be helpful in treating and preventing Alzheimer's disease. Lithium chloride is a drug commonly used to treat bipolar disorder and has these properties. In this experiment, the activity of 12 control 12 mice with Alzheimer’s in cages with running wheels was monitored in a 12:12 light:dark cycle and in complete darkness to assess the ability of Lithium to modulate their sleep-activity cycle.

DOES LAMOTRIGINE ALTER CIRCADIAN RHYTHMS FOR SLEEP AND ACTIVITY IN DROSOPHILA?
Lila Schabacker, 2026; Alex Arata, 2025; Nora Parson, 2026
Bernard Possidente, Professor, Biology Department

Lamotrigine is a psychiatric and neurological drug used to treat epilepsy and bipolar disorder. Both conditions have been linked to sleep disruptions, with decreased quality of sleep associated with worsening symptoms. To determine if the therapeutic effects of Lamotrigine can be attributed to increased quality of sleep, we gave Drosophila melanogaster (fruit flies) Lamotrigine for 10 days, while monitoring circadian rhythms for sleep and activity. Lamotrigine increased sleep and decreased sleep disruptions. A replication of this experiment is in progress.

KANATSIOHAREKE ARCHIVES PROJECT
Cameron Pittl, 2024; Jane Schreibman, 2024
Alexandra Prince, Assistant Professor, Religious Studies Department

The Kanatsiohareke Mohawk community and Skidmore have collaborated since 2021 through the MDOCS Co-Creation Initiative. Students from Religious Studies have actively contributed to this
partnership by digitizing and transcribing physical files and 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 the accessibility of Kanatsiohareke’s media collection and advance the traditional teachings, ways of knowing, and histories of the Mohawk people. As part of our commitment, we participated in service and learning activities during Kanatsiohareke’s annual Strawberry Festival. Ultimately, this project will culminate in an informative exhibit at Kanatsiohareke as well as a digital humanities project.

REDESIGNING THE LINUX LAB WEBSITE
Cian Schneider, 2026
Christine Reilly, Associate Professor, Computer Science Department

The Linux Lab website was created in 2008 as a resource for Skidmore computer science students to learn more about Linux computers, and it has not received a major update since. For this project, we aimed to remake a new, modern version of the Linux Lab website, in hopes that students will find it to be a helpful tool in their time at Skidmore. By following web development standards we successfully completed the first draft of the new website that we evaluated with user interviews, a survey, and an accessibility review. The results of these studies will be used to further refine the website design so that we can be prepared for the next step in web development, beta testing.

DOES pH AFFECT PRECIPITATION OF GOLD NANOPARTICLES ON IMMobilIZED PROTEINS?
Liam Babitz, 2026
Maryuri Roca, Senior Teaching Professor, Chemistry Department

Understanding the interaction between metal nanoparticles and immobilized proteins is necessary before attempting to western blot using antibodies labeled with metal nanoparticles. It is thought that negatively charged metal nanoparticles will preferentially bind to positively charged proteins. Given that a protein’s net charge is variable based on the pH of the solution, binding between nanoparticles and immobilized proteins was tested at different pHs. While gold nanoparticles precipitated more at higher pHs, there was no direct correlation with charge. Results suggest other factors contribute to these protein-nanoparticle interactions.

OPTIMIZING THE DETECTION OF IMMobilIZED LYSOZYMES USING PASSIVATED GOLD NANOPARTICLES
Gavrielle Gordon, 2026
Maryuri Roca, Senior Teaching Professor, Chemistry Department

Traditionally, Western blots have been a common technique in biochemistry laboratories to detect the presence of a specific immobilized protein, using a primary antibody that recognizes the protein, secondary antibody that recognizes the primary antibody, and colorant to cause a band to appear. This process is time-consuming, error prone, and uses expensive resources. Gold nanoparticles can bind to antibodies which directly bind to the desired protein. This appears clearly as a red band, using a fraction of the time and resources. However, nonspecific nanoparticle precipitation causes false positives. The goal of this work was to optimize the passivation of
nanoparticles, specifically the concentrations of antibody, nanoparticles, and passivating agent, to produce consistent and accurate results and to reduce false positives.

CHARACTERIZATION OF TiO2 NANOPARTICLES GRAFTED WITH IRON AND COPPER
Meiirzhan Karataikyzy, 2027
Maryuri Roca, Senior Teaching Professor, Chemistry Department

Environmental iron leached from mineral dust is a nutrient for marine organisms, but because natural samples are complex, correlating the composition of dust with iron leached is challenging. Since copper is believed to influence the leaching of iron, in this work we created synthetic TiO2 with iron and copper grafted as a proxy for environmental reactions. Using the impregnation method, grafting was achieved at 90 oC. Samples grafted with different percentages of iron and/or copper were characterized using microscopy (SEM and TEM), X-ray (XRF and XRD), and optical spectroscopy (DRS and AAS). A clear dependency was observed between the amount of iron and copper taken up by TiO2.

BACILLUS ANTHRACIS INDIRECT PATHWAY FOR ASPARAGINYL-tRNA FORMATION
Katelyn Corpuz, 2026
Kelly Sheppard, Professor, Chemistry Department

*Bacillus anthracis*, the bacterium that causes anthrax, encodes two different routes for attaching asparagine (Asn) to tRNAAsn, an essential step in protein synthesis. The direct route involves an asparaginyl-tRNA synthetase directly ligating Asn to tRNAAsn. In the indirect route, an archaeal non-discriminating aspartyl-tRNA synthetase (ND-AspRS) attaches aspartate (Asp) to tRNAAsn, forming Asp-tRNAAsn. Asp-tRNAAsn is then amidated by the amidotransferase, GatCAB, to form Asn-tRNAAsn. The archaeal ND-AspRS, tRNAAsn, and GatCAB form a transamidosome complex to catalyze Asn-tRNAAsn synthesis. In this research, the transamidosome components were purified to characterize the indirect pathway under various physiologically relevant conditions, in order to elucidate why *B. anthracis* acquired an archaeal ND-AspRS and retained both routes for Asn-tRNAAsn formation to inform novel antibiotic design.

RESURRECTION OF ANCESTRAL ASPARTYL-tRNA SYNTHETASES
Lindsey Han, 2025
Kelly Sheppard, Professor, Chemistry Department

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

CHARACTERIZATION OF THE DUAL PATHWAYS FOR *B. HALODURANS* ASPARAGINYL-tRNA FORMATION
Sophia Witkon 2027; Trisha Tran 2027
Kelly Sheppard, Professor, Chemistry Department

The synthesis of protein requires the attachment of an amino acid to tRNA. There are two distinct pathways for synthesizing Asn-tRNA\textsuperscript{Asn}. With the direct route, Asn is attached directly to tRNA\textsuperscript{Asn} by AsnRS. With the indirect pathway Asn is synthesized on the tRNA. First, a ND-AspRS attaches Asp to the tRNA that GatCAB transamidates to Asn. *Bacillus halodurans* uses both Asn-tRNA\textsuperscript{Asn} pathways. We purified the *B. halodurans* AsnRS and ND-AspRS to test their activities under different physiologically relevant conditions, such as the presence of reactive oxygen species and different pH levels. The research provides insight into why *B. halodurans* retained both pathways, how to grow it better to mass produce lantibiotics, and how Bacilli, including known human pathogens, have adapted to survive in varying conditions.

ANALYZING ENGLISH LANGUAGE ARTS TEACHER PLANNING AND INTERACTIONAL MOVES
Lucy McCulloch, 2026
Jessica Somerville-Braun, Assistant Professor, Education Studies Department

Classroom culture is essential to student learning, yet difficult to teach through methods coursework. Our study explored the question: How do experienced teachers create collaborative student-centered classroom culture? We conducted transcription and qualitative data coding of ethnographic data (recorded observations and interviews) from a fifth-grade English language arts classroom. We found that the teacher created a collaborative student-centered classroom culture by: (1) Facilitating engagement through student choice among diverse chapter books and (2) Creating low-stakes participation by inviting student noticing, then affirming and extending contributions. These pedagogical moves fostered relational trust necessary for sharing personal experiences and empathetic connections. Implications include the need to scaffold pre-service teachers’ observations of experienced teachers with sufficient structure (e.g., coding classroom transcripts) to understand how to create classroom culture.

A BEAUTIFUL DEFIANCE
Udo Hemmelgarn, 2025
Flagg Taylor, Associate Professor, Political Science Department

Our project is centered around studying the experiences of Czechoslovakian dissidents who lived under the Communist regime (1948-1989). The purpose of this project is to gather materials that can be used in a book examining the nature of human existence under totalitarian regimes through exploring ideas such as the power of truth, lies, law, and justice, among others. The research for this project consisted of listening to interviews with the dissidents and reading texts produced by prominent dissidents to get a better understanding of their thoughts and experiences living under the Czechoslovak Communist regime.
RESOCIALIZATION RESCUES DELETERIOUS SLEEP EFFECTS OF DEVELOPMENTAL ISOLATION IN DROSOPHILA MELANOGASTER
Ely S. Lettow, 2025
Christopher G. Vecsey, Associate Professor, Neuroscience Program

Young children may have been the most affected by social isolation during the Covid-19 pandemic, since they were isolated during critical periods of neurodevelopment. Social isolation during larval stages of development disrupts sleep behavior in the fruit fly Drosophila melanogaster. To further isolate critical periods of social development on sleep, we examined sleep in adult fruit flies that had experienced isolation at distinct stages of development. Half of each group was then re-socialized with their group-mates. The fully isolated group showed the shortest and most fractured sleep (supporting previous literature), and flies isolated only for the second half of larval development had intermediate deficits. Interestingly, adult resocialization afterward was able to rescue those sleep effects. Future experiments will investigate neural mechanisms underlying these sleep effects.

THE EFFECT OF SELECTIVE OPTOGENETIC ACTIVATION OF DORSAL-LATERAL AND SMALL VENTROLATERAL CLOCK NEURONS ON SLEEP AND BEHAVIOR IN DROSOPHILA MELANOGASTER
Erica Li, Amherst College; Brayden Mullin, Albany College of Pharmacy and Health Sciences
Christopher G. Vecsey, Associate Professor, Neuroscience Program

Sleep is a universal biological state that is critical to the development and health of many organisms. The fruit fly Drosophila melanogaster in particular has become an important model system for studying sleep due to its similarities to humans in sleep structure and behavior as well as its capacity for extensive genetic manipulation. Previous research has demonstrated that short neuropeptide F (sNPF) is a sleep-promoting messenger analogous to neuropeptide Y (NPY) in mammals; here, we leverage the split-GAL4 system and the red-light absorbing channelrhodopsin, Chrimson (CHR), to optogenetically activate specific subpopulations of sNPF-positive neurons. Through both behavioral studies and confocal imaging, we are able to determine specific pairs of dorsal-lateral clock neurons (LNds) and small ventrolateral clock neurons (sLNvs) potentially responsible for sNPF’s sleep-inducing effect.

EFFECTS OF VARYING INTENSITY OF RED LIGHT ON SLEEP IN DROSOPHILA MELANOGASTER
Jack Mongan, 2026; Makenzie Keir, High School, 2026
Christopher Vecsey, Associate Professor, Neuroscience Program

Previous research has shown that exposure to red light can lead to improved sleep in humans. Our study aimed to test the effects of red light at medium and low intensities, to complement previous research on high intensity, on the sleep patterns of Drosophila melanogaster. We tested these effects on control wild-type CS and w1118, as well as Cryptochrome (cry01), Rh7 (rh7), and rh7cry01 null mutations. Fly lines were also separated based on sex. Exposure to red light appeared to disrupt regular sleep patterns in almost all groups. This was particularly apparent in the effects on morning
sleep activity and timing of peak wake activities during the daytime periods. Nighttime sleep also appeared to increase in most groups, particularly in the male fly lines.

THE CO-ACTIVATION OF OCTOPAMINE NEURON AND ASTROCYTE IN DROSOPHILA MELANOGASTER
Yiwen Su, 2026
Christopher G. Vecsey, Associate Professor, Neuroscience Program

Astrocyte, as an important type of glial cell, plays a key role in homeostatic process during sleep, especially generate sleep rebound after manually activation. TDC2 neuron releases octopamine (OA) to promote wakefulness during night time by manually activation. One paper published in 2022 points out that after sleep deprivation for a long time, one of the key point for the generation of rebound is that astrocyte could bind various type of monoamines such as octopamine. Thus, my research focuses the co-activation of TDC2 neuron and astrocyte to see how the co-activation could change sleep pattern of fruit fly. My study includes regular LD 12:12, DD, and LL for 24 hours co-activation by using thermogenetic manipulation to examine the sleep pattern of flies. The LD experiment demonstrated a strong rebound sleep for the co-activation line, but there is no significant rebound in DD environment. 5 different genotypes flies show significantly different sleep pattern and cumulative sleep in DD and LD environment.

EXAMINATION OF HOW CARBAMAZEPINE AFFECTS SLEEP IN DIFFERENT LIGHT-CONTROLLED ENVIRONMENTS IN DROSOPHILA MELANOGASTER
Eve G. Waldron, 2025; Lara Strunk, 2025
Christopher G. Vecsey, Associate Professor, Neuroscience Program

Carbamazepine (CBZ) is commonly used to treat bipolar disorder and epileptic seizures. In a study with the fruit fly Drosophila melanogaster, CBZ was found to promote wakefulness at night, particularly during dark hours. Further experiments in different light conditions revealed that CBZ decreased sleep during nighttime in both genders under normal light conditions but caused decreased sleep throughout the day and night in total darkness. Females showed a gradual decrease in the effect over time, while males experienced a lengthened circadian period in darkness. Light presence also influenced CBZ’s impact on sleep, with a slight decrease observed in both sexes in constant light. These findings highlight the importance of light in CBZ’s effects on sleep, prompting further research into its mechanisms.

CURATING THE FIRST CRITICAL EDITION OF ALDOUS HUXLEY’S BRAVE NEW WORLD
Kimberly Pienkawa, 2025; Ellery Shea, 2025.
Tim Wientzen, Associate Professor and Chair, English Department

What does Aldous Huxley’s classic dystopian novel Brave New World (1932) continue to offer to audiences nearly a century after its initial publication? This summer, English majors Kimberly Pienkawa and Ellery Shea collaborated with Dr. Wientzen to edit the first ever critical edition of Brave New World. After reading the novel together, they identified elements of the text that required footnotes, and researched and wrote notes to explain Huxley’s allusions to literature, geography, etymology, and historical figures. They also canvassed Huxley’s own non-fiction
writing from the time of the novel’s composition, early reviews of the novel, and historical context to help curate several appendices to the novel. The critical edition is anticipated to release in 2028.

ENVIRONMENTAL JUSTICE AND THE US MILITARY
Diva Belo, 2025
Charmaine Willis, Visiting Assistant Professor, Political Science Department

Environmental justice has gained traction in recent years as the world increasingly recognizes the disproportional impact that environmental hazards have on historically marginalized populations, including communities of color, indigenous communities, and/or under-resourced communities. One area that has received recent attention is the impact of environmental degradation related to US military bases on local populations. While there is anecdotal evidence that US military bases tend to be sited in historically marginalized communities, there are neither studies that examine whether this is a systematic phenomenon nor the impacts of these siting decisions. In this project, we introduce an original dataset of US military base sites in the US and abroad that includes variables to measure historical marginalization and the potential environmental impacts of the bases.
Faculty Student Summer Research Program

Schedule of Final Research Presentations

Thursday, June 27, 2024

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

9:20 am – 10:20 am Oral Presentations

ROOM A

CRAFTING THE LIFE AND DEATH OF JOHN LANSING, JR: NOVEL WRITING FOR THE FOUNDING ERA
Ella Haney Foulds, 2026
Beau Breslin, Professor, Political Science Department

ANALYSIS OF PROPAGANDA LEAFLETS DURING THE KOREAN WAR
Ally Vickery, 2026
Joowon Park, Associate Professor, Anthropology Department

CHINA’S YOUNG DIGITAL NOMADS: WORK, LABOR, AND THE STATE
Marcelina Komornicka, 2026
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MY SPANISH FAMILY
Carla Hamilton, 2024
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ROOM B

SURVIVOR STRENGTHS: PERCEPTIONS OF PARENTING AMONG YOUTH EXPOSED TO INTIMATE PARTNER VIOLENCE (IPV)
Grace McCafferty, 2024
Johanna Reiter, Assistant Professor, Social Work Department

TEMPORAL CHANGES IN THE ECONOMIC LIVES OF THE POOR
Stacy Chen, 2025
Smriti Tiwari, Associate Professor, Economics Department

TALES OF RACIAL APPRENTICESHIP IN COLONIAL FRENCH LITERATURE
Liam Moren, 2025
Catherine Talley, Assistant Professor, World Languages & Literatures Department
ROOM C

DEVELOPING AND EVALUATING LOW-COST SOIL BULK DENSITY COLLECTION METHODS IN DIVERSIFIED FARMS IN THE NORTHEAST.
Eleanor Herbert, 2027; Carlin Krisher, 2027; Jenna Loveman, 2027; Linden Amster, 2027
Kris Covey, Assistant Professor, Environmental Science and Studies Department
Kurt Smemo, Associate Professor, Environmental Science and Studies Department

LAKE GEORGE BATTLEFIELD STATE PARK GPR AND EXCAVATION
Lily Whelden, 2025; Cerys Forster, 2026
Siobhan Hart, Associate Professor, Anthropology Department

TWO TREES: A DOCUMENTARY FILM-IN-PROGRESS
Callahan Mainzer, 2026
Adam Tinkle, Associate Professor, Media and Film Studies Department and Director of John B. Moore Documentary Studies Collaborative

ROOM A

DYING IN DEBT: EXPLORING THE EXISTENTIAL IMPLICATONS OF FINANCIAL DEBT
Jonah Levy, 2026
Harrison Schmitt, Assistant Professor, Psychology Department

DIFFERENTIAL SCANNING FLUORIMETRY STUDIES OF GLUCAN PHOSPHATASES
Isabelle Crampton, 2026; Brandon Yomtov, 2027
Madushi Raththagala, Associate Professor, Chemistry Department

PUMPING IRON AND POUNDING PAVEMENT: UNVEILING THE SIMILAR IMPACTS OF RESISTANCE AND ENDURANCE TRAINING ON MICROVASCULATURE FUNCTION
Melissa Severino, 2026
Justin DeBlauw, Research Fellow, Health and Human Physiological Sciences Department

SYNTHESIS AND AQUEOUS STABILITY OF MANGANESE (II) COMPLEXES WITH CROWN ETHER-BASED LIGANDS AS SUPEROXIDE DISMUTASE MIMETICS.
Hanyu Ruan, 2027
Steven T. Frey, Associate Professor, Chemistry Department

INVESTIGATION OF PHENACETIN SYNTHESIS BY WILLIAMSON ETHERIFICATION
Ethan Pham, 2026; Liam Babitz, 2026
Beatrice Kendall, Senior Instructor, Chemistry Department
ANALYSIS OF PHOSPHORYLATED AND UNPHOSPHORYLATED RNA POLYMERASE II CTD
Kian Sethi, 2026
K. Aurelia Ball, Associate Professor and Chair, Chemistry Department

INVESTIGATION OF THE REDOX REGULATION OF GLUCAN PHOSPHATASES
Slade Rice, 2027; Eriakah Degroat, 2026
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BIOCHEMICAL CHARACTERIZATION OF STARCH EXCESSS MUTANTS FROM ZEA MAYS
Angie Mozrall, 2026; Athena Braverman, 2027
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HOW HIGH AND LOW INTENSITY RED & BLUE LIGHT AFFECTS SLEEP AND RHYTHMS IN DROSOPHILA MELANOGASTER
Ryan Chipperfield, 2025
Chris Vecsey, Associate Professor, Neuroscience Program

QUANTUM CHEMICAL CALCULATION OF CARBOLINE: A MODEL SYSTEM FOR ENVIRONMENTAL CHROMOPHORES
Raul Manana, 2024
Juan G. Navea, Professor, Chemistry Department

SYNTHESIS OF TECOVIRIMAT, AN ORTHOPOX ANTIVIRAL
Alex Arata, 2025
Beatrice Kendall, Senior Instructor, Chemistry Department

UNBINDING OF AN INTRINSICALLY DISORDERED PROTEIN FROM AN SH3 DOMAIN: A MOLECULAR DYNAMICS SIMULATION STUDY
Daniela Poaquiza, 2027
K. Aurelia Ball, Associate Professor and Chair, Chemistry Department

AN EFFICIENT METHOD TO SYNTHESIZE TECOVIRIMAT
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ANALYSIS OF PHOSPHORYLATED AND UNPHOSPHORYLATED RNA POLYMERASE II CTD
Kian Sethi, 2026
K. Aurelia Ball, Associate Professor and Chair, Chemistry Department

The RNA Polymerase II C-Terminal Domain (CTD) is an intrinsically disordered region which regulates the transcription of RNA. Residues within CTD are phosphorylated and unphosphorylated during transcription. Our lab aims to understand how phosphorylation affects the conformation of the CTD and how, in turn, the ability of RNA Polymerase II CTD to regulate transcription is altered. CTD is comprised of heptad repeats, or recurring patterns of seven (“hept-”) amino acids. For this project, we specifically analyzed a tri-heptad repeat, and how their conformations change when phosphorylated. Our results suggest that when phosphorylated, there are more intra-heptad interactions, compared to the inter-heptad interactions between all heptads found in unphosphorylated CTD. Future research should focus on understanding the mechanism by which phosphorylation of RNA Polymerase II CTD affects the conformation.

UNBINDING OF AN INTRINSICALLY DISORDERED PROTEIN FROM AN SH3 DOMAIN: A MOLECULAR DYNAMICS SIMULATION STUDY
Daniela Poaquiza, 2027
K. Aurelia Ball, Associate Professor and Chair, Chemistry Department

SH3 domains are a common site for protein-protein interactions that bind to regions of intrinsically disordered proteins, such as ArkA, to carry out cellular processes. ArkA consists of two segments: seg1 is stably bound to its domain due to its proline-rich motif and seg2 is an unstable, flexible structure due to the lack of this motif. Therefore, the binding of seg1 is not affected by the absence of seg2, as it stays bound nearly 100% of the time. Seg2’s inability to stay fully bound to the partner domain, AbpSH3, allowed us to measure the rates at which it partially unbinds, $k_{-2}$, and fully unbinds, $k_{off}$, from AbpSH3. Understanding the unbinding rates will help us determine each segment's significance in the binding pathway.

PUMPING IRON AND POUNDING PAVEMENT: UNVEILING THE SIMILAR IMPACTS OF RESISTANCE AND ENDURANCE TRAINING ON MICROVASCULATURE FUNCTION
Melissa Severino, 2026
Justin DeBlauw, Research Fellow, Health and Human Physiological Sciences Department

It has been shown that endurance training can positively impact vascular function, however, differences between endurance and resistance training haven’t been explored following acute training. **Purpose:** To compare the effect of acute resistance and endurance training on vascular function. **Methods:** Twelve participants were randomly assigned to either resistance or endurance
training in a cross-over design and completed two weeks of training. The near-infrared spectroscopy-vascular occlusion test was used to evaluate vascular function. **Results:** No significant differences were observed between resistance and endurance training. The change in 10s slope, time to peak, and time to halfway to peak post occlusion were greater after endurance training than resistance training. **Conclusion:** This data suggests that resistance training has similar effects as endurance training on cardiovascular health.

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**CRAFTING THE LIFE AND DEATH OF JOHN LANSING, JR: NOVEL WRITING FOR THE FOUNDING ERA**

*Ella Haney Foulds, 2026*

*Beau Breslin, Professor, Political Science Department*

John Lansing Jr. (1754-1829) is a compelling figure of the early American republic. That is all the more reason why the mysterious circumstances of his disappearance on the evening of December 12, 1829 are still so fascinating. He left his Manhattan hotel room at dusk to deliver a letter to a transport sailing for his hometown in Albany. The letter never arrived at its ultimate destination...and Lansing was never seen again. His disappearance captivated New York’s high society. Some insisted that he was murdered; others were convinced that he stumbled into the water and was swept out to sea. No answer would ever come. It was an intriguing end to a beguiling political life. We are writing an historically accurate novel of his life and shadowy death.

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**AN EFFICIENT METHOD TO SYNTHESIZE TECOVIRIMAT**

*Xiaoran Liu, 2026*

*Beatrice Kendall, Senior Instructor, Department of Chemistry*

This study explores a synthetic method for the synthesis of Tecovirimat, a compound with potential therapeutic applications in treating monkeypox and smallpox. By reexamining the work of Bonku et al. and incorporating insights from additional research, we have identified the conditions for producing tecovirimat through a two-step process involving a Diels-Alder reaction of maleic anhydrate and cycloheptatriene followed by the nucleophilic addition of with para-(trifluoromethyl)benzhydrazide. The resulting Tecovirimat achieves an overall percent yield of 72.2% and a purity of 95%.

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**SYNTHESIS OF TECOVIRIMAT, AN ORTHOPOX ANTIVIRAL**

*Alex Arata, 2025*

*Beatrice Kendall, Senior Instructor, Department of Chemistry*

Tecovirimat has been approved as the only antiviral to treat smallpox and is being tested as a treatment for monkeypox. SIGI Technologies, which holds the patent for tecovirimat synthesis, which involves two reactions, with proprietary experimental procedures. The two reactions to synthesize this product are an endo-selective Diels Alder and an amidation reaction, which can be done in either order. In this experiment, Tecovirimat was synthesized by the amidation of maleic anhydride with p-trifluoromethyl Benzo hydrazide followed by a Diels Alder reaction with 1,3,5 cycloheptatriene. The conditions of these reactions were elucidated. The results from
this experiment validate the synthesis of Tecovirimat by amidation followed by Diels-Alder with 32.5 percent yield for the first reaction and 98.25 crude percent yield for the second reaction.

DEVELOPING AND EVALUATING LOW-COST SOIL BULK DENSITY COLLECTION METHODS IN DIVERSIFIED FARMS IN THE NORTHEAST
Eleanor Herbert, 2027; Carlin Krisher, 2027; Jenna Loveman, 2027; Linden Amster, 2027
Kris Covey, Assistant Professor, Environmental Science and Studies Department
Kurt Smemo, Associate Professor, Environmental Science and Studies Department

Soil bulk density estimates are required to scale soil carbon (C) concentrations to stocks, which are used to calculate CO2 sequestration. Better field tools are needed to facilitate low-cost, rapid collection of bulk density data to support data collection. Here, we present research comparing a novel bulk density tool developed by The Soil Inventory Project (TSIP) to the traditional AMS slide-hammer tool to determine whether it is a viable low-cost alternative. We collected 90 samples with each method across three local farms to capture a spectrum of soil characteristics and land uses. We analyzed bulk density by sieving, drying, and weighing soil samples. The resulting data were used to compare the variability and accuracy of each method relative to time and cost of sample collection.

MY SPANISH FAMILY
Carla Hamilton, 2024

Mary Kate Donovan, Associate Professor, World Languages and Literatures

My Spanish Family is a documentary podcast about racialized mothers, their daughters, and their Spanish nannies. It takes place in the 80s, when racial diversity was almost nonexistent in Spain. The documentary captures a unique moment in Spanish history as these women navigated the complex intersection of race, class, and gender. It is important that their stories are not lost, particularly because they represent a social power dynamic that no longer exists in contemporary Spain. Due to increasing rates of migration to the region, the nannies who care for racialized children are no longer Spanish. By preserving these narratives, My Spanish Family sheds light on a pivotal era and fosters a deeper understanding of how Spain’s social fabric changed at the close of the twentieth century.

SYNTHESIS AND AQUEOUS STABILITY OF 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 the metabolic pathway that eliminates 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. The active site of manganese SOD (MnSOD) contains oxygen and nitrogen atoms of protein amino acids that bind to a manganese (II/III) ion. We have synthesized two aza-crown ether compounds containing pyridine groups, along with their Mn^{2+} complexes, that bear resemblance to the MnSOD active site. Characterization of the compounds was achieved by ^1H and ^13C NMR, FT-IR and GC-MS.
Potentiometric titrations were performed to determine the stability of the two manganese complexes in aqueous solution.

LAKE GEORGE BATTLEFIELD STATE PARK GPR AND EXCAVATION
Lily Whelden, 2025; Cerys Forster, 2026
Siobhan Hart, Associate Professor, Anthropology Department

We discuss the use of both invasive and non-invasive archaeological methods utilized while studying the Lake George Battlefield State Park. We addressed two questions: 1) location of the battlelines of the French and Indian war and 2) location of the remains of a Revolutionary War smallpox hospital. Using ground penetrating radar (GPR), we located many potential cultural anomalies (PCAs). Based on these results, we excavated three test units in areas with high concentrations of PCAs. We found bedrock surfaces that appeared to have been maintained as interior floors, animal bones, and other 18th century artifacts along with modern discarded artifacts. We have demonstrated that GPR is an effective method for identifying PCAs and features. Additionally, there is demonstrated interest from the park in future archaeological research.

CHINA’S YOUNG DIGITAL NOMADS: WORK, LABOR, AND THE STATE
Marcelina Komornicka, 2026
Xiaoshuo Hou, Professor, Sociology Department and Asian Studies Program

Neoliberal globalization has prompted an increase in non-standard, informal forms of employment – often referred to as the gig economy – while new technologies and the internet infrastructures have made it possible to work remotely, free from any spatial constraints. This presentation focuses on the urban youth in China who has joined the force of “digital nomads” and explores the opportunities, challenges, and paradoxes of becoming digital nomads. The case of the young digital nomads in China – from artists and writers to live streamers, tech workers, and self-employed entrepreneurs – indicates the complex relationship between the state and labor, marginality and belonging, freedom and subjugation, and capitalism and alternative ways of living.

INVESTIGATION OF PHENACETIN SYNTHESIS BY WILLIAMSON ETHERIFICATION
Ethan Pham, 2026; Liam Babitz, 2026
Beatrice Kendall, Senior Instructor, Chemistry Department

Phenacetin can be synthesized from acetaminophen by a Williamson ether synthesis. Equate™ brand acetaminophen tablets were refluxed for two hours with ethyl iodide and base in varying solvents to understand the effects of solvent choice, base choice, and base equivalents on yield. Solvent choice, in general, did not appear to have an effect on crude phenacetin with the exception of ethyl acetate being the only solvent providing a significantly higher yield. Base amounts had a positive correlation with average yields. Choice of base resulted in inconclusive data due to possible formation of side products. This analysis provided a deeper understanding of nucleophilic substitution.
TALES OF RACIAL APPRENTICESHIP IN COLONIAL FRENCH LITERATURE
Liam Moren, 2025
Catherine Talley, Assistant Professor, World Languages & Literatures Department

Throughout the early- to mid-19th century, a particular subgenre of French fiction emerged to depict Atlantic crossings–travel between France and its colonies–as a form of initiation into different understandings of race and racial hierarchy. These narratives generally involve white-passing creole characters who, when returning to the racialized social structure of the colonies from an “enlightened” and thus “race-blind” French society, are confronted with the implications of their own mixed-race identity. Our research focused on understanding these stories in relation to their historical context: What were the real racial politics of France and its colonies during this period? Are they accurately represented in these texts? What might have been at stake in representing them this way?

QUANTUM CHEMICAL CALCULATION OF CARBOLINE: A MODEL SYSTEM FOR ENVIRONMENTAL CHROMOPHORES
Raul Manana, 2024
Juan G. Navea, Professor, Chemistry Department

Environmental chromophores, such as marine-dissolved organic matter (m-DOM), are highly complex, light-absorbing organic compounds. Reactions involving m-DOM play a significant role in environmental processes, yet their study is challenging due to m-DOM's intricate composition. In this study, we propose beta-carboline as a molecular model for m-DOM, given its high aromaticity and nitrogen content, which closely resemble the characteristics of m-DOM. We utilized computational tools to investigate the absorption spectra of beta-carboline in the UV-Vis range, as well as its vibrational spectra. This approach provides a simplified yet effective way to study the behavior and properties of m-DOM.

ANALYSIS OF PROPAGANDA LEAFLETS DURING THE KOREAN WAR
Ally Vickery, 2026
Joowon Park, Associate Professor, Anthropology Department

Psychological warfare has played a prominent role in military operations for thousands of years to demoralize the enemy, create dissension, and spread ideologies. During the Korean War (1950-53), approximately 2.8 billion propaganda leaflets, or “paper bombs,” were dropped by the United Nations forces (including the United States and South Korea) and the North Korean and Chinese militaries. “Bury the enemy with paper,” ordered Frank Pace, US Secretary of State at the time. Drawing on archival data from the War Memorial of Korea (in Seoul), this summer collaborative research analyzed the narrative contents of fifty propaganda leaflets. What messages did these leaflets carry? What cultural framings were used to encourage surrender or defection? And how were aerial tactics deployed in relation to the terrestrial warfare?

DIFFERENTIAL SCANNING FLUORIMETRY STUDIES OF GLUCAN PHOSPHATASES
Isabelle Crampton, 2026; Brandon Yomtov, 2027
Madushi Raththagala, Associate Professor, Chemistry Department
Starch EXcess4 (SEX4) is a glucan phosphatase required for efficient plant starch degradation. The structure of ligand-free SEX4 from *Zea mays* (Zm) has been previously determined, and the structural and biochemical characterization of SEX4 reveals how this enzyme dephosphorylates starch substrates. However, how SEX4 interacts with the physiologically relevant starch substrates is unclear. Differential scanning fluorimetry (DSF) was employed to determine SEX4-substrate binding affinity. The -81 Zm SEX4 constructs bound to maltohexaose were observed to have a ATm of approximately 3º C. In future experiments, different microdomains of starch granule structures will be utilized in DSF along with X-ray crystallography and hydrogen-deuterium exchange mass spectrometry (HDX-MS).

**INVESTIGATION OF THE REDOX REGULATION OF GLUCAN PHOSPHATASES**
Slade Rice, 2027; Erikah Degroat, 2026
Madushi Raththagala, Associate Professor, Department of Chemistry

The glucan phosphatases are crucial for regulating starch dephosphorylation in plants. Much of the mechanistic properties of this enzyme family are not well understood, including the kinetics and regulatory strategies. This study, focusing on Like Sex Four2 (LSF2), aimed to decipher whether LSF2 also can undergo reversible oxidation, and how that affects the enzyme activity of the enzyme. We investigated LSF2 activity against p-nitrophenyl phosphate (pNPP) in the presence of a reducing agent, dithiothreitol (DTT), and oxidizing agent, hydrogen peroxide. Our findings suggest that similar to starch Excess4 (SEX4), LSF2 also changes its activity in reduced environments. Future studies will include investigating the activity of LSF2 under physiologically relevant reducing agents such as thioredoxin.

**BIOCHEMICAL CHARACTERIZATION OF STARCH EXCESSS MUTANTS FROM ZEA MAYS**
Angie Mozrall, 2026; Athena Braverman, 2027
Madushi Raththagala, Associate Professor, Department of Chemistry

Starch Excess4 (SEX4) is a glucan phosphatase that plays an essential role in starch degradation within plants. Five mutants of ZmSEX4 (*Zea Mays*) were made using structure-guided mutagenesis. To see if these changes caused kinetic and functional differences, para-nitrophenyl phosphate (pNPP) assays were performed. These pNPP assays showed that the mutant F159A had an increased activity compared to the wild-type protein. The other mutants, including N247K, E254K, S245K, and Q328K, all had a decrease in activity compared to the wild type. This data can be used to further understand the SEX4 structure and function and its crucial roles in the reverse phosphorylation of starch.

**SURVIVOR STRENGTHS: PERCEPTIONS OF PARENTING AMONG YOUTH EXPOSED TO INTIMATE PARTNER VIOLENCE**
Grace McCafferty, 2024
Johanna Reiter, Assistant Professor, Social Work Department

Parenting survivors of intimate partner violence (IPV) face discrimination regarding parenting practices, and are often incarcerated for IPV-related incidents even if they are victims of abuse
themselves. Such discrimination often results in children being placed into the child welfare system, with low-income people of color disproportionately affected. However, previous research suggests that parents in contexts of IPV demonstrate considerable strengths in parenting in such contexts of adversity. The present study explores youths’ perceptions of parents’ strengths in contexts of IPV. Through a review of existing literature, we utilized a total of 20 articles exploring youths’ experiences facing IPV in the home and we designed a study implementing dialogic interviews as well as arts-based research methods to understand youths’ perceptions of their victimized parents’ strengths in parenting.

DYING IN DEBT: EXPLORING THE EXISTENTIAL IMPLACATIONS OF FINANCIAL DEBT
Jonah Levy, 2026
Harrison Schmitt, Assistant Professor, Psychology Department

With U.S. household debt totaling over $17 trillion, people are struggling to flourish financially and psychologically. Recent research suggests that different forms of debt may be seen as socially (dis)advantageous. For instance, culturally-defined “good” debts like mortgages afford financial stability while culturally-defined “bad” debts like payday loans are used to merely survive. A mixed-methods study examined mental health impacts of various kinds of debt. Study 1 offers qualitative analyses of existential themes in debt narratives from StudentDebtCrisis.org (N = 164). Study 2 (N = 399) provides correlational evidence that using “good” debts positively predicts self-esteem, and negatively predicts death anxiety. These studies suggest that different forms of debt have different existential implications which these studies situate within the cultural context of the contemporary United States.

TWO TREES: A DOCUMENTARY FILM-IN-PROGRESS
Callahan Mainzer, 2026
Adam Tinkle, Associate Professor, Media and Film Studies Department and Director of John B. Moore Documentary Studies Collaborative

Inspired by the Mohawk story of the Peacemaker, Chief Jake Swamp (1949-2010) planted trees all around the world to spread a message of peace. Two were planted in Saratoga Springs: one on the campus of Skidmore College and the other in High Rock Park, a site with a history important to the relationship between Mohawk and non-Native people. Unmarked by any plaque, that second Tree of Peace still stands, surrounded by signage that acknowledges only certain threads of that indigenous history. The other Tree is missing – and no one at Skidmore seems to know what happened to it in the 34 years since its planting. In this film, we hear from Skidmore archaeologist Siobhan Hart and Mohawk storyteller Ionataie: was Kay Olan, using these two trees as a lens to examine how and what gets remembered - and forgotten.

TEMPORAL CHANGES IN THE ECONOMIC LIVES OF THE POOR
Stacy Chen, 2025
Smriti Tiwari, Associate Professor, Economics

Indonesia witnessed a remarkable 12% reduction in its poverty rate over two decades. One feature of economic growth is a shift out of agriculture and into manufacturing industries. Using
panel data collected between 1993 and 2014, we study whether and how Indonesian households’ participation and outcomes in non-farm and farm businesses have evolved. We explore this by heterogeneously looking at households that fall in different quintiles of the expenditure distribution. Are households in the bottom 20th percentile different from those within 20th to 40th percentile? Do we see a shift from farm to non-farm businesses? Is this trend more significant for one quintile versus others?

**HOW HIGH AND LOW INTENSITY RED & BLUE LIGHT AFFECTS SLEEP AND RHYTHMS IN DROSOPHILA MELANOGASTER**

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

Poor sleep is a common issue today, partly due to our easy access to artificial light, especially after dusk. Light is a crucial regulator of the daily sleep cycle, as its presence can inhibit melatonin production. Additionally, the intensity and color of light can have significant effects on the body and mind. This research aimed to investigate how varying light intensities affect sleep in fruit flies (Drosophila melanogaster). We found that low-intensity blue light affects fruit fly sleep patterns. Furthermore, medium-intensity light (with analysis) showed that both red and blue light inhibit sleep. High intensity light showed a general reduction in sleep on the 3rd and 4th experimental days.