

# Skidmore College



**FACULTY STUDENT SUMMER RESEARCH PROGRAM**

**SUMMER 2023**

**FINAL PRESENTATIONS**

**AUGUST 3, 2023**

**Faculty Student Summer Research Program  
Summer 2023**

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



## **The Schupf Scholars Program**

**2014-2015**

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

**2013-2014**

Melanie Feen '16  
Michele F6.24

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**Faculty Student Summer Research Program**

**Schedule of Final Research Presentations**

**Thursday, August 3, 2023**

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

9:20 am – 10:20 am Oral Presentations



**AM EFFECT OF A KEY NEGATIVELY CHARGED RESIDUE MUTATION ON THE  
BINDING PATHWAY OF SH3 DOMAIN COMPLEX AND ArkA PEPTIDE**  
Oluebube Onwuzulu, 2024; Alex Arata, 2025



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

Olivia Kazanjian, 2024; Rachel Hambuchen, 2026

Juan G. Navea, Professor, Chemistry Department

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

Andrew K. Shen, 2025

Jessada Mahatthananchai, Assistant Professor, Chemistry Department

**CATALYTIC ISOTOPIC-LABELING OF HYDROCARBON COM (E)-5/tEtEtEtEtEtEtEtEtEtEtEtE**

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

Mary Kate Murphy, 2026

James J. Kennelly, Professor, Management and Business Department

**ROOM C**

**NEUROPHYSIOLOGICAL INDICES OF FLOW IN DANCE IMPROVISATION**

Grace Burnett, 2024

Dominique Vuvan, Associate Professor, Psychology Department

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

Lauren M Greaves, 2023

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

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

Oliver Blum, 2023

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

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

Elena Shostak, 2024

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

**ROOM B**

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

Eve Waldron, 2025

Christopher Vecsey, Associate Professor, Neuroscience Program

**DETECTING PHOSPHATE IN SOIL**

Gavrielle Gordon, 2026

Kimberley Frederick, Professor, Chemistry Department

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

Mary Harbison, 2026

Kimberley Frederick, Professor, Chemistry Department

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

Cassie Davidson, 2025; Maddy Fung, 2025

Aarathi Prasad, Associate Professor, Computer Science Department

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

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

Christoph

**MUTANT ATXIN-1 DISRUPTS MITOCHONDRIAL MEMBRANE POTENTIAL  
(MMP) DYNAMICS: IMPLICATIONS FOR SPINOCEREBELLAR ATAXIA TYPE 1**  
Ada Glynn, 2024  
Sarita Lagalwar, Associate Professor, Neuroscience Department



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

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

Tony Mota, 2024

Yelena Biberman, Associate Professor, Political Science Department

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

## **MINIMAL EXTERNALISM AND WHITE BIAS**

Marley Schmidt 2023

Susan Blake, Visiting Assistant Professor, Philosophy Department

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

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

Gabriella Modesti, 2024

Lisa Chalik, Visiting Assistant Professor, Psychology Department

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

**DETECTING**



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

Sarah Sinnott, 2024

Steven T. Frey, Associate Professor, Chemistry Department

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

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

Raven Jade Villa, 2023

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

From Celia murdering her owner in the 17th century to recent events like Carlisha Hood armed self-protection during an altercation, Black women's use of violence has the potential to transform contemporary debates about "stand your ground laws," politically inflected violence, and the meanings and ethics of self-defense. Theories of necessary violence like those of Fanon, Newton, Williams, Guevarra, and others have advocated for the use of violence to combat oppressive systemic structures. However, until recently, analysis of gender has been absent from these

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

Elena Shostak, 2024

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

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

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

Oliver Blum, 2023

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

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

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

Lauren M, Greaves, 2023

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

Mary Kate Murphy, 2026

James J. Kennelly, Professor, Management and Business Department

This is a pilot project to record and preserve the living history of Irish immigrants in the Capital District/North Country region. We recorded, digitized, and transcribed a series of interviews with Irish immigrants who have settled in this area. The interviews focused on informants' recollections of their lives in Ireland, their reasons for emigrating to America, and their impressions and experiences in their new home. Although the primary purpose of this project was essentially the of history, we noted the recurrence of common themes, particularly the freedom, diversity, openness and opportunity that these immigrants found in America. S ( t)-2

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

Aaron Shellow-Lavine, 2023

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

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

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

Ada Glynn, 2024

Sarita Lagalwar, Associate Professor, Neuroscience Program

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

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

Andrew K. Shen, 2025

Jessada Mahatthananchai, Assistant Professor, Chemistry Department

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

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

Will Hoerle, 2024

Jessada Mahatthananchai, Assistant Professor, Chemistry Department

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

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

Ethan J. Percival, 2026

Jessada Mahatthananchai, Assistant Professor, Chemistry Department

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

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

Wells C. Larsen, 2025

Jessada Mahatthananchai, Assistant Professor, Chemistry Department

Since its discovery in 1932, deuterium, as an isotope of hydrogen, has found many applications in organic chemistry due to stronger carbon-deuterium bond compared to carbon-

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

Elizabeth Scholer, 2024; Sofia Chihade, 2026

Juan G. Navea, Professor, Chemistry Department

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

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

Rachel Hambuchen, 2026

Juan G. Navea, Professor, Chemistry Department

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

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

Sofia Chihade, 2026; Rachel Scholl, 2026

Juan G. Navea, Professor, Chemistry Department

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

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

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

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

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

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

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

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

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

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

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

Rebecca Hagopian, 2024

Feryaz Ocakli, Associate Professor, Political Science Department

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

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

**YOUTH**





analyzer and automated flux chambers we measured gas fluxes in an Adirondack peatland. Peat

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

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

Chris Vecsey, Associate Professor, Neuroscience Program

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

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

Maggie Besthoff, 2024

Erica Wojcik, Associate Professor, Psychology Department

Dominique Vuvan, Associate Professor, Neuroscience Program and Psychology Department

This research project aims to investigate the early infant auditory environment in terms of language, music, and their interaction using the Mendoza Music corpus (Mendoza & Fausey, 2018), which contains full-day naturalistic audio recordings of 35 infants at home in the U.S. We were interested in a subset of recordings that contained solo live singing. The current research consisted of three sub-projects. First, we created a timeline of language and music milestones in children in-utero to age seven. Second, we segmented the audio files by identifying word onsets

**Faculty Student Summer Research Program**

**Schedule of Final Research Presentations**

**Friday, June 30, 2023**

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

9:20 am – 10:20 am Oral Presentations

**ROOM A**

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

Maggie McCurdy, 2024

Siobhan Hart, Associate Professor, Anthropology Department

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

Shey Feng, 2024; Aimee Holland, 2025

Siobhan Hart, Associate Professor, Anthropology Department

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

Kaitlin Kath22Smee,6 (S)26 (S06 (S26 (S46 (S;j-0.002 Tc 0.009XCAV0)2 ( K)4-10 (P)-4 (r)3 (of)32 (e)4 ( M)

**ROOM A**

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

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

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

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

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

Yiwen Su, 2026  
Bernard Possidente, Professor, Biology Department

**RESURRECTION OF ANCESTRAL ASPARTYL-tRNA SYNTHETASES**

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

**ROOM B**

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

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

**RAINBOW STATIC MASTERMIND**

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

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

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

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

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

**ROOM A**

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

Grace Coale, 2025; Sayuri Pfeiffer, 2026

Sylvia Franke McDevitt, Associate Professor, Biology Department

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

Aliza Nazir, 2023

Leigh Wilton, Associate Professor, Psychology Department

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

Cella Sawyer, 2024

Kelly Sheppard, Associate Professor, Chemistry Department

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

Yutian Feng, 2025

Kelly Sheppard, Associate Professor, Chemistry Department

**ROOM B**

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

Sophie Gilbert, 2024

Jennifer Bonner, Associate Professor, Biology Department

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

Emma Lloyd, 2025; Anna Kieffer, 2026

Karen Kellogg, Professor, Environmental Studies and Sciences Program

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

David Salinas, 2025; Sophie Levy, 2025

Laurie Rabinowitz, Assistant Professor, Education Studies Department

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

Ariana Tucker, 2024

Christopher Vecsey, Associate Professor, Neuroscience Program

## **PROJECT ABSTRACTS**

(In alphabetical order by professor's last name)

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

Hunter Wasser, 2023

Charlie Bettigole, GIS Center Director

Skidmore College recently acquired a parcel comprising over 500 acres of forest and wetland. Since then, little investigation of the property has taken place. Through a combination of geospatial analysis and ground truthing (field work), this research has created a wholly original body of mna< (i)-2 (s)-1 c ha



**SKIDMORE ARCHAEOLOGICAL COLLECTION NAGPRA RESEARCH**

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

Bowen Bao, 2024

Xiaoshuo Hou, Professor, Sociology Department and Asian Studies Program

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

## **THE MIND'S EYE IN READING: THE RELATIONSHIP BETWEEN THE**

## **PRE-PRODUCTI**

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

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

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

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

Ariana Tucker, 2024

Christopher Vecsey, Associate Professor, Neuroscience Program

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

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

Julia Cannistraro, 2024

Dominique Vuvan, Associate Professor, Psychology Department

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

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

Heba Salman, 2025

Leigh Wilton, Associate Professor, Psychology Department

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

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

Aliza Nazir, 2023

Leigh Wilton, Associate Professor, Psychology Department

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