

# SRS 2023



## Annual SUNY New Paltz Student Research Symposium

Program Book



# 29th ANNUAL SUNY NEW PALTZ STUDENT RESEARCH SYMPOSIUM

Sponsored by:  
The Research, Scholarship, and Creative Activities ([RSCA](#)) office

*Friday, May 5, 2023*  
*Sojourner Truth Library*  
*4:00 - 6:30 p.m.*

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# *The 2023 Student Research Symposium*

This year marks the 29<sup>th</sup> consecutive installment of the SRS, our annual celebration of students-faculty scholarship at SUNY New Paltz. This year's SRS edition includes 55 poster presentations of work performed by 95 students, supported by 39 faculty mentors representing 22 departments.

## *Symposium Schedule Friday, May 5*

- ❖ 3:45 – 4:15 pm: Check-in and hors d'oeuvres
- ❖ 4:15 – 4:30 pm: Welcome remarks and awards
- ❖ 4:30 – 6:30pm: Poster presentations

## *Online Archive*

Students' poster presentations are also archived online for later viewing:

<https://tinyurl.com/rsca2023srs>

## *Acknowledgments*

We heartily thank:

- ❖ the Office of Academic Affairs for their generous support of the SRS, our [academic semester](#) and [summer](#) grants, and [travel funds](#) for students to present their projects off-campus;
- ❖ the SUNY New Paltz Foundation and donors Michele Di Palo-Williams '77 (Sociology) and Graeme Williams for creating our new [Student Opportunity Grant](#);
- ❖ Sojourner Truth Library for hosting this year's SRS;
- ❖ Campus Auxiliary Services and Sodexo for funding and serving today's refreshments.

## *The RSCA Advisory Board*

[Huicheng Chien](#) (Geography), [Li Gao](#) (School of Business),  
[Gordana Garapic](#) (Geology), [Judith Halasz](#) (Sociology), [Adrianna Martinez](#) (Library)  
[Kathleen Murphy](#) (Music), [Lindsey Russo](#) (Teaching & Learning),  
[Corwin Senko](#), RSCA Director (Psychology)

Administrative Assistant: Amy Witkus

## *Welcome to the Student Research Symposium*

Congratulations to the students whose research and creative inquiry projects are showcased in this year's Student Research Symposium. Congratulations as well to the faculty for dedicating themselves to engaging students in the research experience and creative process, often considered the quintessential forms of high impact educational practice.

To our students, faculty would no doubt appreciate your expressions of gratitude for their investment of time and expertise in your success in research. I hope that you have thanked or will thank them. I ask that you also recognize not only the faculty but also many others at SUNY New Paltz who play a supporting role in student research. They include departmental support staff and an array of individuals across all divisions of the University who provide the administrative, educational, and student support services that contribute directly or indirectly to your overall success, including your achievements in research and creative inquiry.

Finally, I thank you in advance for continuing to share with those outside the campus community your story of a New Paltz education personalized by transformative research opportunities, which were made possible by our dedicated faculty and by many others, including generous benefactors.

***Barbara Lyman***  
Interim Provost and Vice President  
for Academic Affairs



Welcome to this year's SRS!

For many of us, the *Student Research Symposium* is annual tradition is more than a celebration of our scholarship together. It's a celebration of what we most love about being a college professor: collaborating with bright, eager students on the types of projects being shared today.

Faculty mentors, thank you for supporting students through these projects, guiding them gently through its twists and turns. Your efforts provide students a deeper view into your field's possibilities and their own strengths.

Students, thank you for your dogged commitment and enthusiasm! It is nearly impossible to complete such a major undertaking without those qualities. Through your project, I hope that you have honed some skills valued in your discipline and discovered some possible career options, too. Maybe you have even learned a little about yourself. In a few years, may you will look back on these collaborative projects with fondness and a genuine sense of having grown from them.

Finally, if you are graduating soon, do stay in touch with your mentors! For many of us, these relationships with you rank as one of the most rewarding parts of the job. It brings us all great joy and inspiration to hear of your post-New Paltz adventures and triumphs.

***Corwin Senko***  
RSCA Director  
Professor of Psychology



## *Faculty Mentor of the Year Award*

This award honors a faculty mentor who has made extraordinary efforts to support undergraduates' intellectual growth and professional development through research, scholarship, and/or creative experiences outside of the classroom setting.

The 2023 *Mentor of the Year* is [Oksana Laleko](#) (Associate Professor of English; Director of Linguistics program). Congratulations, Oksana!



## ***Research, Scholarship and Creative Activities Program***

The RSCA provides small grants to support scholarly collaborations between faculty and undergraduate students during the Academic Year (AYURE) and Summer (SURE). These competitive grants are open to full-time faculty from all academic disciplines. Students whose work is accepted for presentation at a professional conference are eligible for the RSCA travel awards.

### **AYURE GRANTS**

The Academic Year Undergraduate Research Experience (AYURE) program supports student-faculty collaborations during the Fall and Spring semesters. It provides funds to cover the project's expenses during the semester.

### **SURE GRANTS**

The Summer Undergraduate Research Experience (SURE) program encourages intensive student participation in an aspect of faculty scholarship. Like the AYURE program, it provides funds to cover the project's expenses. Additionally, students are supported with a stipend for the 8-week summer project so that they can devote themselves full-time to the project. Faculty mentors are also provided a small stipend during this period. As a goal of this program is to encourage ongoing faculty student collaboration, students are encouraged to continue working on the project during subsequent semesters.

### **STUDENT CONFERENCE TRAVEL AWARD**

The RSCA program supports students to present the results of the collaborative work at professional conferences.

Congratulations to all award recipients (see pages 36-42).

# *Abstracts*

*(in alphabetical order by faculty mentors' academic departments)*

## **Anthropology Department**

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### ***An Analysis of the Preservation of Pine Street Houghtaling, African Burial Ground and Old Dutch Church Skeletal Remains in Kingston NY.***

Makayla Williamson

Faculty Mentor: Kenneth Nystrom (Anthropology)

Bone taphonomy is described as the how the bone behaves and reacts when exposed to certain environmental, or burial, conditions. The ability for bone to persevere through environmental conditions allows for archaeologists to better understand past populations. In order to study how treatment and maintenance of cemeteries affected the survivability of buried individuals, three skeletal samples from different sites in Kingston NY: the Houghtaling Cemetery (ca. 1830s-1870s), the Old Dutch Cemetery (ca. 1700-1750) and the Pine Street African Burial Ground (ca. 1720s-1870) were considered. Each site was in relatively close proximity (approx. 5 blocks) but demonstrates a diverse array of socioeconomic status present in Kingston from the 1700s to the late 1800s. A preservation score was calculated for each individual which represents the potential for generating osteological data (e.g., sex/age estimation, stature estimation, etc) from that particular individual. The Houghtaling Cemetery had the most individuals in the study and produced the widest range of preservation scores; overall, the lowest scores were observed in this group, indicating that in general bone preservation was worse at this site. Individuals from the Old Dutch Church had the highest scores overall. Several factors could have contributed to this result, however, the individuals who had the highest preservation scores were buried in a cemetery that was maintained and protected.

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## Biology Department

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### ***Studying Plasmids of Harvard Forest Soil Bacteria***

Mireya Anthony

Faculty Mentor: Maureen Morrow (Biology)

This project seeks to study plasmids (circular rings of DNA) from Harvard Forest soil bacteria of the *Rhizobium* genus. Since 1991, soil in the Harvard Forest has been heated by coils buried underground, which gives us a look into the future of how bacteria will adapt to climate change. Currently, our focus is on removing plasmids from these bacteria so we can determine their DNA sequences. By comparing the DNA in bacteria from heated plots to those in control plots, we can learn the ways chronic warming selects for some cell functions. *Rhizobium* bacteria carry large plasmids that can move from one cell to another. The movement (Horizontal Gene Transfer) is an important aspect of bacterial genetic diversity and evolution.

The large plasmids are difficult to separate from chromosomal DNA. We used a modified Eckhardt gel electrophoresis procedure to separate and visualize large plasmid DNA in a band, separate from the chromosome, thus confirming the presence of the large plasmids. We observe the plasmid bands in the gel under UV light, cut them out, and then extract the DNA. We attempted to extract DNA from the gel fragments using electroporation and dialysis tubing, and by spinning the fragment through glass wool, but we were unsuccessful. We are currently using low melt agarose and chemical extraction methods. We will report our progress toward extracting and sequencing the plasmids.

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### ***Protecting Biodiversity at the Mill Brook Preserve through Trail Management***

Vic Bucci

Faculty Mentor: Kara Belinsky (Biology)

Public nature preserves strike a unique balance between conservation and recreation. For habitat protection and land use to coexist in these areas, disturbances must be minimized. The local Mill Brook Preserve is part of the Wallkill River watershed, a key wetland region. These habitats play a crucial role in maintaining ecosystem health at a broad landscape level, but they are also sensitive to human impacts. In my meta-analysis, I was tasked with reviewing the Preserve's existing biodiversity core model and modifying it to reflect recommendations from New York conservation agencies. This involves establishing buffer zones around vulnerable wetland habitat, offering a small range of protection from potential threats. These suggestions can inform the Preserve's planning regarding trail management and wildlife monitoring. It also provides a framework for addressing pertinent issues at the Preserve, such as landscape alteration caused by beaver activity and a loss of understory vegetation from extensive deer browse.

## ***Visualizing Oxidative Stress in Drosophila Melanogaster Digestive Tracts***

Danielle Clapham, Molly Cardamone  
Faculty Mentor: Aaron Haselton (Biology)

Aging, senescence, and overall physical decline in animals is known to be caused by the accumulation of oxidative damage in the cells caused by the byproducts of metabolism. Previously, this oxidative damage was thought to accumulate in the central nervous system, until recent studies found oxidative stress to occur, instead, in the digestive tract in both mice and fruit flies. In this study, we aimed to find similar results by creating paraquat-exposure LT50 data for male *Drosophila melanogaster* based on published protocols. Survivorship curves were generated from exposure to 5 and 10 mM paraquat in 5% sucrose. Forty-eight-hour-old flies on 10 mM paraquat were selected for fluorescence staining based on LT50 results. Flies were dissected and their digestive tracts were probed with fluorescent dye and imaged using laser confocal microscopy. Pixel intensity was quantified to compare the experimental flies to the controls. The experimental flies were found to contain significantly more oxidative stress levels than the controls. This data opens doors for laboratory research, as the investigation of gut tissues is much easier than the investigation of the central nervous system. Reactive oxygen species (ROS) damage can be slowed by various lifestyle and dietary regimes, and it can be accelerated by environmental stressors, including exposure to toxins. The data discovered in this experiment can be furthered by studying ways to combat and prevent ROS damage in higher species.

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## ***Evolving Aptamers that Bind to Estrogen***

Valeria Cueva, Mahmuda Tahsin, Sandra Ibrahim  
Faculty Mentor: Jeffrey Reinking (Biology)

Aptamers are short single-stranded nucleic acid molecules that can fold into a novel three-dimensional shape and bind specific ligands. While aptamers have been discovered in nature (riboswitches), they can also be created artificially using a process known as the Systematic Evolution of Ligands by Exponential Enrichment (SELEX). As such, aptamers behave in a manner similar to antibodies and can be used in their stead in a variety of applications such as biosensors, drug delivery, and therapeutics. The SELEX process first involves generating a large library of different nucleic acid sequences. The library is then incubated with the target molecule. The sequences that bind to the target are selected and then amplified using the Polymerase Chain Reaction (PCR). The process is repeated multiple times, often with increasing stringency of selection, leading to a small pool of aptamers with the desired characteristics. Here we present our attempts to evolve aptamers against steroid hormones such as  $\beta$ -estradiol.

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## ***Investigating the Genes Responsible for Paramecium Caudatum's Response to Holospora Undulata During Bacterial Infection***

Zerlinda Diaz-Gerloven, Jaelle James  
Faculty Mentor: Lydia Bright (Biology)

Paramecium caudatum is a single-celled ciliate that hosts the obligate bacterial endosymbiont, Holospora undulata. Generally, it is understood that Holospora undulata infection causes Paramecium caudatum to undergo lower rates of mitosis and increases the mortality of the host. However, previous studies have discovered a variation of responses to H. undulata infection among different P. caudatum strains, where some strains evolve to become more resistant and others remain susceptible to the bacterial infection. Additionally, this variation in resistance can be quantified. It has also been discovered that certain genes in P. caudatum are upregulated during this parasitic infection, leading us to infer that specific genes may be responsible for the maintenance of H. undulata infection. In our study, specific genes that vary in conservation were chosen to be observed among several different strains of P. caudatum that have evolved from a common ancestral line. The DNA from each strain was extracted, sequenced, and compared to one another to help determine what changes in the genes are associated with bacterial susceptibility or resistance. This information can be used to further understand coevolutionary relationships between parasites and their host, and the genetic evolution within P. caudatum.

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## ***Adapting to Predation and Lake Stratification: Zooplankton of the Sky Lakes***

Paloma Estess, Lucas Hoyt, Taylor Pazderski  
Faculty Mentor: David Richardson (Biology)

Zooplankton serve a vital role in the structure and health of freshwater ecosystems, acting as grazers on green algae and food sources for fish. Zooplankton exhibit diel vertical migration, an evolved behavioral response to predation that is the biggest daily migration in aquatic ecosystems around the world. Since 2013, we have studied zooplankton in regional lakes within the Mohonk Preserve and Minnewaska State Park Preserve. We have observed that in the absence of fish, zooplankton are found to cluster towards the top of the lake during the daytime, a region with optimal food and temperature. When fish are present, zooplankton tend to move deep in the lake to avoid visual fish predators. We also observed that, with less fish present, larger zooplankton were dominant while smaller zooplankton were more prevalent with more fish predators. These interspecies interactions in freshwater ecosystems can greatly affect lentic ecosystem function and health, an area of growing concern and importance in our region and beyond.

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## ***Whole Genome Sequence Analysis of Bacterial Isolates***

Trevor Fisher, Carolyne Molano

Faculty Mentor: Maureen Morrow (Biology)

This project is focused on the whole genome sequencing of bacterial isolates from our culture collection. The isolates are derived from heated soil plots from within the Harvard Research Forest. These soil plots have been heated 5°C above ambient temperatures since 1991. Thus, the bacterial isolates are hypothesized to be genetically adapted to chronic heating. Whole genome sequences can be used to understand these adaptations.

Genomic DNA is extracted from each isolate for 16S rRNA sequencing, which is used to identify the genus and sometimes, the species. The 16S rRNA sequencing results are compared to a database and if the results are interesting then the genomic DNA will undergo whole genome sequencing for total analysis of the genome.

One isolate (NP1) was deemed interesting due to it being a Bradyrhizobium, a genus of slow growing bacteria with a small number of whole genome sequences. Most well studied Bradyrhizobium species are plant associated. Analysis of the NP1 genome shows it to be a new species. Further analysis demonstrates that Bradyrhizobium NP1 is a free-living organism, lacking any nodule formation or nitrogen fixation gene pathways. These results support recent findings of Bradyrhizobium in North American forests being primarily free-living.

An MRA genome announcement paper for NP1 is being finalized, while we continue to perform 16S rRNA sequencing of other bacterial isolates in search of interesting strains to whole genome sequence for analysis.

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## ***Can Nest Box Network Placement Deter House Sparrows and Encourage Native Bird Nesting?***

Stephen Gardner, Jamie Alaa, Wagner Mansour

Faculty Mentor: Kara Belinsky (Biology)

The house sparrow (*Passer domesticus*) is a widely distributed and invasive species in North America. House sparrows build their nests inside cavities (such as holes in trees or artificial nest boxes) and are extremely territorial when selecting nest sites; and may displace native cavity-nesting birds such as the protected Eastern Bluebird (*Sialia sialis*). House sparrows most commonly breed in human-modified habitats, with a specific preference for suburbs over city centers and rural areas. Our research seeks to determine the distance from a human residence at which house sparrows begin to displace native species. For the study, we placed 60 nest boxes in the Millbrook Preserve, a forested nature preserve in New Paltz, NY surrounded by suburbs. The nest boxes were placed at varying distances from the nearest building (ranging from >500m to <5m) and monitored weekly for occupancy of native bird species and house sparrows. For the past three years of data collection, no house sparrows have nested inside the boxes. To determine if house sparrows are being deterred by the forested habitat, 12 of the nest boxes were moved off-site, with 6 being placed around an adjacent elementary school property and 6 being placed on various residential lawns

also adjacent to the preserve. We hope to use this data to better understand how nest boxes can be distributed in both suburban and forested environments in order to encourage biodiversity.

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### ***Localization of Rab Genes in Various Paramecium Species***

Ashley Guity, Leril Otero, Jonny Aguilar  
Faculty Mentor: Lydia Bright (Biology)

Paramecium is a genus of microorganisms that live in aquatic habitats. These microorganisms are single celled eukaryotes called protists. To track the evolution of proteins in different Paramecium species, we used Rab proteins and cloned their genes into plasmids. Molecular cloning is done to localize Rab proteins in the cells for observation. Our goal in this experiment is to track the localization of these proteins using a green fluorescent protein (GFP) tag. In order to do this, we had to tag our Rab genes using the GFP within the plasmid. Rab proteins are a key component of vesicle formation and are essential for membrane trafficking within all eukaryotes, including Paramecium. The intention is to use GFP to bind to our Rab genes of interest using plasmids. Differences in these Rab proteins allow for different tagging destinations in the vesicles. This can be used as an indicator for detecting the Rab genes of interest inside cells. To tag the Rab genes, we used pPXV as our DNA plasmid and inserted Paramecium genes into it. Then, we amplified genes using PCR and later purified them. In addition, plasmids were linearized to use as negative controls or to fuse genes into them. Once we determine that our genes of interest are tagged with green fluorescent protein, we can localize them in cells of different Paramecium species. Using fluorescent confocal microscopy will help visualize and compare localization between the cells.

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### ***Guts, Oxidative Damage, and Environment Health***

Gianna Paiusco  
Faculty Mentor: Aaron Haselton (Biology)

Much of the physiological decline associated with aging and senescence in animals results from the accumulation of oxidative damage in cells due to the accumulation of metabolic byproducts, primarily reactive oxygen species (ROS). Surprisingly, recent work has shown that this damage is much more observable in the digestive tract in mice and fruit flies rather than the nervous system. The health of an aquatic ecosystem is often assayed by characterizing the presence and abundance of certain aquatic invertebrates, including the nymphal stages of mayflies, which are particularly vulnerable to environmental pollutants and can be used as bioindicators. Our lab was interested in developing an ecophysiology-based health-assessment protocol using sentinel aquatic invertebrates by measuring the level of accumulated ROS in the digestive tracts of sampled mayfly nymphs. In this study, we exposed mayfly nymphs to the toxic algae found in blooms in the Wallkill River, *Microcystis aeruginosa*, for 10 days and quantified the ROS accumulation in the gut. The treatment group showed a 62.5% increase in the level of ROS accumulation as compared to the control, showing that exposure to toxic algae causes an increase of oxidative damage in their digestive tracts. More recently, we have been repeating the study on a larger sample size and making improvements to the procedure.

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## ***Evolution of Paramecium in Lakes Recovering from Low pH***

Matthew Sandler, Lola Allen

Faculty Mentor: Lydia Bright (Biology)

Paramecium are single celled ciliates that live in aquatic environments. Over millions of years different Paramecium species have evolved to survive in different environments. With Lake Awosting in our region recovering from a high pH due to acid rain problems in the past, we have found that native Paramecium species have begun evolving to survive the lake's changing environment. Through genetic analysis we have found that there are Paramecium species living in Lake Awosting that don't classify as any known species. To find this, DNA extractions were performed using a chelex prep on samples of Paramecium taken from Lake Awosting. PCR reactions were performed using multiple primers. These PCR samples were run on a gel to find whether the reaction was successful, and if successful were sent to an outside lab for sequencing. We entered these sequences in the BLAST genome database and found that a few of the samples showed only around 85% similarity to the known species Paramecium dubosqui. In the future we hope to use more primers to find more evidence to help us decide whether we have found a new species, and also to image the cells to see if they look like known species. Once it is certain through all of the sequencing of the genes that the identified Paramecium is a new species, it will be crucial to sequence its entire genome.

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## ***Place-Based Education: Utilizing Local Lands within the Classroom***

Matthew Sandler

Faculty Mentor: Kara Belinsky (Biology)

Place-based Education (PBE) is using a local "place" to connect what students are learning in the classroom to a physical space within their community. I am learning how teachers, utilizing PBE can bridge the gap between what students are learning in the classroom and how they can connect what they have learned to their own community. This March, I organized an event for New Paltz students to participate in the DEC's Amphibian Migrations and Road Crossings project. Taking place at the local Millbrook Preserve, students were able to learn about local wildlife. They learned about the mating and migration patterns of amphibians, our human impact, and how to have a positive impact on their community's wildlife. Additionally, I have been working with Dr. Cornellia Harris at Highland Middle School to plan lessons utilizing a small forest behind the school. Students will use the stream running within the forest to find micro-plastics in the water. These students will learn why this plastic pollution is there, how it affects the environment and what they can change in their lives to do better. In both examples of PBE, students used local lands within their communities to learn about detrimental human impacts on the environment and ways they can change their lives to do better for their community and our planet.

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## ***Navigating the Anthropulse: Does Off-Trail Hiking Harm Endangered Birds in the Catskill Mountains?***

Danielle Takacs, Samuel Mateo, Kristyn Gessner  
Faculty Mentor: Kara Belinsky (Biology)

Following the global COVID pandemic, there has been a rise of outdoor recreation. The Catskill High Peaks, a popular hiking destination, has been facing a surge of bushwhackers that create new informal trails. While the increase in exercise and nature appreciation is generally viewed positively, numerous studies have provided evidence that human disturbance can decrease native biodiversity. In recent years, several montane breeding birds have shown steady population declines, such as the endangered Bicknell's Thrush. In collaboration with the DEC, VCE, and Dr. Kara Belinsky, we wrote and were awarded a grant and fellowship through the Catskill Research Collaborative. We plan to investigate the impact of proliferating informal trail networks on the Bicknell's Thrush and other montane birds. From June-July, we will measure bird diversity through point counts on 9 of the peaks; 3 that are officially trailed, 3 that do not have trails, and 3 with extensive informal trail networks. We will also collect measurements of human visitation and the extent of unofficial trails for each location. These data will be used by the DEC to make management decisions that aim to protect sensitive montane species. This type of research is critical to assist land managers in balancing conservation with human recreation.

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### **Chemistry Department**

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## ***Expanding an Electron-Ionization Fragment Prediction Model for Peptides***

Irtiza Bhatti, Fares Sirdah  
Faculty Mentor: Dominic McBrayer (Chemistry)

Electron ionization-mass spectrometry (EI-MS) is a technique that shoots a beam of high-energy electrons to interact with gas-phase analytes and produce ions and fragments that can be detected. This fragmentation can help to identify the analyte, but for more complicated/polymeric materials such as peptides, can also make identification difficult. We have developed a Python-based program that makes peptide fragment predictions. The program applies the fragmentation data in a model produced from our analyses of EI-MS peptide spectra and gives a possible list of amino acids/fragments given an expected sequence. The model still has limitations as some amino acids are more poorly defined in the model and most experiments have involved single amino acids or dipeptides. Therefore, we have synthesized tripeptides and a tetrapeptide to observe the fragmentation mechanisms and patterns to further improve and validate our prediction model in larger peptides. Our study has confirmed that some mechanisms are combinatorial, but not all fragmentation events are equally favored, with some peaks being consistently more intense than others. Future improvements would seek to verify these peaks and build a weighting/labeling system into the prediction model to give an indication of which predictions are most likely to be observed.

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## ***Bdellovibrio Bacteriovorus Predation of e. Coli Variants with Differently Phosphorylated Lipid a***

Lauren Biegner, Sebastian Mazo, Alexandra Higgins  
Faculty Mentor: Megan Ferguson (Chemistry)

*Bdellovibrio bacteriovorus* is a predatory Gram-negative bacterium that attacks other Gram-negative cells. Four different *E. coli* variants with different numbers of phosphate groups in the lipid A portion of their surface lipopolysaccharide molecules were used as prey to analyze *B. bacteriovorus* predation dependence on lipid A phosphorylation. Ultraviolet-visible spectroscopy was used to analyze *B. bacteriovorus* alongside these *E. coli* variants. The increasing clarity of the solution as time went on was correlated with *B. bacteriovorus* predation of the *E. coli*. Atomic Force Microscopy of predator and prey cells trapped on filtration membranes also showed the progression of *B. bacteriovorus* growth as the interaction time with *E. coli* increased. To further examine the *E. coli* variants used in analysis, a lipid A extraction was performed on all four variants. TLC and mass spectrometry of the extracted components are currently being done to confirm the expected phosphorylation of their lipid A.

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## ***Steric Effects on Diaminocyclohexane-Based Ligands***

Ryan Grodin, Caz Wood, Maxwell Brooks, Calvin Havnaer  
Faculty Mentor: Frantz Folmer-Andersen (Chemistry)

We are exploring diastereoselective reactions between alkyllithium reagents and diimines derived from trans-1,2-diaminocyclohexane (DACH) to produce C2-symmetrical diamines in which chiral centers reside on both sides of the amino groups. The reaction was originally reported for diimines derived from benzaldehyde and for methyl-, allyl- and phenyllithium. We have sought to use more sterically demanding reagents in hopes of preparing conformationally restricted diamine products. The reaction readily tolerates methylation of the diimine derived from 2-methoxy-1-naphthaldehyde; but addition of tert-butyllithium to either diimine requires significant modification of the reaction conditions. We are now preparing a series in which the steric demand of the R-group is incrementally varied, and we plan to perform conformational analyses of these molecules. We hope that this work will produce C2-symmetrical diamines with enhanced functions as stereoselective sensors, catalysts, and transport agents.

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## ***Quantifying an Environmental Contaminant in Exposed Regenerating Planaria and Earthworms Found on the SUNY New Paltz Campus***

Natalia Kurek, Delilah Griger, Ashlyn Scaria  
Faculty Mentor: Pamela St. John (Chemistry)

BPA, Bisphenol A, is an organic synthetic compound used in many manufacturing processes and it has become a supply chain contaminant in our environment. Planaria are small flat worms that live naturally in fresh water and are capable of regenerating. We have used planaria as a model organism to study effects of BPA on the worm's regeneration cycle. To distinguish the contaminant BPA from that used for controlled exposure studies, a deuterated form of BPA (d8BPA where the eight H atoms bonded to the aromatic rings have been replaced) was used, since planaria respond similarly to both. We used high-performance liquid chromatography (HPLC) to analyze extracts from d8BPA-exposed planaria to determine how much of the compound was retained by the worms. The signals from the extracts were normalized using the mass of the worm pellet used for extraction. The normalization steps were critical in quantifying how much d8BPA was retained during exposure. To better connect this research to the community, earthworms caught on the SUNY New Paltz campus were also analyzed and found to contain BPA in their tissue.

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## ***Synthesis and Antimicrobial Evaluation of Mono and Bicyclic $\beta$ -lactams and their Corresponding n-sulfonyl Chlorides***

Kripa Kurien, Benjamin Lee, Taha Malik  
Faculty Mentor: Preeti Dhar (Chemistry), Maureen Morrow (Biology)

The  $\beta$ -lactam, a common structural element in antibiotics, is known to interfere with the synthesis of bacterial cell walls by binding with several penicillin binding proteins (PBP's) and causing inhibition of peptidoglycan transpeptidases. Widespread use of  $\beta$ -lactams has caused an alarming increase in bacterial resistance as certain bacteria have developed countermeasures to traditional drug therapies by synthesizing an enzyme called  $\beta$ -lactamase. This enzyme cleaves the  $\beta$ -lactam ring, and thus makes the antibiotic ineffective. This defensive adaptation creates the need for drugs with more specific antimicrobial activity. Toxicity of  $\beta$ -lactams in higher animals is very low and these drugs are very effective in killing infectious bacteria. It has been shown that the biological activity of  $\beta$ -lactams strictly correlates to the presence of suitably functionalized beta lactam ring.

Some synthetic monobactams such as Aztreonam have shown potent activity against gram negative bacteria. In this study, we have synthesized monocyclic and bicyclic  $\beta$ -lactams and their corresponding N- sulfonyl chlorides. Antimicrobial activity of these compounds has been evaluated using gram positive (*Bacillus cereus*, *Enterococcus faecalis*, *Staphylococcus epidermidis* and *Staphylococcus saprophyticus*) and gram-negative bacteria (*Escherichia coli*, *Pseudomonas aeruginosa* and *Pseudomonas putida*). Results of this study will be presented.

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## ***Placing Arsenic in Pincer Ligands: Poison or Promising?***

Lucia Speranza

Faculty Mentor: Miles Wilklow-Marnell (Chemistry)

Goldman et al. recently reported the most active homogenous catalyst for dehydrogenation of n-alkanes known to date. Based on experiments and calculations, this iridium complex, bearing a triphosphorous “PPP” pincer type ligand, owes its enhanced reactivity over related PCP pincer complexes to a destabilization of the square-planar Ir(I) resting state common to both systems. While having many similarities, such as nearly identical electronegativities and only about 10 picometers difference in radius, arsenic and phosphorous have not been studied equally in the field of organometallics. Relatively few examples of complexes/catalysts with organo-arsenic ligands have been reported as opposed to the ubiquitous phosphines. We will report on our effort to replace the central P atom of Goldman’s ligand with As, its’ metalation with iridium, and dehydrogenation of alkanes. We aim to answer if incorporation of the notoriously noxious element arsenic into our new PAsP ligand complex will promote or poison catalysis.

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## ***Characterization of Ruthenium (ii) Containing Films for 3D Printed Oleds***

Oliver Trzcinski

Faculty Mentor: Pamela St. John (Chemistry), Daniel Freedman (Chemistry)

We are interested in developing a method to 3D print tris(bipyridyl)ruthenium (II) solutions onto indium tin oxide (ITO) films to make organic light emitting diodes (OLEDs). To test our synthesis and OLEDs initially, Tris(2,2'- bipyridine) ruthenium (II) hexafluorophosphate, [Ru(bpy)<sub>3</sub>(PF<sub>6</sub>)<sub>2</sub>] (Ru(Bpy)) was synthesized and solutions of the ruthenium complex in acetonitrile were spin coated onto ITO coated glass slides and the OLEDs were observed by applying 5.0 V to the device. Automation of this process via 3D printing could allow variations for the user’s applications, particularly the ability to print OLEDs on curved surfaces. A characterization method for the thin films has been developed which will be used on the 3D printed features and this involves estimating the film thickness using the measured absorbance of the films on ITO/glass substrates and a published standard curve in order to determine the refractive index of the ruthenium complex using ellipsometry. The refractive index of spin coated Ru(Bpy) films on single crystal silicon (Si) spanned from 1.5327 to 1.7948, depending on the quality of the film. Film thicknesses on Si varied from 300 to 1000 Å, where thickness increased with slower spin speeds. Photon emission from the films was quantified using fluorescence spectroscopy.

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## ***Aggregates of Single or Double Stranded Oligonucleotides and Cationic Surfactants***

Samuel Turner

Faculty Mentor: Pamela St. John (Chemistry)

Both single and duplexed oligonucleotides can aggregate or condense in the presence of lipids or lipid-like compounds; an important property of nucleic acids, which was used to aid in the delivery of mRNA into the cell in the SARS CoV-2 vaccine. We have studied this aggregation process using cationic surfactants, including hexadecyltrimethylammonium bromide, and single- (ssDNA) or double-stranded (dsDNA) dye-labeled oligonucleotides of various lengths to understand factors that affect their binding. Oligonucleotide solutions were titrated with surfactants and changes in fluorescence anisotropy were recorded. For ssDNA, the onset of a change in anisotropy occurred when the ratio of surfactant to oligonucleotide molecules approached 0.7. The saturation binding curves showed a sigmoidal shape indicative of a cooperative process which we modeled to obtain association constants and the extent of cooperativity. For surfactants with a straight chain in the hydrophobic region, we found a critical length was needed for DNA aggregation. We also found subtle differences in the extent of aggregation of dsDNA or ssDNA at a given surfactant concentration.

### **Communications Disorders Department**

## ***Immerse Yourself: A Systematic Review of the Effects of Extended Reality Technologies in Speech-Language Therapy for Children with Autism Spectrum Disorder***

Felicita Chipak

Faculty Mentor: Dana Arthur (Communication Disorders)

Autism Spectrum Disorder (ASD) is a neurodevelopmental disability caused by differences in the brain. Differences in social skills and difficulty in communicating and interacting with others are commonly observed in this population. Immersive technologies in therapeutic intervention for children and adolescents with ASD have been developed and researched in the last few decades. Immersive technologies include devices with a high level of immersion in a virtual environment down to low immersion with the use of green screens and computers. A systematic review was conducted searching 7 databases for articles related to the technology's impact on the social skills of children with ASD ages 8-18. Results demonstrate positive effects on social skills, such as joint attention, conversation maintenance, and emotional reciprocity. A comparison of the effects of virtual reality, augmented reality, mixed reality, and digital screens on therapeutic outcomes will be made. A discussion of the implications on clinical practice and future availability of immersive technologies will be included.

## ***(Mine)Crafting Communication: How nline multiplayer Games Support Social Communication Skills in Adolescents with ASD.***

Claire Schoff

Faculty Mentor: Dana Arthur (Communication Disorders)

Research has shown that adolescents with autism spectrum disorders have impairments in social communication involving social reciprocity and social cognition. These impairments affect individuals' ability to interact with others through conversation as well as their ability to make sense of those in the world around them. The creation of multiplayer online video games has created a platform for individuals with ASD to practice social communication in new and low-stakes ways. The purpose of this study is to analyze the general social communication profile of those on the spectrum in the context of online games. A review was conducted of pertinent scientific and popular literature. Data was extracted from articles based on what communication skills were observed, frequency of gameplay, and potential generalization of skills to offline communication. Results indicated a general improvement in social interaction and conversational skills with the use of multiplayer online games including social reciprocity and cognition. Specific game characteristics, such as those from Minecraft, may support social communication skills in adolescents with ASD.

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## ***Downward Dog for Upward Recovery: A Systematic Review of the Efficacy of Yogic Movement for Communication Goals in Patients with Post-Stroke Aphasia***

Molly Skalor

Faculty Mentor: Dana Arthur (Communication Disorders)

A cerebrovascular accident [CVA], more commonly known as a stroke, can have impacts on survivors far beyond what can be seen by the naked eye. CVAs may cause damage to the parts of the brain that control our ability to speak and understand words as they are presented to us, resulting in a diagnosis of aphasia. While treatment can look different for those diagnosed with post-stroke aphasia, yogic movement techniques have become an option presented to patients as a way to improve many of the cognitive and physical abilities lost due to their CVA. A systematic review of peer-reviewed data between the years of 2006 and 2023 was conducted, evaluating the effectiveness of these techniques to meet communicative goals in individualized post-stroke aphasia treatment. Initial evidence suggests yogic movement therapies may increase improvements made towards communication goals, as well as increasing benefits to patients in other areas, such as memory and balance. Maximizing the effectiveness of one's treatment plan can improve patient prognosis and quality of life.

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***Sentence Math: Can You Speak Valid?***

Charles DeGennaro, Tyler Suchy, Emily Herbert, Andrew McDonald, Mostafa Ibrahim, Yiwen Jia, Meghan Stuart, Oliver Trzcinski

Faculty Mentor: Ashley Suchy (Computer Science), Cheyne Glass (Mathematics)

The main goal of this project is to combine the ideas of language processing and algebra to analyze the syntactic validity of a sentence. One result is applying our findings in a Python program, using an algorithm we developed. Using a predetermined set of words (dictionary), our algorithm can run through a sentence and determine if it is syntactically correct. We can manually add words to our dictionary, but an open part of our research is working on a way to automatically add new words to the dictionary. Another goal is understanding how two previously independent math structures are unified by using category theory. These structures are pregroups and finite dimensional vector spaces, which relate to the grammar and meaning of English sentences respectively. The focus is to analyze the grammar and the meaning of a sentence simultaneously. We hope that in finding a solution to the second goal, our algorithm can be optimized and expanded.

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***Weight Fluctuations of Red-Tailed Hawk: Challenges of Collecting Data in the Wild***

Emily Herbert

Faculty Mentor: Chirakkal Easwaran (Computer Science)

Data collection plays a critical role in science. One area is remote sensing used to gather information outside a typical lab setting. This project's purpose is to collect data about a red-tailed hawk remotely. The weight of the red-tailed hawk and ambient temperature is recorded using an apparatus developed for this project. Materials used in the build are a temperature sensor, scale, and Raspberry Pi. Basic circuitry and soldering were needed to connect the sensors to the pi. The program is in Python, using the SQLite library to manage the database. Weight data is only cataloged if the bird sits on the scale, primarily at night when the hawk is asleep on the scale. Current results show a ~0.8% loss in overall body mass in a period of 10 hours. This percentage loss does fluctuate depending on temperature. With the scale complete, more data will be available allowing us to see how much temperature affects metabolism. Information collected will help provide data to conservationists and other falconers. Data collection is a valuable skill to have in any area of science. Occasionally it's necessary to develop instruments specific to your research, a crucial skill in the physical sciences.

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## Engineering Departments

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### ***Hydrogen Energy Production, Implementation, and Impacts in Distribution Systems***

Jenna Corti

Faculty Mentor: Rachmadian Wulandana (Engineering)

Hydrogen gas (H<sub>2</sub>) is zero-carbon emitting and can be produced using a Polymer Electrolyte Membrane Electrolyzer (PEM) through a water-splitting electrochemical reaction. When hydrogen gas is blended with methane gas in a distribution network there are a few expected effects.

This report studies the feasibility of a H<sub>2</sub> Production Plant located in Kingston, NY. The H<sub>2</sub> is transported to 4 different locations, each 15 miles from Kingston. The transportation of H<sub>2</sub> in natural gas distribution systems is studied to increase the understanding of H<sub>2</sub> blending impacts. The transportation of H<sub>2</sub> in natural gas distribution systems is studied to increase the understanding of H<sub>2</sub> blending impacts. The effects of blending hydrogen gas to the distribution system are studied from a fluid dynamics perspective. The study includes different concentrations of H<sub>2</sub>; from 0-20% H<sub>2</sub> in 5% increments. The resulting property, pressure, flow, and velocity changes are analyzed. As hydrogen is increasingly blended into the distribution gas stream, the higher the percentage of hydrogen gas, the greater the flow becomes. The pressure and the velocity will decrease. The throughput of the gas stream will increase due to the decrease in the higher heating value of hydrogen compared to natural gas. The pressure will decrease due to the pressure drop and the chemical properties of the gases.

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### ***3D-Printed Cold Plate for Heat Removal – Design & Characterization***

Robert DeLaurentis, Matthew Krumholtz, Louis Reyes

Faculty Mentor: Ping-Chuan Wang (Engineering), Mahdi Farahikia (Engineering)

As the integrated circuit technology further advances for more sophisticated computations while stay minimal in chip size, the power density consumed by modern chips has been increasing significantly without signs of slowing down. As a result, tremendous amount of heat is generated in the chip from power dissipation, raising the chip temperature to a point to harmfully affect its functionality and reliability. Efficient removal of such excessive heat from IC chips is essential to sustain the development of modern technology. The purpose of this research is to explore the design and fabrication of efficient liquid-cooled cold plate structures using 3D-printing method. In this presentation, we will introduce the design considerations, experimental setup, and computational analysis for this research. Results of the measurements and simulations will be discussed in comparing to the computational modeling data, and future plan of the research will be outlined for further study.

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## ***Optimization of the SHA-256 Hash Function on FPGAS***

Michael DiNardi

Faculty Mentor: Damodaran Radhakrishnan (Engineering)

The SHA-256 hash function is a standardized and trusted algorithm that takes a set of data and produces a unique, deterministic, and irreversible representation called a hash or digest. A component of other protocols, SHA-256 protects password storage, secures and verifies Bitcoin transactions, and authenticates internet communication. This research proposes a new SHA-256 hardware architecture that utilizes adder trees to speed up hash computation. The study analyzes the hash function and a preexisting Verilog implementation at the algorithmic, architectural, and circuit levels to identify and address bottlenecks. The proposed design targets Intel FPGAs for rapid reconfigurability and testing, and it achieves an increase in computation speed of 10%. In application, this can offer faster online communication or a more secure Bitcoin network.

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## ***Electromigration Test Development in Additively Manufactured Copper Structures***

Tyler Hall

Faculty Mentor: Ping-Chuan Wang (Engineering)

Copper is known for its superior conductivity, both thermally and electrically. When used in electronic applications for carrying excessive electrical current, it faces the degradation phenomenon called electromigration. This research project aims to examine the electromigration behavior in 3D-printed copper wires which are known to have high level of defects such as voids. Critical challenges that need to be overcome for this study include (1) mitigating oxidation of the samples during electromigration test, and (2) accurate control of the electromigration conditions. In this presentation, the design considerations and implementation of the electromigration test system to overcome the challenges will be shown, comprising the sample stages to minimize copper oxidation and the algorithm to automate the test control and data acquisition during the electromigration experiments. Preliminary results will be shown to demonstrate feasibility, and plan for further improvement will be proposed.

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## ***Computational Analysis of Resonances of Flow Sensing Micro-beams with Nonuniform Geometries***

Harel Yosef

Faculty Mentor: Mahdi Farahikia (Engineering)

A computational analysis of the resonances of flow-sensing micro-beams is presented. Spider silk is known to move faithfully with acoustic-induced fluid flow, enabling frequency-independent sensing of the flow velocity. This phenomenon has inspired many researchers to develop flow sensors that replicate the excellent behavior of spider silk. Obtaining the same results using lab-made materials like silicon has been challenging for several reasons, such as the presence of multiple resonances within the desired frequency range for micro-beams with nano-scale thickness. The resonances of an ideal sensor fall outside the frequency range of interest. In this presentation, we offer our preliminary results on controlling the resonances of such micro-beams following inspiration from the atomic scale structure of the spider silk. It is observed that micro-beams consisting of wide and short segments (masses) connected by long and narrow sections (springs) enable slightly better manipulation of the resonances than those with uniform geometries.

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### **English Department**

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## ***“Procreating with a Sharer of the Language”: Romance, Nostalgia, and Identity Formation in Immigrant Literature by Jewish Women from the Former Soviet Union***

Brina Novogrebelsky

Faculty Mentor: Michelle Woods (English)

In my project, I am exploring questions of sex and dating, diaspora, and womanhood in immigrant literature written by Jewish women from the former Soviet Union. The project’s purpose is to bring more attention to post-Soviet Jewish women writers, as well as finding an accurate name for this specific canon of literature. I read novels and academic sources ranging from Soviet feminist scholarship to literary theory and Jewish essayists. I took extensive notes on the texts, which I then discussed with my advisor. I also reflected on personal feelings that arose for me in response to the novels. I found that it is practically impossible to find one, holistic label for this literature. Literary scholars, critics, and the authors themselves refer to their writing in a multitude of ways; sometimes one person will use more than one label. What readers can glean from these books is that every immigrant’s experience, whether they identify with a particular people group or not, is wholly individual. My findings are a reminder to scholars of immigrant, Russian, and/or Jewish literature to recognize the unique humanity of the works they are analyzing. Fiction is a mode to analyze other people’s experiences and empathize with the conflicts they come up against.

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## ***"Realities of the Imagination": Narrative reclamation and the therapeutic application of story***

Summer Mohrmann

Faculty Mentor: Michelle Woods (English)

The telling of a tale– the composition of stories– is something not only intrinsically human but inherently interested in the expression of the humane. Our memories are fitted to our ideas of a coherent narrative. When we share our thoughts, we tell them as stories. At night, while the rest of our bodies lie dormant, our minds are twisting and turning– telling us disjointed narratives to pass the time as we sleep. Before written records were widely utilized, we used rich oral traditions to preserve history, genealogy, religion, and geography by embedding them into epic tales of heroism and heartbreak. But what happens when our story stops fitting into our pragmatic purview? What happens when tales take over the telling, the living, for us?

My dualistic experience as an English major and an adult living with diagnosed PTSD has led me to explore the crossovers between the study and production of literature, and the treatment of trauma symptoms for trauma-survivors. Though not yet a clinician, my project weaves trauma theory, literary analysis, principles of art therapy, and clinical reports to examine how literature and literary studies can be applied to ease symptoms of PTSD. I believe a form of art therapy which utilizes not only the crafting of narratives/stories (of all genres and forms), but the consumption and discussion of published works (again, of all genres and forms) in a group setting embodies many principles of clinically accepted modes of PTSD treatment. Both my time in the classroom and with clinical professionals doing my own trauma-work supports this thesis. In my study I examine theorists such as Cathy Caruth, Dori Laub, Shoshanna Feldman, clinicians such as Bessel van der Kolk, David White, and Michael Epston, and authors such as Angela Carter, Salman Rushdie, Vladimir Nabokov, and Herman Melville. I integrate these seemingly disparate ideas through my own conception of a writing-workshop formatted support group which utilizes principles of group work, mutual-aid, art therapy, and book club reading/discussion.

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## Language, Literatures, and Cultures Department

### ***Écoféminisme: The Importance of Including a Feminist Perspective in Achieving Sustainable Agriculture in Francophone Africa***

Jillian Myers

Faculty Mentor: Mary Christensen (Language, Literatures, and Cultures), Andrea Varga (Theater Arts)

Environmentally sustainable practices benefit the environment as well as the people in the affected communities. Women have a unique experience in their relationship with environmental sustainability efforts and climate justice. The concept of ecofeminism highlights the dualism and connection between the oppression women face and the oppression of the planet. As many of the countries in francophone Africa are at similar stages of economic development, due to their shared history of colonization by the French, they are comparable countries in terms of sustainability practices. This study uses case studies from Mali, Cameroon, and Senegal to look at how women are directly involved in and impacted by sustainability efforts in francophone countries in Africa. The second part of this research is an empirical study of data from the World Bank and other sources, specifically looking at social indicators of gender equality in francophone African countries as well as government attitudes towards investing in sustainable practices to investigate the relationship between these two variables. As women are uniquely impacted by environmental degradation and thus, would be more positively affected by sustainable practices, there may be a relationship between gender equality and the investment in sustainability.

## Physics & Astronomy Department

### ***Determining Trapping Force of Optical Tweezers***

Jacob Beadle, Vincent Santini

Faculty Mentor: Catherine Herne (Physics & Astronomy)

Optical tweezers are a non-contact technique to trap and manipulate micron-sized objects with light in which a laser is tightly focused and the object is held at that focus. This method has been used since the 1980s to measure properties of biological systems such as cells, viruses, DNA, and molecular motors, and to manipulate tools for micro-robotics. The essential information in any application of optical tweezers is knowing the force with which objects are trapped. Our research group currently uses optical tweezers to study predatory bacteria and to manipulate tiny crystals. This project quantifies the forces used in these systems, providing the necessary groundwork for their successful completion. To measure the trap strength we collect the laser light after it encounters the trapped object. We then analyze the object's change in position, and by observing these fluctuations, we mathematically infer the trapping force. We apply this technique to measuring the force with which bacteria are trapped and show our results.

## ***Error Propagation in a CSS-Encoded Quantum Circuit***

Zedekiah Fermon

Faculty Mentor: Richard Halpern (Physics & Astronomy)

The objective of this project is to analyze how quantum errors propagate through a quantum circuit encoded using Steane's  $[[7, 1, 3]]$  error code. The ultimate goal is to determine the base physical error rate threshold at which the encoded circuit starts reducing rather than creating errors. This will be determined mathematically using a general model for quantum errors, and I will also compare it to a simulated circuit which I will build and run in Qiskit.

I am still currently working on the analysis. The result is important for achieving meaningful quantum computation in both the near and far terms, since the threshold represents a goal for both the size and reliability of future machines. To achieve fault-tolerant quantum computation, we have to build quantum registers and gates with error rates below that threshold, with enough physical qubits to hold the logical states. Since there is a tradeoff between error code size and error rate thresholds, it is important to have these values known so that we can choose the right error code for each physical device.

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## ***Measuring Time for Attachment of *b. Bacteriovorus* to Prey***

Claire O'Connor, Allyson Sheneman

Faculty Mentor: Catherine Herne (Physics & Astronomy)

Antibiotic resistance is an ever-increasing issue faced by our society. In our research, we work to combat this by studying the predatory behavior of *Bdellovibrio bacteriovorus* to gain a better understanding of the potential use of *B. bacteriovorus* as an antibiotic. *B. bacteriovorus* are thought to use type IV pili, a long hair-like appendage, to facilitate their attachment to prey bacteria. We study the time *B. bacteriovorus* takes to form an initial attachment to *Escherichia coli*. By looking at this attachment time, we can better understand the behavior of this bacteria and the use of its pili for forming attachments to prey. We use optical tweezers to trap *B. bacteriovorus* and move it into contact with *E. coli*. We then wait a set amount of time, ranging from 15 seconds to 2 minutes, and test for attachment. Throughout this process, we have found that attachment rates stay very roughly constant for each length of time. This indicates that the type IV pili may yield almost instantaneous attachments once contact is made. We anticipate that this trend will continue as time increments lengthen, and that a large drop in our attachment rate will occur as time increments decrease due to a minimum amount of time needed for an attachment to occur.

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## ***Improving the Precision of Optical Tweezers with Calcite Crystals***

Elaina Wahmann

Faculty Mentor: Catherine Herne (Physics & Astronomy)

Optical micromanipulation is a non-invasive, non-contact method of controlling tiny objects with light and measuring forces and torques. Optical tweezers is a form of optical micromanipulation that uses a tightly focused laser beam to trap, translate, or rotate micron-sized materials. Our work trapping and rotating calcite, a unique crystal with no degrees of symmetry, pushes the boundaries of the precision of optical micromanipulation. We can position calcite crystals to three translational and rotational degrees of freedom. This is in comparison with positioning objects with spherical or cylindrical symmetry; a cylinder, for example, can be rotated about its long axis without the ability to distinguish its rotational orientation. The position of calcite in optical tweezers, in contrast, can be completely determined. We observe calcite trapped by optical tweezers and model the torques imparted by the tweezers to find calcite's equilibrium position. The observed stable position of calcite aligns with our models of the equilibrium position within six degrees of freedom.

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### **Printmaking Department**

## ***Sustainable and Non-Toxic Fungi Printmaking Inks***

Ezra Heller

Faculty Mentor: Aurora De Armendi (Printmaking)

Over the last few years, especially during the pandemic lockdown of 2020, interest has grown in the art world in homemade and sustainable materials. Pigment making is a particularly prevalent craft in this movement. This exciting change in artistic philosophy, however, has not been introduced to fine art printmaking. The goal of our project, "Sustainable and Non-Toxic Fungi Printmaking Inks," introduces material consciousness and self-sufficiency to our field by focusing on making our own printmaking inks. For our project, we worked with pigments from mushroom derived dye compounds. The mushrooms used were responsibly foraged in Ulster County, in places such as Black Creek Forest Preserve, Nyquist-Harcourt Wildlife Sanctuary, Esopus meadows, and SUNY New Paltz campus. Solute dyes were extracted from these fungi, were chemically altered to become insoluble pigments, and finally dried and mixed into the linseed oil-based binder that printmaking inks are made with. Our findings were encouraging, and our samples yielded transparent yellows and browns. Not all the inks are satisfactory in their chromatic density, but they do show that this is a viable method for making ink. The implications for our field are that ink making is an accessible practice and that industrially, ecologically harmfully produced colors are not always necessary. Our next steps are to broaden our range of pigment sources to include minerals and plant dyes, and to develop a curriculum to teach these skills.

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## Psychology Department

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### ***Would You Swipe Right? A Study on Catfishing and the Social/Psychological Factors which Lead to Forgiveness***

Ethan Eisenberg, Kaitlyn Longo, Emma Jerabek  
Faculty Mentor: Glenn Geher (Psychology)

Deception has been a major issue in the human experience for eons. Modern technologies, such as dating apps, provide highly novel ways for people to engage in deceptive actions. One of the deceptive, antisocial behaviors associated with dating apps is Catfishing: deceiving others about one's height, age, income, education level, etc., to "reel in" dates. The current study investigated factors associated with how people respond to having been catfished in a dating context. Specific variables assessed included (a) the severity of the deception, (b) the content of the deception (lying about height versus age), and (c) the perceived genuineness associated with the catfisher's apology. Findings support multiple aspects of our hypotheses. It was found that, overall, men are more likely than women to forgive the catfisher, as well as overall more likely to go out with the catfisher again. Analyses also found that people who score high on the Light Triad are also more likely to forgive, and go out again with the catfisher. Although all parts of our hypotheses were not supported, analyses produced many interesting results to be discussed.

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### ***Persisting Family Guilt in First-Generation College Students at SUNY New Paltz***

Olivia Hisiger, Princess Wilson, Omar Graves, Sergio Lopez  
Faculty Mentor: Corwin Senko (Psychology)

Nearly 30% of college students in the USA (and on our campus) are first-generation college students (FGS), for whom neither parent received a 4-year degree. These students generally perform worse than continuing generation college students (CGS) and have smaller retention rates. Past work suggests that feelings of "family guilt" and low belonging contribute to these gaps for FGS. In theory, an intervention could inoculate FGS to those feelings of family guilt, thus helping them to maintain their academic motivation, which should, in turn, elevate performance and commitment. This study, using a randomized control design, provided an initial full test at the intervention. The presentation will provide core results, which offered mixed results, and speculate about improvements to make to the intervention going forward.

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## ***The Relationship between Basic Need Fulfillment and Prosocial Behavior: The Moderating Role of Culture***

Aaron John

Faculty Mentor: Matthew Wice (Psychology)

Our project will explore the relationship between the fulfillment of basic psychological needs (autonomy, relatedness, and competence) and prosocial behavior. This project also investigates how this relationship may differ between cultural groups. To assess this, we will administer an online survey to participants in the U.S. and Japan (using the crowdsourcing services Amazon Mechanical Turk and Crowdworks). This survey will include measures of basic psychological need fulfillment (Van der Kaap-Deeder et al., 2020), self-construal as an individual-level marker for cultural differences (Singels, 1994) and a four-item measure of prosocial intentions. We predict that the fulfillment of the basic needs will predict increased prosocial behavior. Further, we predict that culture will moderate this relationship such that autonomy will be more predictive of prosocial behavior in an American sample and relatedness will be more predictive of prosocial behavior in a Japanese sample. Need fulfillment is often understood in relation to one's personal benefit. A connection between need fulfillment and prosocial behavior can suggest how our personal benefit is not necessarily at odds with the benefits of others. The potential cultural moderation can give us a greater understanding of cultural variation in psychological literature.

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## ***The Evolutionary Psychology of Voting Behavior: Dark and Light Triad Traits as Predictors of Preferences for Political Candidates***

Kaitlyn Longo, Julia Lombard, Kyle Powell

Faculty Mentor: Glenn Geher (Psychology)

The current study (N=300) aims to identify the traits people prefer in their leaders. Specifically, this study seeks to identify which voter traits predict these preferences in terms of leaders who possess either dark or light triad traits. To test these questions, we created two vignettes of political candidates, each exhibiting a set of dark or light triad characteristic traits and behaviors. Our findings indicate that participants who prefer the “light candidate” scored high on light triad traits, low on dark triad traits, and low on political conservatism. Findings also showed that participants who preferred the “dark candidate” scored low on light triad traits, high on dark triad traits, and high on political conservatism. The findings are mostly consistent with our original hypotheses that people high in Dark Triad traits AND political conservatives AND Fast life history strategies will show a preference for the DARK leader (and vice versa).

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## ***Are We Evolved to be Courageous? A Study of the Psychological Correlates of Courage***

Sergio Lopez, Sarai Garcia, Kaitlyn Longo  
Faculty Mentor: Glenn Geher (Psychology)

A perspective of work environments as analogous to ancestral conditions suggests that motivations for courageous behavior may reflect awareness of its benefits to the larger population. Evolutionary risk-taking (see Wilke et al., 2014) seems to be strongly predictive of courageous decision-making, suggesting that perhaps courage is an important evolved feature of the human experience. We hypothesize that individuals can engage in courageous behavior, predicted by psychological correlates. This study examines personality, risk-taking propensity, and resilience as predictor variables for courageous decision-making in the workplace. We presented participants with Behavioral Courage Scales designed for this study, along with the Ten Item Personality Inventory (TIPI), Brief Resilience Scale (BRS), and General Risk Propensity Scale (GRiPS). The study used an online survey format distributed through the campus listserv and employing Mturk to find participants. Correlational analyses demonstrated significant positive relationships between courageous decision-making and: extraversion, openness, emotional stability, conscientiousness, agreeableness and risk propensity. These data suggest that these traits facilitate courageous decision-making, better informing our understanding of workplace dynamics.

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## ***Does Social-Contract Reasoning Extend Across Logic Tasks***

Sergio Lopez  
Faculty Mentor: Glenn Geher (Psychology)

Based on the ubiquitous nature of reciprocal altruism in the human experience, Cosmides and Tooby (1992) provided now-classic findings suggesting that human logic seems to improve dramatically when stimuli are presented in terms of social-contract reasoning. Their stimuli were based on the Wason Selection Task, used commonly by cognitive researchers. Our in-progress study, distributed via Qualtrics, will see if this effect generalizes when using the conjunction task, which is another classic logic task that participants tend to get wrong, despite its apparent simplicity. In the conjunction task, participants are presented with a brief scenario and then are asked which of two items is more likely: (a) one incongruous fact or (b) that same incongruous fact along with congruous fact. We will use both social-contract-relevant and non-social-contract-relevant stimuli to see if Cosmides and Tooby's findings generalize with this alternative logic task.

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## ***The Nuances of Male Mating Strategies: Understanding Men, Women, and Opposite-Sex Friends***

Sergio Lopez, Sarai Garcia

Faculty Mentor: Glenn Geher (Psychology)

Research has identified moderators (factors that affect the relationship between variables) between attractiveness levels of opposite-sex friends (OSF) and sexual interest in them; however, the relationship was primarily found in female participants and only at middle to high levels. Evolutionary concepts may help to establish moderators for men, making male-mating strategies more nuanced than previously thought. This study investigates whether tendencies for high risk-taking, stability in the relationship, and satisfaction levels (romantic, sexual, and friendship) will emerge as moderators for both men and women; however, with larger effects in men. Additionally, we expect that high self-esteem, jealous dispositions, and similarities between partners and OSFs will be positively correlated with sexual interest in OSF's, emerging as additional predictor variables that have not been previously identified. The study will be distributed online via Qualtrics.

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## ***Delegation Strategies, Obstacles, & Outcomes***

Kevin Maguire, Laurena Marji

Faculty Mentor: Maryalice Citera (Psychology)

The purpose of this study is to examine the features of successful delegation. In delegating there must be a balance between relinquishing control and getting the task done the way you want it done. Delegation is highly relevant today, as there is much discourse surrounding the ever-changing nature of the workplace. Delegation occurs on a continuum from total authority (the leader tells the subordinate what to do) to total empowerment (the leader gives the subordinate autonomy over completing the task). We operationalized this by comparing a sample of emergent leaders with experienced industry leaders. We predicted that industry leaders would use more empowering strategies when delegating. We also predicted that more empowering strategies would predict fewer obstacles, more empowering resolutions, and more positive outcomes. Across the board, we found that students use slightly more empowering ways of delegating than industry. Students reported more positive outcomes and had fewer negative feelings toward themselves as leaders. While these reports are significant, they didn't support our hypotheses. One reason could be that students have less legitimate authority to fall back on. Across the board, more empowering strategies led to more positive outcomes. Employee-based strategies also led to more positive outcomes. Authoritarian strategies led to negative outcomes. This research can benefit a wide array of people, including students and those in professional spaces.

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## ***Multifractal Stimulation Interacts Multifractal Movement in Distance Perception by Blind Walking***

Oliver Similton, Emma Rabinowitz

Faculty Mentor: Damian Kelty-Stephen (Psychology)

We perceive to act and act to perceive. Movement and sensory stimulation work together in ongoing mutual relationship. Complexity in the way we move shapes the stimulation we absorb. Correlational work has repeatedly measured participants' own movements and found that movement complexity correlates with perceptual responses. The present work advances this inquiry by experimentally manipulating the complexity of stimulation and showing how it interacts with movement complexity to support perception. We presented a music-like stimulus with varying complexity to its meter through headphones while participants perceived distance by blindwalking. We randomly assigned participants to one of three stimulus conditions: low, medium, and high complexity. Each blindwalking trial consisted of two laps: experimenters led participants an instructed distance on Lap 1, and participants attempted to replicate that distance on Lap 2. Stimuli with medium complexity led to most accurate distance replications whereas higher complexity led to over-/underestimation. In both cases, the distance replication attempt reflected an interaction between movement and stimulus complexities. This work opens up a novel experimental paradigm for understanding mutual relationships between movement and stimulation. It also suggests new avenues for enriching "noise"-based stimulation already used as noninvasive rehabilitative and health-care interventions for perceptual-motor deficits.

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## ***Why Do Students Pursue Mastery or Performance Goals?***

Lucia Speranza

Faculty Mentor: Corwin Senko (Psychology)

Students often pursue the academic achievement goals to either learn as much as possible (mastery goal) or outperform classmates (performance goal). Theorists initially proposed that mastery goals are beneficial while performance goals are harmful, and also that the two goals are too different and incompatible to be pursued together. More recent research, including from our lab, contradicts those proposals. We now know that both goals can be beneficial at times. More importantly, students' experience is driven not only by which goal they pursue but also the underlying reason(s) for that goal. The current project explores how both the type and the number of reasons together influence student experience during goal pursuit. We hypothesized that students (a) are more committed to a goal if they have more reasons to pursue it, and (b) that they perceive mastery and performance goals as more compatible when pursued for the same reason(s). We tested this hypothesis in an online study. The survey asked participants to identify their academic goals and then select (from a checklist) all underlying reasons they have for pursuing the goal(s), plus their commitment to the goal(s) and their view of the compatibility of mastery and performance goals. Overall, the study supports our two broad hypotheses.

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## Sociology Department

### ***Centros de Apoyo Mutuo: Examining Analog Methods of Outreach as Potential Solutions for Low Engagement***

Shaleeza Velupillai, Juliana Freiberg

Faculty Mentor: Roberto Vélez-Vélez (Sociology), Jacqueline Villarrubia-Mendoza (Sociology, Anthropology)

The insufficiency of the United States government's humanitarian aid efforts to support communities impacted by Hurricane Maria has resulted in the formation of a network of grass-roots mutual-aid organizations to fill in the gaps. These mutual aid centers, also known as Centros de Apoyo Mutuo (CAMs) use crowdfunding and volunteer work to address the impacts of Hurricane Maria, providing relief in the form of basic necessities as well as initiatives that improve the social health of communities. One of the major challenges facing CAMs is community engagement, both in terms of recruiting volunteers as well as getting community members to participate in and utilize these initiatives. Our work addresses the following question: How and why do CAMs use social media and analog methods of outreach to engage with the community? We take a qualitative, narrative approach to analyze our body of observational notes and interviews, collected over the past 5 years through field research and direct engagement with CAMs. We examine the use of social media and loudspeaker announcements and compare their utility for different initiatives, situations and demographics. In our findings, social media emerges as a tool that allows CAMs to broaden their outreach, but fails to connect Puerto Rican communities due to population demographic changes and a prominent digital divide. The use of loudspeaker announcements as an alternative may help to connect dispersed communities and improve low engagement.

## Theatre Arts Department

### ***A Year with Frog and Toad: A Zero-Waste Musical Staged Reading***

Katherine Gudzik

Faculty Mentor: Andrea Varga (Theatre Arts), Catherine Doherty (Theatre Arts)

As a Theatre Arts major, my Honors Thesis functioned as my final opportunity to produce theatre that would connect with my mission to build community, inspire growth, and spread joy through the arts. In November, I made my directing, music directing, and producing debut with A YEAR WITH FROG AND TOAD (TYA) by Robert and Willie Reale, based on the beloved children's books by Arnold Lobel. My goals were to incorporate ASL (I interpreted/performed 3 songs in the show), integrate sustainability/inclusion, and bring theatre to young audiences locally. I drew inspiration from the UN's Sustainable Development Goals to create an accessible piece of art by and for the New Paltz community. There is a large LGBTQ+ student presence at New Paltz, including myself and most of our company, who resonate with Frog and Toad as characters as well as Lobel's story as a gay man and victim of the AIDS crisis. In October, our 10-member creative team held open auditions to all students across campus

and cast 9 actors; we had 10 rehearsals and a \$750 AYURE grant to assemble our show. Over 400 families experienced our happy-ending queer story together, free of charge. Our production was so successful that we were invited to bring FROG AND TOAD ON THE ROAD to Overlook Primary School in Poughkeepsie this coming May. Art such as this is in high demand in our area. No matter how scrappy or unpolished the work may be, storytelling is magical, core-memory material for these kids. That, to me, is priceless.

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### ***Smaller This Year***

William Reymann, Kiana Duggan-Haas

Faculty Mentor: Tony Speciale (Theatre Arts)

Various sociological theories, homicide statistics, and studies on violence in American media suggest a constant, casualized presence of violence in American society. The last seven years of mass shootings collectively outnumber total calendar days, and research suggests a correlation between this (and other forms of violence) and the upholding of American hegemonic social order. *Smaller This Year* proposes that violence is indeed synonymous with American ideology and employs the dramatic form to make a literal spectacle of casual violence, thus encouraging critical thought on the place of violence in our society.

This production set out to utilize New Paltz Theatre students' education in producing, directing, acting, and design to best support this goal within the confines of limited department resources. Current students and recent alumni run and comprise the entirely student-assembled cast and crew in a production model meant to provide leadership experience, creative autonomy, and student empowerment, especially as artists and citizens entering American society proper. Much of the work so far has been a mix of technical and artistic collaboration, including everything from scheduling and resourcing, to curating a unified theatrical image of 1950s "Hyper-Americana" to best represent the traditional American ideal.

*Smaller This Year* begins rehearsals April 25th and will be performed free of charge on May 6th at 7:30pm and May 7th at 2pm in Parker Theatre.

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### ***The Impact of United States Food Systems on Nutrition and Child Development***

Anna Segal

Faculty Mentor: Andrea Varga (Theatre Arts)

This thesis will examine the United States current agricultural system and how it affects vulnerable populations of children. This study will discuss the importance of nutrition and how it affects the development of children. More specifically, it will examine how nutrition affects vulnerable populations such as children with special needs and those who live in marginalized areas. Lastly, this will look at ways we can improve our agricultural system and transition to a more sustainable framework.

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## *Love in All Its Glory*

Alex Vaynerchuk, Alex Lombardo

Faculty Mentor: Tony Speciale (Theatre Arts)

Problems that is researched and explored are Self acceptance of ones journey whether it be identity, age, sexuality and most of all the relationships between family, friends and fellow peers. Importance of communication of ones challenges, desires and boundaries. Methods used are communicating and bringing together fellow theatre loving students from different walks of life in the theatre to create a production of these themes and to as well give opportunity. Also going about the process of creating the work and bringing it to the stage (Writing, casting, working with designers, dramaturgy, research.). Results are expanding into the field that is play writing that became a therapeutic way for me to express my feelings and experiences in a healthy way and to create work that has universal themes and a variety or perspectives. Conclusions **are to** create a communicative environment to introduce topics that are opposing but do not conflict such as having characters of different identities, walks of life and bringing up sensitive topics that are controversial and or under fire such as de transitioning; **and to** also introduce an aspect of trans life that is dealing and healing with ones mental health. By this I mean that it's not all about societies acceptance but also self acceptance.

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## *2022-2023 RSCA Award Recipients*

The Research, Scholarship, and Creative Activities (RSCA) program is dedicated to supporting student-faculty collaborations. In addition to hosting this annual Student Research Symposium, we provide several awards. These include grants to fund collaborative projects during the academic year ([AYURE grants](#)) or summer ([SURE grants](#)); [travel support](#) for students and their faculty mentors presenting their work at professional venues; and our [Mentor of the Year](#) award to acknowledge an outstanding faculty mentor. The following pages list the winners of these grants and awards during the 2022-2023 season.

### *2023 SURE Award Recipients*

**Abruzzo, Paula** (Psychology with a concentration in Psychobiology), '25  
Faculty Mentor: Giordana Grossi (Psychology)  
Project Title: An Electrophysiological Exploration of Orthographic Precision

**Anderson, Michael** (Mathematics), '24  
Faculty Mentor: Jaiung Jun (Mathematics)  
Project Title: The Linear and Integer Programming and Their Applications

**Anthony, Mireya** (Biology), '24  
Faculty Mentors: Maureen Morrow (Biology) & Pamela St. John (Chemistry)  
Project Title: Characterization of the New Bacterial Species: Bradyrhizobium NP1

**Benson, Matt (Printmaking)**  
Faculty Mentor: Aurora De Armendi (Printmaking), '24  
Project Title: Exploration in Lithography; Lo-Shu, Manière Noire, and Creating a Negative Image

**Bonilla, Briana** (Electrical Engineering), '25  
Faculty Mentor: Kevin Shanley (Engineering)  
Project Title: Diffusing CO2 Through Agilus-30

**Bucci, Vic** (Biology), '24  
Faculty Mentor: Kara Belinsky (Biology)  
Project Title: Conservation in the Face of Urbanization: What Nest Boxes and Bird Banding Can Tell Us About Ecosystem Health

**Day, Mariah** (Sculpture), '24  
Faculty Mentor: Michael Asbill (Studio Art/Sculpture)  
Project Title: Community Carbon

**Frawley, Dylan** (Geology), '24

Faculty Mentor: Kaustubh Patwardhan (Geology)

Project Title: Study of the 3D Geomorphology of Magma Mingling Structures Using Digital Image Analysis

**Gordineer, James** (Mechanical Engineering), '24

Faculty Mentor: Ping-Chuan Wang (Engineering)

Project Title: Simulation of Degradation in Al(Cu) Interconnect in IC Chip

**Grodin, Ryan** (Chemistry), '24

Faculty Mentor: Megan Ferguson (Chemistry)

Project Title: Characterizing Bacterial Predator-Prey Adhesion Using Atomic Force Microscopy

**Heller, Ezra** (Printmaking), '24

Faculty Mentor: Aurora De Armendi (Printmaking)

Project Title: Printmaking Inks with Local and Accessibly Foraged Pigments and Colorants as an Educational Practice

**Herbert, Emily** (Physics), '24

Faculty Mentor: Cheyne Glass (Mathematics)

Project Title: A Category-Theoretic Approach to Language Processing

**Long, Delaney**, (Biology, Environmental Concentration), '24

Faculty Mentor: David Richardson (Biology)

Project Title: Understanding the Largest Daily Migration: Zooplankton Daily Migration in Mohonk Lake

**Ordonez, Brian** (Computer Engineering), '25

Faculty Mentor: Jiun-Hsin (Vincent) Liao (Engineering)

Project Title: Establishment of Semiconductor Test and Characterization Capability in SUNY New Paltz

**Papaleo, Alessandra** (Art History), '25

Faculty Mentor: Beth E. Wilson (Art History)

Project Title: Cutting Critique: Dada Collage and Photomontage in Opposition to World War I

**Poroye, Jennifer** (Music, Concentration in Recording & Electronic Music), '24

Faculty Mentors: Mark Dziuba (Music) & Roy Thompson (Music)

Project Title: "In My Head": EP Project

**Rodrigues Santos Giordani, Glenda** (Mechanical Engineering), '24

Faculty Mentor: Rachmadian Wulandana (Mechanical Engineering)

Project Title: Assessing the Thermal Conductivity and Moisture Transport of Hempcrete

**Similton, Oliver** (Psychological Science), '24  
Faculty Mentor: Matthew Wice (Psychology)  
Project Title: The Morality of Ghosting

**Szurnicki, Katherina** (Geography), '24  
**Eagle, Zoe** (Geology), '24  
Faculty Mentor: Salvatore Engel-Di Mauro (Geography and Environmental Studies)  
Project Title: Urban Soil Contamination in Kingston, NY

**Taylor, EmmaJean** (Psychology), '23  
Faculty Mentor: Tabitha R. Holmes (Psychology)  
Project Title: How True Personal Stories Help us Understand Ourselves and Others

**Torres, Brandon** (Mechanical Engineering), '24  
Faculty Mentor: Mahdi Farahikia (Mechanical Engineering)  
Project Title: Machine-Dynamic Visualization Software Development - An Engineering Education Approach

**Weinstein, Carolyn** (History, Geography, Political Science), '24  
Faculty Mentor: Stephen Pampinella (Political Science & International Relations)  
Project Title: Racial Hierarchy during US Military Occupations, 1898-1952

## ***Spring 2023 AYURE Award Recipients***

**Anthony, Mireya** (Biology), '24

Faculty Mentor: Maureen Morrow (Biology)

Project Title: Large Plasmid Isolation and Sequence Analysis

**D'Alessandro, Ryan, (Chemistry), '24**

Faculty Mentor: Frantz Folmer-Andersen (Chemistry)

Project Title: Spectroscopic Studies of Chiral Molecular Recognition

**Fisher, Trevor** (Biology), 24

Faculty Mentor: Maureen Morrow (Biology)

Project Title: Whole Genome Sequence Analysis of Bacterial Isolates

**Grodin, Ryan** (Chemistry), '25

Faculty Mentor: Frantz Folmer-Andersen (Chemistry)

Project Title: Stereoselective Alkylation of DACH-Based Diimines

**Mohrmann, Summer** (English), '23

Faculty Mentor: Michelle Woods (English)

Project Title: Narrative Reclamation and the Therapeutic Application of Story

**Novogrebelsky, Brina** (History & English), '23

Faculty Mentor: Michelle Woods (English)

Project Title: Post-Soviet Jewish Milieu: An Exploration of Immigrant Literature by Jewish Women from the Former Soviet Union

**Reymann, William** (Theatre), 24

Faculty Mentor: Tony Speciale (Theatre Arts)

Project Title: *Smaller This Year*

**Speranza, Lucia (Canis)**, (Biology), '23

Faculty Mentor: Miles Wilklow-Marnell (Chemistry)

Project Title: Swapping Arsenic into Phosphorous Based Ligands for Dehydrogenation Catalysts: Poison or Promising?

**Vaynerchuk, Alex** (Theatre Arts), '23

Faculty Mentor: Tony Speciale (Theatre Arts)

Project Title: *Love in All Its Glory*

**Yosef, Harel** (Mechanical Engineering), 24

Faculty Mentor: Mahdi Farahikia (Engineering)

Project Title: Nature-Inspired Flow-Sensing Microphone Technology



## *Fall 2022 AYURE Award Recipients*

**Corti, Jenna** (Mechanical Engineering), '22

Faculty Mentor: Rachmadian Wulandana (Mechanical Engineering)

Project Title: Design of Hydrogen Distribution and Impacts Study

**Evans, Danae** (Physics & Astronomy)' 23

**Wahmann, Elaina** (Physics), '24

Faculty Mentor: Catherine Herne (Physics & Astronomy)

Project Title: Calculating Torque for Light-Driven Micro Robotics

**Fisher, Trevor** (Cellular Biology), '24

Faculty Mentor: Maureen Morrow (Biology)

Project Title: Whole Genome Sequence Analysis of Bacterial Isolates

**Gudzik, Katie** (Theatre Arts/Performance), '22

Andrea Varga (Theatre Arts)

Project Title: A YEAR WITH FROG AND TOAD, A Children's Musical Based on the Books by Arnold Lobel. Directed/Music Directed by Katie Gudzik.

**Hall, Tyler** (Mechanical Engineering), '23

Faculty Mentor: Ping-Chuan Wang (Engineering)

Project Title: Assessing Electrical Reliability of 3D-Printed Copper Structures

**Hisiger, Olivia** (Psychology), '23

Faculty Mentor: Corwin Senko (Psychology)

Project Title: Absolving Family Guilt in First-Generation College Students

**Herbert, Emily** (Computer Science, Physics), '25

**Palombi, Lara** (Computer Science, Visual Arts), '25

Faculty Mentor: Chirakkal Easwaran (Computer Science)

Project Title: Remote Monitoring and Data Analysis of the Weight Fluctuations of the Red-Tailed Hawk Due to External Temperature Fluctuations

**James, Jaelle** (Biology), '23

Faculty Mentor: Lydia Bright (Biology)

Project Title: Tracking Gene Expression Changes in Paramecium Using a Whole-Genome Approach

**Kurek, Natalia** (Biochemistry)' 23

**Griger, Delilah** (Biology), '23

**Scaria, Ashlyn** (Biology), '24

Faculty Mentor: Pamela St. John (Chemistry)

Project Title: Measuring Deuterated BPA Retention in Planaria

**Kurien, Kripa** (Biology), '23

Faculty Mentor: Preeti Dhar (Chemistry)

Project Title: Conversion of  $\beta$ - lactams to corresponding Azetidines

**Marji, Laurena** (Industrial/Organizational Psychology, Disaster Studies), '22  
Faculty Mentor: Maryalice Citera (Psychology)  
Project Title: Delegate Responsibilities More Effectively or Delegate Responsibility, Not Jobs

**Paiusco, Gianna** (Biology), '23  
Faculty Mentor: Aaron Haselton (Biology)  
Project Title: Guts, Oxidative Damage, and Environmental Health

**Sirdah, Fares** (Biochemistry), '22  
**Bhatti, Irtiza** (Biochemistry), '24  
Faculty Mentor: Dominic McBrayer (Chemistry)  
Project Title: Improving a Peptide DEP-EI-MS Prediction Model with Common Protecting Group Data

**Turner, Samuel** (Biochemistry), '24  
Faculty Mentor: Pamela St. John (Chemistry)  
Project Title: Effects of Surfactant Length and Functionality on DNA Aggregation

**Yosef, Harel** (Mechanical Engineering), '24  
Faculty Mentor: Mahdi Farahikia (Engineering)  
Project Title: Nature-Inspired Flow-Sensing Microphone Technology

## *Student Travel Award Recipients*

**Michael Anderson** and **Matthew Pisano** presented at the Joint Mathematics Meetings in Boston in January, 2023.

**Brooke Cammann** presented at the 124th Annual Meeting of the Archaeological Institution of America in New Orleans in January, 2023.

**Elina Dart** presented at the 49th Annual Meeting of the History of Economics Society in Minneapolis in June/July, 2022.

**Danae Evans** presented at the Biology & Medicine Through Mathematics (BAMM) conference in Richmond, VA in May, 2022.

**Kristyn Gessner** and **Danielle Takacs** presented at the American Ornithological Society Conference in San Juan, Puerto Rico in July, 2022.

**Ian Hanley** and **Lucia (Canis) Speranza** presented at the Northeast Regional Meeting (NERM) in Rochester, NY in October, 2022.

**Sean Loughran** presented at the SUNY Librarians Association conference in Farmingdale, NY in June, 2022.

## *SUNY Undergraduate Research Conference (SURC)*

Nineteen New Paltz students presented the results of their faculty-mentored research projects at the annual SUNY Undergraduate Research Conference. The conference was held at SUNY Maritime in the Bronx on April 14, 2023.

The students who attended are: Dalton Benn, Giovanni Colindres, Brendan Cunningham, Robert DeLaurentis, Tyler Hall, Bryan Han, Jacob Hulinsky, Matthew Krumholtz, Leiden Luraschi, Nicole Morales, Jake Pennisi, Louis Reyes, James Santo Alvo, Derreck Suhul-Torres, Paulina Wiater, Liam Woods, Bailey Yewchuck, Harel Yosef and Shelly Yousoufov.





# *Publication Opportunities for Undergraduates*

Looking for next steps for your project? Consider publishing it! Your faculty mentor can guide on best options within your discipline. Additionally, these journals focus on publishing undergraduate research.

## *Multidisciplinary*

The [Undergraduate Research Commons](#) has a list of journals and other avenues of undergraduate research communications.

[Stanford Undergraduate Research Journal](#) is an annual peer-reviewed publication of research articles written primarily by Stanford undergraduates, but also well-qualified students at other institutions, from all academic fields.

[Pittsburg Undergraduate Review](#) PUR is a multidisciplinary journal that accepts papers from around the world.

[American Journal of Undergraduate Research](#) is a refereed journal for undergraduate research in the pure and applied sciences, mathematics, engineering, technology, and related areas in education.

## *Humanities*

[The Allegheny Review](#), now entering its 31st year of publication, is one of America's few nationwide literary magazines dedicated exclusively to undergraduate works of poetry, fiction, creative nonfiction, and art.

[History Matters](#): An Undergraduate Journal of Historical Research.

## *Science, Technology, Engineering, & Math*

[Journal of Young Investigators](#) is dedicated to the presentation of undergraduate research in science, mathematics, and engineering.

[Journal of Undergraduate Reports in Physics](#) is a peer-reviewed journal of the Society of Physics Students (SPS) for archiving research conducted by undergraduate physicists.

[IMPULSE](#) is the first international, online neuroscience journal for undergraduate publications.

The [Penn Bioethics Journal](#) is the nation's premier peer-reviewed undergraduate bioethics journal.

[Catalyst](#): Rice Undergraduate Science and Engineering Review accepts submissions from undergraduate students who have performed science or engineering research at any international university or research institution laboratory.

## *Social Sciences*

[Undergraduate Economic Review](#) aimed at promoting high quality undergraduate research.

[Undergraduate Journal for Global Business and Community](#), offers undergraduate students a venue for publishing works.

The [Dialectics Undergraduate Journal of Leadership, Politics, and Society](#) aim is to promote undergraduate discourse and scholarship and to encourage students to pursue and engage in thoughtful discourses on topics of societal importance.

[Issues in Political Economy](#) is committed to supporting and encouraging quality undergraduate research in all areas of economics.

[Psi Chi Journal](#) is a peer-reviewed publication by the national honor society for psychology.

The [Yale Review of Undergraduate Research in Psychology](#) is an annual journal that showcases the best and most original research in psychology conducted by undergraduates from around the world.