Annual SUNY New Paltz
Student Research Symposium

Program Book
28th ANNUAL
SUNY NEW PALTZ
STUDENT RESEARCH SYMPOSIUM

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

Friday, May 6, 2022
Sojourner Truth Library
4:00 - 6:30 p.m.

Table of Contents

Schedule & Acknowledgments ............................................................. 2
Welcome Statements ................................................................. 3-5
Faculty Mentor Award ............................................................... 6
RSCA Opportunities ................................................................. 7
Poster Sessions At-a-Glance .......................................................... 8-11
Abstracts .................................................................................. 12-36
Presenters will be available at their poster for questions during the assigned poster sessions.
Global Sustainability Goal Designations ........................................... 37-38
RSCA Award Recipients in the Past Year ........................................ 39-48
  2022 & 2021 SURE Award Recipients
  Fall 2021 AYURE Award Recipients
  Spring 2022 AYURE Award Recipients
  Student Conference Travel Award Recipients
In Memoriam ............................................................................. 49
Publication Opportunities for Undergraduates ............................... 50

Editors: Amy Witkus, Corwin Senko
Cover Photograph: Rami Abouemira ’16
Cover Design: Kaitlin Hair
The 2022 Student Research Symposium

This year marks the 28th consecutive installment of the SRS, our annual celebration of students-faculty scholarship at SUNY New Paltz. This year’s SRS edition includes 63 poster presentations of work performed by 120 students, supported by 32 faculty mentors representing 14 departments.

Symposium Schedule
Friday, May 6

❖ 4:00 – 4:15 pm: Official Welcome, SRS Orientation, and Mentor of Year Award
❖ 4:15 – 5:15 pm: Poster Session #1
❖ 5:15 – 6:15 pm: Poster Session #2
❖ 6:15 – 6:30 pm: Closing Remarks & Award Ceremony

Acknowledgments

We heartily thank the Office of Academic Affairs for their continuing support of the SRS and other RSCA programs! Thank you also to Print Services for printing many of the posters on display today, Campus Auxiliary Services for funding the student awards presented at the SRS, and the Sojourner Truth Library for hosting this year’s SRS!

The RSCA Advisory Board

Kate Bellody (Library), Huicheng Chien (Geography), Li Gao (School of Business), Gordana Garapid (Geology), Judith Halasz (Sociology), Baback Izadi (Engineering), Kathleen Murphy (Music), Andrea Noel (Teaching & Learning), Corwin Senko, RSCA Director (Psychology)

Administrative Assistant: Amy Witkus
Welcome to the Student Research Symposium

I look forward to joining students and faculty at our May 6 Student Research Symposium, our first in-person event since 2019, and learning about your projects and achievements.

Student participation in research, scholarly, and creative activities beyond the classroom is one of several “high-impact” educational practices known to produce especially deep and meaningful learning. These practices require students to devote time and effort to purposeful tasks; make frequent decisions about their work; interact with faculty and sometimes peers about their work; and receive frequent feedback about performance. Such experiences deepen understanding of the substance and methodology of a discipline and provide opportunities to develop important intellectual capabilities. Those outcomes may not be apparent to a student during a project or upon completion, but often come into sharper focus over time.

Research participation is valuable in the education of all students, not just those planning to pursue a graduate education. National surveys have shown that employers value completion of a research project or similar endeavor that demonstrates knowledge in the major and abilities to solve problems, communicate, and make evidence-based decisions. Recent surveys of college graduates show that those who had worked on a long-term project beyond the classroom were more likely to be engaged in the workplace and thriving in their overall well-being. Such findings highlight why SUNY New Paltz values the Research, Scholarship, and Creative Activities (RSCA) program and other New Paltz programs that encourage student research/creative/scholarly engagement.

Successful undergraduate research programs depend on the dedication, knowledge, and scholarly expertise of faculty. This is a labor of love, but still takes time, energy and effort above and beyond everything else that we ask of faculty. I am deeply grateful to faculty mentors for these important contributions to the education and future of our students. I also want to express my deep gratitude to Professor Corwin Senko, campuswide RSCA Director, and the advisory committee for their dedication to managing our funding allocation processes, advising students, organizing events such as this symposium, and many other responsibilities.

I congratulate students and faculty both for your hard work and your success in projects this past year and wish you continuing success and fulfillment in the future.

Donald P. Christian
President
Congratulations to the students whose research projects have culminated in this year’s Student Research Symposium. Conducted once again in person, the Symposium showcases research that began in more uncertain times, when the course of the pandemic was less predictable. Seen in that light, students are to be congratulated not only for their research itself but also for their persistence in the face of possible disruption.

Congratulations and appreciation to the faculty as well for dedicating themselves to guiding and mentoring students in the undergraduate research experience, often considered the quintessential high impact practice. Faculty made these commitments despite continuing possibilities of pandemic-related interruption of research plans. Faculty thus modeled for students not only modes of inquiry and their applications but also the courage to persist under adversity greater than that which we might expect in more ordinary times.

To our students, faculty would no doubt welcome, even if they do not expect, your expressions of gratitude for their investment of time and expertise in your success in undergraduate research. I hope that you have thanked or will thank them. However, there is yet another way to express gratitude not only to the faculty but to all 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 College who provide the administrative, educational, and student support services that contribute directly or indirectly to your overall success, including your achievements in undergraduate research.

You may wish to consider expressing appreciation to all of the above by sharing with others outside the College, the story of your engagement in undergraduate research here at New Paltz. This includes telling family and friends, community members, former teachers and mentors, and potential future students. Thank you in advance for continuing to share your story of a New Paltz education personalized by transformative undergraduate research opportunities, which were made possible by our dedicated faculty and by many other members of this campus community.

Barbara Lyman
Interim Provost and Vice President for Academic Affairs
After the remoteness of 2020-2021, this balm of a year brought us back to campus and favorite activities. For many faculty, that includes collaborating with bright, eager students on the types of projects being shared today.

Faculty mentors, thank you for providing these project experiences to your students, for guiding them gently through its twists and turns, and giving students a deeper view into your field’s possibilities. Your efforts play a vital role in these students’ personal and professional development.

Students, thank you for your dogged commitment and enthusiasm! It is nearly impossible to complete such a major undertaking without those qualities. Through this journey, I hope that you have honed some skills valued in your discipline and considered the possibilities of a career in that field. Perhaps you have learned a little about yourself, too. No doubt you have coped with uncertainty and overcome surprise obstacles – in inevitable part of any successful project, and a valuable experience at this stage of your careers. In a few years, may you will luck back on these collaborative projects with fondness and a genuine sense of having grown from them.

Finally, if you are soon graduating, 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
Associate 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 2022 Mentor of the Year is Keely Heuer (Associate Professor of Art History). Congratulations, Keely!
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 37-46).
Poster Sessions At-a-Glance

Poster Session I: 4:15-5:15 pm

Characterization of Harvard Forest Bacterial Isolates
AHMED, Hanaa
ZULFIQAR, Laiba

Justice For Jonquil: Grief, Mourning, and Memory
BALLNER, William

Cloning in Paramecium Cells to View Proteins in Infection.
BENHAMMOU, Lyna

Moduli spaces of line arrangements
BURRIS, Matthew
OWENS, Ryan

Artistic Experiences and Inspiration
CARELLA, Amanda

Effect of Birch and Sycamore Extract on Growth of Drosophila
CIVIL, Chris
SPERANZA, Lucia
ZAKARIA, Ziad

Factors that Influence VQoL in Transgender Individuals
CORSINO, Alexis

Effects of temperature on pyrolyzed chicken feathers observe
DURMISHAJ, Arlinda

Catfishing Study
EISENBERG, Ethan
JERABEK, Emma
MONTANA, Darcy
LONGO, Kaitlyn

Synchronization in Complex Quadratic Networks
EVANS, Danae

AAC and the Graduate Student Educational Experience
FLORIO, Samantha

Vocal Perception: What Does Your Voice Say About You?
FOSTER, Kayley

Functional effects of RNAi-induced knockdown in P. caudatum
FURFARO, Julia
DE SILVA, Sherine

Catalytic Alcohol/Quinone Dehydrogenation by [IrCp*Cl2]2
HANLEY, Ian
BUNCE, Joshua
GENDVILLE, Saomi

Monitoring Avian Productivity and Survivorship at Mohonk
HUGHES, Dan

The Financial Structure of the U.S. Long-Term Care System
JAINSCHIGG, Larkin

The Attractiveness Study
LONGO, Kaitlyn
GOODWINE, Avery
FRITCHE, Megan

Comparative History: Spanish Influenza and Covid-19 in the US
LOUGHRAN, Sean

Examining Microfibers in Laundry and Mitigation Strategies
LUDWIG, Roy

Grammars in Contact: Study of Russian in Brighton Beach, NY
MIROSHNYCHENKO, Yana

Neuromodulation of Aggression Behavior in Fruit Flies
MORTIMER, Mackenzie
TAKACS, Danielle
<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
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<tbody>
<tr>
<td>Building and EI-MS Fragment Prediction Model for Peptides</td>
<td>PESCE, Matthew</td>
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<td>FLOOD, Brianna</td>
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<td>MIAH, Jahed</td>
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<td>Who Do You Want to Be? Exploring Personality Goal Motives</td>
<td>RODRIGUEZ, Kanjira</td>
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<td>Insecticidal Properties of S. lappa on Adult D. Melanogaster</td>
<td>SACCOCCIO, Alezandra</td>
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<td>KAUR, Navneet</td>
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<td>Loving-Kindness Meditation, Positive Emotion &amp; Implicit Bias</td>
<td>SAITTA, Christopher</td>
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<td>Universal Access: Bringing Disability Studies to Education</td>
<td>SANFORD, Kimberly</td>
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<td>Larvicidal Potential of Saussurea lappa</td>
<td>TALANKI, Varsha</td>
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<td>WAHEED, Fatima</td>
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<td>Higher Phosphorus Concentrations in Lakes with Fish in Their Food Webs</td>
<td>THRANE, Makaylei</td>
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<td>BALLARD, Shelah</td>
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<td>Elzey, Lissa</td>
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<td>Changes in Acidity and Temperature in Lakes on Shawangunk</td>
<td>TOLEDO, Ruben</td>
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<td>BALLARD, Shela</td>
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<td>Will a House Sparrow Population Spill Over and Invade into the Mill Brook Preserve Nest Box Network?</td>
<td>WIRTHMANN, Grace</td>
</tr>
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</table>
Poster Session II: 5:15-6:15 pm

Caramel: A Social App to Connect with People
BOLLINENI, Lohith

Ultrasonic Fatigue Test of 3D-Printed Steel Structure
BOSWELL, Justin

Does Hand Proximity Enhance Cognitive Control?
CONKLIN, Jessica
VERMILYEA, Kaylin

Analyzing Bladeless Turbines with Rotary Motion
CORÁ, Mario

Genetics of COVID-19 Anosmia
CUEVA, Valeria
HIDALGO, William
NAKAGAWA, Benjamin

Designing a Solar Powered Refrigerator
DANTONA, Jillian

Whole-Genome Sequencing of Harvard Forest Soil Bacteria
DURMAZOLU, Francesca

Deuterated BPA Retention and Impact on Regenerating Planaria
FLOOD, Brianna
KUREK, Natalia
GRIGER, Delilah

Slow Brain Potentials and Hemispheric Lateralization
GARCÍA, Sarai
SPINA, Liv

Stereoselective Alkylation Reactions of Diimines
HAVNAER, Calvin
GALLAGHER, Kian

Enantioselective Liquid-Liquid Extraction of Amino-Acids
IBÁNEZ, Anthony
YU, Yicheng

Analyzing Resistance in Paramecium Caudatum to H. undulata
JAMES, Jaelle
BOURBON, Emily

Synchronization and Clustering in the Basal Ganglia
KO, Yan Lok
KREIDER, Kaitlyn

Design and Performance Analysis of Darrieus Water Turbines
LONGO, Kaitlyn
LOMBARD, Julia
GOODWINE, Avrey
FRITCHE, Megan

The Leadership Study

Addressing Dialectal Differences in Standardized Language As
Delegation Easier Said Than Done
LUGO, Sofia

Measuring LC50s of D8BPA in Whole and Regenerating Planaria
MATHEW, Megha
ABRAHAM, Alina
MANGAL, Riddhi
MAURER, Jessie

The Refrigeration Cycle Efficiency and Performance
MORALES, Nicole
NEUMANN, Lindsay

Plasmid Isolation of Bacterial Strains BS40 and AN88
ANTHONY, Mireya

Parenting and Social Behavior
PATEL, Jenny

Trapping and Manipulating Bdellovibrio with Optical Tweezers
PRATT, Alexia
NAGLIERI, Mia
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<tr>
<td>Design of a Test Apparatus for Diffusiophoretic Water Filter</td>
<td>QUERRARD, Matthew</td>
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<td>Assessing Electrical Reliability of 3D-Printed Copper Wire</td>
<td>RAMIREZ GRIJALBA, Hugo</td>
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<td>Zooplankton Behavior and Vertical Distribution in Mohonk Lake</td>
<td>SANDOVAL, Lydia</td>
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<td>PERSAUD, Shayna</td>
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<td>Evaluating Bee Diversity Prior to Solar Array Construction</td>
<td>SISTI, Megan</td>
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<td>HUGHES, Daniel</td>
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<td>Measuring the Attachment Force of B. bacteriovorus</td>
<td>SMITHING, Carrie</td>
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<tr>
<td>An Impact of Past Vocal Training on Transgender Vocal Change</td>
<td>SPATARO, Melissa</td>
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<td>Cavity Nest Boxes in Millbrook Preserve</td>
<td>VASQUEZ, Cynthia</td>
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<td>BUCCI, Vic</td>
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<td>MUSTAFA, Sam</td>
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<td>Stable Positions of Calcite in Optical Tweezers</td>
<td>WAHMANN, Elaina</td>
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<td>EVANS, Danae</td>
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<td>The Effect of pH on Paramecium Growth Rates</td>
<td>WATTOO, Rida</td>
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<td>TOLA, Jonathan</td>
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<tr>
<td>3D Printed Multi-material Compliant Joints</td>
<td>ZEPPIERI, Zachary</td>
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</tbody>
</table>
**Abstracts**
*(in alphabetical order by faculty mentors’ academic departments)*

### Biology Department

**Characterization of Harvard Forest Bacterial Isolates**
Hanaa Ahmed, Laiba Zulfiqar
Faculty Mentor: Maureen Morrow (Biology)

The Harvard Forest (HF) Long Term Ecological Research site is the location of a soil warming experiment where plots have been maintained at 5°C (9°F) over the ambient temperature since 1991. HF soil was exposed to laboratory drought conditions and two isolates, BS40 and BS71, were obtained and subject to whole genome sequencing (WGS). Bioinformatics analysis indicated that BS40 displayed approximately the same amount of drought tolerance genes compared to its relatives. The BS71 genome, however, shows the presence of more drought tolerance associated genes in relation to its closest relatives, supporting the theory that warming selects for drought tolerant species. This analysis also indicated that BS71 displayed a number of copper tolerance genes, which assist in binding, sequestration, homeostasis, and transport of copper. BS71 copper tolerance was determined in nutrient rich and nutrient deficient media. When compared to known copper resistant (Pseudomonas aeruginosa) and sensitive (Escherichia coli) bacteria, BS71 demonstrates copper tolerance. BS71 and P. aeruginosa copper tolerance abilities however decreased in nutrient deficient media. When supplemented with phosphate and sodium chloride, but not dextrose or nitrogen, copper tolerance is partially restored for both P. aeruginosa and BS71. This work indicates that nutrient limitation should be accounted for when utilizing bacteria for bioremediation purposes.

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**Cloning in Paramecium Cells to View Proteins in Infection**
Lyna Benhammou
Faculty Mentor: Lydia Bright (Biology)

Over evolutionary time, Paramecium caudatum have evolved variation between different strains, including its resistance to infection by pathogens. The gram-negative bacterium Holospora undulata is a highly infectious, micronucleus-specific symbiont of ciliate Paramecium caudatum. It infects the host cell via the oral apparatus. A previous study from our lab successfully identified three host genes (MORN, TVP15, and CC5) which, when knocked down genetically, caused resistance to this parasitic infection. In order to better understand this response, we amplified these three genes and are tagging them with green fluorescent protein (GFP) in preparation for injection into Paramecium cells. Through molecular cloning, we are making a gene fusion within the vector pPXV of the C147 DNA. To clone, we designed a set of forward and reverse primers for each of the genes. We then used these primers to run a PCR to amplify small segments of DNA. With gel electrophoresis, we see which genes were amplified. We then purified those samples that worked and digested them using an enzyme called Kpn1. After digestion, we ran the gel and purified the samples again. We then ligated, or pasted, the pieces of DNA together, transformed the construct into bacterial cells, and plated the bacteria to check for colonies and produce the final DNA construct. Our future steps will be focusing on injecting this DNA into Paramecium and imaging the cells when they have been infected by Holospora.
**Genetics of COVID-19 Anosmia**  
Valeria Cueva, William Hidalgo, Benjamin Nakagawa  
Faculty Mentor: Jeffrey Reinking (Biology)

UGT2A1 and UGT2A2 are overlapping genes expressed in the lining of human nasal cavities and produce enzymes that play roles in metabolizing odorants. A recent genome wide association study (GWAS) identified multiple single nucleotide polymorphisms (SNPs) in the vicinity of these two genes that exhibited a correlation with the self-reported loss of taste (ageusia), and smell (anosmia) coincident with COVID-19 infection. Here, we pursue development of a polymerase chain reaction restriction fragment length polymorphism (PCR-RFLP) based assay to allow an individual to be genotyped for rs7688383, the SNP with the most robust correlation to the self-reported phenotype. We designed multiple primers flanking either side of the SNP and tested each possible pair of primers at a range of annealing temperatures to optimize conditions to produce an amplicon containing the SNP. We then digested the amplicons with several different restriction enzymes, producing fragmentation patterns that could be analyzed by gel electrophoresis to deduce the genotype of an individual for rs7688383.

**Whole-Genome Sequencing of Harvard Forest Soil Bacteria**  
Francesca Durmazolu  
Faculty Mentor: Maureen Morrow (Biology)

Soil bacteria isolated from the Harvard Forest Long-Term Ecological Research site have the potential to provide insights into how these bacteria can adapt to increasing temperatures. Since 1991, soil plots in the Harvard Forest LTER site have been heated to 5°C above the ambient temperature. This project aims to study bacterial isolates from the site and determine which ones are good candidates for whole-genome sequencing (WGS). These bacteria were isolated as part of the Capstone Microbiology class. Methods involve DNA extraction with various kits, PCR, and 16s gene sequencing. The results of the 16s sequencing analysis will be presented and will be used to determine which isolates should be subject to WGS. The WGS data will add to our understanding of the effect of warming temperatures on bacteria. The microbial content of soil can affect human health and industry, as well as influence the rate of climate change through carbon cycle feedback. Determining which species of bacteria thrive in warmer conditions, as well as their adaptations, is a vital part of understanding the long-term effects of climate change.

**Functional Effects of RNAi-induced Knockdown in P. caudatum**  
Julia Furfaro, Sherine De Silva  
Faculty Mentor: Lydia Bright (Biology)

The RNA interference pathway is believed to have been evolved as a tool for defending organisms against viruses, transposons, transgenes, and other DNA-altering threats (Jenkins et al. 2021). The functional effects of genes in organisms that have this pathway can be determined through the use of RNAi-induced knockdowns. Despite the use of RNAi-induced knockdowns in other ciliate species, to examine genes involved in cell division and defense functions, this technique has not been established in our ciliate of interest, Paramecium caudatum.

In this study, our main goal was to establish an effective knockdown protocol in P. caudatum. To do so, we focused on silencing the genes ND7 and Mob1 because they both produce phenotypic effects in other Paramecium species when knocked down. Mob1, specifically, has two paralogs in P. caudatum—Mob1A and Mob1B. One of our goals was to determine the functional effects of knocking down both of these paralogs at the same time and separately. We induced the RNAi pathway through feeding and observed our results using inverted phase-contrast microscopy. Our results showed that the knockdown of Mob1B alone had a greater phenotypic effect than the knockdown of Mob1A alone or Mob1A and B together. By establishing an effective gene silencing protocol, more information can be uncovered about gene expression within this Paramecium species.
Monitoring Avian Productivity and Survivorship at Mohonk
Dan Hughes
Faculty Mentor: Kara Belinsky (Biology)

As the populations of many bird species are declining due to habitat loss, the relationship between forest fragment size, connectivity and surrounding features on habitat functionality has become a pressing area of conservation concern. We’ve been using birds to investigate the effects of habitat fragmentation on ecological health at different locations in New Paltz, NY, using the Monitoring Avian Productivity and Survivorship (MAPS) protocol. MAPS data was collected in previous summers (2016-20) in two forest fragments at SUNY New Paltz’ Campus forest and Mohonk’s Brook Farm- small, secondary growth forests surrounded by suburban development and agricultural lands, respectively. After concluding data collection at these sites, data collection began at a new site within a larger expanse of forest at Mohonk’s Spring Farm this past summer (2021). 6 banding days were conducted with a n=126 birds comprising 29 species banded, including 7 forest-interior specialist species. Data collection at our current site will continue until 2025. Using the numbers of banded birds recorded over the years, we can begin to form questions about the status of each captured species’ productivity and survivorship within our local environments. The presence/success of species with specific habitat requirements (i.e. forest-interior specialists) offers further indication surrounding habitat functionality. From there, a better understanding of the overall health of these environments can be procured.

Analyzing Resistance in Paramecium Caudatum to H. undulata
Jaelle James, Emily Bourbon
Faculty Mentor: Lydia Bright (Biology)

Paramecium caudatum is a single-celled ciliate that hosts the obligate endosymbiont, Holospora undulata. Previous research has shown there are specific genes that are upregulated in Paramecium during the infection process by this obligate endosymbiont. Additionally, these genes are believed to be a main factor in the response to the parasite. We have the goal of understanding which molecules are causing different infection responses in different strains of Paramecium. The precise genes that show differences between these different strains can be determined through the process of RNA extraction and DNA sequencing comparisons between susceptible and resistant Paramecium strains.

For our project, we collected cells from different strains, in order to isolate the RNA. The extracted RNA was then converted to cDNA for barcoding and sequence analysis. Next, we plan to do the final prep steps for the cDNA to be passed through a Nanopore sequencing chip, which will give raw sequencing data that we can assemble and analyze for differences between infected and uninfected cells, and between the different strains.

Neuromodulation of Aggression Behavior in Fruit Flies
Mackenzie Mortimer, Danielle Takacs
Faculty Mentor: Aaron Haselton (Biology)

Neuromessenger proteins such as Neuropeptide-F (NPF) have been linked to aggression in animals such as the fruit fly Drosophila melanogaster. Our lab has previously generated transgenic fly lines and confirmed the expression of optogenetic driver genes in NPF-expressing brain cells. In this study, we used optogenetic techniques to express light-activated ion channel proteins in the membranes of NPF-secreting modulatory neurons, which allowed us to manipulate NPF release in the neural circuits of D. melanogaster. Male fruit flies in particular exhibit stereotyped aggressive behaviors toward one another, making it possible to rank individual aggression based on fight analysis of recorded interactions. We investigated the effects of NPF release on aggression in two strains of transgenic fruit flies (with differing upstream activation sequences) in a stimulated fight arena.
**Plasmid Isolation of Bacterial Strains BS40 and AN88**

Lindsay Neumann, Mireya Anthony  
Faculty Mentor: Maureen Morrow (Biology)

The Harvard Forest Long-Term Ecological Research Site has plots of land that have been heated to 5°C above normal temperature since 1991, to study the effects of climate change associated with warming on the organisms residing there. Bacterial strains BS40 and AN88, isolates from the Harvard Forest, were suspected of containing large plasmids based on their whole genome sequencing assembly data. This data contains contigs, sections of the DNA, that 1) contain plasmid-associated genes and 2) are the size of large plasmids found in many soil bacteria. Because plasmids can be passed from cell to cell, these Mobile Genetic Elements can play a significant role in bacterial adaptation and evolution. To determine if the genome assembly contigs are plasmids and not part of the chromosome, we attempted to isolate plasmid DNA from the bacteria. An alkaline lysis protocol, modified with a lysozyme treatment step, was performed to screen for plasmid DNA, but did not yield results indicative of plasmids. A second protocol, using a kit designed for isolating large plasmids, is being tested. This work can contribute to our understanding of the role of plasmids as bacteria adapt to stressful environments generated with warming.

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**Zooplankton behavior and vertical distribution in Mohonk Lake**

Lydia Sandoval, Lissa Elzey, Nelson Aguilar, Guillermo Granados, Julio Aguilar, Shelah Ballard, Zoe Foery, Shayna Persaud  
Faculty Mentor: David Richardson (Biology)

Zooplankton are the cows of lakes – they feed on the base of the food web and provide a connection to the upper trophic levels like fish. In Mohonk Lake, our nearby study lake, zooplankton have been the prey for many different fish taxa. Because the fish feed during the day as visual predators, many zooplankton species have evolved migration patterns as a way to balance feeding and survival. This behavior is called diel vertical migration where zooplankton migrate tens of meters down deep in the lake each day to where there is minimal light to avoid predation and up to the surface to feed on algae during the night. Previous research in Mohonk Lake have shown these zooplankton populations behaviors linked to increase of water temperatures. We used data from the summer and fall 2019 to see if there was a correlation between nighttime distribution and zooplankton density. There was higher zooplankton density in the fall than summer and higher density of zooplankton at deeper depths at day compared to night. Small zooplankton taxa, like Rotifera, had higher densities in the summer than fall while larger zooplankton, like Crustacea, had higher fall abundance than summer. We can use this data to understand behavior and migration of zooplankton in local, regional, and global lakes.
**Evaluating Bee Diversity Prior to Solar Array Construction**
Megan Sisti, Daniel Hughes  
Faculty Mentor: Kara Belinsky (Biology)

With increasing concerns on the global impacts of climate change resulting from fossil fuel consumption, alternative energy sources such as photovoltaics (PV) are becoming more frequently utilized. While PV solar arrays provide energy generation with reduced carbon emissions, PV installations can result in habitat loss. Analyzing bee and wildflower diversity before and after PV construction can help pinpoint the effects of land use change associated with solar arrays to help mitigate deleterious effects. On a capped landfill site at the New Paltz Recycling Center, bee diversity was surveyed using sweep-net and soap-trap sampling, and wildflowers were surveyed by counting. This was replicated at an adjacent forest reference site to compare data. The solar array at our site will be installed in 2022, and a post installation assessment will be conducted the following year. In our pre-installation sampling we found a total of 30 different species of bees, with the Common Eastern Bumblebee (n=57) and the European Honey Bee (n=27) being most abundant. This diverse community included one species of New York State high-priority conservation status: the Yellow Bumblebee. We also found 25 species of wildflowers, with Birds Foot Trefoil (n=2,446) and Queen Anne’s Lace (n=1,775) being most abundant. To promote the populations of bees, our goal is to be able to make suggestions that will help mitigate the environmental impacts associated with the construction of PV solar arrays.

**Larvicidal Potential of Saussurea lappa**
Varsha Talanki, Fatima Waheed  
Faculty Mentors: Aaron Haselton (Biology), Preeti Dhar (Chemistry)

The herb Saussurea lappa contains 2 terpene derivatives, costunolide and dehydrocostus lactone, with known insecticidal activity. The larvicidal potential of S. lappa was investigated against Drosophila melanogaster at 12, 25, and 50 mg/ml crude ethanolic extract, along with a control. D. melanogaster eggs were exposed to the extract and larvae were collected after 2, 3, and 4 days. The larvae were preserved and measured to compare differences in average body length between the treatment groups. S. lappa extract exposure resulted in significantly reduced larval body lengths at each day sampled. This growth inhibition effect was dose-dependent, with moderate inhibition at 12 mg/ml, and near complete growth inhibition at 25 and 50 mg/ml. Based on these results, S. lappa has promising insecticidal properties and further analysis at other points of D. melanogaster development are of interest.

**Higher Phosphorus Concentrations in Lakes with Fish in Their Food Webs**
Makaylei Thrane, Norman Reid, Zoe Foery, Shayna Persaud, Julio Aguilar, Nelson Aguilar, Shelah Ballard, Lissa Elzey  
Faculty Mentor: David Richardson (Biology)

Three local lakes, Awosting, Minnewaska, and Mohonk Lake. Each have a different history of fish presence despite being close in proximity. Awosting is fishless, while Mohonk has been stocked with various species of fish for over a century. Minnewaska was fishless until 2008 when several new species were first found. This variety of fish presence allows us to determine the effect that fish have on nutrient concentrations in lakes such as phosphorus. Samples were taken at the surface, then 12-15 meters deep at the center of each lake. As a team we have collected data frequently from 2019 to 2021. Mohonk lake (fish stocked) has a significantly higher phosphorus level compared to Minnewaska and Awosting. This could be due to the consistent stocking of various species of fish.
**Changes in Acidity and Temperature in Lakes on Shawangunk**

Ruben Toledo, Julio Aguilar, Shelah Ballard  
Faculty Mentor: David Richardson (Biology)

The average normal pH of lakes is between 6.0 to 9.0 indicating neutral conditions. However, many lakes in the Hudson Valley and northeastern North America have been much more acidic due to acid rain occurring from the 1970s. Concurrently, lakes usually stratify in the summer into layers consisting of a warmer top layer and colder lower layer and stratify inversely in the winter with layers consisting of ice on top and colder water underneath. We collected data from 1986 to 2019 of the temperatures of various depths within 0 meters to 12 meters of the lake using a temperature sensor and pH meter. The pH decreases during the summer months and increases during the winter months. Due to recovery from acid rain, the pH has been increasing in the summer and winter but often differentiates between the surface and deep waters due to stratification.

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**Cavity Nest Boxes in Millbrook Preserve**

Cynthia Vasquez, Vic Bucci, Sam Mustafa  
Faculty Mentor: Kara Belinsky (Biology)

Nest boxes are essential for the breeding success of native cavity bird species. Invasive house sparrows have been known to dominate nest boxes in urbanized locations, however it has been observed that in more suburban locations this may not be the case. In order to gain a better understanding of how nest box placement can support native species, we designed a study using a next box network comprised of 60 nest boxes within the Millbrook Preserve. These boxes were consistently observed, and any nesting activity was recorded. Over the past two years of the study no house sparrows have entered or been observed near the nesting boxes, however four native cavity nesting species the nest box network: Black-capped Chickadees, Tufted Titmice, and Eastern Bluebirds, and Tree Swallows. For the future, we plan to expand our nest box network, and this study will help us to provide recommendations on where to place nest boxes in order to avoid any invasion by house sparrows.

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**The Effect of pH on Paramecium Growth Rates**

Rida Wattoo, Jonathan Tola  
Faculty Mentor: Lydia Bright (Biology)

Paramecia are unicellular organisms that occupy most aquatic environments. According to prior studies, neutral pH levels are most suitable for them to survive. The two local lakes that were chosen for this study are: Lake Mohonk, which has a neutral pH and Lake Awosting, which is acidic. Due to industrial pollution, many lakes such as Lake Awosting were subjected to acidification, making it a less optimal environment for Paramecium to grow. Lake Mohonk did not receive these same effects. The goal of our research was to identify how well cells from each lake grew in different conditions. These conditions include lab media with water from each lake and lab media on its own. We also determined the genotype, or genetic background of each isolate to see if the differences in phenotype, such as growth rates and ability to grow in the lab, might be due to differences in genotypes. Overall, Mohonk cells survived and grew better, but the Awosting cells grew as well. This may be due to the genotypic differences, since all of the lines isolated from Mohonk were a different strain than that isolated from Awosting. In the future, we will be comparing growth rates of cells fresh out of the lake, and ones that have been growing in the lab for several generations.
Will a House Sparrow Population Spill Over and Invade into the Mill Brook Preserve Nest Box Network?
Grace Wirthmann (Biology)
Faculty Mentor: Kara Belinsky

The house sparrow, an invasive species that has been competing with all species of bird for housing in order to reproduce. House sparrows are a species of bird that lives in a community type population and are aggressive in pushing other bird species out of habitats. Even though they are very aggressive it may take up to a few seasons for them to actually overcome the native species in the area. A nest box network has been set up in the Mill brook Preserve, a 134-acre, second-growth forest surrounded by suburban housing. This network was created to see how far a bird house must be placed away from an urban setting in order for house sparrow dominance to be stopped. This study is in its 3rd year of data collection and the conclusions thus far have shown that even though there were house sparrows close to the most outer placed nest boxes they did not invade into the network in the preserve. My research was conducted to see if already prospering house sparrow populations can be found outside the preserve. Once these populations are established a recommendation can be made for new nest boxes to be placed to see if the spill over population for the house sparrows will move into the Mill Brook preserve if given the opportunity to do so. My research is to help prove the theory that the nest box network is established a safe distance away from urban/suburban buildings and houses to prevent house sparrows from moving into the Mill Brook preserve.

Chemistry Department

Effect of Birch and Sycamore Extract on Growth of Drosophila
Chris Civil, Lucia Speranza, Ziad Zakaria
Faculty Mentors: Miles Wilklow-Marnell (Chemistry), Aaron Haselton (Biology)

In our research we are investigating the use of birch bark extract; containing triterpenoids such as betulin, betulinic acid, and lupeol as its major components, in order to observe the effects it has on Drosophila species. In previous studies it has been shown that extract from Terminalia Arjuna has similar triterpenoids and has been observed to be a deterrent in the growth and development of D. Melanogaster when incorporated into their diet. Dried bark of white birch (Betula papyrifera) was extracted by Soxhlet method using various solvents. The average yield of concentrated extracts was 19.35%. 1H-NMR studies confirmed the presence of Betulinic triterpenoids when compared to known reference spectra. The relative content of betulin and betulinic acid has been investigated by GCMS analysis. Preliminary results have indicated that D. Melanogaster that have been fed diets including birch extract from the B. papyrifera have shown resistance to oxidative stress. Betulinic acid has been reported to be more biologically active than other triterpenoids. This compound has been found in greater quantities in sycamore (Platanus occidentalis) bark than birch bark, we are currently comparing the effects of sycamore extract to birch extract.
Effects of Temperature on Pyrolyzed Chicken Feathers
Observe
Arlinda Durmishaj
Faculty Mentor: Megan Ferguson (Chemistry)

Effects of temperature on pyrolyzed chicken feathers observed using atomic force and scanning electron microscopy

Chicken feathers, which would otherwise be considered a waste product, are being researched for their potential applications in electronics, absorption properties such as water filtration, gas storage, and catalytic properties. These applications first require heating the feathers to several hundred degrees in the absence of oxygen, known as pyrolysis. Chicken feathers treated with a two-step pyrolysis method were obtained at temperatures ranging from 600–900 °C and imaged using scanning electron and atomic force microscopy. Structural and electronic properties of pyrolyzed feather material were observed. The number of fibrous strands in feather material increased as the pyrolysis temperature increased. Graphite-like plate structures were also observed from AFM/SEM imaging. Rigid and plate and hollow tube structures attribute to higher absorptivity properties. The material was observed to be electrically conductive.

Deuterated BPA Retention and Impact on Regenerating Planaria
Brianna Flood, Natalia Kurek, Delilah Griger
Faculty Mentor: Pamela St. John (Chemistry)

Bisphenol A (BPA) is a xenoestrogen commonly used in industrial processes, specifically the production of plastics, health and beauty products, and pharmaceuticals. Due to its prevalence in consumer goods, exposure to this environmental pollutant is inevitable. In previous experiments, we have determined that freshwater planaria (G. tigrina) exposed to micromolar concentrations of D8-BPA have demonstrated deleterious phenotypic effects, such as the inability to regenerate effectively and changes in eyespot distance. We have attempted to correlate the observed phenomena with the amount of D8-BPA absorbed and retained by the worms after surgical transection. To do this, eyespot distance as well as regeneration growth curves were digitally quantified during the experimental period. The retention of D8-BPA was quantified using high-performance liquid chromatography (HPLC). However, the lack of a trend in retention across various concentrations of D8-BPA indicated that intensity values were being impacted by the variable size of each worm. To correct for this, dried worm pellets were weighed, prior to HPLC analysis to normalize peak area and intensity to mass. The normalized D8-BPA values were then compared to our previously obtained phenotypic data to determine a correlation between adverse phenotypic phenomena and retention.

Catalytic Alcohol/Quinone Dehydrogenation by [IrCp*Cl2]2
Ian Hanley, Joshua Bunce, Saomi Gendville
Faculty Mentor: Miles Wilklow-Marnell (Chemistry)

Iridium complexes have proven useful in alcohol dehydrogenations. However, complicated ligands are often used, the complexes may be very sensitive to oxygen, and an excess of base is commonly needed. Pentamethylcyclopentadienyl iridium dichloride dimer ([IrCl2Cp*]2), a simple commercially available iridium complex, has been found to catalytically dehydrogenate benzyl alcohol to benzaldehyde, with the help of benzoquinones as catalytic hydrogen acceptors. This reaction can be done with off the bench solvents under aerobic conditions. A range of quinones and bases were tested, yielding up to 91 % benzaldehyde. In a later step, Ceria (Ce02) nanoparticles can be introduced into the reaction and act as electron transfer mediators. This facilitates the reaction of hydrogen with oxygen for an overall oxidative dehydrogenation pathway, allowing for catalytic amounts of benzoquinone to be used. Results will be discussed.
Stereoselective Alkylation Reactions of Diimines
Calvin Havnaer, Kian Gallager
Faculty Mentor: Frantz Folmer-Andersen (Chemistry)

We describe efforts toward the synthesis of a series of C2-symmetrical diamines derived from trans-1,2-diaminocyclohexane (DACH), in which chiral centers reside on both sides of the amino groups. Our synthetic strategy involves the diastereoselective addition of nucleophilic organometallic alkylating agents to diimines derived from DACH and aromatic aldehydes. This approach has previously been reported with unhindered organomagnesium (Grignard) and organolithium reagents. However, our attempts at similar reactions with various Grignard reagents have returned unreacted starting materials (a result consistent with other reports). Recently, we successfully added two equivalents of a highly hindered alkyl lithium (tert-butyl lithium) at around -90 °C to produce a novel target compound retaining C2-symmetry with high purity and yield. We are now investigating the stereochemical outcome of this new reaction. Ultimately, we hope to use this new compound as an enantioselective liquid-liquid extraction (ELLE) agent for the resolution of amino acids, which we have recently demonstrated with related new DACH derivatives that we have prepared through non-stereoselective synthesis.

Enantioselective Liquid-Liquid Extraction of Amino-Acids
Anthony Ibanez, Yicheng Yu
Faculty Mentor: Frantz Folmer-Andersen (Chemistry)

In recent years, our laboratory has developed syntheses of three isomeric forms of new chiral C2-symmetrical macrocycles containing both trans-1,2-diaminocyclohexane (DACH) and 1,1'-bi-2-naphthol (BINOL) subunits. These compounds differ by the geometry of the arene linkages, and by the relative stereochemistry of the DACH and BINOL subunits. We now report the use of the Cu(II) complexes of these macrocycles as enantioselective carriers of amino acid substrates from water into halogenated organic solvents. The optical purities of extracted amino acid samples have been measured by chiral stationary phase high-performance liquid chromatography (CSP-HPLC), which shows that the selectivity of the extraction is significantly affected by the shape and stereochemistry of the macrocycle, and in some cases is significantly greater than that observed for a non-macrocyclic control complex.

Measuring LC50s of D8BPA in Whole and Regenerating Planaria
Megha Mathew, Alina Abraham, Riddhi Mangal, Jessie Maurer
Faculty Mentor: Pamela St. John (Chemistry)

Bisphenol A (BPA) is a chemical compound added into many consumer products by the plastic industry to modify a material’s physical properties. BPA has found its way into the environment and has been shown to act as an endocrine disrupting compound (EDCs) as it interferes with our body’s hormone production leading to a range of deleterious effects in people. As the usage of BPA increases, so does its retention in organisms and therefore, we are interested in determining the lethal concentration of this compound. We have used a model organism, G. tigrina (planarian), which is a freshwater flatworm that is known for its regenerative abilities, to determine lethal concentrations and, since BPA exists as a pollutant, even in planaria, we have used deuterated BPA (d8BPA) for exposure studies where the eight phenyl hydrogens have been replaced with deuterium. We determined the lethal concentration (LC50) of d8BPA for regenerating planaria over 1 – 3 days and compared our findings to whole worms. In addition, the amount of d8BPA retained by both whole and regenerating planaria following exposure to varying concentrations of the compound was determined using analytical techniques.
**Building and EI-MS Fragment Prediction Model for Peptides**  
Matthew Pesce, Brianna Flood, Fares Sirdah, Shahadat Houssain, Jahed Miah  
Faculty Mentor: Dominic McBrayer (Chemistry)

Electron-ionization mass spectrometry (EI-MS) is an analytical technique used to fragment gas-phase compounds via a beam of high-energy electrons. Whereas other ionization methods tend to be softer (lower in energy / less destructive), resulting in fewer and larger fragments, EI-MS tends to shatter compounds into somewhat predictable fragments. However, this tendency for high fragmentation presents limitations when attempting to analyze polymeric peptide structures, and contaminant peaks are sometimes hard to differentiate from sample peaks caused by ionization. We have been developing a Python-based fragment prediction program that uses a data-driven, combinatorial fragmentation model to predict likely high-intensity fragmentation peaks resulting from a given amino acid or peptide sample. To develop our prediction model, we have used Direct Exposure Probe (DEP) EI-MS to analyze single amino acids and short peptides to experimentally confirm and expand on reported literature fragmentation mechanisms. We continue to use these compiled data to refine the prediction model. We have approached our analysis by categorizing amino acids by their structural functional groups and properties. In doing so, we have found additional reproducible function- or property-associated fragmentation mechanisms. Notably, we have identified a novel fragmentation pattern related to amide-bearing asparagine and glutamine.

**Insecticidal Properties of S. lappa on Adult D. melanogaster**  
Alezzandra Saccoccio, Navneet Kaur  
Faculty Mentors: Preeti Dhar (Chemistry), Aaron Haselton (Biology)

Saussurea lappa is a plant found in Himalayan regions of China, Pakistan, and India known to have medicinal, pesticidal and insecticidal properties. Studies show that crude ethanolic extracts of S. lappa, when mixed in food source of D. melanogaster, resulted in growth inhibition at the larval stage. The aim of this study is to investigate the effects of S. lappa on adult D. melanogaster. Male and female Drosophila, previously separated by sex, on the seventeenth day of their life cycle were exposed to 5 mg/µL, 10 mg/µL, and 20mg/µL concentrations of crude ethanolic S. lappa extract under starvation-stress conditions. Fly starvation survivorship exhibited a dose-dependent reduction upon exposure to S. lappa extract. Females LT 50 was longer relative to males across treatment concentrations, with the 50% survival mark time increasing in the following order: 20 mg/µL, 10 mg/µL, 5 mg/µL and 200 proof ethanol (ACS grade). The exposure to increasing concentrations of crude ethanolic extract of S. lappa resulted in an overall increase in mortality which suggests that crude ethanolic extract of S. lappa is insecticidal towards adult D. melanogaster.
Communication Disorders Department

Factors that Influence VQoL in Transgender Individuals
Alexis Corsino
Faculty Mentor: Dana Arthur (Communication Disorders)

For many transgender people, vocal change is a pivotal aspect of transitioning. The current study addresses factors that influence satisfaction in male-to-female transgender voice. This information can improve both the quality of life, and more specifically the voice quality of life (VQoL) of transgender individuals. VQoL is a self-rating questionnaire that estimates the influence of voice disorders on quality of life. A review of peer reviewed evidence was conducted, comparing multiple results pertaining to VQoL in transgender individuals. The literature reveals several factors that have an impact on client’s overall satisfaction with their voice. Knowledge of these factors and their effects, positive or negative, could assist transgender people with decisions about their transition to maximize quality of life.

AAC and the Graduate Student Educational Experience
Samantha Florio
Faculty Mentor: Dana Arthur (Communication Disorders)

Augmentative and alternative communication (AAC) is defined as any form of communication other than talking; AAC can be low-tech (letterboards) or high-tech (eye-gaze devices and tablets). Graduate students in communication disorders need special preparation in AAC to support their clients who use these modes of communication. The current project was composed of two surveys: a survey of communication disorders graduate programs to determine how AAC fits into their curricula, and a survey of current communication disorders graduate students to determine their level of interest, prior knowledge, and comfort in using AAC in their future clinical practice. Results of the graduate programs survey revealed that there is no universal way that AAC is incorporated into the graduate school curriculum. Data show a mix of required, elective, or no course offered on AAC. Initial data from the graduate student survey indicate that students generally have a high degree of interest in AAC. AAC is a useful tool that speech-language pathologists may use in their clinical practice with patients, and the current study reveals a potential area of increased need in communication disorders graduate education to match student interest.

Vocal Perception: What Does Your Voice Say About You?
Kayley Foster
Faculty Mentors: Dana Arthur (Communication Disorders), Anne Balant (Communication Disorders)

Vocal fry is a characteristic of speech that is marked by a “creaky” sounding voice that is lower in pitch. This unique voice quality has become more common recently as a vocal characteristic used by several celebrities. As vocal fry use rises in popularity among younger people, there is a divide in how it is perceived by older and younger Americans. In addition to this division of perspectives, vocal fry seems to be more distinguishable in females than males, despite it being a speech characteristic that is used across all genders. The current research directly addresses negative perceptions associated with vocal fry, and how individuals may perceive female voices with vocal fry differently than males with the same characteristics. This hypothesis was tested using voice samples of a male and female with and without vocal fry in their speech. After listening to each sample, participants were asked to rate each voice on a series of attributes in an effort to measure their perceptions of vocal fry. Initial findings indicate that younger populations are largely accepting of individuals who use vocal fry, and attribute few negative characteristics to these voices. The current findings contradict previous research, in which older participants expressed negative perceptions about women who use vocal fry. This research informs larger issues of negative judgments often formed about certain kinds of voices, and how perceptions of these voices change over time.
Addressing Dialectal Differences in Standardized Language Assessment

Sofia Lugo
Faculty Mentor: Dana Arthur (Communication Disorders)

African American English (AAE) is a widely used dialect with unique semantic and grammatical features. Speech-language pathologists are responsible for evaluating language skills in children in many demographics, including children who use AAE. Speech-language pathologists need to be familiar with AAE and its features when administering language assessments, in order to appropriately diagnose language deficits in their clients. However most standardized language tests are based on Standard American English, not on AAE. It is important for these tests to bridge the gap between the two dialects to ensure accurate scoring and interpretation of test scores. The current study investigates the extent to which children’s language assessment manuals address AAE. The manuals of 20 standardized child language assessments were evaluated to identify whether AAE is mentioned, how thoroughly AAE is discussed, if any changes in administration and scoring are recommended. Results indicate that the majority of language assessments examined did not address AAE at all. However, more recently published tests tended to address AAE, and give speech-language pathologists thorough information on administration and scoring. This research indicates that speech-language pathologists who administer older tests are not always given the information that they need to accommodate children's linguistic differences.

An Impact of Past Vocal Training on Transgender Vocal Change

Melissa Spataro
Faculty Mentor: Dana Arthur (Communication Disorders)

This case study used quantitative and qualitative methods to investigate a female to male (FTM) transgender person’s vocal change and past singing training. Previous research has found that past singing training does not result in significant differences in FTM voice change; however, examination of qualitative factors provides a broader picture of an individual’s transition. The current study addressed the following research question: does the participant feel that past singing training has affected his transition, and if so, how? Ethnographic interview methods were used to better understand the participant’s opinions and feelings about past singing training. Audio sample analyses were also used to examine the participant’s habitual pitch and vocal range. Through the interview questions, the participant explained that he used past singing training throughout his vocal transition. Because of his vocal training, he had a better understanding of his voice and pitch. He also said that when he used knowledge of articulation and the speed at which he speaks to sound more masculine. The study explores how singing training can be used to increase transgender people’s confidence in their voices. This qualitative information may also offer insight to what other FTM transgender people could use to better transform their voices to better pass besides hormone replacement therapy (HRT).
Caramel: A Social App to Connect With People
Lohith Bollineni
Faculty Mentor: Kaitlin Hoffmann (Computer Science)

Caramel is a social app that lets you connect with people based on your thoughts. One can set preferences for the people they want to connect, like the gender, orientation, age, location they live in etc. The app was built using MERN (MongoDB, Express, React, NodeJS) stack of technologies which is a popular tech stack used for Web Development. This app is currently built as a web app (for desktops) but will be developed for Mobile platforms too in the future. The app is currently under beta testing for limited users but will soon be available for general public. To put it briefly, the basic idea of the app is a fusion of Twitter and Tinder. Imagine you get to swipe and match people based on their tweets (strictly text). Again, that was an analogy and neither Twitter nor Tinder apps are linked here. Also, the app is definitely not limited to dating and designed to let people socialize. There are tons of applications out there, that would let you connect with people but Caramel was built to make that connection more authentic. Many people out there would like to get to know about people more than just their faces and photos. Caramel does that job. Also it has an anonymous feature, obviously, to hide people's profiles, before they actually get to know somebody.

The Financial Structure of the U.S. Long-Term Care System
Larkin Jainschigg
Faculty Mentor: Edith Kuiper (Economics)

This paper discusses the financial structure of the United States’ long-term care (LTC) system for the elderly (people aged 65 and older). In my research, I examine the impacts of aging in the U.S. over the coming decades. In the U.S., the LTC system for the elderly is financed primarily via public (government) healthcare insurance, private healthcare insurance, and individual out-of-pocket costs. In the western world especially, the overall aging of the population coupled with the increasing lifespans poses severe constraints on the future of the economy, particularly on the labor market. Using a systems dynamics approach to analyze the financial structure of the U.S.’ LTC system, this paper identifies areas of weakness, such as the fact that those burdened by the current structuring of the LTC system -- the paid and unpaid healthcare workers -- lack sufficient support. Ultimately, the findings suggest that those with unpaid elderly care responsibilities in addition to a paid job endure increasing strain. It is they who bear the brunt of elderly care, thus indicating the unsustainability of the current LTC system and the need for future restructuring and improvement.
Justice For Jonquil: Grief, Mourning, and Memory
William Ballner
Faculty Mentor: Shannon McManimon (Education)

“Justice For Jonquil: Grief, Mourning, and Memory” was an independent study looking at why and how we grieve vulnerable bodies lost to bigotry and violence. This project used the ideas of grief and mourning as a form of storytelling and, more specifically, telling the stories of those lost and those left to remember them. Questions of how grief manifests in response to death of our loved ones and others and why we mourn were addressed through analysis of articles, discussions, and non-traditional storytelling techniques. These techniques included zines, reflections on my old writing, oral storytelling and reflections in a group setting, and a culminating project in the form of a tabletop roleplaying game (TTRPG) module, “Justice for Jonquil.” The outcome of this study was that grief is a form of remembering and, at our core, that remembering stems from a place of love for the person lost- and if not that, then love for who they could have been and for the social changes we are in need of. The ability for one to be remembered is contingent on two things: the vulnerability of the person being remembered and the space we need to experience grief. From the wailing parties of Black women to roadside memorials to calls to action, the implication of this study is that in order to understand the ways we love and our responses to death and injustice, we must process the ways we mourn, and that process is defined by the one experiencing the loss; to mourn is to remember is to love.

Universal Access: Bringing Disability Studies to Education
Kimberly Sanford
Faculty Mentor: April Coughlin (Education)

Our project was born out of a lack of educational resources in the discipline of Disability Studies (DS) at the college level, specifically for teacher candidates. Through the acquisition of print and audiovisual materials via the AYURE grant, we were able to develop a DS curriculum resource library for teacher candidates to include in interdisciplinary 7-12 classrooms. The materials are both teacher-facing and student-facing, providing candidates with resources to challenge their preconceived notions of Disability. These resources aided in our presentation at the Multicultural Education Conference at New Paltz, developing the second annual DS Series at New Paltz, writing an article for the Journal of Teaching Disability Studies (JTDS) at CUNY, and participating in a featured author's panel for JTDS. Through these additional endeavors, we expanded the reach of DS to professionals in secondary and higher education in our county and across the state. Overall participant engagement and feedback indicated a growing interest in and need for DS in Education (DSE) and how a background in this discipline can aid in supporting students of all abilities at various levels of education. This work continues the efforts of Disability Rights advocates of past and present, we hope these resources aid ongoing battles for equitable access to education and other forms of social infrastructure in society.
Ultrasonic Fatigue Test of 3D-Printed Steel Structure
Justin Boswell
Faculty Mentor: Ping-Chuan Wang (Engineering)

Additive manufacturing (AM) of metal structures is rapidly gaining attention in the industry for convenient prototyping and fabrication of non-critical components that are otherwise impractical to produce. Many challenges remain before the technology becomes widely adopted. Primarily, additive manufacturing parts tend to show weakness in mechanical integrity, mainly resulted from defects intrinsically associated with the additive manufacturing metal 3D printing process such as surface roughness as well as internal lack of densification and possible material homogeneity. We developed an ultrasonic-based technique and methodology to characterize fatigue behavior of the additive manufacturing structure. This allows for studying how certain additive manufacturing parameters including both layer orientation and printing direction affect the mechanical integrity of different 17-4 PH stainless steel structures. In this poster presentation, the specimen design considerations and experimental tests and results will be discussed, including the simulation work to rationalize the observations and the proposed hypothetical interface layer between printed layers. Microstructure inspection with scanning electron microscopy will also be shown to relate to the mechanical weakness in the tested structure, followed by plans to continue the research project.

Analyzing Bladeless Turbines with Rotary Motion
Mario Cora
Faculty Mentor: Rachmadian Wulandana (Engineering)

Bladeless turbines are argued to be more cost efficient, quieter, and cause less harm to the environment than the opposed bladed turbine. The application of the “Vernier Go Direct Rotary Motion Sensor” will attempt to gratify analytical data for 3D printed bladeless turbine designs by measuring bidirectional angular motion (in laminar water flow, and air flow) and relating that motion to principles of electromagnetic induction for hydrokinetic energy. We have been developing a 3D printed encasing for the sensor that acts for a triple purpose: water resistance, shaft extension, and torque protection for the shaft that the turbine is coupled to. We continue to collect data in laminar water flow to refine our prediction model but recognize that perpendicular stresses deform and prohibit low friction rotation of the turbine.

Designing a Solar Powered Refrigerator
Jillian Dantona
Faculty Mentor: Rachmadian Wulandana (Engineering)

The purpose of this project is to design a 20 cubic feet solar powered refrigerator to hold fruits and vegetables. The three refrigerant cycles being studied are the ideal simple vapor compression, cascade, and multistage cycles. Using EES software, parametric studies were completed to alter the maximum pressure and intermediate pressure in the cycle. The effects these parameters had on the cooling load, compressor work, and the COP were recorded and used to aid the design process. A third parametric study was done to alter the maximum and minimum temperatures to determine which working refrigerant would be most efficient. Research on refrigerants have proven that many are harmful to the environment and deplete the ozone layer. This study will allow the refrigerant that has the highest productivity and is the most environmentally friendly to be used in the final design.

By testing the effects different pressures had on cycles and temperature had on the fluids, it was determined that the cascade cycle with R134a refrigerant produced the highest COP, while also being the most environmentally friendly refrigerant. The materials for this refrigerator were then specifically chosen for the purpose of minimizing heat loss. After the selection of preferred cycle, fluid, and materials, the design was complete. This design allowed for an environmentally friendly refrigerator powered by solar panels to be completed and encourage others to focus on bringing green energy inside our homes.
**Design and Performance Analysis of Darrieus Water Turbines**
Kaitlyn Kreider  
Faculty Mentor: Rachmadian Wulandana (Engineering)

The Darrieus water turbine is a vertical axis turbine with blades that rotate around a vertical shaft. The purpose of this study is to determine how the height of a Darrieus water turbine affects the power output. A Darrieus turbine is designed in SolidWorks and modified to 3 different configurations that vary by height: 40 mm, 60 mm, and 80 mm. The cross-sectional airfoil and the radius of all the turbines are held constant in this experiment. These 3 turbines are 3D printed using PLA filament. The turbines are wired to a DC generator and then tested by using the water tunnel at SUNY New Paltz. The fluid flow will spin the shaft of the turbine, and the shaft work will cause the DC generator to produce a voltage. A digital multimeter is connected to the DC generator so that the voltage output will be measured over time. Plotting the voltage output versus time will conclude which turbine configuration produces the greatest power output.

**The Refrigeration Cycle Efficiency and Performance**
Nicole Morales  
Faculty Mentor: Rachmadian Wulandana (Engineering)

Modern refrigeration cycles are designed for the best performance while focusing on aesthetics. The purpose of this research was to explore varying parameters to reach the best refrigeration performance. Thermodynamic theory, heat capacity and transfer, calculations and procedure was utilized to define the different thermal system cycles and calculate the coefficient of performance. Components varying between the cycles such as the compressor, expansion valve, condenser, and evaporator were analyzed. The mixing chamber and heat exchanger of the cascade and multistage cycle were also explored. Parametric studies were performed to select the best ideal cycle and produce a non-ideal overview that better represents real-world behavior. In addition, various refrigerants were parametrized for the selected cycle. A final design of the idealized Cascade Refrigerator Cycle was utilized based on the efficiency and power consumption. With the understanding of thermodynamics and heat transfer, the refrigerator can continue to increase its efficiency for future uses. For future research, different environmental considerations should be reviewed.
**Design of a Test Apparatus for Diffusiophoretic Water Filter**

Matthew Querrard  
Faculty Mentor: Kevin Shanley (Engineering)

Typical modern water filtration consists of membrane technology in which a physical membrane is used to separate contaminants dispersed throughout a water source. This is observed throughout conventional reverse osmosis systems wherein a semipermeable membrane is utilized to retain fine contaminants under pressure-driven flow. Due to the employment of a physical membrane, fouling and scaling can occur resulting in higher energy consumption and frequent cleaning periods. A potentially more efficient method of water filtration is to introduce a chemical concentration gradient to induce diffusiophoretic motion of colloidal particles. Diffusiophoretic motion occurs when contaminated water is exposed to a chemical concentration gradient, in which charged particles are inclined to migrate to one side of a contained apparatus, based on the polarity of their surface charge. In order to test the reliability of this approach a microchannel test apparatus was designed. The apparatus consists of a 207 mm long channel with a 1.2 mm x 2 mm rectangular cross section. Below the channel is a chamber that contains CO2 at 1.1 atm. Above the channel is a chamber that exposes the system to air at atmospheric pressure. Contaminated water enters the channel through a 0.6 mm diameter needle driven by an NE–300 Just Infusion™ syringe pump. 23.5 mm upstream of the exit to the channel sits a 0.01 mm thick stainless steel splitter which directs half the flow out one exit and the other half out another.

**Assessing Electrical Reliability of 3D-Printed Copper Wire**

Hugo Ramirez Grijalba  
Faculty Mentor: Ping-Chuan Wang (Engineering)

The objective is to test the limits of what 3D-printed copper wires can achieve and explore the electromigration process of the 3D-printed Cu wires. I designed a dog bone shape structure that was printed as a copper structure through the Desktop Metal Studio System at the Hudson Valley Additive Manufacturing Center (HVAMC). Once printed, a series of electrical and thermal experiments will be conducted to study the effect temperature and current have on our printed specimens. Using 4-point resistance setup to monitor electrical resistance and using a furnace to accelerate thermal stress to cause electromigration. Electromigration (EM) –is biased diffusion of metal atoms in metal interconnects due to momentum transfer from electrons (“electron wind”) through metal conductor line. After conducting the experiments, the surface of the 3D printed copper structure appears to have distinct change in reflective surface. With MATLAB image analysis, on the positive terminal (anode end) of the structure appears to be more reflective and the negative terminal (cathode end) appears to be duller in comparison. Upon closer inspection using scanning electron microscopy (SEM), the brighter region had a smoother more consistent surface, whereas the duller region had an irregular topography. Based on these preliminary results, there’s signs of surface diffusion due to electromigration. This research project intends to explore the effect of electromigration on 3D-printed copper structures wires.
3D Printed Multi-material Compliant Joints

Zachary Zeppieri
Faculty Mentor: Heather Lai (Engineering)

Compliant joints offer an alternative to rigid-body joints, with benefits in fatigue life and reliability. The aim of this research is to characterize the interaction of flexible and rigid materials, to predict the system behavior and properties of different geometries included within a dual material compliant joint. To create these joints, a variety of carefully designed test specimens imitating cantilever beams are modeled in SOLIDWORKS and printed using a dual extrusion FDM 3D printer. Each part is then tested on an angular shaker, with an output of frequency response graphs which are compared to MATLAB calculations and CAD results. The testing results show much more movement in the lower frequency spectrum, potentially a resultant of delamination between the rigid and flexible joint areas. In contrast, the CAD results and MATLAB calculations show a closer correlation with the first mode occurring at a higher frequency. The results demonstrate that the methodologies employed when designing multi-material joints are important when trying to replicate calculations based on the geometry of the test specimen, as maintaining complete connectivity between multi-material joints prove essential for testing accuracy.

Library Studies

Comparative History: Spanish Influenza and Covid-19 in the US

Sean Loughran
Faculty Mentors: Chrissy O’Grady (Library), Adrianna Martinez (Library)

My project is a digital history museum comparing the Influenza Pandemic of 1918-1919 and the Covid-19 Pandemic in 2020 within the continental United States. The drive behind the project was to see what could be learned by comparing the Influenza Pandemic and the Covid-19 Pandemics within the United States. While working on this student-driven project through the Sojourner Truth Library, I was mentored by Chrissy O’Grady and Adrianna Martinez. The museum was built using Zotero and Omeka in tandem: Zotero was used to store primary sources I found on online databases. At the same time, Omeka would house these primary sources for viewing. My approach was to find similarities or differences in each pandemic and create exhibits focused on these findings. Ultimately, similarities and differences were found through analysis of primary sources, and the most pertinent primary sources were selected to become a part of various exhibits. The project has four total exhibits that highlight two cities and their responses to the pandemics, two presidents and their reactions to their pandemics, and one focused on fake medicines during these two pandemics. The ultimate goal of this project was to create a digital resource that utilized historical analysis to make viewers think of how history can be better utilized in the future to inform us of our present and future and avoid repeating the pitfalls of the past.
Grammars in Contact: Study of Russian in Brighton Beach, NY
Yana Miroshnychenko
Faculty Mentor: Oksana Laleko (Linguistics)

The term “heritage speaker” encompasses a broad range of bilingual speakers raised in homes where the primary language of communication does not align with the dominant language of the society at large (Valdés, 2000). Russian has received particular attention within heritage language scholarship, which has primarily utilized language samples of participants residing in different regions across the United States to draw conclusions about the developmental trajectory of heritage Russian grammar within an English-dominant language environment. This brings us to question whether or not the grammatical structure and lexical inventory of a heritage language is influenced by the context and quality of exposure, particularly in input-rich acquisitional settings. This study focuses on the grammatical trajectory of heritage Russian within the geographical boundary of Brighton Beach, New York, where heritage Russian speakers typically confront the Russian language within their immediate community. Language samples were elicited from 17 adult heritage Russian speakers, which were then examined for lexical innovations and innovations within the three heavily researched areas of vulnerability within heritage Russian grammar (case, grammatical gender, verbal aspect). The results of this study suggest some location-specific influence on lexical choice and the utilization of grammatical structures that align with previous findings in heritage Russian scholarship.

Mathematics Department

Moduli Spaces of Line Arrangements
Matthew Burris, Ryan Owens
Faculty Mentor: Moshe Cohen (Mathematics)

A line arrangement is a finite collection of lines in the plane. A Zariski pair of complex line arrangements is a pair of combinatorially isomorphic arrangements that have different complements in the complex projective plane in a topological sense. Theorems by Randell and by Cohen-Suciu illustrate how to rule out Zariski pairs using moduli spaces. There is no Zariski pair for 9 lines and fewer. The classification of the moduli spaces of arrangements with 10 lines has been completed. We construct examples and compute the moduli spaces for several line arrangements of 11 lines and one quadruple in the complex plane. We show that none of these examples are Zariski pairs.

Synchronization in Complex Quadratic Networks
Danae Evans
Faculty Mentor: Anca Radulescu (Mathematics)

Many natural systems function as dynamic networks of interconnected units (nodes). In our work, we investigate ties between a network's connectivity and its ensemble dynamics. This relationship is notoriously difficult to approach mathematically in natural, complex networks. We aim to understand this relationship in a canonical framework (using complex quadratic node dynamics), and using Mandelbrot sets to visualize long term behavior.

Our project focuses on the phenomenon of node clustering, or synchronization. We investigate the mechanisms that lead to nodes exhibiting identical or different long term dynamic behavior. We propose that this clustering is strongly determined by the network connectivity patterns, and the geometry of these clusters is further controlled by the connection weights. The phenomena of synchronization and clustering are well-studied in the context of networks of oscillators (such as neural networks). Understanding the similarities to how these concepts apply to complex quadratic networks contributes to our understanding of universal principles in dynamic networks, and may help extend theoretical results to natural, complex systems.
Synchronization and clustering in the basal ganglia
Yan Lok Ko
Faculty Mentor: Anca Radulescu (Mathematics)

It is well-known in neuroscience that certain patterns of neural activity, such as oscillations between different firing rates, or synchronized activity between neurons, can be indicators of efficient versus pathological function in a brain circuit.

The connectivity architecture of a neural circuit has been hypothesized to be one crucial factor that governs its dynamic patterns. Our study focuses on investigating the relationship between connectivity and dynamics in the particular case of the basal ganglia. Replicating and extending a well known study by Terman et al, we show how the number, strength, and distribution of projections between the globus pallidum and the subthalamic nucleus (two components of the basal ganglia) determine the efficiency of their coupled dynamics. In particular, differences in connectivity profiles lead to separation of the neurons in different synchronized clusters, which reflect the different functional ranges for the brain circuit.

Understanding the mechanisms underlying this clustering behavior is important for clinical applications, since abnormal firing patterns within the basal ganglia have been strongly associated with Parkinson's disease.

Physics & Astronomy Department

Trapping and manipulating Bdellovibrio with Optical Tweezers
Alexia Pratt, Mia Naglieri
Faculty Mentor: Catherine Herne (Physics)

Optical tweezers are one of the many useful techniques of the physics world. They use light to manipulate very tiny objects and have been instrumental in many experiments such as manipulating organic materials, measuring forces on particles, and building micro-machines. In our research, we progress towards finding the attachment strength of host-dependent Bdellovibrio bacteriovorus bacteria to prey bacteria, Escherichia coli. The purpose of this work is to learn more about type IV pili that B. bacteriovorus use to attach to other bacteria. In the case of attachment to E. coli, it is believed that a B. bacteriovorus bacterium will extend a pilus which secures it to its prey in order to consume it. Confirming this process and learning more about it will assist in exploring whether B. bacteriovorus could be used to treat harmful E. coli infections or other infections from bacteria that utilize type IV pili. In this poster we describe the steps necessary to complete this work and show examples of B. bacteriovorus attaching to its prey. We explain the bacteria preparation, how to create a sample environment, and the mechanics of optical tweezers. We also discuss optimal conditions for B. bacteriovorus to attach to E. coli. Our examples of attachments clearly show one end of the bacterium linked to its prey while the other floats freely, supporting the assumption that pili are engaged from one end of the bacterium.
**Measuring the Attachment Force of B. bacteriovorus**

Carrie Smithing  
Faculty Mentor: Catherine Herne (Physics)

The goal of this research is to examine the attachment of the predatory bacteria known as Bellaire bacteriovorus onto its prey bacteria, Escherichia coli, and to increase the understanding of the B. bacteriovorus predatory process. This type of bacteria is being considered as an alternative to antibiotics called predatory therapy, which is the use of predatory bacteria to target pathogens in the body. The B. bacteriovorus has hair-like appendages known as type IV pili which are believed to be the cause of the attachment. One or two pili extend and attach to the bacterium’s prey, then pull the predatory bacterium into its prey where it transitions from its attack phase into its reproductive phase. We use optical tweezers to facilitate attachment of a trapped B. Bacteriovorus to an immobilized E. coli. After attachment, the optical trap is used to pull the two bacteria apart. The optical tweezers provide a way to measure the attachment force associated with short attachment times ranging from 90 seconds to five minutes. For the short attachment times, we found the force to be a minimum of a few piconewtons. We hypothesize that the force will become greater over longer periods of time.

**Stable Positions of Calcite in Optical Tweezers**

Elaina Wahmann, Danae Evans  
Faculty Mentor: Catherine Herne (Physics)

Optical tweezers are a mechanism used to move and manipulate microscopic objects optically, created by trapping objects in the focus of a laser beam. When trapped in the focus, optically-responsive particles will experience a variety of forces and torques, depending on the polarization of the light (ranging from linear to circular). While the optical behavior of simple shapes, such as spheres and cylinders, have been theoretically and experimentally verified, more complex objects are more difficult to test. Confirming theoretical models would pave the way for the construction of exotic objects to be used in optically manipulated processes. In our experimental setup, we observe calcite under varying polarizations to verify theoretical predictions. Calcite is the rhombohedral crystal structure of Calcium Carbonate (CaCO3) and has two indices of refraction (extraordinary and ordinary) and one optic axis. When levitated in an optical trap, its near-cubic rhombohedral form should make it hover stably on one corner. Theory also states that the extraordinary axis should line up with the propagation axis of the laser beam, causing the crystal to settle in a very particular stable equilibrium when the axes are aligned. We show the stable positions of calcite in linearly polarized light at different orientations. We explain how this behavior is consistent with existing models for controlling objects with light.

**Psychology Department**

**Artistic Experiences and Inspiration**

Amanda Carella  
Faculty Mentor: Doug Maynard (Psychology)

Why do some artists choose to create work from their imagination while others produce work based on things they see? Psychologists have long been aware of a link between mental health and the healing powers of creation, but have yet to examine if there is a specific distinction between why someone chooses fantasy or realism as the subject of their works of art. This study draws upon research done on childhood adversity, fantasy proneness, and openness to experience to determine correlations between artists who report using ideas from their imagination, and those who report using ideas from everyday life or other artists’ work. Childhood adversity, fantasy proneness, and openness have each been linked to greater creativity, which may help to better understand stylistic differences between artists. Participants will be assessed using the Adverse Childhood Experiences Questionnaire, Creative Experiences Questionnaire, and openness to experience subscale from the Big Five Inventory, as well as a brief self-report survey regarding the use of creativity and imagination as the subject in their art-making. This project is currently being analyzed so the results and conclusions have not yet been determined.
Does Hand Proximity Enhance Cognitive Control?
Jessica Conklin, Kaylin Vermilyea
Faculty Mentor: Giordana Grossi (Psychology)

In a Stroop task, participants are asked to identify the color of the word rather than the meaning of the word presented. Congruent stimuli are ones in which the color of the text and the meaning of the word presented match (e.g., “red” in red). Incongruent stimuli are ones in which the color of the text does not match the meaning of the word (e.g., “red” in green). Participants are typically slower and less accurate with incongruent than congruent stimuli (Stroop effect). Past studies have found that variations in hand proximity, the distance between participants’ hands and a stimulus, is associated with the stimulus being processed differently. In previous studies, the Stroop effect has been found to be smaller when the participants’ hands are placed closer to the stimulus. Davoli and colleagues have proposed that changes in the Stroop effects due to hand proximity reflected enhanced cognitive control near the hands (2010). We tested this hypothesis by manipulating the percentage of incongruent, a variable known to affect cognitive control. In each hand position, participants (n=49) were presented with a set of stimuli that was made up of 20% or 80% incongruent stimuli. As expected, we observed a Stroop effect moderated by the percentage of incongruent trials. The Stroop effect was larger when most trials were congruent. An interaction with hand proximity was found in an unexpected direction. We tentatively concluded that hand proximity does not enhance cognitive control.

Catfishing Study
Ethan Eisenberg, Emma Jerabek, Darcy Montana, Kaitlyn Longo
Faculty Mentor: Glenn Geher (Psychology)

Building off De’Jesus et al’s., (2021) study, the current study proposes catfishing as the modern form of betrayal. A ‘catfish’ can be defined as a person who “creates falsified online profiles on social networking sites with the purpose of fraudulently seducing someone else” (Lamphere et al., 2019). We may view catfishing through an evolutionary lens due to the technological mismatch of the situation (similar to ghosting and other forms of technological deception). In this in-progress study, we predict that the level of forgiveness from the deceived will be dependent on perceived guilt-genuineness on the part of the catfisher (betrayer), that the level of forgiveness from the deceived will be dependent on the gender of the catfisher and the mating implications of the type of catfishing. We also predict that likelihood of going out on another date will be dependent on the perceived mate value of the deceived.

Slow Brain Potentials and Hemispheric Lateralization
Sarai Garcia, Liv Spina
Faculty Mentor: Giordana Grossi (Psychology)

Brain electric potentials elicited over visual regions are generally larger over the left hemisphere for words but larger over the right hemisphere in response to faces. These patterns develop during adolescence. This electrophysiological study tests the potential usefulness of slow brain potentials to study the development of hemispheric lateralization for object recognition. The first part of the project involves piloting a study to compare the spatial distribution of slow brain potentials on the scalp in response to different linguistic matching tasks. We will be recording electroencephalogram data while adult participants perform a rhyming task and case-matching task. We expect to replicate previous work demonstrating a larger brain potential over left posterior regions for words and a different distribution in slow potentials for the two tasks. The findings for the pilot experiment replicated effects described in previous literature. Posterior brain potentials were observed at the expected time and with the expected scalp distribution. Slow potentials were observed with a different distribution from the predicted. This pilot provided valuable information on what changes need to be implemented for future work.
The Attractiveness Study
Kaitlyn Longo, Avery Goodwine, Julia Lombard, Megan Fritche
Faculty Mentor: Glenn Geher (Psychology)

Have you ever wondered what is so alluring about the bad boy persona and why the good guys always finish last? Why is it that in every romantic comedy it's the dark and mysterious character that sweeps the girl off her feet? This study looks at attractiveness through the lenses of the Light and Dark Triads to look into what qualities people actually find attractive in others. This study used a 2x2 design and randomly assigned participants to 1 of 4 conditions. The 2 independent variables were the descriptive vignette describing someone with character traits of either the Dark Triad or the Light Triad, and the second one was a generic sketch of a female or male to accompany the description. After seeing their vignette and photo, participants were asked to answer a series of questions. One to assess how attractive they thought the person was, followed by a 20 question "Likeness Scale" that we created to assess how much the participant liked the person. This study is currently in the data cleaning and analysis stage and has not been fully analyzed yet, but we do hope to have analyzed and reportable results by the time of the symposium to add to the poster. We hope to be able to report on what qualities people find attractive and from there come up with applications and ideas for further research on the topic based on those results.

The Leadership Study
Kaitlyn Longo, Julia Lombard, Avrey Goodwine, Megan Fritche
Faculty Mentor: Glenn Geher (Psychology)

In this study, we looked at the psychology behind which qualities people prefer in a leader. A survey was sent out to the students at SUNY New Paltz that measured their political orientation, Dark Triad traits, Light Triad traits, and Life History Strategy. They were then given a choice between a presidential candidate high in Dark Triad traits and a presidential candidate high in Light Triad traits and asked which candidate they would vote for in a hypothetical election. We hypothesized that political conservatives high in Dark Triad traits with masculine gender identities and fast life history strategies will show a preference for the Dark Triad leader and that political liberals high in Light Triad traits with feminine gender identities and slow life history strategies will show a preference for the Light Triad leader. This project is currently in the data cleaning and analysis stage, but we hope finish analyzing soon and have solid findings to include on the poster by the time of the symposium.

Delegation Easier Said Than Done
Laurena Marji
Faculty Mentor: Maryalice Citera (Psychology)

This study’s purpose was to describe emergent leaders’ delegation. Leaders face many challenges when delegating yet, delegation is important because the leader cannot do all the work and must gain the support and assistance of others. Sharing responsibility is sometimes easier said than done. Twenty-one leaders (M Age= 20.7, 8 Males, 9 Females, 4 Nonbinary) who held a student leader position (as a club Executive Board member or a Senior Resident Assistant), participated in an online interview. Interviews were video recorded and speech-to-text transcripts were created. The researchers developed a code of common themes and the transcripts were independently coded using Dedoose. Cohen's Kappa for interrater reliability was .84 (range=.65 to 1.0). The top 5 themes were leadership skills, techniques for delegating, obstacles, reasons why people don’t comply, and how to resolve delegation problems. For leadership skills, planning and experience were top issues. For delegating techniques, the top themes were structured roles, skills match, asking for volunteers, and doing it yourself. For obstacles, they discussed lack of control, fear of being seen as dominant, and results that don’t meet expectations. We examined code by demographic variable interactions for gender, race/ethnicity, and leadership type. Results informed us about delegation among emergent leaders and these insights can benefit new leaders by highlighting ways to delegate and the hurdles they face.
Parenting and Social Behavior
Jenny Patel
Faculty Mentor: Glenn Geher (Psychology)

Social estrangements have negative effects on people’s emotion and social lives (Geher et al 2019). The current research is designed to shed light on this general issue to help us better understand the predictors of estrangements. Participants of at least 18 years in age were surveyed in both the United States and in India. A Qualtrics survey was used to collect data from participants. The first section measured their attachment style. The second section measured perception of their parents’ parenting styles. The third section assessed their cultural orientation, and the last section assessed their estrangement history. To obtain sample, recruitment methods included advertising the Qualtrics survey link on social media, SUNY New Paltz Psychology Subject Pool, and MTurk. Results are in line with the hypotheses. Although culture is not significantly correlated with estrangements in this study, Horizontal individualism and collectivism is positively correlate with Estrangements whereas Vertical individualism and collectivism is negatively correlated with Estrangements. Estrangements are negatively correlated with Authoritative Parenting style, positively correlated with Authoritarian Parenting style, positively correlated with Ambivalent Attachment style, and negatively correlated with Secure Attachment style. Based on these results, the current research concludes that culture, parenting styles, and attachment styles are predictors of estrangements.

Who Do You Want to Be? Exploring Personality Goal Motives
Kanjira Rodriguez
Faculty Mentor: Corwin Senko (Psychology)

The main purpose of this study is to expand our understanding of personality from a growth motive perspective. Not only do personality traits change over the lifetime, but people actively desire to change their own traits. Using a quantitative online-survey, researchers asked participants if they wanted to change their personality traits, why they wanted to change, and if those reasons for changing influence their strength of commitment to those goals. The findings of this research will hopefully highlight the important role motivation plays in the context of personality change goals.

Loving-Kindness Meditation, Positive Emotion & Implicit Bias
Christopher Saitta
Faculty Mentor: Doug Maynard (Psychology)

The need to address implicit bias is a prerequisite for a just society, and meditation has been empirically supported to reduce it. However, it's important to differentiate between the relevant and irrelevant aspects of meditation that contribute to bias reduction. In the current study, different versions of loving-kindness meditation (LKM) were compared to see which one is associated with the lowest implicit bias levels. Participants followed a 8-minute LKM audio clip where the instructions were altered to manipulate the focus of the meditation across three groups. The meditation will direct them to send their love and positive energy to either themselves, younger peers, or the elderly population. Then, participants took an age-based implicit association test (IAT) to compare implicit bias across groups. Additionally, participants were asked to rate their experience of several positive emotions to see if the conditions caused differences in types of positive emotion (either other-regarding or non-other-regarding) and whether these positive emotions mediated the effects of LKM on implicit bias. The results revealed that meditation conditions did not have a significant impact on differences in positive emotions or implicit bias, and the mediating effect of other-regarding positive emotions on the relationship between LKM and implicit bias was not observed. The results suggest that meditative focus may be a negligible factor when it comes to affecting positive emotion and bias.
An emerging area of environmental concern is microplastic pollution in marine and freshwater environments. These plastic particles never completely degrade and have serious impacts on the health of organisms, including humans. Plastic microfibers make up a significant portion of microplastic waste and form from machine washing synthetic clothing. The purpose of this study was to perform a limited investigation into the presence of microfibers in three rivers of the Hudson River watershed as well as research the usage of two microfiber filtration technologies available for washing machines. The investigation of microfibers in the Hudson River watershed consisted of retrieving water samples from the Black Creek, Wallkill River, and Saw Mill Brook in Highland and New Paltz, New York. These water samples filtered and viewed under a microscope. Microfibers were found in each of the samples with the Saw Mill Brook containing the most microfibers per quart of sample water. The Saw Mill Brook drains the water features on the campus of SUNY New Paltz into the Wallkill River. Researching the usage of microfiber filtration technologies consisted of installing two microfiber filters, Microplastic-Luv-R and Filtrol, onto machines in McKenna and Parker Theaters on the campus of SUNY New Paltz. Data was collected regarding the consumer usage of each filter which included the installation, efficacy, and cleaning. Based on these evaluations, the Filtrol was regarded as the better filter.
**Global Sustainability Goal Designations**

These projects were recognized by the [SUNY New Paltz Sustainability Group](#) as serving one of the 17 core [Global Sustainability Goals](#).

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Student Presenters</th>
<th>Sustainability Goal(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloning in Paramecium Cells to View Proteins in Infection</td>
<td>Benhammou, Lyna</td>
<td>??? #3: Good Health and Well-Being?</td>
</tr>
<tr>
<td>Effect of Birch and Sycamore Extract on Growth of Drosophila</td>
<td>Civil, Chris, Speranza, Lucia, Zakaria, Ziad</td>
<td>??</td>
</tr>
<tr>
<td>Factors that Influence VQoL in Transgender Individuals</td>
<td>Corsino, Alexis</td>
<td>??? #5 Gender Equality</td>
</tr>
<tr>
<td>Monitoring Avian Productivity and Survivorship at Mohonk</td>
<td>Hughes, Dan</td>
<td>??? #3 Good Health and Well-Being?</td>
</tr>
<tr>
<td>Comparative History: Spanish Influenza and Covid-19 in the US</td>
<td>Loughran, Sean</td>
<td>#13 Climate Action</td>
</tr>
<tr>
<td>Examining Microfibers in Laundry and Mitigation Strategies</td>
<td>Ludwig, Roy</td>
<td>#15 Life on Land; #13 Climate Action</td>
</tr>
<tr>
<td>Universal Access: Bringing Disability Studies to Education</td>
<td>Sanford, Kimberly</td>
<td>#15 Life on Land</td>
</tr>
<tr>
<td>Higher Phosphorus Concentrations in Lakes with Fish in Their Food Webs</td>
<td>Thrane, Makaylei, Reid, Norman, Foery, Zoe, Persaud, Shayna, Aguilar, Julio, Aguilar, Nelson, Ballard, Shelah, Elzey, Lissa</td>
<td>??? #3: Good Health and Well-Being?</td>
</tr>
<tr>
<td>Changes in Acidity and Temperature in Lakes on Shawangunk</td>
<td>Toledo, Ruben, Aguilar, Julio, Ballard, Shela</td>
<td>#12 Responsible Consumption &amp; Production</td>
</tr>
<tr>
<td>Will a House Sparrow Population Spill Over and Invade into the Mill Brook Preserve Nest Box Network?</td>
<td>Wirthmann, Grace</td>
<td>??? #10: Reduced Inequalities</td>
</tr>
<tr>
<td>Genetics of COVID-19 Anosmia</td>
<td>Cueva, Valeria, Hidalgo, William Nakagawa, Benjamin</td>
<td>??? #13: Climate Action</td>
</tr>
<tr>
<td>Designing a Solar Powered Refrigerator</td>
<td>Dantona, Jillian</td>
<td>??? #6: Clean Water and Sanitation</td>
</tr>
<tr>
<td>Whole-Genome Sequencing of Harvard Forest Soil Bacteria</td>
<td>Durmazolu, Francesca</td>
<td>#14: Life Below Water</td>
</tr>
<tr>
<td>Title</td>
<td>Author(s)</td>
<td>Category</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>-----------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>Addressing Dialectal Differences in Standardized Language As</td>
<td>Lugo, Sofia</td>
<td>??? #10 Reduced Inequalities</td>
</tr>
<tr>
<td>The Refrigeration Cycle Efficiency and Performance</td>
<td>Morales, Nicole</td>
<td>#15: Life on Land; #7 Affordable &amp; Clean Energy</td>
</tr>
<tr>
<td>Design of a Test Apparatus for Diffusiophoretic Water Filter</td>
<td>Querrard, Matthew</td>
<td>??? #5: Gender Equality</td>
</tr>
<tr>
<td>Zooplankton Behavior and Vertical Distribution in Mohonk Lak</td>
<td>Sandoval, Lydia</td>
<td>#14: Life Below Water</td>
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<tr>
<td>Eizey, Lissa Aguilar, Nelson Granados, Guillermo Aguilar, Julio Ballard, Shelah Foery, Zoe Persaud, Shayna</td>
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<td>Evaluating Bee Diversity Prior to Solar Array Construction</td>
<td>Sisti, Megan</td>
<td>#14: Life Below Water</td>
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<td>Hughes, Daniel</td>
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<tr>
<td>An Impact of Past Vocal Training on Transgender Vocal Change</td>
<td>Spataro, Melissa</td>
<td>#15: Life on Land</td>
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<tr>
<td>Cavity Nest Boxes in Millbrook Preserve</td>
<td>Vasquez, Cynthia</td>
<td>??? #3: Good Health and Well-Being?</td>
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<td>Bucci, Vic Mustafa, Sam</td>
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**Sustainable Development Goals**

1. No Poverty
2. Zero Hunger
3. Good Health and Well-Being
4. Quality Education
5. Gender Equality
6. Clean Water and Sanitation
7. Affordable and Clean Energy
8. Decent Work and Economic Growth
9. Industry, Innovation and Infrastructure
10. Reduced Inequalities
11. Sustainable Cities and Communities
12. Responsible Consumption and Production
13. Climate Action
14. Life Below Water
15. Life on Land
16. Peace, Justice and Strong Institutions
17. Partnerships for the Goals
2021-2022 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 2021-2022 season.

2022 SURE Award Recipients

**Anderson, Michael** (Mathematics/Computer Science), ‘23
Faculty Mentor: Anca Radulescu (Mathematics)
Project Title: Synchronization and Clustering in Realistic Reticular Thalamic Brain Architectures

**Cammann, Brooke** (Art History & Chemistry), ‘23
Faculty Mentor: Keely Heuer (Art History)
Project Title: From “Perfecting” to Stabilization: The Evolution of Ancient Italian Bronzeworking Conservation

**Dart, Elina** (Economics/Business Administration), ‘23
Faculty Mentor: Edith Kuiper, Economics
Project Title: Sadie Alexander and the Economics Science of Her Time

**Estes, Paloma** (Biology: Environmental concentration), ‘22
Faculty Mentor: David Richardson (Biology)
Project Title: Vertical Distribution and Diel Vertical Migrati[349x291]on of Zooplankton in Regional Lakes

**Gilbride, Gabriella** (History), ‘24
Faculty Mentor: Reynolds J. Scott-Childress (History)
Project Title: Folk Taxonomies of Race

**Grisales, Vanessa** (Early Childhood/Childhood Education, Concentration: History), ‘23
Faculty Mentor: Kiersten Greene (Teaching & Learning)
Project Title: Transinclusive Education in K-12 & Educator Preparation

**Kitchen, Jeffrey** (Chemistry), ’22; **Alice Rojas** (Geology), ’23; **Julia Cannizzo** (Geology), ’24
Faculty Mentor: Salvatore Engel-Di Mauro (Geography)
Project Title: Trace Element (TE) Contamination of Kale by Atmospheric Deposition in Urban Community Gardens (UCGs)

**Pennisi, Jake** (Mechanical Engineering; Digital Design and Fabrication), ‘23
Faculty Mentor: Kevin Shanley (Engineering Programs)
Project Title: Agilus-30 Permeability and Its Role in Water Filtration
**Pisano, Matthew** (Computer Science/Applied Mathematics), ‘22
Faculty Mentor: Jaiung Jun (Mathematics)
Project Title: Jacobians of Graphs and Related Topics

**Reyes, Louis** (Mechanical Engineering), ‘23
Faculty Mentors: Mahdi Farahikia & Ping-Chuang Wang (Division of Engineering Programs)
Project Title: Novel Heat Sink Design and Analysis for Efficient Thermal Management of Electronic Devices

**Russo, Annabella** (Sociology, Criminology Concentration), ‘23
Faculty Mentor: Anna Gjika (Sociology)
Project Title: Rape Victims on Trial: Digital Evidence in Sexual Assault Proceedings

**Speranza (Canis), Lucia** (Biology & Psychology), ‘22
Faculty Mentor: Miles Wilklow-Marnell (Chemistry)
Project Title: Biological effects of Betulinic Triterpenoids Derived from Native Birch and Sycamore Barks

**Takacs, Danielle** (Biology Organismal Track), ‘23; **Mustafa, Sam** (Environmental Biology), ‘25
Faculty Mentor: Kara Belinsky (Biology)
Project Title: A bird’s-eye View of How Wildlife is Affected by Development in the Hudson Valley

**Weinstein, Carolyn** (Geography, History & Political Science), ‘23
Faculty Mentor: John Sharp (Geography)
Project Title: Breaking Barriers at Land Grant Institutions: A Historic Geography

**Yosef, Harel** (Mechanical Engineering), ‘24
Faculty Mentor: Mahdi Farahikia (Division of Engineering Programs)
Project Title: Nature-Inspired Flow-Sensing Microphone Technology
Spring, 2022 AYURE Award Recipients

**Abraham, Alina** (Biology), ’22; **Mangal, Riddhi** (Biology, ’22; **Mathew, Megha** (Biology), ‘22
Faculty Mentor: Pamela St. John (Chemistry)
Project Title: Measuring Lethal Concentrations of Deuterated Bisphenol A in Regenerating Planaria

**Burris, Matthew** (Mathematics), ’23; **Owens, Ryan** (Mathematics), ’23
Faculty Mentor: Moshe Cohen (Mathematics)
Project Title: The Geometry of Line Arrangements

**DeSilva, Sherine** (Cellular Biology), ’22; **Furfaro, Julia** (Cellular Biology), ‘22
Faculty Mentor: Lydia Bright (Biology)
Project Title: Functional effects of gene expression changes during RNAi-induced knockdown of Paramecium caudatum

**Durmazolu, Francesca** (Biology), ‘23
Faculty Mentor: Maureen Morrow (Biology)
Project Title: Bacterial evolution in response to experimental climate change; cataloging plasmids of abacterial culture collection

**Havnaer, Calvin** (Biochemistry), ‘22
Faculty Mentor: Frantz Folmer-Andersen (Chemistry)
Project Title: Synthesis of Modified Enantioselective Receptors

**Morales, Nicole** (Mechanical Engineering), ‘23
Faculty Mentor: Rachmadian Wulandana (Mechanical Engineering)
Project Title: Bio-inspired axial turbines for hydrokinetic energy harvesting

**Neumann, Lindsay** (Cellular/Molecular Biology), ‘22
Maureen Morrow (Biology)
Project Title: Bacterial evolution in response to experimental climate change: cataloging plasmids of a bacterial culture collection

**Pilmanis, Aleks** (Music & Computer Science)
Faculty Advisor: Phyllis Chen (Music)
Project Title: New Music for Synth Series

**Sanford, Kimberly** (Adolescent Education: English), ‘22
Faculty Mentor: April Coughlin (Teaching & Learning)
Project Title: Universal Access: Bringing Disability Studies to Higher Education

**Talanki, Varsha** (Biology), ’23
Faculty Mentor: Aaron Haselton (Biology)
Project Title: Continued investigation into the insecticidal effects of *Sassurea lappa* extract against the vinegar fly, *Drosophila melanogaster*

**Zeppieri, Zachary** (Mechanical Engineering), ‘22
Faculty Mentor: Heather Lai (Engineering)
Project Title: Dynamic Behavior of 3D Printed Compliant Joints
Fall 2021 AYURE Award Recipients

Acquisto, Sophia (Childhood Education, History Concentration), ‘22
Faculty Mentor: Jennifer Rutner (Library)
Project Title: “My Hudson History”: An Educational App for Teaching Hudson Valley History

Ahmed, Hanaa (Biology/Chemistry & Disaster Studies), ‘22
Faculty Mentor: Maureen Morrow (Biology)
Project Title: Characterization of BS71 Copper Resistance Capacity

Boswell, Justin (Mechanical Engineering), ‘22
Faculty Mentor: Ping-Chuan Wang (Division of Engineering Programs)
Project Title: Investigating Fatigue Failure in 3D-Printed Stainless Steel with Ultrasonic Vibration

Dantona, Jillian (Mechanical Engineering), ‘23
Faculty Mentor: Rachmadian Wulandana (Mechanical Engineering Program)
Project Title: Effects of 3d-printing Parameters on the Performance of Vortex-induced Bladeless Turbines

Dur mishaj, Arlinda (Chemistry), ‘22
Faculty Mentor: Megan Ferguson (Chemistry)
Project Title: Properties of Pyrolyzed Chicken Feathers

Evans, Danae (Physics & Astronomy/Applied Mathematics), ‘23
Faculty Mentor: Anca Radulescu (Mathematics)
Project Title: Universality of Synchronization Properties in Dynamic Networks

Hanley, Ian P. (Chemistry), ‘24
Faculty Mentor: Miles Wilklow-Marnell (Chemistry)
Project Title: Iridium Catalyzed Alcohol/Quinone Transfer Dehydrogenation

Ko, Yan Lok (Electrical Engineering & Mathematics), ‘22
Faculty Mentor: Anca Radulescu (Mathematics)
Project Title: Mechanisms of Recurring Activity Generation in the CSTC Circuit

Ludwig, Roy (Geology/Earth Science Education/Honors), ‘22
Faculty Mentor: Andrea Varga (Theatre Arts & Honors)
Project Title: Microplastics in the Hudson River Watershed: An Examination of Plastic Microfiber Waste Through Laundry and Potential Mitigation Strategies

Kurek, Natalia (Biochemistry/Business), ‘23
Faculty Mentor: Pamela St. John (Chemistry)
Project Title: Improvement in Detection of Retained Estrogen Disruptor in Planaria

Loughran, Sean (History & English), ‘21
Faculty Mentors: Adrianna Martinez and Chrissy O’Grady (Library)
Project Title: Comparative History: Spanish Influenza and COVID-19 in the U.S.
Miroshnychenko, Yana (Communication Disorder & Contract: Linguistics), ‘21
Faculty Mentor: Oksana Laleko (Linguistics Program)
Project Title: Grammars in Contact: A Linguistic Study of Russian in Brighton Beach, NY

Pesce, Matthew (Biochemistry), ’22; Flood, Brianna (Biochemistry/Music), ’22; Miah, Jahed (Biochemistry & Biology), ’21
Faculty Mentor: Dominic McBrayer (Chemistry)
Project Title: EI-MS Analysis of Challenging Amino Acids and Protected Peptides

Smithing, Carrie (Physics/Computer Science), ’22
Faculty Mentor: Catherine Herne (Physics & Astronomy)
Project Title: Attachment of B. bacteriovorusto Prey Using Type IV pili
2021 SURE Award Recipients

Sophia Acquisto (Childhood Education, History Concentration), ‘22
Faculty Mentor: Chrissy O’Grady (Library)
Project Title: Researching the Hudson Valley's Historically Significant Places for the Creation of an Educational History App

Erin Dougherty (Sculpture), ‘22
Faculty Mentor: Emily Puthoff (Art)
Project Title: Sculpting Resilience: Conserving Pollinators through Community Engagement

Brianna Flood (Biochemistry), ‘22
Faculty Mentors: Spencer Mass (Biology) & Pamela St. John (Chemistry)
Project Title: Quantifying Estrogen Disruptor Retention with Regenerative Phenotypes in Planaria

Zoë Foery (Biology), ‘22
Faculty Mentor: David Richardson (Biology)
Project Title: Does the type of pond affect how the pond functions? A study of local small aquatic waterbodies.

Julia Furfaro (Cellular Biology), ‘22
Faculty Mentor: Lydia Bright (Biology)
Project Title: Functional effects of gene expression changes during infection of Paramecium

Daniel Hughes (Biology), ‘22
Faculty Mentor: Kara Belinsky (Biology)
Project Title: Nest boxes at the Millbrook preserve and Bird Banding at Mohonk: What birds can teach us about developing sustainable communities

Christopher Lunetta (Theatre Arts), ’21
Gina Lardi (Theatre Arts), ’22
Faculty Mentor: Katya Stanislavskaya (Theatre Arts)
Project Title: The Poorhouse Project: workshopping a new musical theatre piece

David Mano (History), ‘22
Faculty Mentor: Mary Christensen (Languages, Literatures & Cultures)
Project Title: Translation and Analysis of the Correspondence of the Count of Artois, Future King Charles X of France, 1792-1804

Jahed Miah (Biology & Biochemistry), ‘21
Faculty Mentor: Dominic McBrayer (Chemistry)
Project Title: Establishing a Reporter Assay for Inter-Species Quorum Sensing with Bacillus subtilis

Lauren Mulvey (Digital Media Production/Journalism), ‘22
Steph Fogler (Adolescence Ed: English), ‘22
Faculty Mentors: Nicola Wilson Clasby (English) & Rachel Rigolino (English)
Project Title: Designing Online Writing Tutor Training Modules for ENG SWW
Matthew Querrard (Mechanical Engineering), ‘22  
Faculty Mentor: Kevin Shanley (Engineering)  
Project Title: Diffusiophoretic Water Filtration

Hugo Ramirez Grijalba (Mechanical Engineering), ‘22  
Faculty Mentor: Ping-Chuan Wang (Engineering)  
Project Title: Assessing Electrical Reliability of 3D-printed Copper Structures

Elizabeth Rigby (Geology), ‘22  
Faculty Mentor: Kaustubh Patwardhan (Geology)  
Project Title: Study of the 3D geomorphology of pillow lavas using digital image analysis

Jenna Santaniello (Business Analytics and Finance), ‘21  
Marco Lopez II (Business Analytics), ‘21  
Faculty Mentor: Ai Ren (Business)  
Project Title: The Impact of CARES Act on U.S. Healthcare System During the Covid-19 Pandemic

Kianu Schwerdtfeger (Linguistics; Spanish), ‘22  
Faculty Mentor: Oksana Laleko (Linguistics)  
Project Title: Understanding the Effects of Top-Down Language Contact: Four Case Studies in Language Change
Undergraduate Research Travel Award Recipients


Kieran Cavanagh, Mechanical Engineering, ’21, presented at the TMS conference in March 2021.

Terence Costigan, Engineering, ’21, presented at the MS&T20 Virtual Technical Meeting and Exhibition in November 2020 and at the TMS conference in March 2021.


Bennett Terrill attended the ASEE (American Society for Engineering Education) conference in Worcester, MA in October 2021.

Brianna Flood and Jahed Miah traveled to Phoenix, AZ to present at the Integrative and Comparative Biology conference in January 2022.

Justin Boswell and Hugo Ramirez Grijalba traveled to Anaheim, CA to present at the TMS 2022 Annual Meeting in February/March 2022.

Elizabeth Rigby attended the Northeast Geological Society of America conference in Lancaster, PA in March 2022.

Yana Miroshnychenko and Kianu Schwertfeger virtually attended the National Council on Undergraduate Research (NCUR) in April 2022.

Clara Zonis virtually attended the Richard Macksey National Undergrad Humanities Research Symposium in April 2022.

Darcy Montana and Ethan Eisenberg attended the NorthEastern Evolutionary Psychology Society conference in Pittsburgh in April 2022.

Taevon Allen attended the American Philosophical Association, Pacific Division meeting in Vancouver in April 2022.
**SUNY Undergraduate Research Conference (SURC) 2021 & 2022**

**Boswell, Justin** (Mechanical Engineering), ‘22  
Faculty Mentor: Ping-Chuan Wang (Engineering)  
Investigating Fatigue Failure in 3D-Printed Stainless Steel with Ultrasonic Vibration

**Hanley, Ian** (Chemistry), ‘24  
Faculty Mentor: Miles Wilklow-Marnell (Chemistry)  
Iridium Catalyzed Alcohol/Quinone Transfer Dehydrogenation

**Farzana Akhter** (Mechanical Engineering), ’21  
Faculty Mentor: Rachmadian Wulandana (Mechanical Engineering)  
Title: Heat Analysis of a Smart Fishing Bobber

**Kieran Cavanagh** (Engineering), ’21  
Faculty Mentor: Ping Chuan-Wang (Mechanical Engineering)  
Numerical Investigation of Electromigration-Induced Stress Generation in Al(Cu) Interconnects

**Terence Costigan** (Engineering),’21  
Faculty Mentor: Ping-Chuan Wang (Mechanical Engineering)  
Fatigue Testing of 3D-Printed Metals for Material Properties and Reliability

**Brianna Fitapelli** (Psychology)  
Faculty Mentor: Glenn Geher (Psychology)  
Narrative Inquiry: Reflection of Life Experiences

**Jevon Hewafonsekage**  
Induction Heating 3D Printer

**Nataniell Ilyayev**  
Investigation of Drag and Rotational Speed of Autorotating Bladeless Cross Cylinder Models for Hydrokinetic Renewable Energy

**Christian Olmoz** (Mechanical Engineering), ‘21  
Faculty Mentor: Mahdi Farahikia (Mechanical Engineering)  
Design of Induction Heating for 3D Metal Printing
Seth Pearl (Engineering), ‘21
Faculty Mentor: Rachmadian Wulandana (Mechanical Engineering)
CFD Simulation of Bladeless Turbine for Hydrokinetic Energy

Jazmine Remache
Impact Damage Tolerance of Hierarchical Structures in Biological Composites

Tawfiq Shamsudeen (Mechanical Engineering)
Faculty Mentor: Ping-Chuan Wang (Mechanical Engineering)
Addressing Heat Creep in 3D Metal Printing

Bennett Terrill, Mechanical Engineering, ‘21
Faculty Mentor: Rachmadian Wulandana (Mechanical Engineering)
Comparison of Induction and Conduction in 3D Printing
**In Memoriam**

In recognition of two outstanding members of our RSCA community who passed this year.

**Spencer Mass**  
(Instructor, Biology)

**David Mano**  
(History major; French minor)

Spencer was a longtime supporter of student scholarship. He mentored dozens of students, always with a gentle and supportive touch. Many of them won RSCA grants for their projects, which they presented at regional, national, or international conferences.

In recognition of his commitment to students’ professional development, Spencer was named the 2015 Mentor of the Year. In support of his nomination, one student shared, “Dr. Mass is quick to see his students as equals, trusting their abilities and judgment” and that he patiently spent hours helping the student to improve her conference presentation.

David loved history, especially the French Revolution period. That passion came through visibly last summer in a project supported by a SURE grant from the RSCA. David translated never-before-seen letters from King Charles X to a friend before ascending the throne.

He took it far above and beyond expectations. His video presentation is a captivating, thorough, and truly hilarious account Charles’s biography and letters. It left more than a few visitors in awe and stitches. David then won the prestigious President Don and Sandy Christian scholarship to continue this work during the past year.
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.

Pittsburgh 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.