2018 SRS

24th Annual SUNY New Paltz Student Research Symposium

Abstract Book

New Paltz
STATE UNIVERSITY OF NEW YORK

24th ANNUAL SUNY NEW PALTZ STUDENT RESEARCH SYMPOSIUM

Sponsored by:
The Research, Scholarship, and Creative Activities Program

Friday, May 4, 2018
Sojourner Truth Library
4:00 - 6:30 p.m.

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Editor: Maureen Morrow, RSCA Director Cover
Design: Michelle Pielli
Cover Photograph: Morgan Gwenwald

The 2018 Student Research Symposium

Once again, as the academic year comes to a close, we have this opportunity for scholarly exchange amongst our faculty and students. The 2018 Student Research Symposium includes 75 poster presentations of work performed by 119 students representing 21 majors, sponsored by 45 faculty mentors representing 15 departments/ centers. This is an occasion for us to share our accomplishments in a spirit of camaraderie.

The Student Research Symposium is sponsored by the Research, Scholarship and Creative Activities (RSCA) Program. The mission of the RSCA program is to encourage and support student- faculty collaboration in the active participation of scholarly and artistic activities that generate new knowledge or works.

Such activities enable students to gain knowledge, skills, and confidence to contribute as productive members of their professions and contribute to a learning environment which is challenging,
student-centered, and personalized.

Acknowledgements

The following people have provided generous support of this event:
Aram Agajanian (Computer Services) for support of the web based abstract submissions;
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Julia A. Verdile (RSCA) for abstract book preparation, poster printing, and additional support.

The RSCA Advisory Board:

Dana Arthur (Communication Disorders), Kara Belinsky (Biology), Kate Bellody (Library), Mary Stella Dean (English), Minghui Ma (School of Business), Maureen Morrow (RSCA Director, Biology), Andrea Noel (Teaching and Learning), Thomas Sarrantonino (Art),
Francis Valiquette (Mathematics),Daniel Hulseapple (Student Representative, History '18)

Minds @ Work

1:00-3:20pm – Honors Thesis Presentations, Honors Center
2:00-4:15pm Engineering Senior Design EXPO WH, 2nd floor
3:00-4:30pm - Celebration of Writing, Library Lobby
4:00-6:30pm - Student Research Symposium, Library Main Room
4:00 - 7:00pm - BFA Graphic Design Senior Show, Fine Arts Building Rotunda
4:30-6:00pm - Student Documentaries, Library, room M34
5:007:00pm – Opening Reception: BFA II Student Thesis Exhibition, Dorsky Museum

Welcome to the Student Research Symposium

Student research participation 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.

Research participation is directly relevant to the education of all students, not just those planning to pursue graduate education. More than 80% of employers responding to recent national surveys value completion of a research project or similar endeavor that demonstrates knowledge in the major, and the ability 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 we value the Research, Scholarship, and Creative Activities (RSCA) program and other New Paltz programs that encourage student research engagement.

Successful undergraduate research programs depend on the dedication, knowledge, and scholarly expertise of faculty. I recognize the commitment of time and effort of those who mentor and advise student research and scholarly projects, and am grateful for these important contributions to the education and future of our students. I also want to take this opportunity to express my deep gratitude to Professor Maureen Morrow, campus-wide RSCA coordinator, 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 Christian
President

As you have learned, there is much to gain from engaging in primary level research into scholarly questions. Such work helps you to further the ability to think carefully about past findings and how they fit into theoretical understandings of the world, identify areas of opportunity in developing understanding, formulate research questions and hypotheses that can be tested, gather data, analyze and interpret results, and assess the strengths and weaknesses of the research project. And, the value is not just for you.

You have now become part of the scholarly pursuit in your field of study and have contributed to our knowledge about some phenomenon in the world. This is impressive and exciting!

Thank you for being part of this program and supplementing the richness of the learning community at SUNY New Paltz in this way. I know you join me in extending my great appreciation for the support and work of your faculty mentors, the RSCA Advisory Board, and the RSCA director, Dr. Maureen Morrow. Without such leadership, this program could not exist.

To actively participate in scholarly research at an undergraduate level, in a manner that goes beyond standard classroom assignments, is truly impressive. Congratulations on both your willingness to take on this work and on completing your projects. We are impressed with the commitments and accomplishments you have made.

We look forward to hearing about the many experiences and successes you have as you take the knowledge, skills, and understandings gleaned in these experiences and others into your future educational, professional, and civic lives.

Lorin Basden Arnold
Provost & Vice President for Academic Affairs

On behalf of the Research, Scholarship, and Creative Activities Program Advisory Board, I would like to welcome you to the 2018 Student Research Symposium. Today's event is the 24rd consecutive celebration of student-faculty scholarship at SUNY New Paltz.

The process of producing scholarship through research and/or creative activities is both challenging and exciting. I am certain the faculty- student interactions you experienced in this process were unique and stimulating. We know that these types of experiences impart gains in important skills such as critical thinking and communication. We are grateful to the faculty who provide these opportunities.

Please know that these types of interactions are a particularly fulfilling part of a college professor's job. Do stay in touch after you have graduated. It brings us all great joy and inspiration to hear of your post- New Paltz adventures and successes. I hope this event brings you fulfillment in presenting the results of your work and inspiration from your fellow students' accomplishments.

Maureen Morrow
RSCA Director and Professor of Biology

Research, Scholarship and Creative Activities Program

Faculty student collaborators may propose projects for support funds through the Summer Undergraduate Research Experience (SURE) and Academic Year Undergraduate Research Experience (AYURE) programs. Both of these programs are competitive and are selected for support by a faculty committee. Students whose work is accepted for presentation at a professional conference are eligible for the RSCA travel awards. Congratulations to all award recipients (see pages 50-54).

SURE

The focus of the SURE program is to encourage intensive student participation in an aspect of faculty research. Each student participant is supported with a stipend for the 8 week summer project and is expected to devote 37.5 hours per week to the project. Faculty mentors direct and provide guidance to participating students as they work on a particular aspect of the faculty's research program. As a goal of this program is to encourage ongoing faculty student collaboration, and thus students are encouraged to continue working on the project during subsequent semesters.

ACADEMIC YEAR FUNDS

This program (AYURE) supports student faculty collaborations on projects that span the Disciplines. Projects that generate new knowledge or works are eligible for support. Funds for supplies and support of the research, scholarship or creative activities are provided through this program.

STUDENT CONFERENCE TRAVEL AWARD

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

WE ARE ON FACEBOOK

SUNY New Paltz Undergraduate Research, Scholarship and Creative Activities Group
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Student Documentaries

4:30p- 6:00p
Library Lobby

The three documentaries will play throughout the
SRS Poster Sessions

Max Capacity: The Cat Damon Story
A young man goes down the internet rabbit hole in search of celebrity

She Comes at Night
An exploration of drag culture in the Hudson Valley

Run Like a Girl
The story of Marathon Runners Bobbi Gibbs and Nina Kusick

BFA II Student Thesis Exhibition

5–7:00 pm – Opening Reception

Featuring the work of BFA candidates:

Hali Canzler | Andrea Alboretti Colman | Kennedy Coltey | Ashley DeMartino | Dani Epstein | Joseph Gallina | Kaitlyn Graves | Erica Koplitz | Lindsay Loforte | Meghan Mason | Kim Manfre | Min Kyung Seong | Grace Moore | Myung sook koh | Jessica Oliveira | Jenna Papageorgantis | Sidnye O. Stepanov | Zhengyao Wang

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Poster Session I 4:30-5:10 pm

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Caffeine-otyping	ERTRACHTER, Zachary
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SEM of Fracture Surfaces and Porosity of 3D Printed Polymers	GOTTSTINE, Matthew; HANNA, Ryan
Modeling and Testing of Flexible 3D printed Viscoelastic Materials	KUANG, Cuiyu; EISGRUBER, Rachel
Perceptual and Affective Responses to Possible and Impossible Figures in Early Infancy	LONGO, Danielle; KRAUSE, Christina
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Aaron Burr: Villain to Hero Upgrade	PRALAT, Barbara

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Abstracts

The Historical Analysis of Ethical, Cultural and National Identity of Japanese Brazilians

Yura Yokoyama (Anthropology)
Faculty Mentor: Benjamin Junge (Anthropology)

The Historical Analysis of Ethical, Cultural and National Identity of Japanese Brazilians Abstract: Beginning in 1908, large numbers of Japanese citizens immigrated to Brazil, in search of a better life and an escape from rural poverty in their homeland. The primary objective of this research is to elucidate the process by which Japanese Brazilians were accepted by Brazilian society as a distinct ethno-racial sub group. Drawing from Harada's migratory history framework, four periods are considered: (1) the period of adaptation from 1942-1962, (2) the period of immersion from 1942-1962, (3) the period of crating the new identity from 1963-1980, and (4) the final period of complete assimilation after 1980. As a consistent finding across these time periods, Japanese Brazilians established a positive ethnic, cultural and socio-economic identity through the practice of cultural and ethnic community-making and through upward class mobility. By observing how this specific migrant positive minority, this study contributes to the discussion of identity formation of migrants in the field of immigration studies.

Tracking individual birds across the SUNY New Paltz Campus

Emma Bruno (Biology), Mireya Romero (Biology)
Faculty Mentor: Kara Belinsky (Biology)

Urbanization of natural landscapes decreases suitable habitat for wildlife, resulting in declines in native bird populations. To better understand how native species use habitat on the SUNY New Paltz campus, we color-banded 113 House Finches, American Goldfinches, and Black-capped Chickadees, with each individual bird given a unique three color-band combination. We recorded videos around the campus feeder network to re-sight color-banded individuals and determine distinct patterns of their movements around the campus. So far we've re-sighted a total of 37 birds, however, the first round of videos recorded didn't have high enough resolution to always distinguish the specific combination of color bands on the bird seen. Since then, we've been recording videos using high definition cameras and expect that with more data we'll successfully determine where individuals of the three species travel around campus to gather resources. We hope to use the long-term results of this study to design a model for a more bird-friendly campus using specific landscape attributes that promote native species diversity.

Investigating Paramecium caudatum Susceptibility to Holospora undulata Infection

Winiffer D. Conce Alberto (Biology)
Faculty Mentor: Lydia Bright (Biology)

Paramecium caudatum is a single-celled ciliate that has been shown to be susceptible to infection by the parasitic bacterium *Holospora undulata. Holospora* infects *Paramecium* by entering the cell via the oral apparatus and translocating to the micronucleus where is takes either its reproductive or its infectious form depending on resources available within the *Paramecium* cell. Previous work has shown that different *Paramecium* strains have varying susceptibility to *Holospora* but the factors that determine these differences are yet unknown. In order to determine genes that factor into the infectious process, we would like to determine which *Paramecium caudatum* strains isolated from around the world and representing at least two syngens, and whose genomes are sequenced, are more susceptible to infection than others. We are currently developing protocols to effectively infect naive strains of *Paramecium caudatum* and to track infection phenotypes over a week time course. We will combine the infection phenotypes of these strains with comparative genomics and studies focusing on gene expression during the different infection stages. This will help us to determine the cellular factors that contribute to the symbiosis, and then to track how they have evolved to produce resistance or susceptibility.

Sampling the genetic diversity of Paramecium in local ponds

Katherine Dobosh (Biology)
Faculty Mentor: Lydia Bright (Biology)

Paramecia are unicellular ciliates that live in aquatic environments, typically ponds. There are numerous species of *Paramecia* that vary morphologically and genetically, however, there has not been much research done on species distribution from season to season over short geographical distances. Over three consecutive seasons, we sampled five local ponds for *Paramecium* cells. We isolated single cells, created lines of culture and allowed them to grow to high density from each collected sample. We then extracted DNA, amplified specific genes by polymerase chain reaction (PCR), and sequenced them by Sanger sequencing. To determine the species, we compared the new sequences to sequences of know *Paramecium* species. We found species diversity within ponds as well as between ponds, indicating that there has been recent migration between the ponds. Between all of the ponds, we collected *Paramecium caudatum*, *Paramecium biaurelia*, and *Paramecium triaurelia*. We are currently analyzing the haplotypes of the different species and further sampling in order to determine the species distribution over different seasons, as well as to better understand how genetically related the species are between ponds.

Testing hypotheses about which amino acids drove functional change in the evolutionary history of Rab11 GTPases in Paramecium species

Nicole Mills (Biology)
Faculty Mentor: Lydia Bright (Biology)

The duplication and evolution of eukaryotic genes has resulted in increased complexity relating to membrane trafficking pathways and the resulting functional diversification. The Rab-GTPase family of proteins specific to Paramecium species exhibit differing functionality between family members with regards to intracellular trafficking proteins. The lineage of Rab-GTPase proteins show similar sequences that differ by as little as a single amino acid residue change which causes variation in their targeting pathways. Our goal for this semester was to understand the influence of particular amino acids in driving the functional changes between genes, and how it effects the phylogenetic relationship between the Rab proteins in Paramecium species. Related clades of Paramecium are currently being injected with a gene fusion of Rab-GTPase to an antibiotic resistant vector with GFP in a hope to understand the targeting functions of the different Rab-GTPases and their evolutionary history. Site-directed mutagenesis was utilized to study these changes in protein activity by monitoring targeted single amino acid substitutions. IN addition, Gibson cloning, a form of polymerase chain reaction based cloning, was used to join multiple DNA fragments. Through this we hope to study the localization of Rab proteins in Paramecium cells from different species of specific clades.

Protein Evolution: A Look into Rab GTPase Gene Family Evolution

Bridget McGuire (Biology), Nicole Mills (Biology)
Faculty Mentor: Lydia Bright (Biology)

Cells from different Paramecium species have been evolving for millions of years, and look almost exactly the same. However, their proteins and the associated functions have been changing in parallel in the different species. We study the Rab GTPase gene family specifically. To get a clear picture of the changes to protein function between gene duplicates in the same species, as well as across species, localization patterns were documented for Rab11 clades A and C within this gene family. This was done by making a Green Fluorescent Protein fusion to the Rab GTPase in question, and then injecting it into Paramecium cells. The fusion is then transcribed and translated by the Paramecium cell, and can easily be detected and visualized using confocal microscopy. We are now interested in the localization patterns of proteins that are in outgroup species, that diverged before the other species evolutionarily. We hope that by doing this, we will learn something about the original localization patterns and functions of the protein in each clade. Overall, we hope that this work will shed some light on the evolutionary history of these proteins; particularly, how the outgroup of the tree relates to the other clades, and what that may be able to tell us about how the proteins changed over time.

Paclitaxel mimics effects of BPA in regenerating planaria

Amber Funk (Biology), Brett Pinsky (Biology), Nick Wills (Biology)
Faculty Mentor: Spencer Mass (Biology)

The known xenoestrogen Bisphenol-A (BPA), has profound effects on planarian regeneration. Prior work in our lab has shown that BPA can depress and delay regeneration in a variety of flatworms at high doses and stimulate regeneration at very low doses. Since regeneration involves both proliferation and cell movement, we hypothesized that cytoskeleton may be one of the mechanisms by which endocrine disruptors are affecting regeneration in flatworms. In this work we compare the effects of Paclitaxel, a microtubule polymerization inhibitor, to BPA to determine if the regenerative phenotypes are similar.

Environmental Impact of Plant Versus Animal Foods

Helena Kaminski (Biology)
Faculty Mentor: Eric Keeling (Biology)
Faculty Mentor: Gidon Eshel (Bard College)

Investigations of the environmental impact of food production systems are fairly new and information regarding the environmental impacts of specific foods is unavailable to consumers. Although pulses contain both more calories and protein per gram than meat, previous studies have shown that the rate of meat consumption is above dietary guidelines, while the rate of pulse consumption is low. We assessed whether plant-based foods have a heavier burden than animal-derived foods. Land use, reactive nitrogen use, water use, and carbon dioxide emissions data were collected for 98 plant food products in eight categories. Each metric was standardized by caloric value and protein content. Means for each crop category of impact were plotted along with four foods derived from animal sources. Plant foods generally had lower carbon emissions and land use per calorie than animal foods. Animal foods had a lower water use per calorie/protein content. In six assessments beef had the highest impact compared to means of plant categories and other animal products. Beef's impact was always greater in these assessments than the impact for pulses. This paper offers a starting point for the public to make more informed choices regarding their ecological burden, and suggests that by eating more plant-based foods consumers can mitigate impact while retaining nutritional intake.

When Axolotls Metamorphose: The Kinematics of Salamanders That Shouldn't Walk

Victoria Narici (Anthropology), Michelle Pirrone (Electrical Engineering), Tobin Mathew (Biology)
Faculty Mentor: Spencer Mass (Biology)

Axolotls are ambystomoids closely related to North American tiger salamanders. They are neotenic and remain aquatic throughout their lives. Very rarely, they undergo spontaneous metamorphosis and become terrestrial animals. While metamorphosed axolotls closely resemble other terrestrial ambystomoids, there are differences in form and function which are poorly understood due to the rarity of specimens. Casual inspection reveals that the terrestrial axolotls have problems with coordinated movement. Are the metamorphosed axolotls less adapted for terrestrial movement than the tiger salamanders? Are there developmental timing windows for metamorphosis that are not available to axolotls? We are interested in the developmental aspects of what appear to be differences in functional morphology. Our first step has been to compare the kinematics of axolotls to tiger salamanders using high speed cinematography. Particular physical features of the salamanders were marked, tracked, and analyzed to compare their movements and functions. Analysis of the data shows higher amounts of work and force in the metamorphosed axolotls than the tiger salamanders, which are indicative of lower efficiency of locomotion and may help to explain the observed lack of coordination.

Preservatives that synergize with xenoestrogens: effects of co-administration of BHT and BPA/BPS on regeneration in Planaria

Trisha Chabria (Biology), Kenney Abraham (Biology), Hannah George (Biology), Kayla Massena (Biology), Maria Talloni-Perlett (Biology), Lucia Milla (Biology)
Faculty Mentor: Spencer Mass (Biology)

Butylated hydroxytoluene (**BHT**) is a commonly used food additive and antioxidant. Bisphenol-A (**BPA**) is a known xenoestrogen which is used to synthesize polycarbonate plastics, epoxy resins and numerous plastic materials used in packaging. Bisphenol-S (**BPS**), also an organic compound and xenoestrogen, is an analog of BPA and is frequently used in products as an alternative for BPA. Interestingly, BHT and BPA/BPS are found together in cases where plastic packaging is used for food, cosmetic and household products. While BHT is an FDA approved additive for food, health and beauty products, it has known toxicity, especially in aquatics, and has long been suspected as a possible carcinogen. Prior work in our lab has shown that BPA can have deleterious effects on planarian regeneration. In this study we demonstrate that BPA synergizes the lethal effects of BHT at high doses in planaria (LC50 BHT ~35 µM; whereas ~15 µM in presence of sublethal dose of BPA) and examine the effects of coadministration of BHT with BPA as well as BHT with BPS on regeneration in planaria.

The Effect of Atrazine on the Cytoskeletal Structure of Jurkat Cells

Ashley Fisher (Biology)
Faculty Mentor: Maureen Morrow (Biology)

Little is known about the effect of atrazine on T cells, an important component of the immune system. Although Atrazine is an herbicide that is widely used the US, reports of its detrimental effect on the endocrine and reproductive systems call its safety into question. A few reports have demonstrated that T cell activation is inhibited by atrazine. Proper T cell function depends on the rearrangement of the cytoskeleton, which is composed of alpha, beta, and gamma-microtubules. The microtubule-organizing center, or MTOC, is crucial to the T cell's activation process as it is formed when a T cell is presented with antigen, via another cell. The cytoskeleton plays a role in the migration of additional T cell receptors to the MOTC activation site. Gamma-tubulin plays a major role in the MTOC, and will therefore we will be the focus of this study. Jurkat cells are a commonly used T cell line and we will activate these cells with CD3 and CD28 coated beads, both with and without atrazine, and examine the gamma-tubulin MTOC response. These cells will be stained and observed with a confocal microscope. The hypothesis is atrazine will alter the T cell cytoskeletal rearrangement, leading to decreased activation of the T cells.

Caffeine-otyping

Zachary Ertrachter (Biochemistry)
Faculty Mentor: Jeffrey Reinking (Biology)

Genotyping humans has become a critical aspect of health and genetics as well as a tool for other research. Single Nucleotide Polymorphisms (SNPs) are alleles that vary in only one nucleotide. While most traits have more complicated basis of genetic variation, some traits can result from a simple SNP. Here we present a methodology for determining the genotype of rs4410790, a SNP related to the speed of caffeine metabolism. Though there is controversy, literature suggests this gene may affect athletic responses to and habitual consumption of caffeine. We employ a PCR-RFLP technique (Polymerase Chain Reaction - Restriction Fragment Length Polymorphism) in a manner that is adaptable to the constraints of teaching a laboratory in combination with several other PCR-based assays that we have reported previously.

Ecological responses to food-web disruptions in Lake Minnewaska

Sawyer McFadden (Environmental Geochemical Science), Heather Wander (Biology), Anthony Hollander (Biology), Emma Bruno (Biology), Hailee Edwards (Biology), Kayla Reid (Biology)
Faculty Mentor: David Richardson (Biology)

When one component of an ecosystem is disrupted, there may be repercussions for the rest of the lake ecosystem. Lake Minnewaska in the recent past has seen its food-web disrupted by the introduction of two fish species and the subsequent loss of one; a cascade of effects has been observed throughout the lake during this period. The phytoplankton biomass, a control on the geochemical and nutrient cycles, has decreased. We examined dissolved oxygen (DO) and phosphorus concentrations which are directly and indirectly controlled by phytoplankton. Over a five-year period, DO concentration was low in the bottom of the lake but the magnitude of hypoxia - DO concentrations close to 0 - varied from year to year. These variations are related to spring phytoplankton concentration. The lake alternates between a small and large percent of its end of year volume having significantly low DO or hypoxia. The rates of increase in the volume of hypoxia in a given year also follow this trend. Deepwater DO concentration controls the release of sediment phosphorus. As DO decreases, phosphate iron complexes more readily disassociate, and phosphorus increasingly enters the water column. The maximum volume of low DO concentrations was significantly related to fall deepwater phosphorus concentrations. Food-web disruptions can have unintended ramifications for the entire lake ecosystem and affect management strategies for maintaining high water quality.

What controls algae in northeastern US lakes?

Hailee Edwards (Biology), Heather Wander (Biology)
Faculty Mentor: David Richardson (Biology)

Increased anthropogenic loading of nitrogen (N) and phosphorus (P) to aquatic systems has resulted in an increase in the frequency and intensity of harmful algal blooms. However, the role of each macronutrient (N and P) in limiting freshwater phytoplankton productivity remains unresolved. P was traditionally identified as the primary limiting nutrient in most freshwater ecosystems. However, there is spatial and temporal variation in limitation patterns, with evidence for both nitrogen (N) limitation and co-limitation in addition to P limitation. In this study, we performed standardized nutrient limitation experiments in 16 lakes across four different states using the geographic distribution of lakes in NE GLEON (northeastern North American region). After one-week in situ incubations, we measured chlorophyll a as a proxy for phytoplankton biomass in each of four nutrient treatments (Control, N, P, N&P). Preliminary results show that within the northeastern United States, lakes show variation in nutrient limitation, with co-limitation occurring in 50% of study lakes. Cases of both N (19%) and P (25%) limitation occurred in similar proportions of lakes. These results challenge the conventional theory that P limitation dominates primary productivity in freshwater lakes. Given the observed spatial variation, there is a need to increase focus on the factors that determine nutrient limitation type to prevent the ecological and health consequences of toxic phytoplankton blooms.

Zooplankton response to predation across three lakes

Heather Wander (Biology), Emma Bruno (Biology), Kayla Reid (Biochemistry), Anthony Hollander (Biology), Hailee Edwards (Biology), Sawyer McFadden (Environmental Geochemical Science)
Faculty Mentor: David Richardson (Biology)

Diel vertical migration (DVM) is a commonly observed zooplankton behavior in many freshwater ecosystems where zooplankton migrate to different depths in the water column to pursue food (phytoplankton) or avoid predators. In this study, we examined the effect of predation on zooplankton DVM in three Sky Lakes on the Shawangunk Ridge that differ in food web structure. Awosting is a fishless lake, Minnewaska has had fish for 10 yrs, and Mohonk has been stocked with fish for over a century. We predicted that zooplankton would exhibit the greatest DVM in the presence of predators and that larger-bodied zooplankton would travel the farthest during the day to minimize the risk of predation. In three separate sampling events each one month apart, zooplankton were collected from the lakes at four different depths. Density, individual size, and community diversity were then analyzed for each lake. In Awosting, density was highest near the surface and size did not differ across depths indicating minimal DVM. In Mohonk, both density and individual size were highest at the bottom of the lake indicating maximum DVM. In Minnewaska, both density and average size were highest near the thermocline indicating moderate DVM. Examining the effect of predation on zooplankton movement is necessary to understand species interactions and ecosystem structure across lakes with differing food webs.

Metagenomic Survey of Sediments from Two Tributaries of the Amazon River System

Brittany Grandville (Biochemistry/Biology)
Faculty Mentor: Jason Valens (Biology)

The purpose of this study is to survey microbes, determine the community diversity from various niches in the Amazon River system, and ultimately compare them to each other. Areas that these microbial populations were collected include the Solimoes, Rio Negro, and Jauperi in Brazil. Each of these has differing water pH, density, dissolved solids, as well as nutrients. The DNA from the samples were extracted and through the use of PCR reaction, a degenerate primer was utilized in order to amplify the 16S gene. These 16S PCR fragments were cloned and samples were successfully sequenced. Sequences analyzed did not have any close similarity (>97%) to any known species.

DNA Analysis of Commercial Cat Foods to Investigate Accuracy of Labeled Ingredients

Jessica Siconolfi (Biology)
Faculty Mentor: Jennifer Waldo (Biology)

Due to a lack of testing and enforcement by a governing agency, it is suspected that pet foods may present a higher potential for labeling inaccuracies compared with that of human foods. Animals, especially the domestic feline, are susceptible to food allergies, and the health ramifications resulting from long term exposure to food allergens mirrors those experienced by humans. The goal of this research was to compare the ingredients listed on commercial cat foods, with the plant and animal materials contained within each food. To investigate this possibility of label inaccuracy, over 40 commercial cat foods were analyzed for the presence, or absence, of genetic material from plant and animal sources used in their manufacture. These findings were then compared to the ingredients listed on the label for each food. DNA extractions were performed, and the resultant material was quantified to determine nucleic acid purity, and concentration. Primers specific for several different plant and animal genes were utilized, and amplification was performed via Real-Time Polymerase Chain Reaction (RT-PCR). The amplified DNA fragments were separated by size using gel electrophoresis, and were visually analyzed using a GelDoc UV-panel viewing system. The results for each sample are compared against its listed ingredients, and will hopefully shed some light on the accuracy of commercially produced cat foods.

Investigating the Antifungal Properties of Mahamarichyadi Tel

Colin Duell (Chemistry), Degen Mariniello (Chemistry)
Faculty Mentor: Preeti Dhar (Chemistry)
Faculty Mentor: Hon Ho (Biology)

The oil, Mahamarichyadi Tel, is used in India as a topical remedy for many skin diseases, such as inflammation, eczema, and leprosy. It is also claimed that the oil has strong antifungal properties. Extensive qualitative research has been conducted on each of the oil's components. Several of the components have been found to have fungicidal effects. Observing the nature of the oil in its entirety, it is not yet understood if there is significant antifungal action. Antifungal bioassays using the disc diffusion method are currently underway to determine how the individual components of Mahamarichyadi Tel work in combination. The oil is being tested for its action against the following plant-pathogenic fungi: Rhizopus stolonifer, Fussarium oxysporum, Penicillium expansum, Botryosphaera obtuse, Monilinia fruticola, and Phytophthora capsici. The results of these antifungal assays may determine whether the oil can be used as an alternative to modern pesticides.

Purification of Heratomin from Heracleum maximum

Brett Pinsky (Biochemistry), Jamie Woych (Biochemistry), Jordan Greenough (Chemistry)
Faculty Mentor: Preeti Dhar (Chemistry)

Heracleum maximum (HM), a plant native to North America, has been used traditionally to treat various ailments. Prior studies have shown that plants within the Heracleum genus contain a class of phototoxic compounds called furanocoumarins including heratomin. Previous work from our lab showed for the first time that HM contains heratomin. This research intended to isolate and characterize heratomin. HM seeds were extracted sequentially in solvents of increasing polarity (hexane, diethyl ether, ethyl acetate and ethanol) using Soxhlet extraction. The hexane extract was rich in furanocoumarins (determined by TLC with authentic samples), and was subjected to various methods of purification such as: column chromatography, preparative thin layer chromatography, and recrystallization. All of these techniques have proven successful for purifying heratomin and other furanocoumarins. Complete purification was thought to have been achieved twice following column chromatography after NMR analysis showed peaks characteristic of heratomin. Unfortunately, this NMR analysis also contained peaks from contaminants that were later traced to be from the stock Chloroform-D. We are currently working on more efficient ways to purify heratomin that compensate for its extremely similar Rf value to bergapten and its propensity for degradation in light. Future work would entail purifying heratomin from sequential ethanolic extract which is cleaner than the crude hexane extract (shown by TLC).

Convenient Synthesis of Iodo-Alcohols

Aakriti Ramayani (Biochemistry), Diana Serdah (Biology)
Faculty Mentor: Preeti Dhar (Chemistry)

Iodo-alcohols are important starting materials in organic synthesis; however, they are not readily available, and hence custom-ordered. The focus of this project was to synthesize various iodo-alcohols in an efficient and economical way. Earlier work from our lab has shown that cyclic ethers readily undergo ring opening in the presence of sodium borohydride/iodine to give corresponding iodo-alcohols. For reactions of five and six-membered cyclic ethers, toluene worked well as a solvent, as long as 10-fold excess of cyclic ether was used; the product (iodo-alcohol) was also less prone to degradation. However, reactions of three and four membered cyclic ethers did not give iodo-alcohols in toluene, but replacing toluene with tetrahydrofuran (THF), gave the expected product. Furthermore, we used NaBH4/Br2 to synthesize bromo-alcohols in order to compare the stability of the end products (iodo and bromo-alcohols). The postulated mechanism of NaBH4/I2 with cyclic ethers involves formation of HI in situ. THF and 2-MethylTHF reacted faster with HI than with NaBH4/I2, but the setting and monitoring of the HI reaction was much more tedious.

Effects of Ionic Strength on Lipopolysaccharides and its implications to the AdG Model

Nicolette Rigaud (Environmental Geochemical Science), Alyssa Cox (Chemistry), Tina Liu (Chemistry)
Faculty Mentor: Megan Ferguson (Chemistry)

Gram-negative bacteria have biopolymers known as lipopolysaccharides (LPS). LPS are used for cellular adhesion and interactions among cells. Thus, by studying the steric forces of LPS, we hope to better understand how these bacteria interact. Here, E. coli and Bdellovibrio bacteriovorus cells were fixed to glass slides and submerged in buffer solution. AFM force curves were taken by pressing a cantilever into an LPS-coated bacterial cell and then retracting the cantilever. Then the buffer was changed to have a different ionic strength and the same cells were relocated before collecting new force curves. These data were applied to the Alexander and de Gennes (AdG) model, which describes the steric forces of polymers. This model includes a density-related parameter termed s. The s parameter has been assumed to be the root spacing (distance between the bases of the LPS molecules), however, since the LPS can interact with each other, it may also be the mesh spacing (Distance between each entanglement of different LPS strands). Effects of buffer ionic strength on s will be discussed and interpreted to predict whether s is the root or mesh spacing.

Effect of lipopolysaccharides versus glycosphingolipids on predation by B. bacteriovorus

Tina Liu (Biochemistry)
Faculty Mentor: Megan Ferguson (Chemistry)

Bdellovibrio bacteriovorus is a Gram-negative bacterium that has been demonstrated to prey upon every Gram-negative species except itself, indicating that the signal for prey versus non-prey must be a fundamental property of Gram-negative bacteria. Most Gram-negative bacteria, including all that have been previously tested with *B. bacteriovorus*, have lipopolysaccharide (LPS) molecules that anchor into their outer membrane. Although there is substantial diversity in LPS molecules, most of that diversity is in the polysaccharide chains extending outward from the membrane, whereas the chemical structure of the anchor, called Lipid A, is well conserved. Typical Lipid A structure consists of two phosphorylated glucoseamines with fatty acid chains extending downward into the bacterial outer membrane. Due to the differences in Lipid A of *B. bacteriovorus* and coexisting species in the human gut, prey identification may be based on the presence of phosphate groups in Lipid A and its consequent effects on the chemical environment of the cell surface. Here, however, we used both AFM and macroscopic observations to demonstrate that *B. bacteriovorus* preys upon Gram-negative *Novosphingobium capsulatum*, which have glycosphingolipids instead of LPS. Glycosphingolipids lack phosphate groups, but their carboxylic acid functionality may have a similar effect on the membrane surface charge environment.

Quantifying the Retention of BPA in Regenerating Planaria

Esther Chan (Biochemistry), Troy Moody (Biochemistry)
Faculty Mentor: Pamela St. John (Chemistry)
Faculty Mentor: Spencer Mass (Biology)

Bisphenol A (BPA) is a xenoestrogen and endocrine disruptor, organic compounds that bind to estrogen receptors found in the environment in various concentrations, originating from human industrial and consumer products such as cleaning, health and beauty products, pharmaceuticals, and plastics. They can be harmful to organisms, considering they mimic estrogen and can alter the body's own production of estrogen. We optimized a detection method for BPA using high performance liquid chromatography (HPLC) with fluorescence detection to quantify the amount absorbed by planaria. Ongoing biological experimentation has shown that planaria exposed to micromolar concentrations of BPA experience a myriad of deleterious effects including: dramatic behavioral changes, delayed reactions to stimuli, and severely affected ability to regenerate. HPLC is used to detect BPA as it absorbs light in the ultraviolet range and fluoresces upon UV excitation. We have extracted on the order of picograms of BPA from planaria that live for a period of several days in media containing sub-micromolar concentrations of the substance. We were able to quantify the amount of BPA extracted and we compared this value to the original BPA concentration. The sensitivity that granted detection of such low BPA concentrations has led to realization of BPA contamination through the use of common plastics in the lab. Therefore, we have also fine-tuned experimental protocols in order to attain more reproducible data.

An Investigation of the Effect of Linguistic Distance on Cognitive Reserve in Bilingual Alzheimer's/Dementia Patients

Julie Pento (Communication Disorders)
Faculty Mentor: Inge Anema (Communication Disorders)

The term "cognitive reserve" has been defined as the amount of brain damage an individual can tolerate before reaching a clinical threshold for impairment. Having higher cognitive reserve can delay the diagnosis of diseases such as Alzheimer's and dementia. Factors that contribute to this are occupational complexity and education level, as well as whether or not the individual is bilingual. Studies have shown that bilingual and trilingual children outperform their monolingual counterparts on tests of executive functioning. The performance of second language learners falls in between these two groups, suggesting that minor variances in language understanding can still affect cognitive function. From here, we ask: Will a bilingual individual who's second language (L2) is more linguistically distant from English have greater cognitive reserve than a patient who's L2 is more linguistically similar? If so, will this then result in the patient with greater cognitive reserve being diagnosed later and having more brain pathology when therapy begins? The purpose of this project is to compare how linguistic distance can affect cognitive reserve by analyzing the progression of Alzheimer's disease in bilingual individuals. Using previous research, this scientific review intends to demonstrate that increased linguistic distance from a first language requires an individual to recruit higher-level cognitive functioning abilities, further developing cognitive reserve.

Comparing Computer-based Programs to In-person Programs for Improving the Social Skills of Children with Autism

Lindsay Feminella (Communication Disorders)
Faculty Mentor: Inge Anema (Communication Disorders)

Social skills are vital for young children when trying to make friends whether they be typically developing or on the autism spectrum. Children on the autism spectrum, with the help of professionals, can learn some of these social skills. There are several programs that facilitate the acquisition of pragmatic skills such as eye contact and turn taking. The purpose of this review is to analyze computer-based versus in-person therapy options for children with high functioning autism. Under computer-based programs we understand, for example, structured online games or social skill training on a tablet. In-person programs involve, for example, groups organized through school and sports teams. This analysis will categorize the strengths and weaknesses of each therapy option. The individualized aspect of the computer-based program may be fitting for some children, while others may flourish in a group setting which can be found in many in-person social programs. The computer-based programs also offer the opportunity to work without interacting with others, while in-person sessions give the child the chance to work directly with other people. It is hypothesized that computer-based programs will be more effective for children with high functioning autism when trying to improve pragmatic skills. Differences between computer-based programs and in-person programs will be discussed in addition to how children with high functioning autism increased eye contact and turn taking.

The Relationship Between Language Proficiency and Familiarity with Proverbs of Non-Native English Speakers

Allison Heavey (Communication Disorders)
Faculty Mentor: Anema Inge (Communication Disorders)

An understanding of formulaic language, slang terms, and swear words allows a speaker to flawlessly integrate into a linguistic culture. For second language learners these aspects are some of the last features of language to be mastered, as they rely on pragmatics and frequently carry non-literal meanings. For bilinguals learning English, the understanding and use of English proverbs is an indicator of proficiency. A proverb is a phrase that has both a literal and nonliteral meaning and conveys a lesson, such as “don’t judge a book by its cover” or “a picture is worth a thousand words”. The purpose of this study is to examine the relationship between proverb use of English as Second Language (ESL) students and English language proficiency, as determined by the Language Experience and Proficiency Questionnaire (LEAP-Q), a standardized proficiency questionnaire. The LEAP-Q has been produced to be a “valid, reliable, and efficient tool for assessing the language profiles of multilingual, neurologically intact adult populations in research settings”. This study will examine English language proficiency and proverb use of high proficient and low perficient ESL students using the LEAP-Q and additional survey questions assessing proverb familiarity. It is hypothesized that ESL students who are familiar with English proverbs will rate themselves as more proficient in English than students are less familiar with English proverbs .

The Effect of Economic Activity on Climate Change

Danielle Carollo (Economics)
Faculty Mentor: Simin Mozayeni (Economics)

Research Question: What is the effect of increased economic activity on climate change? Are the costs of taking preventative measures advantageous? Research has established that an increase in greenhouse gas (GHG) emissions in the atmosphere has a strong correlation with global gross domestic product (GDP). As a result global warming emerges with its adverse effects on the environment and compromise of lives and wellbeing of humans and animals. While greenhouse gasses emerge naturally in the environment, they are largely byproducts of economic activity. Burning fossil fuels for generating heat, including in production of electricity, and deforestation share a common characteristic—they use natural resources to deliver goods for consumption. This analysis focuses on the relationship between global GDP and GHG emission. This research plan will be pursued in two phases: First, we formally conduct a test for the hypothesis that human quest for consumption causes climate change. Second, we examine the comparative costs and benefits for reduction of GHG after it happens to a prevention scheme. To test the key hypothesis of our research, first we use a model for estimation of the effect of global GDP on global GHG emission and the resulting global temperatures. We then discuss the detrimental effects this can cause. From there we develop a cost-benefit analysis model for evaluation of alternative measures for restraining the amount of GHG.

Quantifying Mechanical Properties of Natural Fibers

James Reap (Mechanical Engineering)
Faculty Mentor: Jared Nelson (Engineering)

Natural fibers offer industry a more sustainable alternative often with comparable mechanical properties to synthetic fibers. Variations in plants and cultivation methods have significant impacts on the mechanical properties of natural fibers as do methods of processing for specific end-uses. Generally, these variations result in different fiber diameter and length. The traditional method for testing the tensile strength of fibers is in accordance with ASTM C1557 for aligning the fiber in tensile testing and measuring the diameter to calculate the cross sectional area are outdated. This study investigated the effects of diameter on the mechanical properties of flax, kenaf, and hemp fibers. By using the Diastron LEX 810/820 extensometer and the FDAS 770 laser scan micrometer, more accurate and repeatable results where observed. This equipment ensured that fibers tests were aligned and diameters were precisely measured and preliminary results indicate that smaller fiber diameters had less variation in both fiber shape and failure properties. Moving forward, mechanical properties of fibers due to different agronomic variation will be quantified to help develop the value chain and identify new uses for these materials.

Modeling and Testing of Flexible 3D printed Viscoelastic Materials

Cuiyu Kuang (Mechanical Engineering), Rachel Eisgruber (Mechanical Engineering)
Faculty Mentor: Heather Lai (Engineering)

Flexible, viscoelastic materials are developed in 3D printing. Using these materials, 3D printers are capable of producing prototypes with specific viscoelastic and damping behaviors. The post-manufactured behaviors of the flexible materials were examined in this research. The objective is developing the mechanical behavior of the 3D printed test specimens by using both quasi-static and dynamic mechanical testing. Quasi-static testing was conducted to determine the basic material properties of the materials since there was little information about the 3D printed viscoelastic materials. The material properties developed from the quasi-static test would be used to develop FEA model. A harmonic test was applied in both FEA modeling and experiments. The mechanic (damping) behaviors of the models from the FEA modeling were compared the experimental results. The materials examined in this project were Ninja Flex and Tango Plus FLX930/Vero Clear RGD 810.

Use of Advanced Dimensional Analysis for Wool Fiber Grading

Bryan Feigel (Mechanical Engineering), Tyler Rihm (Mechanical Engineering)
Faculty Mentor: Jared Nelson (Engineering)

Wool is a commonly used natural fiber found in clothing and textiles. Although its structure and characteristics are well researched, detailed mechanical analysis has been hindered by technological limitations. Improvement of wool products will rely on utilization of new technology to determine fiber geometry and cross sectional area. The efficacy of a fiber dimensional analysis tool (FDAS770) to more accurately measure fiber diameter was validated through comparison with wool's extensive research base and the ASTM-D3991 grading standard. Five different strains of wool; Merino Combed Top wool, Tan Alpaca wool, Juvenile Mohair wool, Scoured White Pool wool,and Natural Color Romney wool were investigated. The fibers were prepared in 20 mm segments before testing. Diameters of the wool fibers were found using a FDAS770 which holds the fibers and applies a nominal load to remove slack. Multiple diameter measurements were taken at each of 5 points ('slices') along the fiber length. Graphs of varying diameter along the length as well as at each point were generated. In all fibers the FDAS measurements reflected the established ovular, spindle-like shape of wool fiber. Following confirmation of the FDAS's efficacy, specification of the fineness grade may be done in accordance with ASTM-D3991. Future work will seek to develop mechanical properties of various natural fibers through tensile testing. Special consideration will be given to relative humidity and crimp.

Design and Testing of an RF Energy Harvesting System

Michael Feenaghty (Electrical Engineering), John Kuhling (Electrical Engineering)
Faculty Mentor: Reena Dahle (Engineering)

The design and testing of a Radio Frequency (RF) energy harvesting system capable of powering an Internet of Things (IoT) temperature sensor is presented. External power supplies often needed by IoT devices limit device portability due to weight and design volume, and make maintenance inconvenient. Ambient RF energy harvesting to power an IoT device can eliminate the need for an external power source, and can drastically reduce required maintenance. This improves the feasibility of using the device in a multiple applications, while also allowing significant flexibility in the device's design. The device consists of an antenna that harvests the RF energy, a charge pump to convert the RF energy to Direct Current (DC), and a temperature sensor that is powered by the combination of the antenna and charge pump. The antenna is non-directional and circularly polarized. The charge pump transforms the low-magnitude RF input power to DC power that is stored in a capacitor. The charge pump has an electrical efficiency of 7.6\%. This capacitor stores energy until it is capable of powering the connected device for a limited amount of time, after which the charge pump charges the capacitor again. This allows the device to operate at certain intervals without the need for an external power source. A temperature sensor capable of reading the temperature once a minute is used to demonstrate the device functionality. The data is stored locally or transmitted to a nearby computer.

Applying Computer Vision in Manufacturing

Karen Ho (Engineering)
Faculty Mentor: Yi-Chung Chen (Engineering)

Manufacturers must satisfy customer requirements with a rigorous process control to stay in the marketplace. As such, a manual continuous product inspection serves the purpose of quality control at a majority of manufacturing plants. This type of assessment for mass produced goods is costly and tedious, with room for misclassification of complex products. Adoption of automation will be required to keep contemporary relevance, and to lower costs. Real-time fault detection using image processing will be covered in this presentation as a swift and feasible method with increased accuracy.

SEM Imaging of Fracture Surfaces and Porosity of 3D Printed Polymers

Matthew Gottstine (Mechanical Engineering), Ryan Hanna (Mechanical Engineering)
Faculty Mentor: Jared Nelson (Engineering)
Faculty Mentor: Gordana Garapic (Geology)

3D printed materials result in lower material properties than injection molding due to the anisotropy resulting from the layer-by-layer deposition process. The purpose of this study was to visually observe post-testing fracture surfaces of 3D printed polymers to identify trends between the different orientations while determining the void content of the specimen. A scanning-electron microscope (SEM) was used to capture images of fracture surfaces of the samples tested in tension. The samples were carbon-coated and then taken at moderate acceleration voltage (10 kV), beam intensity of 10, and at relatively short working distance with variable tilt angles. Samples over a range of magnifications were imaged to get the overview as well as the details of the fracture surfaces. From the images an overall trend was observed where the fracture surface would propagate more along the inter-layer bonds and less through the individual filament as the print orientation angle increased from 0 to 90 degrees. Further, these images were used to approximate void content in representative areas of each specimen. Given the reduction in cross-sectional area compared to those measured traditionally, the originally calculated stress values underestimate those experienced by the specimen. Looking forward, more in-depth analyses of fracture surfaces will be performed, advancing void content measurement accuracy and improving the precision of calculated material strength.

Mechanical Properties of 3D Printed Composites

Matthew Gottstine (Mechanical Engineering), Ryan Hanna (Mechanical Engineering)
Faculty Mentor: Jared Nelson (Mechanical Engineering)

A composite is a material composed of more than one constituents with different physical or chemical properties that when combined produce a tailored, engineered material. 3D printed composites are produced by depositing each constituent layer-by-layer which provides a fast turnaround while producing parts incorporating new material properties. The purpose of this study was to investigate the relationship between the mechanical properties and the fiber type as well as the orientation at which they were printed. To test this, specimens were printed with nylon as the matrix and either fiberglass, carbon fiber, or kevlar fiber in concentric or quasi-isotropic orientations. With recent developments in the capability of carbon fiber, these specimens also included a third, balanced fiber orientation, with angles of 0, ±30, ±45, ±60 or 90 degrees. Previous studies primarily resulted in grip failures which are not indicative of the actual material properties. The prepared test specimens were tested in tension using an Instron 5984 load frame with a 150 kN (33 kip) load cell using the ASTM D3039 standard. It has been concluded that tabbing the test specimens improved testing consistency by reducing the number of grip failures and resulted in more accurate material properties. The acquired strength and stiffness from the 3D printed composites were compared to traditionally manufactured composites and were found to have lower values for both properties.

Self-Unfolding Mechanism for Wings - A Research Progress

Jennifer Luu (Mechanical Engineering)
Faculty Mentor: Rachmadian Wulandana (Mechanical Engineering)

This research project aims to gain a better understanding of the mechanism behind self-unfolding aircraft wings. The concept of self-unfolding aircraft wings is not new, but it is attractive as it provides an efficient way of storing aircrafts. By implementing this concept, a greater amount of space will be available for more aircrafts by decreasing its wingspan. In order to do so, research was performed on various ideas. Ideas includes: utilizing hinges, shape memory polymers, and shape memory alloy. Throughout the researching process, the concept of utilizing shape memory alloys was chosen. This was due to the availability of the material in the current market, the cost, and the versatility of the material. Throughout the researching process, the type of wire chosen was nitinol since it is the most popular type of shape memory alloy. These wires were programmed to memorize a specific shape. The memorization process was performed by forming the wire to a desired shape, applying a source of high heat, cooling the wire, manipulating it into another shape, apply a source of specific heat, and watching the wire adjust itself to the initial shape. The wire will be shaped into the frame of aircraft wing. Multiple designs for the wire were tested out to find the most suitable shape. As part of the research process, an origami-type frame will also be studied to further analyze the movements of the wire.

Utilization of Organic Rankine Cycles for Waste Heat Recovery of Residential Solar Panels

Tom Brookbank (Mechanical Engineering), Ryan Hanna (Mechanical Engineering), Peter Demertzis (Mechanical Engineering), Kyle Morgan (Mechanical Engineering)
Faculty Mentor: Rachmadian Wulandana (Mechanical Engineering)

The project aims to examine the potential of organic Rankine cycles in converting the excessive heat of solar photovoltaic panels into useful power. The recovery of the wasted heat increases the PV efficiency and provides extra economical benefit for the solar panel users. An average house with solar roofing in New Paltz, NY experiences approximately 1,312 hours of sunlight per year, which can save up to $12,000 over the course of 20 years. This energy generation is strictly based off of photovoltaic cells. Numerical modeling of organic Rankine cycles that considers eco-friendly refrigerants as working fluids estimate additional extra dollars for the customers. A solar panel absorbs roughly 1.8 kWh per square meter per day, this is a value that can fluctuate based on the cells for the design of the solar panel. The structure of the cells are based on that is either monocrystalline, polycrystalline, and thin film amorphous. Monocrystalline, converts 22% of sunlight into energy, currently the most efficient, and the most expensive; Polycrystalline, converts 14-16% to energy, and costs less; Thin film panels are inefficient at converting sunlight to energy, but are the most cost effective. In short, Monocrystalline cells are the best choice for sustainable energy harvesting in solar panels

Investigating the Power Harvesting Potential of Mini Bladeless 3D-Printed Turbines

James Araneo (Mechanical Engineering), David Foote (Mechanical Engineering)
Faculty Mentor: Rachmadian Wulandana (Mechanical Engineering)

Power harvesting from mini 3D-printed vortex-induced turbines was investigated using CFD (Computational Fluid Dynamic) simulations and physical experimentation in a closed-circuit water tank with controllable flow rates. When exposed to streaming water, the bladeless, symmetrical turbines show either stagnation (no motion), periodic oscillation, or auto-rotational effects, depending on the flow speed. Using COMSOL Multiphysics, we performed two-dimensional CFD analysis to study the drag and lift coefficients of turbine models in laminar flow condition. In collaboration with Montclair State University, we conducted experimentation using a (15.4 cm x 45.7 cm x 15.4 cm) water tunnel. We developed a supporting platform with a telescoping mechanism to allow the turbines to be tested in different water depths and to reduce bending effects caused by water flow on the shaft. Turbine models were printed using either acrylonitrile butadiene styrene (ABS) or polylactic acid (PLA) material with different printing density (infills). The metal shaft of the turbine was connected via a plastic coupling to a mini DC motor with 0.5 V starting voltage in order to generate voltage and current. Experimentation using turbine models of different sizes and shapes revealed that the cross models (models with intersecting cylinders) and having ratios of length to diameter (Aspect Ratio) close to unity demonstrate auto-rotation.

Testing the Effect of Working Fluid on Cycle Performance

Matthew Gottstine (Mechanical Engineering), Jennifer Luu (Mechanical Engineering), Tyler Rihm (Mechanical Engineering), Hanami Robles (Mechanical Engineering)
Faculty Mentor: Rachmadian Wulandana (Mechanical Engineering)

The simple rankine cycle is defined as having two isobaric processes, and two isentropic processes, while the open, and the closed systems follow the same basic principle with extra processes in between the main stages. Both, the open, and the closed feedwater cycles allow the heat from certain processes to be transferred to the fluid at different stages. Either through direct mixing, or just a transfer of heat. The purpose of this study was to determine how the coefficient of performance is affected by using various working fluids in a cascading Rankine cycle with a closed feedwater cycle going into an open feedwater cycle. The fluids that are being used are: carbon dioxide, ammonia, R290, and R11. By using a different combination of fluids in each of the cycles, we can determine which combinations would produce the highest performance, and which combinations are effective based on the temperature of the fluids during the heat transfer from the condenser of the open cycle to the boiler of the closed cycle, which can be achieved by matching their pressures as best as possible at the heat exchange. We utilize tools such as MATLAB in which the numerous combinations of fluids can be developed, and analyzed much more efficiently. More studies could be performed in the future to incorporate a more diverse list of working fluids in order to truly find the most efficient combination of working fluids for the specified setup.

Binary Geothermal Powerplant

Saad Bahji (Mechanical Engineering), Yorman Escobar (Mechanical Engineering), Swami Mendieta (Mechanical Engineering), James Reap (Mechanical Engineering)
Faculty Mentor: Rachmadian Wulandana (Mechanical Engineering)

Binary Geothermal Power Plant Saad Bahji, Yorman Escobar, Swami Mendieta, James Reap Mentor: Dr. Wulandana Abstract: With environmental concerns driving the need for renewable energy, geothermal solutions are becoming increasingly viable and effective. The energy contained in water from geothermal springs is exploited in binary systems for power generation. Geothermal resources vary with geological settings, which requires unique thermal system design on a location basis. This takes into account well depths, temperatures, pressures, etc. The locations considered for a geothermal plant are Reykjavik, Pisa, and Draskovec. The Rankine Cycle is compared for varying temperature and pressure conditions for optimal design on three working fluids; R134a, R125 and CO2. The R125 working fluid was found to have a higher power output at lower temperature ranges (110°F to 130°F) in comparison to the standard R134a. Average well depths are predicted to be at 400 meters.

Measurement, Visualization, and Modeling of Acoustics of a Barrel-Vaulted Sanctuary

David Foote (Mechanical Engineering)
Faculty Mentor: Heather Lai (Engineering)

This investigation centers on a recently constructed church with a barrel-vaulted sanctuary ceiling exhibiting excessive reverberation times. Based on complaints of poor speech intelligibility at specific locations, an investigation was made consisting of reverberation time measurements developed from logarithmic sine sweep data and sound pressure level measurements in the diffuse sound field. Reverberation times in excess of 5 seconds in the speech-frequency range were observed at locations along the center aisle, along with correspondingly elevated sound pressure levels. A CAD model of the sanctuary was developed, imported into Odeon and used to simulate the acoustical behavior. Multiple means for visualizing the acoustical behavior are presented, demonstrating how the long reverberation time can be detected in the measured data as well as the models. Odeon analysis of proposed solutions for retrofit of the space to improve intelligibility are also described.

The Keeper of the Belt: Exploring Objects, Family, and the Russian Diaspora

Carina Kohn (English)
Faculty Mentor: Cyrus Mulready (English)

My project consists of a collection of short stories which explore material culture through the lens of the Russian diaspora. Each piece gives voice to Russian immigrants who have experienced what it feels like to uproot one's entire life and leave almost everything behind. My focus is on the items they have held on to. In preparation to tell these stories, I have examined historical texts and memoirs discussing the cultural and political structures of the Soviet Union. I have also interviewed Russian family members and friends—many of whom are represented as protagonists in their respective stories. Throughout my first of set interviews, it became evident that these individuals were deeply attached to the items they presented, and were able to tap into a reservoir of memories associated with them. I have my own set of Russian objects, which have been passed down to me by my mother, and this project has helped me pay attention to them in new ways. It has also given me the opportunity to contextualize my mother's immigration and view it as a part of a larger experience. I am currently in the process of adding to my pool of interviews. With every story that I write, I gain a deeper understanding of what it means to have a relationship to places where you live, and the people who you love. If a photograph is known to speak a thousand words, then how many can a preserved candy wrapper say, or a loved one's wallet?

Locating Potential Landfill Sites to be Covered by Solar Panels in NY

Trent Reid (Geography)
Faculty Mentor: Huicheng Chien (Geography)

In conjunction with the ever-increasing national demand for energy, the need for sustainable development such as solar panels is on the rise. Landfills make excellent sites for the installation of solar panel systems because the land they encompass is otherwise unusable from pollutants in the underlying Earth. For example, Hickory Ridge landfill in Georgia was fitted with a solar cap which generates 1 megawatt of power, enough to power 225 homes. Because New York has an abundance of landfills, I will locate potential landfills that can be fitted with solar panels using ArcGIS. My criteria for potential solar panel placement are as follows: The landfill must be larger that 40 acres, the site must have high average insolation relative to the rest of the state, and the site must have a southern facing aspect to receive adequate sunlight. To locate these sites, I have created a digital elevation model of New York State at the 30 meter resolution to determine south facing aspect. Also, I have downloaded the annual average incoming solar radiation data for New York state from the National Renewable Energy Lab and Tax Parcel data from the NY GIS Clearinghouse to find landfill sites. Using spatial analysis, I will eliminate any landfills which are of inadequate size or aspect and Google Earth to create shape files of the potential landfills which remain. This research will help green energy efforts in NY.

Connecting Attractions via New Trails on Joppenbergh Mountain; Utilizing GPS and GIS in Cost Path Analysis

Jillian Eggers (Geography)
Faculty Mentor: Huicheng Chien (Geography)

Local awareness of trails on Joppenbergh Mountain in Rosendale, NY are generally high. However, as the trestle and overlook become more well known to tourists and non-locals, the lack of a trail connecting the two attractions leads to departing from the identified trail and/or more traffic in the congested areas of Rosendale. The objective of this project is to propose a new hiking trail for the Wallkill Valley Land Trust connecting the Joppenbergh Mountain Overlook trail to the Wallkill Valley Rail Trail. This allows people already aware and using the rail trail to access the mountain overlook from the same trailhead and parking area. Existing trails leading to the mountain overlook are mapped using GPS to determine where the potential trail connects most sensibly. Distance and cost path analysis are used in a GIS model to determine paths with an acceptable slope that are not prone to immense erosion in the coming years, and that follow the general trend of the ridge, allowing for the most scenic route. Due to the legal property constraints of the Wallkill Valley Land Trust, two potential routes have been identified; One following the most sensible slope of the land and the other remaining within the property lines with a slightly higher slope. The final route is proposed to the Wallkill Valley Land Trust and upon their agreement identified using GPS and markers for a trail to be created by volunteers.

California Wildfire Distribution from 1980-2016 and Finding High Risk Wildfire Perimeter Areas

Amanda Simmonds (Geography)
Faculty Mentor: Huicheng Chien (Geography)

In California; 9,235 wildfires were reported between 1980 and 2016. The average 10-year percentage of U.S. wildfires are caused 88% by humans and 12% lightning caused. Wildfires can occur anywhere. However, the fuel including tress and underbrush, weather including temperature, wind, and moisture, and topography including the slope and aspect may determine the birth, growth, and death of a wildfire. The objective of this study is to analyze the relationship among the occurrences of wildfires, weather, and topography. The data of wildfire perimeters from 1980 to 2016 were downloaded from the Fire and Resource Assessment Program (FRAP). Gridded temperature and moisture data were downloaded from NOAA Climate Data Online (CDO). Slope and Aspect were developed using 30-meter Digital Elevation Model (DEM) using ArcGIS spatial analysis. Spatial and temporal mapping will be used to analyze the relationship among wildfires, weather, and topography. This research will help shed light on high risk areas to help protect the residents of California, vegetation and wildlife.

Aaron Burr: Villain To Hero Upgrade

Barbara Pralat (History)
Faculty Mentor: Susan Lewis (History)

The research project explores the historiography surrounding Aaron Burr. For most of United States history, he has been vilified as a traitor to the nation and the murderer of Alexander Hamilton. However, Aaron Burr's reputation has been questioned through Gore Vidal's novel: Burr, published in 1973, which humanizes Burr without taking away from his notorious reputation. Nancy Isenberg's historical biography: Fallen Founder published in 2007, which explores Burr as a feminist and looking at the accusations against Burr in the political world. More recently the musical Hamilton by Lin Manuel Miranda, explores Burr as Hamilton's first friend and someone who is sympathetic and wants to get ahead in life. Using both primary and secondary sources to trace the history of Burr's reputation and to show if Aaron Burr is really a villain, based on his character and career. Included in the research is highlights of Aaron Burr's life and events that led to his reputation being portrayed as negative. The poster explores how one of America's most notorious founding fathers gained such a bad reputation and if he deserves this reputation or if he deserves a better reputation and belongs among the other founding fathers.

Dynamics of Quadratic Networks

Simone Evans (Biochemistry, Mathematics)
Faculty Mentor: Anca Radulescu (Mathematics)

Many natural systems are organized as self-interacting networks composed of coupled quadratic nodes. Because these nodes receive functional input from not only themselves but also the other nodes in the network, they have ensemble behavior different from that of isolated functional nodes. Our objective is to study how the architecture of a network affects asymptotic dynamics. We investigate how traditional results may generalize in the case of networks. We discuss extensions of concepts like escape radius and Julia and Mandelbrot sets (as parameter loci in C^n, where n is the size of the network). We study topological properties of these asymptotic sets and of their two-dimensional slices in C (defined in previous work). We find that, while network Mandelbrot sets no longer have a hyperbolic bulb structure, some of their geometric landmarks are preserved while other properties depend on the network structure. We investigate possible extensions of the relationship between the Mandelbrot set and the Julia set connectedness loci in the case of network dynamics. While single-map complex quadratic iterations have been studied over the past century, considering ensembles of such functions, organized as coupled nodes in a network, generate new questions with potentially interesting applications to the life sciences.

Construction of a multiple-exposure hologram

Matthew Cattani (Physics)
Faculty Mentor: Catherine Herne (Physics)

Light carries information stored in its intensity and phase. A standard photograph records only the intensity of the light, and so is left as a two-dimensional representation of a three-dimensional scene. Photography does not account for the phase information carried by light, which results in an altered representation dependent on the angle of viewing. Holography is a technique for recording and recreating all of the information carried by light through interference between light from an object and a reference beam. A hologram is the recreation of a three-dimensional image. Holograms have several practical uses surrounding interferometry, security, data storage, and art. There are multiple methods of creating and reconstructing holograms. Simple holograms refer to transmission or white-light reflection holograms which make an image of only one object. In this work I show the creation of a multiple-exposure hologram, which is being explored as a way to store more information than a simple hologram. I describe the process I developed, explain the optical science involved, and show my results.

Trapping force measurements of Bdellovibrio Bacteriovorus using optical tweezers

Shanel Montreuil (Physics), Alexis Hartmann (Physics and Astronomy)
Faculty Mentor: Catherine Herne (Physics)
Faculty Mentor: Megan Ferguson (Chemistry)

We research the optical micromanipulation of Bdellovibrio Bacteriovorus through the use of optical tweezers. Optical tweezers are scientific instruments that allow us to hold, translate and rotate B. Bacteriovorus in three dimensions. B. Bacteriovorus are highly mobile gram-negative bacterial predators that prey on other gram-negative bacteria. We are interested in exploring the B. Bacteriovorus life stages, including the stage where it hunts and attaches to its prey, and the following stage where it grows inside its prey. Optical trapping offers a new measurement tool that has not been utilized to learn about B. Bacteriovorus. In this work, we study B. Bacteriovorus mobility specifically during its hunting and attachment phase. We show the trap strength at different trapping power and different locations relative to the surface of a sample. By measuring how tightly the B. Bacteriovorus is held in our optical trap, we can infer its mobility. Through quantifying the trap strength, we gain insight into the mechanisms of B. Bacteriovorus life stages.

Israeli-Palestinian Women's Peace Organizations

Miriam Ehrlich (Women's, Gender, Sexuality Studies)
Faculty Mentor: Kathleen Dowley (Political Science)

The Israeli-Palestinian conflict has recently been placed back in international consciousness due to President Trump's planned actions with moving the capital of Israel. Within discourse about the conflict, discussion tends to lean towards political events rather than efforts for peace. I seek to shift the focus towards the efforts that are made for peace, specifically those made by women.In my essay I argue that both Israeli and Palestinian women are participating in vital coalition work through peace movements and organizations. This is done to raise consciousness and create a dialogue between two groups of women who experience a lot of pain and violence as much as it seeks other goals like ending the occupation and Israeli government violence. Through my research I have discovered multiple organizations run by Israeli and Palestinian women to work towards peace. Through my discussion of the specific organizations Israeli and Palestinian women actively participate in, I intend on grounding their activism in a specific geographic location and experiences. By placing women at the forefront of conversations about activism, especially in locations where their identities are often ignored, I intend on providing a platform for making their voices and actions heard.

Border Security & its Effect on Clandestine Transnational Actors

Julia Farawell (Political Science)
Faculty Mentor: Kathleen Dowley (Political Science)

Within the past 40 years, the United States has been increasingly vocal about its views on immigration. Most specifically, U.S. legislators and many of their constituents have become fixated on policies related to individuals moving across the U.S.-Mexico border. This research will assess the complexity of the relationship between U.S. Border Patrol funding and the deterrence of Clandestine Transnational Actors (CTAs). Academically, the term "CTA" has encompassed terrorist networks, drug traffickers, weapons traffickers, and human smugglers. This project will focus on CTAs as human smugglers who are employed by migrants seeking assistance crossing the US-Mexico border. Catalytic years will serve as the framework for a comparative analysis of two hypotheses. U.S. Border Patrol data on border apprehensions related to human smuggling will be assessed pre- and post-2007 (i.e. the Global Financial Crisis). U.S. border security policies pre- and post-2001 will be analyzed in relation to border apprehension data -- specifically at traditional, urban entryways that have been increasingly blocked by Border Patrol personnel. The use of CTA human smugglers has been made more essential for migrants looking to cross the border at new, more dangerous entryways.

Is Age Just A Number? A Study in Youth Voter Turnout

Mary Thomson (Political Science)
Faculty Mentor: Joel Lefkowitz (Political Science)

All voters, no matter their age, have factors that encourage or discourage their participation in elections. The youth are an important group to observe, as they have been known to have the least turnout in polls in comparison to other age groups, despite voting becoming more accessible since the passing of the 26th amendment. Studying this group requires careful consideration, as voting behavior and turnout of individuals aged 18-14 is unique from other age classes. Existing research has explored several hypotheses to explain the trends in young voter participation in both terms of turnout and vote choice, however, most research focuses on vote choice rather than turnout. This study will attempt to fill some of the gaps in scholarly research to answer why youth voter turnout differs from other age classifications. I hypothesize that one's upbringing, examined in terms of the degree of parental political participation and home political socialization, will have a positive correlation of increased youth voter turnout. I also hypothesize that 18-year-old voters will have higher turnout rates than other young voters aged 19-24. Gathering data from the ANES 2016, and the Youth Parent Civic Cohort Dyad Survey 2002, and controlling level of education, race, political party, gender and competitiveness of state district, this study will quantify the statistical significance of each hypothesis on youth voter turnout in elections.

PhotoNovella and The Lived Experience of Anticipatory Emotions

Jessica Bordon (Psychology), Kristen Kocaj (Psychology), Puja Patel (Psychology), Nicole Posluszny (Psychology), Kathryn Shybunko (Psychology)
Faculty Mentor: Maryalice Citera (Psychology)

Anticipatory emotions, like dread and anxiety, are experienced when an individual faces the prospect of a future event (Baumgartner, Pieters, & Bagozzi, 2008). The purpose of this study was to determine whether these two emotions are distinct using an approach called PhotoNovella (Burles & Thomas, 2014). This approach provides a set of qualitative data based on lived-experiences, providing greater insight than survey approaches. We modified this approach and asked participants to take photographs about events or issues that depicted dread or anxiety in their everyday lives and then to collectively discuss the meaning of their photos. We gathered data on language used in describing dread and anxiety during focus groups, the content participants chose to portray their emotional experience, and photographic techniques used to distinguish between them. Preliminary results showed that for the dread group, individuals described feeling a stagnancy in time, lack of energy, and little desire to press on. For the anxiety group, individuals described being pressured by time, fear of not knowing what will happen in the future, and obligation to press on. Participants expressed that by identifying what causes them dread or anxiety, they were able to grasp a better understanding of why they felt such emotions, aiding them in finding solutions. PhotoNovella revealed rich, personal, and unique everyday experiences that distinguish feelings of dread from anxiety.

Scalloped Hammerhead Sharks' Cephalofoil as an Indicator for Reproductive Success

Jacqueline Di Santo (Psychology)
Glenn Geher (Psychology)

An interesting example of the diverse morphology in elasmobranch fish is the hammerhead shark, getting its name from the hammer-like shaped head, referred to as the cephalofoil. This unique structure has gathered much speculation about its functionality, and the present hypotheses on its evolution disregard possible reproductive benefits. The purpose of the current study is to explore the reproductive benefits of the cephalofoil in the scalloped hammerhead shark, Sphyrna lewini and its role in intersexual (i.e., females displaying a preference for male cephalofoil size) and intrasexual (i.e., males using cephalophoils as a means to physically compete with other males for access to females) selection. It is predicted that males with larger cephalofoils will copulate with a greater amount of females, suggesting the cephalofoil may aid in female mate choice. It is also hypothesized that males will show physical aggression toward other males by using their cephalofoils (i.e., head-butting).

Differences in Reactions to Infidelity Based on Sex and Sexuality

Alec Goldstein (Psychology), Julie Planke (Psychology)
Faculty Mentor: Glenn Geher (Psychology)

Sex differences in mating psychology, particularly reactions to infidelity, have been well documented by Buss and colleagues (1992), and replicated by Howard and Perilloux (2017) with heterosexual and homosexual individuals. Previous research suggested that these differences are a result of one's biological sex, rather than one's sexual orientation. However, participants were required to identify as either heterosexual or homosexual, and therefore the inherent fluidity of human sexuality was not accounted for. This study seeks to examine differences in mating psychology, utilizing the Kinsey-scale to adequately measure sexuality. With the fluidity of sexuality in mind, we will also assess differences in reactions to infidelity based on the sex of the target the participant's partner is having an unfaithful secondary relationship with.

Politics and Academic Values in Higher Education

Julie Planke (Psychology), Kelsey Newhook (Psychology), Richard Holler (Psychology), Kian Betancourt (Psychology), Amanda Baroni (Psychology), Jacqueline Di Santo (Psychology), Jackie Eisenberg (Psychology)
Faculty Mentor: Glenn Geher (Psychology)
Faculty Mentor: Morgan Gleason (Psychology)

This research examined academic values among a broad sample of academics throughout the United States. The primary purpose of this research was to see if academic values are related to field of expertise, political orientation, gender, and personality. Participants, who included 177 academics, were asked to indicate how much they prioritize five academic values, including academic rigor, academic freedom, student emotional well-being, social justice, and the advancement of knowledge. Political orientation was related to each of these values, except for academic freedom, with political liberalism corresponding to a focus on student emotional well-being and social justice with a concomitant de-emphasis on academic rigor and knowledge advancement. Scholars from the field of education showed a pattern similar to those who have a strong liberal political orientation and scholars in the field of business showing the converse trend. Gender had independent effects, with females having stronger emphases on student emotional well-being and social justice. Those who scored relatively high on a measure of agreeableness demonstrated more emphasis on student emotional well-being and social justice with a de-emphasis on academic rigor and knowledge advancement. Taken together, these findings indicate that academic values are strongly related to a variety of socially and psychologically relevant variables. Further, these data provide strong evidence that values among academics vary wildly.

“I Evolved This Way:" Examining Bisexuality as an Evolutionary Adaptation

Amanda Baroni (Psychology)
Faculty Mentor: Glenn Geher (Psychology)

The Affiliation Model, proposed by Dr. Frank Muscarella, advocates for the concept that homosexual behavior may have evolved as a way to maintain social bonds. It is likely that sexual behavior as a whole is not dichotomous, therefore, early hominids would have exhibited both homosexual and heterosexual behavior. This theory allows for the maintenance of social bonds without hindering the possibility of heterosexual reproduction. According to this logic, individuals who identify within a nonmonosexual orientation, such as bisexuals, should score higher in proxies of mating success than monosexual individuals. This hypothesis is tested in the current study by measuring previously supported proxies of mating success and an original measure of affiliation. Results and implications of the findings are discussed.

Save the Apology: The Evolutionary Psychology of Social Transgressions

Amanda Baroni (Psychology), Vania Rolon (Psychology), Richard Holler (Psychology), Kian Betancourt (Psychology), Matthew Chason (Mental Health Counseling), Katherine Dobosh (Biology)
Faculty Mentor: Glenn Geher (Psychology)

The current study was designed as an experimental approach to better understand specific factors that shape psychological responses associated with rifts within social communities. The research focused particularly on the nature of social transgressions and explored how people respond to social transgressions as a function of three evolutionarily relevant factors related to past research into the evolutionary psychology of interpersonal interactions. This included (a) transgression intensity (i.e., how big a particular transgression was (b) target of the transgression (i.e., if the transgression was targeted at an individual or at his or her property), and (c) whether an apology was presented subsequent to the transgression. Transgression intensity and target of the transgression had consistent significant effects on the dependent variables in the predicted directions. High scores on the Dark Triad measure of personality traits predicted the outcomes as well with high scores on the Dark Triad corresponding to strong negative responses to social transgressions. Implications for the evolutionary psychology of interpersonal relationships are discussed.

Hot Stuff!: The Evolutionary Psychology Behind the Attractiveness of Volunteer Firefighters

Nicholas Primavera (Psychology)
Faculty Mentor: Glenn Geher (Psychology)

This study aims to explore the attractiveness of volunteerism, more specifically with regards to volunteer firefighting. Based on evolutionary psychological research, we know that volunteering is attractive, and riskiness in males is attractive, especially so for short-term relationships. With that information in mind, this study seeks to extend those findings to see if they apply to members of the volunteer fire service. The study itself will consist of a short questionnaire with approximately 20-30 items. These items will include a brief measure of the Big Five personality traits and the dark triad. Alongside those measures, this study will include a picture of a male firefighter with a short biography, which the participant will rate on attractiveness. This survey would be administered to approximately 180 women, with 20-30 per condition. The results will be interpreted via a 2-way 3x3 ANOVA.

The Effect of Hand Proximity on Letter Encoding

Danielle Lukaszewski (Psychology)
Faculty Mentor: Giordana Grossi (Psychology)

Hand proximity effects have been reported in a variety of tasks. Previous research suggests that hand proximity enhances certain tasks while impeding others. The goal of this study is to test whether hand proximity enhances letter encoding, as suggested by Adam et al. (2012), who found that hand proximity improves letter encoding in letter identification tasks. The letter identification task adopted by Adam and colleagues involved not only stimulus encoding but also attentional processing in iconic and short-term memory (Sperling, 1969). In this study, we utilize a paradigm known as crowding that provides us with more precise information about what stage of letter encoding is facilitated by hand proximity.

Hand Proximity Effect: Impoverished semantic processing or enhanced cognitive control?

Katrina Stevens (Psychology)
Faculty Mentor: Giordana Grossi (Psychology)

“Nearby-hand” refers to having one’s hands immediately next to a stimulus. Previous works found closer hand proximity results in impoverished semantic processing. Davoli et al. (2010) performed an experiment examining the Stroop effect taking hand proximity into consideration. The magnitude of the Stroop effect was found to be reduced with participants’ hands in a proximal position. These results support previous findings of impoverished semantic processing. However, another explanation suggested for the reduction of the Stroop effect is enhanced cognitive control nearby hands. The present study was unable to replicate the Stroop task’s findings of impoverished semantic processing nearby hands and may point towards enhanced cognitive control.

Does Hand Position Influence Semantic Processing?

Sarah Stoudt (Psychology)
Faculty Mentor: Giordana Grossi (Psychology)

Evidence suggesting the influence of hand proximity on semantic processing (Davoli et. al, 2010) was the basis for current and past replication studies. The authors of the original study found that when subjects' hands were positioned near the stimuli (proximal position), their ability to distinguish sensible from nonsensible sentences was impaired versus when their hands were farther from the stimuli (distal position). Subsequent replication studies were unable to replicate these results. To further investigate the level at which semantic processing may be influenced by hand position, the current study uses a picture naming task. Using photographs of common objects, subjects provide a verbal response to name the object. Accuracy and response time act as dependent measures. This task has been used in prior research (Damian and Als, 2005; Belke, 2013; Riley et. al, 2015) and showed the interference of presenting categorically related objects on semantic processing. The current study adapts this paradigm to investigate whether hand proximity interferes with semantic processing at the level of lexical retrieval.

The impact of providing environmental and well-being indicators upon development decisions

Andrew Perry (Psychology), Leah Mancini (Psychology), Egamaria Alacam (Psychology), Alessandra Moss (Psychology), Sydney Shepard (Psychology), Ariel Barter (Psychology), Vania Rolon (Psychology)
Faculty Mentor: Douglas Maynard (Psychology)

Alternative indicators of progress that balance economic markers with measures of well-being and environmental sustainability may promote more sustainable, well-being focused decision-making. Participants made decisions regarding land development with some participants receiving economic indicators of progress and others receiving both economic and environmental indicators. Those receiving only economic indicators developed 37% more acres of land than those who received both economic and environmental indicators. Results indicate that alternative progress indicators may impact future sustainable decision-making.

The Development of a Measure of Play Fulfillment

Andrew Perry (Psychology), Egamaria Alacam (Psychology), Alessandra Moss (Psychology)
Faculty Mentor: Douglas Maynard (Psychology)

Research on playfulness in adulthood has been increasing steadily in recent years. There is some debate regarding the operational definition of play in adults, and there has never been a measure developed assessing the degree of play fulfillment in adults. The present study is a systematic investigation of play fulfillment as a construct with the goal of developing a survey measure designed to assess this construct. We developed a measure of play fulfillment that incorporates the multiple definitions of adult play currently in use. The results of the survey construction, its validity and reliability, and its impact on the field of adult playfulness research and positive psychology will be discussed.

I'm Bad at Math! A Study of Statistical Anxiety and Attitudes Across Majors.

Egamaria Alacam (Psychology)
Faculty Mentor: Alison Nash (Psychology)

The purpose of this research is to assess statistical anxiety and attitude towards statistics of students. This includes gender differences within a specific major, as well as across majors. Past research has shown significantly higher math anxiety scores and emotional negativity in females in comparison to males. However, when examined by major, there were no significant gender differences for psychology majors. In contrast, for business majors, females had higher emotional negativity. I will attempt to replicate these findings and extend to math majors as well. I predict that math will follow the same finding as business students because math is another field underrepresented by women. In addition, further questions included in the survey is the amount of time since the student last took a math class and what math course it was. Also, students will be asked to write why they think they are doing well or poorly in the course. Lastly, the student will be asked to write about an experience (good or bad) that they had while taking a math course. This study gives light to an under researched topic, yet something very prevalent, regardless of major. With more studies like these, we can make it known that gender differences in anxiety and attitudes exist, even at the collegiate level. The more that this is known, the higher probability we will have of creating classrooms with little to no gender differences in anxiety and attitudes towards statistics, or any math related course.

Perceptual and Affective Responses to Possible and Impossible Figures in Early Infancy

Danielle Longo (Psychology), Christina Krause (Psychology)
Faculty Mentor: Sarah Shuwairi (Psychology)

This research is aimed at evaluating young infants' facial expressions as they viewed pictures of possible and impossible objects. Previous studies demonstrated that four-month-olds look longer at impossible figures. We set out to determine if increased looking co-occurs with facial expressions of curiosity, surprise, and puzzlement. These expressions could be used as an index of infants internal conceptual understanding of real, coherent objects. For example, facial expressions of surprise toward impossible objects relative to possible ones may reveal that impossible figures violate inherent expectations about 3D object structure. Results indicated that impossible figures evoked reliably more affective facial responses ($p < .003$) relative to the possible ones. Specifically, there was an increased frequency of behaviors indicative of curiosity which includes looking back ($p<.003$), as well as more expressions of surprise, such as open wide eyes ($p<.001$) and raised eyebrows ($p<.04$). These results suggest that infants may have a gradually developing foundation of mental representation regarding global object coherence.

Evaluation of Preferred Sorting Strategies for Categorizing Pictures and Words

Danielle Torre (Psychology)
Faculty Mentor: Sarah Shuwairi (Psychology)

Our goal was to learn more about people's abilities to detect a variety of different perceptual properties and use this information to classify pictures and words into groups based on perceived similarities. In this experiment we were interested in evaluating which information is more readily detected when adult observers examine sets of pictures and words. For example, would they notice the font type of printed words or the semantic meanings? And, would the perceptual or semantic contents dominate their sorting of the stimuli into groups? When subjects were presented with pictures of artwork, they sorted by semantic contents (e.g., people vs. nature) of the paintings rather than by artistic style (e.g., realism vs. impressionism). The headline clippings consisted of 14 words in smaller and larger font sizes and types (e.g., serif vs. sans serif) appearing in bold and unbold. We observed 30 college students in a free-sorting task in which subjects were asked to group the words based on what seemed natural and best to them. We also examined thinking style (e.g., holistic vs. analytical) in correlation with sorting style. Only 12% of subjects ever sorted by artistic style in the first round and 7% sorted by bold/unbold in the first try, and very few ever reported noticing these perceptual properties. Most observers readily classify pictures of objects and words based on semantic associations, rather than low-level perceptual properties that may not be as obvious or salient.

The Ancestor's Trail: An Evolutionary Pilgrimage Through Time

Olivia Jewell (Psychology)
Faculty Mentor: Aron Wiegand (Psychology)
Faculty Mentor: Glenn Geher (Psychology)

The Ancestor's Trail is an educational outreach tool designed to teach its visitors about the evolutionary tree of life based on the works of Charles Darwin. The idea for the trail comes from a book by Richard Dawkins called *The Ancestor's Tale*, which describes the journey of genetic life going back through evolutionary and geological time, until the earliest and simplest life forms. The trail itself features several different trailheads, each representing a unique category of species and its ancestors. A visitor to the trail, or Pilgrim, chooses a trail which "starts" at a modern-day species. As the Pilgrim walks down the trail each step represents a certain number of years into the past, creating a life-size model of evolutionary time. Along the way, the Pilgrim will "encounter" ancestors of the species represented by the trail, as well as common ancestors with species's represented by other trails. The goal of the trail is to create an interactive teaching environment where pilgrims can learn about the expanses of evolutionary time, the intimate relationships between all living things, the impact of geological and environmental changes on evolution, and the factors that influence evolution, both within and external to an individual species. The project seeks to foster an environment of curiosity and learning, where people from across the Hudson Valley community can come learn about the evolutionary processes that have helped create the world as we know it today.

Queer Sexuality in Video Games

Steven Bagoly (Sociology)
Faculty Mentor: Judith Halasz (Sociology)

This paper explores how the history of digital game culture has influenced the identity of the modern-day gamer, and the way this has structured the representation of lesbian, gay, bisexual, and transgender (LGBT) characters in the video game industry through a statistical analysis. Ultimately, the research looks to find how this diverse representation affects the experience of gamers. Factors that were analyzed include (a) the age distribution of modern gamers; (b) the centrality of these LGBT characters; (c) the critical ratings attributed to most of the games throughout history with any explicit LGBT representation; (d) arguments against representation that have played a role in the development of games; and (e) how LGBT players have identified themselves in video games without explicit representation. The analysis finds that there has been an overall positive trajectory in terms of the number of LGBT characters in video games over the past 30 years, and that games with multiple explicit representations of LGBT characters can be and have been critically successful. Although there is still much research to be done into the intersection of sexuality and digital games, the findings indicate a shift in a desire for the representation of a demographic that has historically not been marketed to in this medium.

Community Responses to the Influx of Unaccompanied Minors in the Hudson Valley

Timothy Allan (Sociology)
Faculty Mentor: Anne Roschelle (Sociology)

In June 2014 approximately 10,000 unaccompanied minors migrated to the United States from Central America. This initial influx of child migrants into the Hudson Valley created a humanitarian crisis. The overwhelming majority of kids spoke either Spanish or only their indigenous language and many were traumatized by the journey. There were no services in place for these minor children or for their sponsors. Service providers, educators, and immigration lawyers were caught off guard and scrambled desperately to find solutions to the complex problems associated with the unprecedented arrival of unaccompanied immigrant children. This research examines how federal immigration policy impacted child migrants at the local Hudson Valley level and the collective response by service providers, educators, activists, and immigration lawyers to effectively deal with the crisis. Through twenty-five qualitative interviews, obtained via snowball sample, we present the voices of those on-the-ground individuals who responded to the lack of support for these kids, and attempted to organize an interconnected web of local services, in the context of federal immigration policy. In addition, we present alternative policy recommendations formulated by service providers and immigration advocates based on their experiences working with unaccompanied minors and their family members. Finally, we present policy suggestions of our own, based on our fieldwork and our combined expertise.

Social Emotional Learning in a Small City School District

Danielle Carollo (Economics)
Faculty Mentor: Robin Jacobowitz (The Benjamin Center)

Social Emotional Learning (SEL) is “the process through which children and adults acquire and effectively apply the knowledge, attitudes, and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions." A nature-based, experiential education organization partnered with the small city school district to design a program to target social and emotional wellness of students in three areas: building inner character; strengthening and supporting the social health and well-being of participants, and regenerating healthy and whole communities. The effects of this program are being assessed through qualitative and quantitative methods; a qualitative approach explores the impact of project activities on SEL measures, as well as challenges of program implementation. A quantitative approach is used to measure student growth on SEL measures. Research methods and interim outcomes will be discussed at the symposium.

To Kill a Mockingbird: Set Design

Alayna Klein (Theatre Arts)
Faculty Mentor: Ken Goldstein (Theatre Arts)

Creating an evocative and cohesive set design for SUNY New Paltz's Fall 2017's production of *To Kill a Mockingbird*, required historical, emotional, and imagery based research. Adapted from Harper Lee's novel, *To Kill a Mockingbird* follows a child's perspective of a small town in 1930's Alabama. Before beginning the design process, it was crucial to research the specific time and place of the play, the different cases of racial injustice, and Harper Lee, herself. Collaborating with the director, Catherine Doherty, the set design for this small town came to life. It was important that the space reflected the contrast between the world of the children, the tragic events happening in the town, and how compassion and cruelty exists in both. I was able to achieve this by focusing on how color, texture, and patina are able to convey a community with a deep history. After doing sketches, a model, drafting, and paint elevations, I worked closely with the technical director to oversee the construction of the scenery, as well as lead a team of painters to make the set become an environment for the characters.

Costume Design for To Kill a Mockingbird

Kirsten Walsh (Theatre Arts)
Faculty Mentor: Andrea Varga (Theatre Arts)

Initial costume design research for the SUNY New Paltz Theatre Arts production of *To Kill a Mockingbird* by Christopher Sergel based upon the novel by Harper Lee, was influenced by the photography of Walker Evans in rural Alabama during the 1930s, and vintage depression-era Sears catalogs. Fashion research from this era inspired the development of a unique and authentic look created by the costume shop for each character while maintaining accuracy for the time period and location. The color palette was composed of muted complimentary colors, blue and orange, to achieve the director's desired sepia overtone for the production design, while also metaphorically representing the moral division of the community residents. The intimate thrust space of Parker Theatre presented the opportunity to include small details found in the research that could be seen by the audience in close proximity. Vintage reproduction fabrics and distressing techniques gave depth and authenticity to the characters and their lives.

Late submissions:

What we do around the forest: Impacting the Lives of Birds Within

Sarah Robinson (Biology)
Faculty Mentor: Kara Belinsky (Biology)

To investigate how urbanization impacts forest bird diversity and survivorship, we implemented the MAPS (Monitoring Avian Population and Survivorship) protocol to catch birds in nets, to identify, band, and then safely release them. We operated MAPS at two sites: one site is surrounded by protected lands (Mohonk Preserve), while the other is surrounded by a surban campus (SUNY New Paltz). From two years of data, we recorded more long distance migrants at our Mohonk site, and more short distance migrants at our campus site. We also found that more birds banded in our 2016 season returned in the 2017 season at our Mohonk site. This means that the neighboring lands influence how long distance migrants choose their habitat from year to year. Although the forest with neighboring protected lands supported more forest bird species, the small forest next to our campus still proves to be important for some bird species and it acts also as an important stop-over site during migration.

Power, Politics, and Perception: Locally Elected Official's View on Gender Representation in Government

Jesmine Romanelli (International Relations) Timothy Allan (Sociology)

Faculty Mentor: Kathleen Tobin (Sociology and Benjamin Center)

Since 1920, the year women got the right to vote in the United States, women's representation in local, state, and national government has steadily increased. With a female lieutenant governor, 8 women holding seats in US Congress and a rank of 20th in the country among state legislatures for their proportion of women, New York State has made considerable progress in expanding women's representation in elected office. At the local level, nearly one third (29.6%) of elected local government officials in New York are women. Nevertheless, women make up approximately 51% of our population and are still underrepresented. Although political representation has increased, do local officials place importance on reducing the gender gap in politics? This research compares New York State's locally elected officials and residents perceptions of the role and importance of women in local, state and national government. Our data collection methodology consists of a statewide simple random sample of elected officials in cities, counties, towns, and villages. As interns at The Benjamin Center for Public Policy Initiatives, we assisted in conducting an online survey with a sample of 383 locally elected officials in order to better understand New York State's political actors' perceptions on a myriad of issues, including the importance of increasing the numbers of women in government. Data collected will be analyzed and compared to the responses of New York State residents from a separate poll done in 2017.

Publication Opportunities for Undergraduates

Pittsburgh Undergraduate Review PUR is a multidisciplinary journal that accepts papers from around the world http://www.pur.honorscollege.pitt.edu/

Undergraduate Economic Review aimed at promoting high quality undergraduate research http://titan.iwu.edu/%7Eecon/uer/index.html

Undergraduate Journal for Global Business and Community, offers undergraduate students a venue for publishing works http://jgbc.fiu.edu/index.php?journal=JGBC

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. http://www.abington.psu.edu/dialectics/

Pi Sigma Alpha Undergraduate Journal of Politics built a reputation for publishing outstanding research by undergraduate students. http://web.ics.purdue.edu/~psalpha/journal/call.html

Issues in Political Economy is committed to supporting and encouraging quality undergraduate research in all areas of economics. http://www.elon.edu/e-web/students/ipe/journalinfo.xhtml

Critique provides a forum for graduate and undergraduate students of politics to express and exchange diverse ideas and to imagine new possibilities for democracy and justice https://about.illinoisstate.edu/critique/Pages/default.aspx

The Penn Bioethics Journal is the nation's premier peer-reviewed undergraduate bioethics journal. http://bioethicsjournal.com/about/

IMPULSE is the first international, online neuroscience journal for undergraduate publications. http://impulse.appstate.edu/

Undergraduate Research Journal for the Human Sciences The URC Undergraduate Research Journal is an annual online national, reviewed journal dedicated to the publication of undergraduate student research. The twofold purpose of the journal is to foster and reward the scholarly efforts of undergraduate human sciences students as well as to provide a valuable learning experience. http://www.kon.org/CFP/cfp_urjhs.html

National Undergraduate Research Clearinghouse accepts any scientific manuscript. They can be empirical studies or literature reviews. http://www.webclearinghouse.net/help.php

American Journal of Undergraduate Research A refereed journal for undergraduate research in the pure and applied sciences, mathematics, engineering, technology, and related areas in education. http://www.ajur.uni.edu/

Catalyst: Rice Undergraduate Science and Engineering Review http://catalyst.rice.edu/ Submissions for reviews will be accepted from undergraduate students who have performed science or engineering research at any international university or research institution laboratory.

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. http://www.yale.edu/yrurp/

Psi Chi Journal of Undergraduate Research a national, fully reviewed, quarterly journal dedicated to the publication of undergraduate psychology student research. http://www.psichi.org

Journal of Young Investigators JYI's web journal (which is also called JYI) is dedicated to the presentation of undergraduate research in science, mathematics, and engineering. http://www.jyi.org/about/

Journal of Undergraduate Chemistry Research is a new peer review journal that will be published quarterly with papers of original research performed by undergraduates. http://www.vmi.edu/show.aspx?tid=36955&id=2214&ekmensel=8f9c37c3_156_160_2214_3

The Allegheny Review is one of America's few nationwide literary magazines dedicated exclusively to undergraduate works of poetry, fiction, creative nonfiction, and art http://alleghenyreview.wordpress.com/

The Oswald Review, An International Journal of Undergraduate Research and Criticism in the Discipline of English http://scholarcommons.sc.edu/tor/

Young Scholars in Writing: Undergraduate Research Young Scholars in Writing: Undergraduate Research in Writing and Rhetoric, a peer-reviewed journal for undergraduates.http://cas.umkc.edu/english/publications/youngscholarsinwriting/index3.html

History Matters: An Undergraduate Journal of Historical Research. http://www.historymatters.appstate.edu/

AnthroJournal is an open source journal of outstanding scholarly research papers and reports authored primarily by undergraduate and graduate college students. http://www.anthrojournal.com/

Valley Humanities Review http://www.lvc.edu/vhr

Discussions, the Undergraduate Research Journal of Case Western Reserve University Information about *Discussions* can be found at: http://case.edu/discussions/

2017 SURE Award Recipients

Emily Correia, Environmental Studies, ’18 (Mentor: Alex Bartholomew, Geology)
Astrochronology and Faunal Investigation of the Lower Devonian (Emsian) Esopus and Schoharie Formations in the Hudson Valley

Sarah Robinson, Biology, ’19 (Mentor: Kara Belinsky, Biology)
Color Banding Birds to Track Individual Behavior Across a Suburban Campus

Carmina Chloe Taduran, Biology, ’18, and **Katherine Dobosh**, Biology, ‘19 (Mentor: Lydia Bright, Biology)
Understanding Protein Evolution through Comparative Localization of Membrane Trafficking Proteins in *Paramecium* cells

Haley Springston, Geology, ‘18 (Mentors: Shafiul Chowdhury, Geology)
Development of a Conceptual Model to Evaluate the Potential for an On-Campus Groundwater Supply Wellfield to Fulfill the Water Needs of SUNY New Paltz

Nicholas Gonda, EGS, ’17 (Mentor: Megan Ferguson, Chemistry)
Examining the Potential for Disinfection Byproduct Formation in Wallkill River Water

Emily Steward, Mechanical Engineering, ’19 (Mentor: Michael Gayk, Art/Metal)
“And by Sea”

Lucas Tracy, Physics, ’19 (Mentor: Catherine Herne, Physics and Astronomy)
Determining Elliptical Polarization of Light from Rotation of Calcite Crystals

Dan Hulseapple, History, ’18 (Mentor: Keely Heuer)
Art and Empire: Akkadian Kings and their Influence on Political Visual Culture

Ada Bellantoni, Geography, ’18 (Mentor: Scott LeVine)
Quantitative Content Analysis of Urban Transportation Planning Studies

Gregory Krupp, Geography, ’19 (Mentor: Lawrence McGlinn, Geography)
Historical Maps of New Paltz: Georeferencing and Uncertainty

Carina Kohn, English/Creative Writing, ’18 (Mentor: Cyrus Mulready, English)
The Next Keeper of the belt: Objects, Family, and the Russian Diaspora

Andrea Bialosuknia, English, ’18 (Mentor: Thomas Olsen, English)
A Study of Power, Politics, and Personal Identity in Shakespeare’s History Plays

Elizabeth Chase, English; Jewish Studies, German, ’17 (Mentor: Vanessa Plumly)
Woman as Ideological Bridge: Assessing Continuities in Weimar and Nazi German Cinema

2017 SURE Award Recipients continued….

Heather Wander, Biology, ’19 (Mentor: David Richardson, Biology)
Zooplankton Diversity and Density as Mediators of Trophic Cascades and Food Web Shifts in Lake Minnewaska, NY

Meagan Stone, Geography, ’18 (Mentor: Melissa Yang Rock, Geography)
Blue Light Phones and Campus Security: Assessing Visibility, Accessibility and Knowledge of Blue Light Phones Using a Mixed-Method Research Approach

Mary Dellas, Public Relations, ’18 (Mentor: Rachel Somerstein, Digital Media & Journal)
Strangers in a Strange Land: News Photographs of Syrian Refugees in U.S., Canadian, and Lebanese Newspapers

Esther Chan, Biochemistry, ’18 (Mentor: Pamela St. John, Chemistry)
Optimizing BPA detection Using HPLC and Studying its Effects Using AFM

Megan Gangewere, Mechanical Engineering, ’18 (Mentor: Rachmadian Wulandana, Engineering)
Tesla Turbines with Removable Rotor Discs and Nozzels

Fall 2017 AYURE Award Recipients

James Araneo, Mechanical Engineering, `18
(Mentor: Rachmadian Wulandana, Mechanical Engineering)
Energy Harvesting from Vortex-induced Autorotating Bladeless Turbine

Katherine Dobosh, Biology & Psychology/Evolutionary Studies
(Mentor: Lydia Bright, Biology)
Tracking Relatedness between *Paramecium* Isolates from Local Ponds

Simone Evans, Mathematics/Biochemistry, `19
(Mentor: Anca Radulescu, Mathematics)
Dynamic Behavior in Networks of Complex Quadratic Maps

Ashley Fisher, Biology/ Spanish, `19
(Mentor: Maureen Morrow, Biology)
The Effect of Atrazine on the Cytoskeletal Structure of Jurkat Cells

Amber Funk, Biology,`19
Brett Pinsky, Biochemestry, `18
Nicholas Wills, Bilology, `18
(Mentor: Spencer Mass, Biology)
Comparison of BPA with Paclitaxel on Regeneration in Planaria

Brittany Grandville, Biochemistry/ Business Administration,`18
(Mentor: Jason Valens, Biology)
Metagenomic analysis of Brazilian Amazon river sediments

Jaclyn Greco, Adolescence Education, Concentration in Mathematics
(Mentor: Kate McCoy, Educational Studies and Leadership)
History, Educational Policy, & Ideology: A Systems Approach

Alyna Klein, Theatre Arts/Visual Arts `18
(Mentor: Ken Goldstein, Theater Arts)
Scenic Design and Research for Harper Lee's To Kill a Mockingbird, by Christopher SergelChristina

Christina Krause, Psychology/Psychobiology, `18
Danielle Longo, Psychology/Sociology, `18
(Mentor: Sarah Shuwairi, Psychology)
Young Infants' Facial Expression and Affective Responses to Impossible Figures

Fall 2017 AYURE Award Recipients continued…

Cuiyu Kuang, Mechanical Engineering. `18
(Mentor: Heather Lai, Engineering)
Modeling and Characterization of Viscoelastic 3D Printed Materials

Sawyer McFadden, Environmental Geothermal Science/Computer Science, `18
(Mentor: David Richardson, Biology)
Nutrient Profiles of Lakes with Differing Trophic States in the Shawangunk Mountains

Gabrielle Jones, Chemistry, ’16, and **Brett Pinsky**, Biochemistry, ’18
(Mentors: Maureen Morrow, Biology, Preeti Dhar, Chemistry)
Stimulation of B16 Cells by PC and HM Plant Extracts

Jessica Mortensen, Anthropology/Biochemistry, ‘17
(Mentor: Kenneth Nystrom, Anthropology)
Reconstructing Faunal Diet at the Site of Nadin, Croatia

Hailee Edwards, Biology, ’18, **Anthony Hollander**, Biology, ’18, **Kayla Reid**, Biochemistry, ’18, and **Heather Wander**, Biology, ’18
(Mentor: David Richardson, Biology)
Nutrient Limitation of Algal Growth and Food Webs in Lake Minnewaska

Samantha Guglielmo, Theatre Arts/Art History, ‘17
(Mentor: Andrea Varga, Theatre Arts)
Costume Design for Theatre Arts production of *The Shadow of a Gunman* by Sean O’Casey

Matthew Ryan Limerick, Theatre Arts, ‘17
(Mentor: Andrea Varga, Theatre Arts)
Costume Design for an original play “Mask’s Off” by student playwright Raine Grayson

Spring 2018 AYURE Award Recipients

Yura Yokoyama, Anthropology, '18
(Mentor: Benjamin Junge, Anthropology)
Ethnic, National, and Class Identities among Japanese-Brazilians

Michelle Pirrone, Mechanical Engineering, '20
(Mentor: Spencer Mass, Biology)
Amphibious locomotion in ambystomoid salamanders

Jennifer Luu, Mechanical Engineering, '19
(Mentor: Rachmadian Wulandana, Mechanical Engineering)
Self-unfolding mechanism for ultra-light wings

Jessica Siconolfi, Biochemistry, '19
(Mentor: Jennifer Turner Waldo, Biology)
Genetic analysis of plant-derived ingredients in pet foods

Student Travel Awards

URETA

-Undergraduate Research Experience Travel Award: conference travel funding provided to students who participated in AYURE or SURE.
Thirteen URETA students presented at professional conferences during the 2017/2018 Academic Year.

STA

-Student Travel Award: conference travel funding provided to students who have not participated in AYURE or SURE.
Eighteen STA students presented at professional conferences during the 2017/2018 Academic Year.

SURC

Twenty four New Paltz students, (22 separate projects), listed below, presented the results of their faculty mentored research projects at the annual SUNY Undergraduate Research Conference (SURC).
The conference was held on April 20, 2018.

Title	Name(s)		Mentor	
LIVING STRANGE, a young adult novel	Allison	Giese	Larry	Carr
Towards Re-embodiment: Creating Through the Body in the Wake of Trauma	Hannah	Ward	Jessica	Pabón
Investigating the Power Harvesting Potential of Mini Bladeless 3D-Printed Turbines	James	Araneo	Rachmadian	Wulandana
Small-Scale Tesla Turbine Redesign with Removable Rotor Configuration	Megan	Gangewere	Rachmadian	Wulandana
Data Acquisition and Analysis of 3D-Printed Tesla Turbines and Vortex-Induced Auto-Rotating Turbines	David	Foote	Rachmadian	Wulandana
An Augmentation Extending the Suitable Viscosity Range for a Benchtop Viscometer	Vaughan	Clewis	Kevin	Shanley
Solar-Powered Portable Medical Cooler Using Thermoelectric Cooling (TEC)	Adama Faramarz	Ouedraogo Vaziri	Rachmadian	Wulandana
Female Body Ideals Across the World Explained through Waist-to-Hip Ratio	Kelsey	Newhook	Glenn	Geher
Differences in Reactions to Infidelity Based on Sex and Sexuality	Alec	Goldstein	Glenn	Geher
Template iterations of quadratic maps and hybrid Mandelbrot sets	Kelsey	Butera	Anca	Radulescu
Jewish Feminism in the Age of Trump	Miriam	Ehrlich	Jessica	Pabón
Women of Color Feminisms in Academic Spaces	Justine	Veras	Jessica	Pabón
The Effect of Macroeconomic Activity on Climate Change	Danielle	Carollo	Simin	Mozayeni
The Keeper of the Belt: Exploring Objects, Family, and the Russian Diaspora	Carina	Kohn	Cyrus	Mulready
Aaron Burr: Villain To Hero Upgrade	Barbara	Pralat	Susan	Lewis
Dynamics of Quadratic Networks	Simone	Evans	Anca	Radulescu
System on Chip Implementation of a Multilayer Perceptron	Anthony Thomas	Carvino Coppola	Yi-Chung	Chen
"Performance, Trauma and Identity: Looking at the Reign of William the Conqueror in the aftermath of Prince Cnut"	Reuben	Slater	Michael	Vargas
Sampling the genetic diversity of Paramecium in local ponds	Katherine	Dobosh	Lydia	Bright
Protein Evolution: A Look into Rab GTPase Gene Family Evolution	Bridget	McGuire	Lydia	Bright
A Benchtop Falling Ball Viscometer for Measuring the Viscosity of Highly Viscous Fluids	Kristen	O'Sullivan	Kevin	Shanley
Quantifying Infants' Facial and Affective Responses to Possible and Impossible Figures	Christina	Krause	Sarah	Shuwairi