



2017 SRS

23rd
Annual SUNY New Paltz
Student Research Symposium

Abstract Book



New Paltz
STATE UNIVERSITY OF NEW YORK

23rd ANNUAL SUNY NEW PALTZ STUDENT RESEARCH SYMPOSIUM

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

***Friday, May 5, 2017
Sojourner Truth Library
4:00 - 6:30 p.m.***

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

The 2017 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 2017 Student Research Symposium includes 75 poster presentations of work performed by 116 students representing 20 majors, sponsored by 39 faculty mentors representing 16 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

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The RSCA Advisory Board:

Kara Belinsky (Biology), Michael Chuang (Business), Laura Dull (Teaching and Learning),
Ari Pignatelli (Student Representative), Jaclynne Kerner (Art History),
Emma Clausen (Library), Francis Valiquette (Mathematics),
Dana Arthur (Communications Disorders), Jessica Pabon
(Women's, Gender, and Sexuality Studies)
Maureen Morrow (RSCA Director, Biology)

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 2017 Student Research Symposium. Today's event is the 23rd 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 49-54).

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 conferences.

WE ARE ON FACEBOOK

SUNY New Paltz Undergraduate Research, Scholarship and Creative Activities Group
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COUNCIL ON UNDERGRADUATE RESEARCH INSTITUTIONAL MEMBERSHIP

CUR provides support for undergraduate research in a variety of way. All faculty, staff, and students are eligible for free membership in CUR. Your membership sends a strong message to lawmakers and provides you with access to the CUR Quarterly Publication and monthly e-newsletters.

Students should consider participating in CUR's Undergraduate Registry. The purpose of this Registry is to facilitate matching between undergraduates and graduate schools seeking high quality students who are well prepared for research.

<http://www.cur.org/ugreg/register.asp>



SUNY NEW PALTZ
IS AN INSTITUTIONAL MEMBER OF THE
COUNCIL ON UNDERGRADUATE RESEARCH

Learning Through Research

Poster Sessions at-a-glance

Poster Session I 4:30-5:10 pm

ELICK, Troy; SCULLY, Ciara	<i>Using Bird feeders to Study Bird Diversity on a Suburban Campus</i>
GHEEVARGHESE, Reshma	<i>Using DNA Fingerprinting to Understand Songbird Family Structure</i>
HOLLANDER, Anthony	<i>Supplementation at Birdfeeders: A Preliminary Mealworm Study</i>
MABEY, Aidan; STARK, Laura; ELLICK, Troy	<i>Bird Communities in Two Forest Fragments: Does Fragment Size Matter?</i>
STARK, Laura	<i>An Examination of Historical Bird Data from Mohonk Preserve</i>
BADE, Kelly	<i>Chickadee Habitat Preference in the Millbrook Preserve</i>
RAMAYANI, Aakriti; SHE, Tianyu;	<i>Synthesis of Versatile Starting Materials: The Iodo-Alcohols</i>
CUMMINGS, Mackenzie	
PRENAJ, Arjeta	<i>Exploring Illegal Drug Policy Making in the United States</i>
GARMON, Zanyell	<i>Reverence, Refuge, Despair, and Loss: Poetic Encounters with Nature</i>
GRECO, Jaclyn	<i>Political Representation of Women in the Mid-Hudson</i>
WIELAND, Robert; WAKEFORD, Colin	<i>Weather Data Analysis using MapReduce Based K-means Algorithm</i>
JONES, Chris	<i>The Effect of Minimum Wage on the Poverty Rate in California</i>
ANDERSON, William	<i>Fossil Fuel Consumption and CO2 Emissions: An Environmental Kuznets Curve Analysis</i>
WYLER, Samantha	<i>Sums of Consecutive Polygonal Numbers</i>
COLON, Jonathan	<i>Equivalence of Autonomous k-th Order Difference Equations Under Point Transformations</i>
ROBERTS, Steven	<i>The Stockhausen Project</i>
FITZPATRICK, Kelly; ARGUELLO, Melyssa	<i>Goal Shifting in Older Adults</i>
TALLONI-PERLETT, Maria; PATERNELLA, Jonimaree; SWEENEY, Meagan; GUNN, Bridget	<i>Perceived Stigma among Mono & Bisexuals in LGBTQIA+ Community</i>
HERMAN, Kathleen; MILLER, Tyler;	<i>Colored Targets and Distractors in Attentional Capture</i>
MENDEZ-SANCHEZ, Evelyn; HALADY, Ellen	
MATTHEWS, Hailey; MARTINEZ, Gabriella;	<i>Lucid Dreaming</i>
HAN, Samuel	
CHABRIA, Trisha; PASKOFF, Regina;	<i>Does hand proximity affect sentence processing?</i>
CHASON, Matt	
LIMERICK, Matthew	<i>Unmasked Costume Designs</i>
PLANKE, Julie	<i>How Do We Form Categories of Pictures, Objects and Words?</i>
GUGLIELMO, Samantha	<i>Shadow of a Gunman Costume Design</i>
BARRETT, Caitlynn	<i>Oklahoma! Set Design</i>
MANCINI, Leah; BARTER, Ariel; ROLON, Vania	<i>The Emotional Impacts of Competitive, Cooperative, and Solo Gameplay in Adults</i>

Poster Session II 5:10-5:50 pm

HANNA, Stephanie	<i>Isolation and Characterization of an Isaria fumosorosea Anti-Fungal Metabolite</i>
LOPEZ, Leesandra	<i>Verification of ingredient claims in commercial soap products via DNA extraction and analysis</i>
HOLLANDER, Anthony; WANDER, Heather; EMMA, Bruno; EDWARDS, Hailee; GREEN, Deaja; MCFADDEN, Sawyer; REID, Kayla SICONOLFI, Jessica	<i>Lake Minnewaska Recovery from a Trophic Level Loss</i>
ZLOTNICK, Andrew	<i>DNA Analysis of Commercial Cat Foods to Investigate Accuracy of Labeled Ingredients</i>
EDWARDS, Hailee; REID, Kayla; BRUNO, Emma; GREEN, Dejae; HOLLANDER, Anthony; MCFADDEN, Sawyer; WANDER, Heather	<i>Analysis of Bacterial Lipopolysaccharides Using Atomic Force Microscopy</i>
RIGAUD, Nicolette; FORTADO, Jessica; CRIOLLO, Alexa	<i>Co-limitation of nitrogen and phosphorus as a bottom-up control on algal biomass</i>
MATHEW, Tobin	<i>Developing a Method to Examine Steric Forces of Lipopolysaccharides by AFM</i>
FAGAN, Abigail; MOODY, Troy	<i>When Axolotls Metamorphose: The Kinematics of Salamanders that Shouldn't Walk</i>
PINSKY, Brett; LIU, Tina; KING, Cassidy	<i>Quantifying Bisphenol A Absorption in Planaria and Studying its Effects on Planaria Regeneration</i>
CHIPKIN, Julian	<i>COMPARATIVE TOXICITY OF HERACLEUM AND PSORALEA EXTRACTS</i>
ORDONEZ, Tamara; KENNEDY, Robert; KUANG, Cuiyu; GANGEWERE, Megan	<i>Simulation of the Manufacturing Process of Foamed Cement</i>
VAUGHN, Clewis; PALOMBO, Thomas; PALOMBO, Joseph	<i>Effectiveness of Supercritical CO₂ Rankine Cycles</i>
TRACY, Lucas; CATTANI, Matthew	<i>Sustainability Analysis of Renewable Energy Technologies on the Island of Batanta</i>
HOLMBERG, Patrick; BURGOS, Angelique; SPRIGGS, Brett	<i>Examining the use of Super-critical Carbon Dioxide as a Refrigerant</i>
BARONI, Amanda; TALLONI, Maria	<i>Measuring rotation rates of graphite in Laguerre-Gauss modes</i>
IBBETSON, Scott; MOSCHETTO, Caitlin; GREENSPON, Lina	<i>"Four in a Row" - How Extending Variable Target Repetitions Alters Attentional Capture</i>
BOGERT, Rachel; BROCK, Kasey; MUELLER, Jessica; MOSCATIELLO, Nicholas	<i>Expectations for Future Careers: A Comparison Between Heterosexual and LGBT*Q Identified Undergraduates</i>
ARENA, Robert	<i>Testing the Supermodel of Letter Recognition</i>
TALLONI-PERLETT, Maria; SWEENEY, Meagan; PATERNELLA, Jonimaree	<i>Targets and Distractors Sometimes Share Shapes Across Displays</i>
MABIE, Brittany; TOZSER, Timea; BLANKSTEIN, Melissa; MARIVELLI, Cari; SCHNEIDER, Monica; SCARIMBOLO, Katrina; MIRO, Lauren; GILLEN, Faith	<i>Investigating the Validity and Reliability of a Discounted Utility Scale</i>
PLANKE, Julie	<i>Gender Differences in Ambivalent Sexism and Political Beliefs</i>
	<i>What If We had Never Broken Up?</i>
	<i>The Evolutionary Mismatch of Familial Proximity Relating to Mental Health</i>

MATUS, Katherine

Low Income Communities in Long Island, NY Affected by Sea Level Rise | A cross-disciplinary study of income levels on climate resiliency Play Among Nursing Home Residents

MANCINI, Leah

CAHILL-ASSENZA, Brian

Immersive Audio in Virtual Reality

Poster Session III 5:50-6:30 pm

MODI, Viraj

Evolution of Rab GTPase proteins in Paramecium cells

WOYCH, Jamie; GEORGALAS, Christina

The Printing of Three Dimensional Biochemical Models

MARX, Miriam

Nosing out who can smell pungent asparagus metabolites

DERAMON, Edward

CATALYSIS OF THE HYDROLYSIS OF POLY(METHYL METHACRYLATE) USING CHAOTROPIC AGENTS

FISHER, Ashley

The Effect of Atrazine on the Cytoskeletal Structure of Jurkat Cells

SCARIMBOLO, Laura

The Effect of Modeled Microgravity on the Activation of Jurkat Cells

CUSHEN, Kate

Middle Devonian Plant Specimens of the Plattekill Fm., Shokan, NY

AHMED, Alvina

Sickness and Seduction in Thomas Mann's The Magic Mountain

BEST, Brianna

Trans-space and Performance: Liminality and the Gender Relations in Mädchen in Uniform

ATKINS, Dylan; GOTTSTINE, Matthew

Anisotropic Effects of Print Orientation on Mechanical Properties of 3D Printed Polymers

ZOEGER BOGGIANO, Christian; YANG, Jack

Use of Digital Image Correlation to Find Material Properties of Carbon Fiber Composites

YANG, Jack; ZOEGER, Christian; ATKINS, Dylan; HUANG, Jeffrey

Effect of Common Print Parameters on the Mechanical Properties of the Produced Parts

GANGEWERE, Megan; O'SULLIVAN, Kristen

Energy Efficiency Assessment of SUNY New Paltz Resnick Engineering Hall using Computer Software Program, eQUEST

HUANG, Jeffrey

Comparison of Mechanical Performance of 3D Printed Polymers to Injection Molding

BROGAN, Daniel; CATTANI, Matthew

Determination of Laser Mode Polarization via Birefringent Particle Motion

CATTANI, Matthew

Analysis techniques for calcite crystal motion

LONGO, Danielle

Do young infants react with surprise, curiosity or puzzlement when viewing optical illusions?

GRUSKIN, Kathryne

The Evolved Classroom: Using Evolutionary Theory to Inform Elementary Pedagogy

NEWHOOK, Kelsey; VANIA, Rolon

Female Body Ideals Across the World Explained through Waist-to-Hip Ratio

PLANKE, Julie

Eye Movements in 4-month-olds Viewing Impossible Objects

SCARIMBOLO, Katrina

Reactions to Behaviors: BFRBS and The Role of Education

HOLLER, Richard; DI SANTO, Jacqueline; CHASON, Matthew; EISENBERG, Jacqueline JEWELL, Olivia

Friends, Love, & tinder: An Evolutionary Mismatch of Mating Strategies
Investigating Emotions in Music

Abstracts

Isolation and Characterization of an Isaria Anti-Fungal Metabolite

Stephanie Hanna (Biochemistry)

Faculty Mentor: Maureen Morrow (Biology)

Isaria fumosorosea, a fungus known to act as a parasite for many species of insects, also possesses anti-fungal metabolite activity. Previously, samples of the metabolite were examined by SDS page, which showed bands and revealed that there are proteins present in the metabolite sample. The anti-fungal activity is associated with molecules less than 5KDa in size and is destroyed by a protease. Last semester we succeeded in achieving appropriate separation of the sample mixture with a solvent system of acetone, acetic acid, and water. Now, we intend to characterize the metabolite through subjecting it to size fractionation and then performing TLC analysis on the lyophilized samples. Our protocol for TLC analysis involves two plates, both containing the size fractionated samples containing molecules less than 5 KDa. One plate will be stained with ninhydrin to view separation of the sample, whereas the other will be exposed to activated fungal spores to ensure the metabolite is present in the sample and has not been affected by TLC analysis. Ultimately, the goal is to isolate the peptide using TLC and use NMR spectroscopy to determine the composition.

Using DNA Fingerprinting to Understand Songbird Family Structure

Reshma Gheevarghese (Cell/Molecular Biology (BS))

Faculty Mentor: Kara Belinsky (Biology)

Faculty Mentor: Jennifer Waldo (Biology)

Many songbirds are raised by socially monogamous pairs of parents, but instances of infidelity among some of the parent songbirds have been observed. Veery is a species of thrush with mysterious family life that breeds in the forests of the North East, United States. In Dutchess County, NY banding of veeries allowed individuals to be identified, and Dr Belinsky and her team observed several instances of multiple males feeding nestlings in the same nest. Are veeries strictly monogamous or not? Do they engage in cooperative breeding? To address these questions, we are conducting a genetic analysis of paternity on blood samples that Dr. Belinsky collected from adults and nestlings at her field site. The hypothesis is that Veeries breed cooperatively, and if this is true then it should be possible to find nests with young veeries fathered by multiple male veeries. To obtain results that will establish the family structure, DNA was extracted from each blood sample, PCR was used to amplify microsatellites that vary among individuals, and each sample was run on a 5% acrylamide gel to visualize the genotypes. The bands in the gels at different length are compared to the molecular marker and provide a genotype for each bird. Comparing this data with the field data already collected is allowing us to better understand the family structure of Veery birds in the Dutchess County.

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

Jessica Siconolfi (Biochemistry)

Faculty Mentor: Jennifer Waldo (Biology)

The purpose of this experiment was to obtain information on the genetic material contained in several commercially produced feline foods by testing them for various plant and animal DNA, and then to compare those findings with the ingredients listed on their labels.

Accurate ingredient labeling on pet food is as significant as with human food. Animals, especially the domestic feline, are extremely susceptible to food allergies, and the health ramifications of long term exposure to food allergens for them mirrors that of humans. Due to a lack of testing and enforcement of pet food for labeling compliance by a governing agency, there is a suspected higher possible incidence of inaccuracy when compared with that of human foods.

To investigate the possibility of label inaccuracy, several commercial cat foods were analyzed to determine the plant and animal sources used in their manufacture. 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 added, 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.

Supplementation at Birdfeeders: A Preliminary Mealworm Study

Anthony Hollander (Biology)

Faculty Mentor: Kara Belinsky (Biology)

Urbanization forces birds from their natural habitats into areas with buildings and lots of people. SUNY New Paltz has an established bird feeder network that offers seeds and is visited by various bird species already. However, not all bird species eat seeds, some will only eat other foods like insects, berries and nuts. Food supplementation is adding a new food source to determine if there are any changes to the bird species attracted. In this study, we introduced mealworms as an additional type of food along with the seeds we already provided at the feeders. We then recorded videos at each feeder for one hour after the mealworms were provided, and we measured which bird species ate the mealworms versus the seed from the feeders. We found that no mealworms were eaten during several trials. We then conducted a second set of trials where activity at each feeder was recorded for seven hours. The mealworms were bought online in bulk but raised, cared for and allowed to breed in a lab on campus. Our preliminary study showed that while birds initially feed on the seed before approaching the mealworms, the longer the mealworms were left out for, the more likely the birds would eat them. Both the 1-hour trials and the 7-hour trial had five species attracted to the mealworms, four were the same for both trial types. The 7-hour trial showed that more time was required than one hour for species to use to the mealworms as a food source.

An Examination of Historical Bird Data from Mohonk Preserve

Laura Stark (Biology)

Faculty Mentor: Kara Belinsky (Biology)

Daniel Smiley was a naturalist and one of the key figures in the formation of the Mohonk Preserve here in New Paltz, NY. He dedicated his entire life to studying the preserve, and recognized the value of preserving historical data in the effort to maintain healthy ecosystems. As the human population grows, urbanization poses a threat to the preservation of natural forest habitats and biodiversity of ecosystems. Birds are often sensitive to human derived habitat alterations, leaving only those that are more urban- or suburban-adapted to survive. Although Mohonk Preserve forests have remained protected over the years, the human disturbance in surrounding areas may influence the ability of certain bird species to succeed there. I investigated the impacts of the New Paltz town population on the bird species that inhabit Duck Pond, a portion of Mohonk Preserve that is relatively close to suburban New Paltz. I compared Breeding Bird Census data from 1974 to 2011 that Daniel Smiley helped obtain to the US Census Bureau data for each decade. I expected avian species richness to decrease over time with increasing human population density. I also predicted that the species more acclimated to human disturbance may increase in presence. In examining this historical data, I hoped to contribute to the ongoing continuation of Daniel Smiley's legacy and provide insight needed to sustain the responsible stewardship of the natural environment that he advocated for.

Using Bird feeders to Study Bird Diversity on a Suburban Campus

Troy Ellick (Biology), Ciara Scully (Geography)

Faculty Mentor: Kara Belinsky (Biology)

The conversion of natural land such as forests and fields, to cities, towns, and farmland is known as urbanization. Urbanization has been found to change wildlife community compositions, increasing invasive species populations' abundances while native species decline. To examine the effects of urbanization, we characterized bird diversity across a suburban campus. We installed a network of 16 bird feeders, in four varying levels of urbanization. We sampled bird diversity at each feeder using 6 hour-long video recordings in spring, summer and fall of 2016, and 3-hour mist-netting and banding sessions at each feeder on two dates from May-July 2016. We then used aerial photographs and GPS ground-truthing to create maps of land cover types with 10 and 50m radius circles around each feeder using ArcGIS. Species richness was highest at the forest edge feeders in our banding data, and was lowest at the central feeders in our video data, indicating that we found the expected trend overall. In addition, invasive house sparrows dominated the Central feeders, accounting for 69.8% of birds banded there. A preliminary analysis of GIS land cover variables indicates that forest cover and pavement are correlated with species diversity. We conclude that subjectively categorized urbanization categories and land cover at the small scales that we measured are both indicators of how urbanization affects bird communities at bird feeders.

Chickadee Habitat Preference in the Millbrook Preserve

Kelly Bade (Biology)

Faculty Mentor: Kara Belinsky (Biology)

Black-capped Chickadees are North American songbirds that live in forests and woody areas. They are a non-migratory species that begin their breeding season searching for a mate in early January. I decided to investigate whether or not they had a preference to a habitat type to breed in. I chose twelve locations in the Millbrook Preserve in New Paltz, NY that were in four different types of habitat: dense deciduous, dense coniferous, lake edge, and swamp. I decided to observe and record the number of chickadees seen, the number vocalizing the “chickadee-dee-dee” call, the number singing “hey, sweetie” for a mate, and the total number of chickadees in the area for ten minutes at each location. I did this once a week for 11 weeks from early January to mid-March. I observed a greater total number of chickadees in dense coniferous habitat, as well as a greater number of singing individuals. Dense deciduous habitat had the least amount of chickadees in total, whereas swamp and lake edge habitats had similar total amounts of chickadees. However, all three of these habitats had similar numbers of singing individuals. These results may suggest that chickadees have a preference for being in dense coniferous habitat, although in terms of searching for a mate they are fairly opportunistic in all habitats. Dense coniferous habitat may offer better protection or more food resources which can attract more birds, but habitat type may have no effect on chickadee breeding.

Bird Communities in Two Forest Fragments: Does Fragment Size Matter?

Aidan Mabey (SUNY New Paltz), Laura Stark (Biology), Troy Ellick (Biology)

Faculty Mentor: Kara Belinsky (Biology)

As human populations expand, forests have become more fragmented. Forest fragmentation diminishes interior habitat while increasing edge habitat. Birds are good indicators of habitat change because they are plentiful and easily observed. The purpose of our research was to characterize how forest fragments varying in size and connectivity support bird community diversity, composition, and breeding productivity. We studied communities in two fragments: a small fragment near the New Paltz campus (87 ac), and one at the edge of Mohonk (8,000 ac). We used a banding protocol which relies on ten nets placed in a 50 acre area. We banded for six hours on 6-7 days during the summer of 2016. We expected greater diversity at Mohonk due to its large size and connection to the nearby larger forest but we found that Campus had higher species richness. Also Campus had 8 unique species while Mohonk had only 5. However, species composition is arguably more important than richness. Mohonk had more migrant species not found on Campus, including the eastern pewee and indigo bunting. Species found only on Campus included the American robin and European starling. These species are residents and are human-associated species. These results indicate that while fragment size and connectivity may not affect overall species richness of bird communities, they do affect composition, and that smaller, unconnected forest fragments may favor invasive/human-commensal species over vulnerable migrants.

Evolution of Rab GTPase proteins in Paramecium cells

Viraj Modi (Cellular & Molecular Biology)

Faculty Mentor: Lydia Bright (Biology)

Millions of years of evolution within different *Paramecium* species have evolved genes, and the proteins for which they code, in parallel with each other. One family of proteins is the Rab-GTPases, highly specific intracellular trafficking proteins that have different functions between different family members. Previous work has shown similar sequences between the Rab-GTPase proteins across independent lineages, with single amino acid residue changes corresponding to differences in targeting. Our goal for this semester was to begin tagging the different Rab-GTPase genes with green fluorescent protein (GFP) in preparation for injection into *Paramecium* cells. Through molecular cloning, we are making a gene fusion of the Rab-GTPase to an antibiotic resistant vector with GFP. The gene fusion will be used to inject into the *Paramecium*. Ultimately we hope to understand the targeting functions of the different Rab-GTPases and to further our understanding of their evolutionary history and the history of the targeted compartments. We also plan to make site-directed, single amino acid substitutions in the parts of the proteins that we think are driving the targeting. Over the summer, we will be injecting and imaging the *Paramecium* cells with the gene fusion products. After injections, we hope to move onto the next phase of the project: studying the localization of the different Rab proteins in *Paramecium* cells from different species.

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

Tobin Mathew (Biology)

Faculty Mentor: Spencer Mass (Biology)

Axolotls (**Ambystoma mexicanum**) are neotenic salamanders that do not typically undergo metamorphosis. They remain aquatic when they reach sexual maturity. Very rarely, some axolotls may spontaneously metamorphose into the terrestrial adult form. Due to the rarity of metamorphosis, very little is known about the biology of terrestrial axolotls. We have three of these metamorphosed axolotls in our laboratory. While observing these axolotls interact with their environment, we noticed that they walked in a seemingly clumsy and awkward fashion. This case study uses motion analysis of slow motion video to investigate the kinematics of terrestrial salamander locomotion. We are comparing terrestrial axolotl locomotion to a close relative in the same genus that does normally metamorphose: the tiger salamander (*Ambystoma tigrinum*). Due to the fact that axolotls are adapted to an aquatic environment, there may be losses and/or changes in developmental processes relative to other terrestrial ambystomoids that would not become phenotypically apparent until metamorphosis. Future studies will examine the neuromuscular anatomy after their natural death to determine whether there are gross anatomical differences between metamorphosed axolotls and tiger salamanders.

The Effect of Modeled Microgravity on the Activation of Jurkat Cells

Laura Scarimbolo (Biology)

Faculty Mentor: Maureen Morrow (Biology)

The microgravity environment experienced in Earth's orbit inhibits various cell types, including T cells. Modeled microgravity (MMG) is used in laboratories to simulate these effects; cultured T cells (Jurkat) are rotated at a rate that maintains them in free fall. The T cell microtubule-organizing center (MTOC) plays a role in transmitting activation signals. Upon activation, T cell receptors are concentrated at the antigen binding site, and are known to be associated with the MTOC of the cytoskeleton. MMG is hypothesized to have an effect on the cytoskeleton of T cells. The MMG treated cells demonstrate signaling alterations that are also associated with anergy. Anergic cells are unable to respond to antigens. To determine if MMG induces changes in the cytoskeleton, Jurkat cells will be activated with CD3 and CD28 coated beads, as this models antigen binding to T cell receptors. The cells will be fluorescently stained for beta-tubulin, an important component of the T cell MTOC. A confocal microscope will be used to visualize the MTOC of activated Jurkat cells, both with MMG and control treatment. It is hypothesized that there will be a difference between the MTOC structure of Jurkat cells activated in MMG as compared to control cells. The same set of cells will also be analyzed for the expression of anergy associated genes. This work will expand our knowledge of T cells and the role of the MTOC.

The Effect of Atrazine on the Cytoskeletal Structure of Jurkat Cells

Ashley Fisher (Biology)

Faculty Mentor: Maureen Morrow (SUNY New Paltz)

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 in 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. In order for T cells to function properly, they depend on the rearrangement of the cytoskeleton, which is composed of alpha and beta-microtubules, among others. 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 MTOC activation site. Beta-tubulin plays a major role in the MTOC, and therefore we will be focusing on this protein. Jurkat cells are a commonly used T cell cancer line and we will activate these cells with CD3 and CD28 coated beads both with and without atrazine and examine the beta-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.

Nosing out who can smell pungent asparagus metabolites

Miriam Marx (Biology)

Faculty Mentor: Jeffrey Reinking (Biology)

Upon the consumption of asparagus, humans produce sulfurous waste products that are excreted in the urine. To many people, these metabolites have a distinct odor that has been commented on throughout the centuries - Benjamin Franklin once wrote “A few Stems of Asparagus eaten, shall give our Urine a disagreeable [sic] Odour” in “A Letter to a Royal Academy” (1781). Recently, a Genome-Wide Association Study (GWAS) identified human Single nucleotide polymorphism (SNP) rs4481887 on human chromosome 1 as having a strong correlation with the differential ability to smell “asparagus pee”. In this research project, we developed a PCR-based genomic assay allowing facile and rapid determination of an individual’s genotype at this locus. Additionally, we will present the methodology of the progress made in identifying the elusive metabolite(s) responsible for the odor through a functional assay.

Lake Minnewaska Recovery from a Trophic Level Loss

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

Interactions within a lake’s food web have an important influence on the habitat. It is not fully known how predator loss alters that habitat. Historically fishless, Lake Minnewaska has been in flux recently with the loss of an intermediate predator. In 2008 Golden Shiners (GS), were unintentionally introduced, followed by the Largemouth Bass (LMB) in 2012. GS disappeared in 2014, resulting in a gradual decline for the LMB. We predicted that other variables would be affected following the disappearance of the GS. With the loss of their predator, we expected zooplankton to increase in both density and size, increasing water clarity, and decreasing anoxia. From 2014-2016, we collected zooplankton samples, measured water clarity and dissolved oxygen from 0-20m throughout each ice-free season. From 2013-2016, average density of zooplankton has decreased and the size of Daphnia has increased, suggesting that the larger zooplankton are more abundant once free from predation. After the loss of GS, algal biomass decreased resulting in recovering water clarity. The mean summer Secchi depth has increased from 2012-2016. Conversely, anoxia has significantly increased throughout the lake as a likely result of accumulating organic matter. Though algal biomass has been decreasing since 2012, the anoxia levels have yet to show the signs of recovery to pre-GS conditions. This data will be used to determine if conservation measures need to be taken for recovery.

Co-limitation of nitrogen and phosphorus as a bottom-up control on algal biomass

Hailee Edwards (Biology), Kayla Reid (Biochemistry), Emma Bruno (Biology), DeJae Green (Biology), Anthony Hollander (Biology), Sawyer McFadden (Environmental Geochemical Science), Heather Wander (Biology)

Faculty Mentor: David Richardson (Biology)

Lake Minnewaska has been rising in pH over the last 30 years; concurrently, water clarity has decreased raising concern. As lake acidity decreased Golden Shiner and Largemouth Bass were unintentionally introduced, resulting in increasing algal growth and decreasing water clarity. In this study we investigated the bottom up controls on algal biomass by performing a nutrient limitation experiment. We focused on Lake Minnewaska, a mesotrophic lake, and predicted the co-limitation of both nitrogen and phosphorus on phytoplankton biomass. The experiment consisted of introducing treatments of an unamended lake water control (C), and three treatments amended with nitrogen (N), phosphorus (P), and a combination of nitrogen and phosphorus (N+P). The samples were suspended on the surface of Lake Minnewaska and incubated in-situ for one week during June 2016, and in September 2016. After retrieving the samples, we measured chlorophyll a (chl a) concentrations for algal biomass. For the June 2016 experiment, chl a concentration of the N+P treatments in Lake Minnewaska were highest. However, a one-way ANOVA was not significant, indicating the means were not significantly different. In the September experiment, the chl a concentration of the N+P treatments had a significant ANOVA. We will work with the state park managers to determine sources of nitrogen and phosphorus to the lake phytoplankton and evaluate steps for mitigating the effects of the excess nutrients.

Verification of ingredient claims in commercial soap products via DNA extraction and analysis

Leesandra Lopez (Cellular/Molecular Biology)

Faculty Mentor: Jennifer Waldo (Biology)

Commercial soap products contain many different types of oils and ingredients. In this study, we attempted to develop a methodology to correctly extract plant DNA from soap samples. In order to produce a substantial amount of DNA, we developed a protocol to minimize the carryover of detergents and other species that may inhibit subsequent analysis. With this protocol in place, we used Real-Time PCR (qPCR) and gel electrophoresis to identify the ingredients and further verify the presence of coconut oil, olive oil, and palm oil, respectively, in the various samples. In order to ensure its efficacy, we performed this procedure on intact plant materials. The outcome of the experiment yielded amplified DNA. We will report on our analysis of the specificity of the primers selected to detect different ingredients.

The Printing of Three Dimensional Biochemical Models

Jamie Woych (Biochemistry), Christina Georgalas (Biochemistry)

Faculty Mentor: Daniel Freedman (Science and Engineering)

The purpose of the work conducted during this project was to unify the methods of molecular viewing and 3D printing. This was achieved through testing various molecular viewing programs with a small Ru-binding molecule. The process aims to minimize error and produce high-resolution molecules.

The program Mercury was used to convert the .cif and .pdb files found in RCSB to .stl format used in 3D printing programs. After file conversion, Rhino was used to check the mesh competency. Any solvent molecules around the molecule of interest were deleted. If errors, such as self-intersecting faces or holes existed, Netfabb was used as a repair program for a successful print. Automated supports created by Makerbot were often not adequate for complex molecules. Simplify was used to create custom supports under regions that protruded too far from the central structure.

The Ru-binding molecule was printed in sizes ranging from 25–250% of original scale. These trials ascertained the capability of the Replicator 2 to print small highly resolved models. More shells were added for weak areas. The same techniques were applied to A-DNA, B-DNA, and Z-DNA. Because hydrogen bonds hold these two strands together, bases were added to maintain helical structure.

These techniques cannot be applied universally. Complications may arise that require additional steps. This project has been successful in laying the foundation for the process of creating 3D biochemical models.

Synthesis of Versatile Starting Materials: The Iodo-Alcohols

Aakriti Ramayani (Biochemistry), Tianyu She (Biochemistry), Mackenzie Cummings (Biochemistry)

Faculty Mentor: Preeti Dhar (Chemistry)

Iodo-alcohols are important starting materials in organic synthesis; however, they are not readily available, and hence are custom-ordered. The focus of this project is 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 and iodine to give the corresponding iodo-alcohols. However, this method had a few limitations. In addition to being the substrate, the cyclic ether also served as the solvent, and hence this method could not be extended to expensive cyclic ethers or solid ethers. Additionally, the product (iodo alcohol) was not stable under the reaction conditions and quickly broke down. This prompted us to look for a suitable solvent in which the above reaction could be replicated. After careful experimentation with various solvents, toluene was found to work the best.

A few cyclic ethers have already been investigated using this new method, including tetrahydrofuran (THF), 2-methyltetrahydrofuran (2-MeTHF), tetrahydropyran (THP) and 3,4-dihydro-2Hpyran (DHP). Corresponding iodo-alcohols have been characterized using ¹³C and ¹H NMR. This methodology will also be extended to three and four membered cyclic ethers, as well as to aromatic cyclic ethers.

Comparative Toxicity Of Heracleum And Psoralea Extracts

Brett Pinsky (Biochemistry), Tina Liu (Biochemistry), Cassidy King (Biology)

Faculty Mentor: Preeti Dhar (Chemistry)

Faculty Mentor: Maureen Morrow (Biology)

Heracleum maximum (HM), is a plant native to North America and is rich in a class of compounds called furanocoumarins. The stem and root of this plant are edible and have been used by Native Americans in traditional medicine for treating a variety of infectious diseases. *Psoralea corylifolia* (PC) is a plant native to India and is also known to contain furanocoumarins. PC has been used in folklore medicine to treat various skin diseases such as vitiligo.

Prior work from our lab has shown that the crude ethanolic PC extract was phototoxic but not toxic and the crude ethanolic HM extract was toxic towards brine shrimp. This led us to perform a sequential extraction of both plants. Using a Soxhlet extractor, the seeds of these two plants were extracted with solvents of increasing polarity (hexane, ether, ethyl acetate, ethanol, and water respectively). Since *Artemia salina* (brine shrimp) are very sensitive to phototoxic compounds, the PC and HM extracts were subjected to brine shrimp bioassays to assess the phototoxicity/toxicity of both plants. The overall toxicity of the extracts is also being assessed by B16 murine melanoma cells. Determining how the cells respond to the extract will give us a better understanding of why HM has not been used in folklore medicine to treat vitiligo.

The results of the brine shrimp bioassay as well as the progress of the toxicity assay using B16 murine melanoma cells will be presented.

Developing a Method to Examine Steric Forces of Lipopolysaccharides by AFM

Nicolette Rigaud (Environmental Geochemical Science), Jessica Fortado (Chemistry), Alexa Criollo (Biochemistry)

Faculty Mentor: Megan Ferguson (Chemistry)

There is a positive trend between the amount of bacterial lipopolysaccharides (LPS) and how well those bacteria adhere to surfaces. Thus, by studying the steric forces of the LPS of gram-negative bacteria, a better understanding of their interactions will increase knowledge of how to control bacterial adhesion and treat pathogenic bacteria. We have used atomic force microscopy (AFM) to explore the effects of ionic strength and pH on bacterial LPS, but trends were difficult to see over the large variability from cell to cell. By performing AFM within a closed fluid cell, phosphate buffered solutions of different salt concentrations can be introduced while examining the same bacterial cells. *Escherichia coli* with an added fluorescence gene were adhered to the glass slide within the closed fluid cell using EDC/NHS cross linkage. To ensure the bacteria were alive and responsive, fluorescence was activated by introducing arabinose into the solution. AFM force curves were taken in contact mode on the bacteria to gain quantitative data about the LPS steric forces as well as cell stiffness and adhesion forces.

Analysis of Bacterial Lipopolysaccharides Using Atomic Force Microscopy

Andrew Zlotnick (Chemistry)

Faculty Mentor: Megan Ferguson (Chemistry)

Bacterial lipopolysaccharides (LPS) play a critical role in the adhesion of Gram-negative bacteria. Atomic force microscopy can be used to determine physicochemical properties of LPS, but when that LPS is in its native state on a bacterial cell the system becomes much harder to interpret. Therefore, the aim of this research was to evaluate the coverage of fluorescently-labeled LPS extracted from *E. coli* using fluorescence spectroscopy and atomic force microscopy. To create a surface layer of LPS, a gold coated disc was treated with dodecane-thiol. The thiol functional group bonded to the gold so the hydrophobic interaction of the long carbon chain and the LPS would create a monolayer of LPS. To determine if the LPS had successfully attached to the gold disc, the gold disc was examined by fluorescence. The proper detection of LPS was rendered impossible due to the gold disc's ability to reflect light without the presence of LPS. The next step in this research is to pursue LPS fixation on glass via a mono-alkoxy silane compound.

Quantifying Bisphenol A Absorption in Planaria and Studying its Effects on Planaria Regeneration

Abigail Fagan (Chemistry), Troy Moody (Biology)

Faculty Mentor: Pamela St. John (Chemistry)

Faculty Mentor: Spencer Mass (Biology)

Bisphenol A (BPA) is a toxic organic compound that mimics estrogen and binds to its receptors altering the body's own production of estrogen. Such compounds, called xenoestrogens, are found in the environment in various concentrations, originating from wastes like cleaning and beauty products, pharmaceuticals, and plastics. We have used high performance liquid chromatography (HPLC) with fluorescence detection to quantify the amount of BPA absorbed by planaria, a model organism, as BPA 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 micromolar concentrations of the substance. During their time spent in this media, the planarian behavior changes dramatically. Movements become slower and their reactions to stimuli are delayed. Experiments were conducted to test the planarian's ability to regenerate during their exposure to BPA. The regeneration process involves cell proliferation for blastema formation and morphallaxis for symmetry and proportion. This allows planaria to regenerate a tail from a head and a head from a tail. However, this regenerative ability is impaired when BPA is present in the planarian's medium resulting in inferior and deformed regeneration and death.

Catalysis Of The Hydrolysis Of Poly(Methyl Methacrylate) Using Chaotropic Agents

Edward deRamon (Chemistry)

Faculty Mentor: Daniel Freedman (Science and Engineering)

Poly(methyl methacrylate) (PMMA), is a thermoplastic comprised of an ester containing polymer. PMMA as a co-polymer with polyacrylic acid (PAA) is used as a support material in 3D printing. 3D printing is a process in which successive layers of materials are formed under computer control to create an object. When an object with protruding parts is being printed, support material is used to suspend those parts. When the object is finished printing, the PMMA in the support material can be hydrolyzed, causing it to become water soluble, allowing it to be effectively washed away. This reaction can take several hours, causing a bottleneck in successive production. We sought a catalyst to increase the rate of this reaction while remaining cost effective and environmentally friendly. Reaction rates were measured by following the appearance of methanol via proton NMR, a product of the hydrolysis reaction. By adding chaotropic agents, such as ethanol, the reaction rate showed up to a 68% increase.

Weather Data Analysis using MapReduce Based K-means Algorithm

Robert Wieland (Computer Science), Colin Wakeford (Computer Science)

Faculty Mentor: Min Chen (Computer Science)

Tremendous amount of data has been accumulated in all fields of studies in this current information age due to the growth of the Web, the rise of social media, the use of mobile, and the information of Internet of Things (IoT) by and about people, things, and their interactions. The big data era has arrived. Big data becomes the most influential force in daily life. How to store huge amounts of data is not the biggest problem anymore. But how to design solutions to understand this big amount of data is a major challenge. Clustering is one of the popular approaches in data mining and has been widely used in big data analysis. The goal of clustering involves the task of dividing data points into homogeneous groups such that the data points in the same group are as similar as possible and data points in different groups are as dissimilar as possible. A mapreduced-based k-means algorithm is implemented to group weather data from NOAA (National Oceanic and Atmospheric Administration). The proposed k-means algorithm divides the huge amount of data into small pieces. These small pieces of data can be loaded on different computers and the huge problem can be solved using the processing power of these computers. Data management platform such as Amazon Web Services (AWS) provided by Amazon is adopted to handle the weather data using the proposed k-means algorithm.

Fossil Fuel Consumption and CO2 Emissions: An Environmental Kuznets Curve Analysis

William Anderson (Economics)

Faculty Mentor: Mona Ali (Economics)

This study analyzes the relationship between Gross Domestic Product (GDP), Fossil Fuel Energy Consumption (EC) and CO2 in the United States and Germany. The Environmental Kuznets Curve theory states that the relationship between economic growth and environmental degradation follows an inverted u-shaped curve where the economy grows while environmental degradation increases until a turning point is reached where environmental degradation decreases. The objective of this research is to show that there is a causal relationship between GDP, EC and CO2 and this will be determined through the use of econometric modeling and causality tests which will reveal the direction of causality between the variables. The expected results are that there will be unidirectional causality from GDP to CO2 and from EC to CO2. The relationship between EC and CO2 can be defined by a monotonic relationship where CO2 rises with EC as well as the inverse. The Kuznets curves are expected to show that Germany will have a more significant curve in comparison to the curve for the US which will plateau. This is explained by the results of the causality tests and that Germany's CO2 is less than that of the US. This is significant because it reveals that the best method of CO2 abatement is to reduce EC and that this course of action may ultimately lead to the prevention of the effects of climate change. The policy implication of this conclusion is that governments must invest in clean technology to abate CO2.

The Effect of Minimum Wage on the Poverty Rate in California

Chris Jones (Economics)

Faculty Mentor: Mona Ali (Economics)

Starting in 2015, the State of California has voted to increase the minimum wage to \$15/hour by 2023, responding to increasing calls of lower-wage earners wanting a living wage. However, opponents to this say this wage hike will only reduce employment levels and cause more harm than good for the economy. Proponents for the wage legislation say that this will help those in poverty gain a chance at a living wage and is a good, positive change in long-run. Therefore, we question whether or not minimum wage actually does help those in poverty, or if it even lifts them out of poverty. Using data from the State of California Department of Industrial Relations and from the Federal Government's Economic Research Tool (FRED), we run an OLS regression. Using the unemployment rate, the CPI, and the minimum wage as control variables, we see the effects of unemployment, inflation, and the minimum wage on the state's poverty rate. The results find that increases in unemployment and inflation do increase the poverty rate for the state. However, the most important variable, minimum wage, does indeed show that the poverty rate decreases, slightly, with increases in the wage. Thus, we find that because the poverty rate only decreases slightly with minimum wage, policy needs to be a multifaceted approach in order for California's poverty rate to decrease significantly.

Reverence, Refuge, Despair, and Loss: Poetic Encounters with Nature

Zanyell Garmon (Education)

Faculty Mentor: Mary Sawyer (Education)

There is something special that happens when nature and poetry are intertwined. Writers at the Hudson Valley Writing Project's youth summer program were introduced to the art of poetry, sketching, and "Nature" and the transparent eye-ball by Ralph Waldo Emerson; then they were taken outside to sketch and write about the nature surrounding them. This research explores the impact on teens' writing during this "Walk Poem", adapted from Ron Padgett (1987). We asked ourselves, "To what extent does the Walk Poem experience provide teens with a writing experience that they value?" and "To what extent does the Walk Poem experience support students' in developing an understanding of themselves and their connection to place?" To answer this, we turned to our data which includes co-researchers' teaching journals; curricular materials; videos and photographs of the lesson and writing experience; teens writing resulting from the lesson; teen's written reflections about their writing and writing experience, and a videotaped group interview with a subset of volunteer teens about their writing and writing experience. We found that the Poetry Walk was an inspiration to their writing process and an experience they truly valued.

Political Representation of Women in the Mid-Hudson

Jaclyn Greco (Secondary Education - Mathematics)

Faculty Mentor: kt Tobin (Associate Director of the Benjamin Center)

In the United States, at the national level, there is undoubtedly an underrepresentation of women holding elected positions in government. At the highest executive level, we have had no woman president. In the United States Congress there are 104 women, a mere 19.4 percent, with only 21 women in the Senate (21 percent) and 83 women in the House of Representatives (19 percent). This trend continues, but is slightly better, at a local level in the Hudson Valley. In four Mid-Hudson counties (Dutchess County, Orange County, Sullivan County, and Orange County) in 2010, 28 percent of locally elected officials were female. Today, the percent of women in local government in these same counties has remained constant at 28 percent after the 2016 elections. There are some positions which have even greater gender disparity, such as Highway Superintendent, which is comprised of 2 percent women, and Clerk, which is comprised of 87 percent women. These examples exemplify the gendering of government positions, whereby gender roles track women into some positions and men into others. This study seeks a greater understanding of the underrepresentation of women in local government so that the greatest obstacles against women running for public office can be recognized and addressed to increase the representation of women in government.

Middle Devonian Plant Specimens of the Plattekill Fm., Shokan, NY

Kate Cushen (Biology/Geology)

Faculty Mentor: Alexander Bartholomew (Geology)

The Devonian Period (417-365 Mya) was an exuberant moment in the evolution of life outside of water, particularly for the expanding world of plant life. At the beginning of the Devonian, life on land consisted primarily of algae, non-vascular plants, and a very limited number of simple vascular plants restricted to wet areas close to streams and ponds. By the end of the period we have the development of complex terrestrial ecosystems with upland forests, and tall (>10m) trees. A sizable collection of fossil plant specimens from the Devonian period were collected from the area around West Shokan, NY and donated to SUNY New Paltz. Examination of specimens in research conducted in 2016 revealed numerous examples of external molds and abundant carbonized primary and secondary branch and trunk sections. Noted among many specimens was the presence of *Eospermatopteris*, a cladoxylopsid and the first tree in evolutionary history. *Eospermatopteris* is a very common tree species in the Gilboa Forest of NYS, which was assumed slightly later in geological time than other specimens in the collection. Examples of the "speckled bark" pattern of the upper frond region of the *Eospermatopteris* tree were discovered- the pattern is presumed to be sclerotic nests of rigid thick-walled cells. Some specimens contained thick ridges, possibly vascular, and signs of branching. These areas are possible examples of progymnosperms, or the finger-like frond region of *Eospermatopteris*.

Sickness and Seduction in Thomas Mann's The Magic Mountain

Alvina Ahmed (English, German (Literature, Language, and Cultures))

Faculty Mentor: Vanessa Plumly (German (Literature, Languages, and Culture))

In Thomas Mann's *The Magic Mountain* (1926), the main character, Hans Castorp, goes through a period of "self-discovery" in a tuberculosis sanatorium. The novel is set in the pre-WWI era when Kaiser Wilhelm I undertook many measures for imperial expansion. As more and more markets were established in the East, domestic opposition to such foreign policies increased because overseas trade exploited the working class of Germany. This opposition made the entire ruling establishment of Germany vulnerable to a downfall. In the novel, Castorp, falls in love with Clavdia Chaucat. She is a Russian patient, who is overly exoticised for possessing eastern features. Mann makes her seem inferior to the Germans by depicting her as extremely irrational and emotional. Yet, she is the one who seduces Castorp with her "Asiatic eyes." If we examine this seduction from a political perspective, we can infer that Mann is implying that exploiting certain groups could lead to a "communist c'oup d'etat" in Germany, which would in turn lead to a loss of individualism. This research investigates the possible reasons Mann may have chosen tuberculosis as the "sickness" of an isolated setting. Interpreting Mann's *The Magic Mountain* through a socio-historical lens, this literary investigation explores how the fear of downfall played a role in bourgeois German society at the turn of the twentieth century, and how policies made a nation vulnerable to revolution and prone to war.

Trans-space and Performance: Liminality and the Gender Relations in Mädchen in Uniform

Brianna Best (English)

Faculty Mentor: Vanessa Plumly (Languages, Literatures & Cultures)

This paper will explore the way in which a queer phenomenology, as defined by Sara Ahmed, operates in a system which is structured by a clearly normative architectural semiotics to reconfigure certain spaces, which then become sites of gender transgressiveness. In Leontine Sagan's 1931 film, *Mädchen in Uniform*, the space of the boarding school acts as a tool to enforce a cisheteronormative patriarchal structure through the use of the rigid institutionalization of education and life. The boarding school as an entity works to police both the public and private life of its inhabitants. It demands that everything must be quantifiable and "straight." However, liminal spaces within the text do exist, or rather are opened up. One clear example is the changing room, in which barriers between inside and outside—of the body, of each other—are transgressed and a "disorientation," defined by Ahmed, ensues. I will pursue this line of thought, looking at what I will call the "trans-space" of the changing room, and explore how disorientation allows the bodies of the students who experience it to confront performance of gender and reconfigure it.

Exploring Illegal Drug Policy Making in the United States

Arjeta Prenaj (International Relations)

Faculty Mentor: Kate McCoy (Educational Studies and Leadership)

This research explored the process of national drug policy making in the United States. Historically, reviewing President Nixon's "drug war" initiatives provided insights into what the process looks like and the impact of policies that disproportionately affect people deemed "undesirable" in our society. By analyzing documents such as "A drug policy for the 21st century" introduced by Obama's presidency, this research project investigated the drug control strategies of the Obama administration, its stated priorities, and the budget allocated for implementing drug policy. I found that there are discrepancies between the administration's stated goals and how policies are implemented. Scholarly literature on drug policy making suggests that corporations and entities such as the American Legislative Exchange Council (ALEC) and churches seem to have a larger impact than people and populations directly affected by the policies. People who use illegal drugs, struggle with addiction, and those held as prisoners for drug offenses are not part of policy-making processes and their concerns and the concerns of their communities are not considered. Lastly, through theoretical literature on policy making, I learned about multiple factors involved in the process and the complexity of incorporating scientific and scholarly research into drug policy making. I have found that information about the drug policy making process is not very accessible to the public.

Sums of Consecutive Polygonal Numbers

Samantha Wyler (mathematics)

Faculty Mentor: Diego Dominici (Mathematics)

Polygonal numbers are numbers such that that many dots form the shape of a regular polygon, meaning a polygon that is equal angular as well as equilateral. In researching polygonal numbers I was able to find an equivalency relationship involving the sums of consecutive polygonal numbers. After being introduced to a formula on how to find all the various polygonal numbers for the different types of polygons I was then able to prove this equivalency relation using the method of summation notation along with other equivalency relationships.

Equivalence of Autonomous k -th Order Difference Equations Under Point Transformations

Jonathan Colon (Mathematics)

Faculty Mentor: Francis Valiquette (Mathematics)

Given two autonomous k -th order finite difference equations, I will explain how to decide if there exists an invertible map sending one equation onto the other. If such a map exists, then the difference equations are said to be equivalent. The solution to this problem is obtained by constructing the invariants of the pseudo-group of point transformations using the new method of equivariant moving frames. By definition, an invariant is a function that remains unchanged under the action of the group. A necessary condition for two equations to be equivalent is for the restriction of the invariants to both equations to overlap.

Use of Digital Image Correlation to Find Material Properties of Carbon Fiber Composites

Christian Zoeger Boggiano (Mechanical Engineering), Jack Yang (Mechanical Engineering)
Faculty Mentor: Jared W. Nelson (Div of Engineering Programs)

Composite materials require characterization testing, due to their lightweight and anisotropic properties to maximize its use in structures. Testing notched coupons is beneficial as parts are optimized for damage tolerance reducing time and cost. Additional advantages of these tests are that machining of the coupon is not critical, the location of failure is known, and notched samples simulate worst case defects. Digital Image Correlation (DIC) is used to make full-field, quantitative visualization of strains that then correlate to stress concentrations. This research hypothesized that the amount of testing required to establish compressive material properties could be reduced by using DIC. A unique coupon based on standardized open hole compression (OHC) and compression after impact (CAI) test methods was used. Notched IM7 carbon fiber/RS8 BMI coupons with symmetric laminates were tested. Several material properties were found and compared to published values. Full field strain and stress at failure matched the published values. In addition, static fatigue testing was performed. While no plastic deformation is noted at this loading during testing-to-failure, plastic strains were noted as high as 0.2% strain with load duration as short as 60 minutes. Overall, these results indicate that DIC may effectively be used for the visualization of stress concentrations while quantifying defect and material properties.

Effect of Common Print Parameters on the Mechanical Properties of the Produced Parts

Jack Yang (Mechanical Engineering), christian zoeger (SUNY New Paltz), Dylan Atkins (Mechanical Engineering), Jeffrey Huang (Mechanical Engineering)
Faculty Mentor: Jared W. Nelson (Div of Engineering Programs)

3D printers are employed by most major industries as a rapid prototyping tool, used to test fit and form before going into full production. In order to make the leap from prototyping tool to manufacturing technology, the effect of the FDM process on the produced parts must be more closely understood. To establish this relationship, the effects of orientation, temperature, and material on the produced FDM prints were explored. In order to test the effects of material, orientation and temperature, coupons were printed using a modified version of the ASTM D3039 standard geometry. ABSi, Nylon, and PC specimens were printed using layer orientations from 0° to 90°. PLA and ABS specimens were printed using extrusion temperatures from 210°C to 250°C. Tensile tests were performed on these specimen to determine the modulus of elasticity, yield stress, and yield strain. Digital Image Correlation (DIC) was used on one coupon from each parameter value to better understand the deformation of the coupon as the test occurred. The orientation data showed decreasing mechanical properties as the angle increased from 0° to 90°. The temperature coupon data indicates that there is an optimal temperature at which FDM parts should be printed at to achieve the maximum mechanical properties. Using these preliminary results further studies can be performed, allowing for the 3D printing process to become a more accurate manufacturing technique.

Comparison of Mechanical Performance of 3D Printed Polymers to Injection Molding

Jeffrey Huang (Mechanical Engineering)

Faculty Mentor: Jared Nelson (Div of Engineering Programs)

As 3D printing continues to grow as a viable manufacturing process, quantification of the processing options and parameters will allow for better design and modeling of printed parts, or at least clearly define the trade-offs between the different processing options. The aim of this research was to quantify the differences between injection molding and 3D printing while also quantifying the differences between professional and personal 3D printers. In both cases, quantification of the processing allows for improved understanding for design and modeling. The study was carried out by processing two materials (nylon and ABS) using recommended parameters. An injection molder, a professional grade FDM printer and a personal grade FDM printer were used to make standard coupons for both tensile and impact testing. Standard test methodologies were followed and print orientations were adjusted for comparison of print orientation on properties. The study resulted in four main findings: 3D printing of these polymers leads to lower mechanical performance than injection molding; performance decreases along the Z-axis for both personal and professional printing; performance along the XY-axes are very similar between the personal and the professional grade printers; and, performance along the Z-axis are significantly better on the professional printer than on the personal printer.

Anisotropic Effects of Print Orientation on Mechanical Properties of 3D Printed Polymers

Dylan Atkins (Mechanical Engineering), Matthew Gottstine (Mechanical Engineering)

Faculty Mentor: Jared W. Nelson (Mechanical Engineering)

Fused Depositional Modeling (FDM) produces plastic parts layer-by-layer in an extrusion process resulting in anisotropic parts where the mechanical properties vary based on the direction of loading. This anisotropic nature is an effect of the orientation of the layers being deposited. This study investigated the relationship between the mechanical performance of 3D printed parts and the angle at which the layers are printed. To test this unidirectional specimen were printed with layer angles ranging from 0 to 90 degrees in 15 degree increments were printed out of nylon, ABSi, and PC. In addition, balanced specimen of ± 30 and ± 60 were printed to gather a more complete understanding of the effect of orientation. The prepared coupons were tested in tension using an Instron 5984 load frame equipped with a 150 kN (33 kip) load cell. Digital Image Correlation (DIC) was utilized to gather a more complete description of the deformation as the test occurred. Following the tension testing, the modulus of elasticity, yield stress and max stress were calculated for each coupon. From the data gathered it was found that as the layer angle increased from 0 to 90 degrees the mechanical properties of the produced parts decrease for all three materials tested. The data gathered from the DIC testing indicated that the common failure mode was the bonds between adjacent filament strands, with stress concentrations occurring at these interfaces.

Simulation of the Manufacturing Process of Foamed Cement

Julian Chipkin (Mechanical Engineering)

Faculty Mentor: Kevin Shanley (Mechanical Engineering)

Foamed cement has been used widely by the petroleum industry as a high-stress resistant, low-density material to withstand extreme downhole environments inherent to offshore wellbores. A lack of understanding regarding how foamed cement sets under subsurface field conditions can lead to risk assessment uncertainties and compromised well integrity.

The National Energy Technology Laboratory (NETL) has developed a novel procedure for manufacturing foamed cement in a laboratory environment which entails forcing the fluid through a series of sudden contractions and sudden expansions. This work investigated the effects of such geometric features on the internal pressure and velocity fields of cement during the manufacturing process. Numerical simulations were conducted on a fluid flowing through three key geometric configurations chosen to mimic the aforementioned process with density and viscosity comparable to the cement produced by NETL. It was observed that the velocity profiles developed and regressed quickly and efficiently, achieving uniform parabolic shapes while traversing both sudden contractions and sudden expansions. Predictable trends in flow patterns were also exhibited by sudden contractions followed by sudden expansions.

Energy Efficiency Assessment of SUNY New Paltz Resnick Engineering Hall using Computer Software Program, eQUEST

Megan Gangewere (Mechanical Engineering), Kristen O'Sullivan (Mechanical Engineering)

Faculty Mentor: Kevin Shanley (Mechanical Engineering)

In the past decade, higher educational Institutions have been taking precautions to address the environmental, political, and social threat of climate change. Standards and assessment programs have been produced to advance energy efficiency and promote usage of green sustainable energy. In this research project, an energy model of the Resnick Engineering Hall at SUNY New Paltz was constructed using the whole building energy modeling software, eQUEST. This QUick Energy Simulation Tool was utilized to create a profile of the campus building. The key energy consuming factors were inputted into eQUEST. Upon completion of the building profile, a breakdown of the monthly and annual energy consumption reports were generated. Since a reverse energy analysis of an already existing building was completed, the main objective of this research was to identify where energy consumption can be reduced. A comparison between the actual utility bills and the baseline eQUEST simulations was drawn. A baseline model was developed which incorporated the building master schedule and justified assumptions about occupant usage. Comparative features on eQUEST, as well as, renewable energy options were investigated to identify potential savings. Results indicate that the campus may be able to realize an energy reduction with an acceptable return on investment.

Examining the use of Super-critical Carbon Dioxide as a Refrigerant

Clewis Vaughn (Mechanical Engineering), Thomas Palombo (Mechanical Engineering), Joseph Palombo (Mechanical Engineering)

Faculty Mentor: Rachmadian Wulandana (Mechanical Engineering)

The purpose of this presentation is to explore the analyses of super-critical vapor compression and cascade refrigeration cycles utilizing the refrigerant R744, commonly known as carbon dioxide, while comparing it to the widely used refrigerants norflurane (R134a) and ammonia (R717). The refrigerants commonly used today have significant variances when considering the efficiency of the process and environmental impact due to accidental release or mishandling. In fact, some commonly used refrigerants today being phased out due to environmental harm within just a few short years. To determine the effectiveness of using super-critical carbon dioxide as a refrigerant, graphical parametric studies were performed to view how varying the maximum and minimum pressures of the system would affect the coefficient of performance for each cycle, and thus the overall effectiveness of the refrigerant. Super-critical carbon dioxide was shown to be nearly as effective as the commonly sourced norflurane and ammonia, while having the added advantage of being more environmentally friendly and non-toxic.

Sustainability Analysis of Renewable Energy Technologies on the Island of Batanta

Megan Gangewere (Mechanical Engineering)

Faculty Mentor: Rachmadian Wulandana (Mechanical Engineering)

In this study, sustainable renewable energy technology was investigated for a remote island of Batanta (0.8647° S, 130.6494° E) near Papua island in the eastern part of Indonesia. The 453 squared-kilometer island is occupied by several tribes totaling a 2500 population with limited access to power lines. The island is surrounded by shallow oceans (10 - 30 m depth) with endangered coral and protected marine biodiversity. Oil spills during sea transportation and coral damage by large ships limit the energy supply to the island. Solar photo-voltaic panels demonstrate the most feasible option for the electricity supply. However, other possible solutions are required to anticipate population growth. Alternative energy suppliers studied include hydro-kinetic power, wind turbines, and a solar chimney. The water power can be made possible by creating a rain collector at the highest part of the island (1184 m) and employing a water turbine to generate electricity. The low-speed wind (around 2 m/s) of this island require wind turbines with a large diameter. However, the transportation and construction cost can be high. The design of a solar chimney electric generator is considered due to its zero emission along with a possible combination of desalination technology.

Effectiveness of Supercritical CO₂ Rankine Cycles

Tamara Ordonez (Mechanical Engineering), Robert Kennedy (Mechanical Engineering), Cuiyu Kuang (Mechanical Engineering), Megan Gangewere (Mechanical Engineering)
Faculty Mentor: Rachmadian Wulandana (Mechanical Engineering)

This research is motivated by the US Government mandate to reduce greenhouse gas emission and extract it from the environment. Carbon Dioxide is beneficial for industrial applications due to its abundance, non toxic characteristic, and very low critical temperature. These features make CO₂ a good candidate for renewable solar energy and waste heat recovery applications.

A parametric study was done on the simple Rankine cycle and its complex modifications such as reheat with open feedwater heater and regenerative Rankine cycle. MATLAB was used in conjunction with an open-source extension, CoolProp, to determine the thermodynamic properties of the fluid. All results are compared to steam that functioned as the baseline reading. Several simulations with different operating conditions were investigated. It was found that when carbon dioxide was used as the working fluid at subcritical conditions the cycle had only a modest thermal efficiency when compared to steam. Critical and supercritical conditions allowed for at least a 10% increase in thermal efficiency with significantly less heat input into the system. With both cycles failing to exceed the overall efficiency of the steam cycle. For the simple Rankine configuration using CO₂, temperatures below 31oC typically had 15% - 20% thermal efficiency, whereas temperatures above 31oC were able to achieve 25%-30% efficiency.

The Stockhausen Project

Steven Roberts (Composition/Music)
Faculty Mentor: Alex Peh (Music)

The Stockhausen Project is a twelve month, multidisciplinary, internet based performance piece consisting of arrangements of Karlheinz Stockhausen's seminal work, Tierkries. Tierkries is a set of 12 miniature melodies and accompaniments. Within the preface to the score, Stockhausen permits the arranger to add or remove notes, modify pitches, and to set the score for any chamber ensemble. Therefore, a major component of this project has been to experiment and push the boundaries of what an arrangement can consist of and to write for many and diverse sets of instruments. Since this piece is written as part of the zodiac cycle, the performance of this piece has lasted nine months so far and will end in July with each piece being recorded and uploaded to YouTube and the SUNY New Paltz Music department website during each zodiac period.

Measuring rotation rates of graphite in Laguerre-Gauss modes

Lucas Tracy (Physics), Matthew Cattani (Physics)

Faculty Mentor: Catherine Herne (Physics)

Optical trapping is the technique of using light to hold and manipulate small (on the order of micrometers) particles. It was first developed by Arthur Ashkin in 1970. This work expands on the techniques developed by Ashkin, and demonstrates a novel technique for trapping and rotation of absorbing materials. Laguerre-Gauss modes are laser modes that carry angular momentum and rotate objects by transferring the angular momentum through absorption of the laser light. We demonstrate rotation in Laguerre-Gauss modes by combining absorbing graphite and transparent polystyrene materials. The polystyrene effectively holds the combined system in the laser trap, and the graphite absorbs significant angular momentum from the laser mode. This combination of materials presents a unique set of challenges and results. Through our work it was determined that trapping and rotating graphite is an especially difficult, but not impossible, task.

Analysis techniques for calcite crystal motion

Matthew Cattani (Physics)

Faculty Mentor: Catherine Herne (Physics & Astronomy)

Optical micromanipulation is the practice of stabilizing and rotating small objects with light. In this work we develop a reliable process for the measurement of birefringent calcite motion in order to determine the characteristics of the manipulating light. Through knowing the instantaneous rotational velocity and orientation of calcite crystals, we can find the polarization of the trapping laser mode. We measure the motion in two ways: with a camera that images the particles, and with a photodiode that captures the light that passes through them. The camera gives information about the crystal position, and the photodiode tells us rotational speed. We show the simultaneous interfacing between the camera, photodiode and data analysis that we developed to make quick and accurate measurements of calcite rotation. The outcome of these measurements will be a classification of the incident laser beam, based on the characteristics of the crystal motion.

Determination of Laser Mode Polarization via Birefringent Particle Motion

Daniel Brogan (Physics & Astronomy), Matthew Cattani (Physics)

Faculty Mentor: Catherine Herne (Physics & Astronomy)

Tiny objects can be rotated, translated or stabilized using a focused laser mode, a process known as optical micromanipulation. Properties of these laser modes can be determined through birefringent particle motion. One property, the spin of a calcite crystal, can describe the polarization state of a laser beam. Whether a mode is linearly, elliptically, or circularly polarized can be determined from analyzing the angular velocity of the crystal in the mode. This work shows the implementation of an independent determination of the laser polarization. This serves as a confirmation of the polarization found through the crystal motion. The measurement involves aligning optics that gauge the polarization of the transmitted incident mode by recording the intensity of the light with a photodiode. We show parallel determinations of the laser polarization through both techniques.

Perceived Stigma among Mono & Bisexuals in LGBTQIA+ Community

Maria Talloni-Perlett (Psychology), JoniMaree Paternella (Psychology), Meagan Sweeney (Psychology),
Bridget Gunn (Psychology)

Faculty Mentor: Lisa Bauer (Psychology)

Perceived Stigma among Mono & Bisexuals in LGBTQIA+ Community

Stigmatization has historically been an issue of high prevalence in the LGBTQ community, with one of the lasting impacts being lowered levels of self esteem. However, little research has been done to specifically analyze which groups felt the most social ridicule. In order to study this, we collected information from a college undergraduate sample (N=131) Participants were asked about their gender identity, the gender identities of persons they are romantically and sexually attracted to, and were administered the Rosenberg Scale (1965) and the Lesbian, Gay, and Bisexual Identity Scale (LGBIS) (Mohr & Kendra, 2008). We hypothesized that Bi and Pan identities would negatively correlate with one's self esteem over monosexual identities, as well as result in feelings of greater stigma. Feelings of stigmatization negatively correlated with self esteem ($r = -.247$, $P < .01$). However, there were no significant differences as a function of bi/pan or mono identities, except when examining how it interacted with gender. Specifically, bi and pansexual men reported least stigmatization and highest self esteem, while both mono and polysexual women reported the highest stigmatization and lower self esteem ($F(3, 109) = 7.53$, $P < .001$). Other findings are reported.

Gender Differences in Ambivalent Sexism and Political Beliefs

Maria Talloni-Perlett (Psychology), Meagan Sweeney (Psychology), JoniMaree Paternella (Psychology)

Faculty Mentor: Lisa Bauer (Psychology)

Glick and Fiske (1996) identified 2 types of ambivalent sexism, hostile and benevolent. Hostile sexism is the more chauvinistic form, while benevolent is paternalistic - both reinforce stereotypes of men and women. Given the political climate of the past year, and the 2016 presidential election and its results, sexism has been an area of heightened discussion. Specifically, conservatives have been accused of being much more hostilely sexist while liberals are seen as benevolently sexist. To study this, the 12 Item Social and Economic Conservatism scale (SECS) and the Ambivalent Sexism Inventory (AIS) were utilized. We hypothesized that people measuring higher in benevolent sexism would demonstrate stronger liberal views, and people measuring higher in hostile sexism would demonstrate stronger conservative views. Results did not support the hypothesis, and in fact showed both subscales in economic conservatism negatively correlated with both hostile ($r = -.53$, $P < .001$) and benevolent sexism ($r = -.34$, $P < .001$) social conservatism with HS ($r = -.57$, $P < .001$) and BS ($r = -.48$, $P < .011$). Gender demonstrated its role as a covariate, in that women were significantly less conservative ($t(115) = 3.4$, $P < .01$) and held more hostile sexist views ($t(115) = -4.3$, $P < .001$). Analysis of specific political values are also presented.

Goal Shifting in Older Adults

Kelly Fitzpatrick (Psychology), Melyssa Arguello (Psychology)

Faculty Mentor: Jacquelyn Berry (Psychology)

Time has long been an integral part of motivation and goals among humans. The amount of time one perceives in life has a great effect on their daily motivations and the goals that they set. This study brings light to the paradox of aging. This psychological paradox holds that although there are many losses that come along with old age, people who are happy remain that way, and many even report the most happiness later in life. Some of these losses may include the loss of motor skills and senses but also cognitive impairments. The paradox of aging brings attention to the idea that the emotions one faces everyday are more important than the goals that are set to achieve things in the future. This is based on an idea known as Socioemotional Selectivity Theory, which posits that when people perceive future time as limited they set goals based on regulating their emotional state and maximizing close personal bonds and relationships in order to remain happy. This idea though, is not only apparent in those who are of older age but those who are subject to geographical relocation, illnesses, and war. This suggests then that it is not necessarily age but amount of perceived time in life that determines motivation and goals. This study is an examination of how motivation and goals differ between those that are young and those that are old along with those that perceive time in a different manner.

Lucid Dreaming

Hailey Matthews (Psychology), Gabriella Martinez (Psychology), Samuel Han (Psychology)

Faculty Mentor: Jacquelyn Berry (Psychology)

The goal of this study is to investigate how common lucid dreaming is among college age adults and also to understand if there are demographic differences between those who report lucid dreaming ability with life satisfaction, frequency of nightmares, and public self-awareness. These understandings aim to bring us closer to discovering the highly unexplored question of why can some people naturally lucid dream and others must learn, why do we lucid dream at all? This survey uses three different scales including ones for lucidity level, public self-awareness, and life satisfaction. Also included in this survey are questions relating to subject's nap and nightmare frequency, as well as general demographic questions.

The awareness of one's reality has been shown to have positive influences on lucidity ability as it is used as a technique to teach people how to lucid dream. Part of this study studies if natural public self-awareness is high in natural lucid dreamers, to link the techniques used in previous studies with natural abilities. Life satisfaction in participants can show us if lucid dreaming may be a result of low life satisfaction or high life satisfaction. This study investigates nightmare frequency and context as a means to understand the relation, if any, between the two types of night visuals, lucid dreaming and nightmares.

Colored Targets and Distractors in Attentional Capture

Kathleen Herman (Psychology), Tyler Miller (Psychology), Evelyn Mendez-Sanchez (Psychology), Ellen Halady (Psychology)

Faculty Mentor: Jacquelyn Berry (Psychology)

The purpose of this visual search experiment is to investigate what captures one's attention; either internal or external factors. Can you train yourself to see certain things if you know what to look for? Or is it that we are drawn to things that are out of the ordinary, such as bright colors and large objects? There is research that supports both claims but this study looks to prove that it is external factors (things like color and shape) that capture our attention. This study aims to test how fast people respond to shapes that appear on a screen. The target objects in this experiment are colored and have either a vertical or horizontal line inside of them. The nontarget objects are gray. The participant is asked to look for a certain target shape - either a circle or a diamond - and must press the proper key that corresponds to the line inside the shape. By measuring the participants reaction times to the targets, both when there is a distracting object present and not present in the display, we can determine whether it is internal or external factors that capture the participant's attention. The distracting objects in this particular experiment are also colored like the targets, but at the opposite end of the color spectrum, i.e. blue and yellow when the targets are red and green. Having both the target and distracting objects be distinctive in color makes this an interesting experiment to test exactly what it is that captures attention during visual search.

"Four in a Row" - How Extending Variable Target Repetitions Alters Attentional Capture

Patrick Holmberg (Psychology), Angelique Burgos (Psychology), Brett Spriggs (Psychology)

Faculty Mentor: Jacquelyn Berry (Psychology)

The purpose of this research is to determine if the visual search for target stimuli is influenced by internal factors (I.E the use of a search strategy), or external factors (I.E priming). In this experiment participants were asked to search for a target shape and identify if a line inside of it was horizontal or vertical. Depending on the experimental condition, the targets were either held constant, varied and were repeated, or varied and were not repeated. Furthermore, in half of the conditions the targets were presented alongside non target shapes which were made salient by being colored, termed "singleton distractors." The presence of singleton distractors reduces the speed of target identification. This reduction in speed is termed "singleton distraction interference." If visual search is driven by external factors then the singleton distractor interference in the constant and variable & repeated conditions should be equal, with the greatest singleton distractor interference in the variable & not repeated condition. If visual search is driven by internal factors then there should be equal singleton distractor interference in both the variable conditions, with greater singleton distractor interference in the constant target conditions. In this particular experiment, we are investigating the degree to which intertrial priming can be further maximized by having four of one target type appear sequentially in variable target conditions.

Testing the Supermodel of Letter Recognition

Scott Ibbetson (Psychology), Caitlin Moschetto (Psychology), Lina Greenspon (Psychology)

Faculty Mentor: Jacquelyn Berry (Psychology)

Letter recognition by the human visual system has been a highly debated topic within the cognitive psychology community. One of the most popular theories is that subjects are aware of the different geometric features, i.e. straight and diagonal lines, circles, etc. that make up individual letters and the combinations of these features help one to identify the letter itself. The present work explores feature-based recognition when various geometric feature models are considered at once. The Supermodel of letter recognition combines the most critical features of each model, with the addition of a few wholistic features, to make a letter recognition model that accounts for more possible recognition points. This research tests how well the Supermodel can predict performance measures as subjects make a series of "same/different" judgments on a series of letter pairs.

Targets and Distractors Sometimes Share Shapes Across Displays

Rachel Bogert (Psychology), Kasey Brock (Psychology), Jessica Mueller (Psychology), Nicholas Moscattiello (Psychology)

Faculty Mentor: Jacquelyn Berry (Psychology)

The purpose of this visual search experiment is to investigate what captures one's attention; either internal or external factors. Can you train yourself to see certain things if you know what to look for? Or is it that we are drawn to things that are out of the ordinary, such as bright colors and large objects? There is research that supports both claims but this study looks to prove that it is external factors (things like color and shape) that capture our attention. This study aims to test how fast people respond to shapes that appear on a screen. The target objects in this experiment are colored and have either a vertical or horizontal line inside of them. The nontarget objects are gray. The participant is asked to look for a certain target shape - either a circle or a diamond - and must press the proper key that corresponds to the line inside the shape. By measuring the participants reaction times to the targets, both when there is a distracting object present and not present in the display, we can determine whether it is internal or external factors that capture the participant's attention. In this particular experiment subjects are unaware of the identity of the target feature in advance for variable targets. Furthermore, in half of the conditions the target and nontarget shapes overlap in shape, i.e. are both circles and diamonds, and in the other half of conditions the targets and nontargets do not share shapes, i.e. the nontargets are diamonds and hexagons.

Investigating the Validity and Reliability of a Discounted Utility Scale

Robert Arena (Psychology)

Faculty Mentor: Maryalice Citera (Psychology)

The purpose of this study is to assess the validity and reliability of a discounted utility scale for procrastination created for this study. Participants will complete a survey composed of the Discounted Utility Scale and six established scales. Convergent validity will be assessed by comparing correlations between The Discounted Utility Scale and five of these scales (the 10 Item Self-Scoring Self-Control Scale, the Quantitative Workload Inventory Scale, the Delaying Gratification Scale, Sources of Self-Efficacy Scale and the Wishful Thinking Scale). Divergent validity will be assessed by comparing correlations between the Discounted Utility Scale and the Rosenberg's Self-Esteem Scale and by comparing the correlations between the different constructs measured by the scale (i.e. workload and wishful thinking). Internal consistency reliability will be tested using Cronbach's Coefficient Alpha. It is expected that measures from the discounted utility scale will have high correlations with items measuring the same constructs measured by the established scales. Also, items measuring different constructs on the discounted utility scale will not be significantly correlated with each other and items from the Rosenberg's Self-Esteem Scale. The possible contribution to the work is that there is no scale measuring discounted utility and this scale could effectively measure this construct.

*Expectations for Future Careers: A Comparison Between Heterosexual and LGBT*Q Identified Undergraduates*

Amanda Baroni (Psychology), Maria Talloni (Psychology)

Faculty Mentor: Maryalice Citera (SUNY New Paltz)

The purpose of this research is to compare expectations of undergraduate heterosexual and Lesbian, Gay, Bisexual, Transgender and Queer (LGBT*Q) students about perceived discrimination, fairness of treatment and sexual orientation stigma in their future career. Participants were undergraduate students at SUNY New Paltz, over the age of 18. An online survey was conducted using Qualtrics and included the following measurements: future perceived discrimination ("I expect my supervisors to use ethnic/racial/sexual slurs towards me"), expectation of fairness ("I expect my supervisors to refrain from improper remarks or comments") and expectations of respect ("I expect my supervisors to value what I contribute at work"). Data collection is ongoing. We are exploring differential responding between students who identify as heterosexual and students who identify as part of the LGBT*Q community to examine whether they perceive workplaces as safe, supportive and fair. Recognizing that perceived discrimination, fairness and respect may be concerns of undergraduate students searching for their first job will enable career counselors to help individuals understand and explore person-organization fit and how to look for organizations with supportive cultures.

The Evolutionary Mismatch of Familial Proximity Relating to Mental Health

Julie Planke (Psychology)

Faculty Mentor: Glenn Geher (Psychology)

Evolutionary explanations for clinical syndromes attempt to frame characteristics of mental disorders as adaptive (Nesse, 2000). However, this contention fails to account for the high prevalence of more severe forms of mental illness and relies on the assumption that these disorders are “natural.” Prolonged persistence and severity of mental disorders may rather be accounted for by an evolutionary mismatch between our environment of evolutionary adaptedness (EEA) and demands of post-industrial society. For humans, the EEA in regards to a social context, consisted of communities of roughly 150 individuals who consequently often shared a high degree of genetic relatedness (Dunbar, 1993). This study seeks to introduce the mismatch of geographical proximity of one’s kin as a potential explanation for mental illness.

Female Body Ideals Across the World Explained through Waist-to-Hip Ratio

Kelsey Newhook (Psychology), Rolon Vania (Psychology)

Faculty Mentor: Glenn Geher (Psychology)

This research was designed to explore universal body ideals from an evolutionary perspective. Past research has shown that women with a waist-to-hip ratio (WHR) of 0.7 are found to be most attractive. Past research has also shown that women with a WHR of approximately of 0.7 have higher fertility. A project called “Perceptions of Perfection Across Borders” sent a single photo of a woman to photoshop artists across the world. The project gave the artists the instructions to alter the woman’s body using photoshop so to fit the body ideals of their country. 18 different countries were included. For my study, I took the altered photos from this project and measured the WHR of each image. The average WHR of all the photos was 0.698, providing further evidence regarding the optimal WHR as close to 0.7. While the bodies varied across cultures and proportions, drastically differing visually, they all had a common theme of a WHR of approximately 0.7.

Investigating Emotions in Music

Olivia Jewell (Psychology)

Faculty Mentor: Glenn Geher (Psychology)

Past research has indicated that there is a relationship between music and emotions. The current study focuses on examining the degree to which participants are able to detect an emotion in a piece of music that was composed for the purpose of eliciting that emotion. A research assistant was asked to compose 36 short clips of music on acoustic guitar, six for each of the six basic emotions, proposed by Paul Ekman. A survey was distributed to American participants of varying age and region. For each of the clips of music they were asked to rate, from 1 to 100, the degree to which each of the emotions was present in the musical clip, if at all. We predict that scores for the intended emotion of the musical clip, will be the highest, compared to the other emotions.

Friends, Love, & tinder: An Evolutionary Mismatch of Mating Strategies

Richard Holler (Psychology), Jacqueline Di Santo (Psychology), Matthew Chason (Psychology), Jacqueline Eisenberg (Psychology)

Faculty Mentor: Glenn Geher (Psychology)

With the rise of novel social venues provided by technology and the internet, the forces that shape human intimacy and sexuality are on the verge of significant change. Exposure to sounds of social-environmental ambience or social stimulation (SS; sounds of conversations, laughter, body movement, etc.) appears to decline as online social venues become more popular. To examine if auditory SS has an effect on perceived sexual and romantic attraction, participants were randomly assigned to listen to either to restaurant-ambient sounds (SS), sounds of flowing water, or silence, and then rated how interested they would be to (1) have sex with and (2) romantically date a series of attractive models, and (3) rate how sexually attractive those models were.

The Evolved Classroom: Using Evolutionary Theory to Inform Elementary Pedagogy

Kathryne Gruskin (Elementary Ed.)

Faculty Mentor: Glenn Geher (Psychology)

As the goal of education is to provide children with the skills needed to succeed later in life, it should come as no surprise that there is seemingly unending dispute about how to best educate our children. From an evolutionary perspective, the current system of education in the United States is highly unnatural and mismatched with the evolutionary history of our species. For example, rather than learning in mixed-age playgroups, children in our society find themselves separated into compulsory age-segregated classrooms completely directed by an unfamiliar adult. By bringing pedagogical methods related to early forms of education into modern schools, there is the potential to minimize adverse effects from evolutionary mismatch. This study surveyed a sample of 361 students from SUNY New Paltz. From these data, zero-order correlations were used to find a relationship between a composite variable representing evolutionary relevance in education and variables representing various measures of success. A further mediation analysis was conducted to better explain the relationships. Results from the study suggest that a relatively evolutionarily relevant education does, in fact, lead to success through both secondary and post-secondary education. These findings support the ability of evolutionary theory to inform elementary pedagogy.

Reactions to Behaviors: BFRBS and The Role of Education

Katrina Scarimbolo (Psychology)

Faculty Mentor: Kathleen Geher (Psychology)

BFRBs are body-focused repetitive behaviors. They include trichotillomania (hair pulling), excoriation disorder (skin picking), onychophagia (nail biting), and trichophagia (hair eating). These disorders induce negative social, economic, physical, and emotional impacts, on the individuals with BFRBs. Previous research does not address the reactions of those witnessing these disorders or how reactions differ based on the specific disorder. To address this the study asks participants to score positive, negative, and neutral adjectives on a scale of strongly disagree (1) to strongly agree (7). Each anecdote described someone experiencing the disorder. Half the participants received an informational page about the disorders to see if this influences participants' reactions. Participants were recruited through public spaces. All participants had to be at least 18 years old. The surveys were collected from the SUNY New Paltz area, and from the New York City area. This study has a between and within subjects design and was analyzed using ANOVAs. The sample included 221 participants. It is hypothesized that onychophagia will receive the most positive ratings, followed by excoriation disorder, trichotillomania, with trichophagia receiving the most negative ratings. It is predicted that the group receiving the education intervention will rate all the disorders more positively. It is hoped that this research can provide insight into improving educational materials to eradicate stigma.

Does hand proximity affect sentence processing?

Trisha Chabria (Biology & Psychology), Regina Paskoff (Psychobiology), Matt Chason (Psychobiology)

Faculty Mentor: Giordana Grossi (Psychology)

Recent evidence suggests that hand proximity influences the judgment of the sensibleness of English sentences (Davoli et al. 2010). These authors found that in the proximal condition (hands located near the stimuli and within visual field) subjects had more trouble distinguishing nonsense from sensible sentences, compared to the distal condition (hands not located near the stimuli and out of direct visual field). The researchers present two possible explanations for such effects: the correct grammar of both nonsense and sensible sentences causes a bias to judge both types as "acceptable," or that hand proximity impairs semantic processing, causing an impoverishment when stimuli are near the hands. The purpose of this study was to replicate the Davoli et al. (2010) study and extend its scope by using a different set of stimuli and adding sentences with grammatical violations so that the two hypotheses were contrasted. Reaction time and response accuracy were used as dependent measures.

What If We had Never Broken Up?

Faith Gillen (Psychology), Brittany Mabie (Psychology), Timea Tozser (Psychology), Melissa Blankstein (Psychology), Cari Marivelli (Psychology), Monica Schneider (Psychology), Katrina Scarimbolo (Psychology), Lauren Miro (Psychology)

Faculty Mentor: Tabitha Holmes (Psychology)

“What If We had Never Broken Up?”: How Men and Women Make Meaning Out of Past Relationships
Although research has examined the psychological “costs” of relationship dissolution, there is little understanding of how individuals make meaning out of these break-ups and how these relationships are integrated into a larger life narrative. Accordingly, the purpose of our study is to investigate how men and women think about their past relationships and the ways in which these relationships have influenced their lives. Participants were asked to construct counterfactual trees (e.g., “maps” of how their life would be different if they had never broken up with their partner). This new methodology allowed us to understand individuals’ perceptions of personal growth and stagnation. Men and women, ranging in age from 18-25, were recruited from campus emails. All participants selected a “significant” romantic relationship that ended more than 6 months ago. Participants created counterfactual thinking maps, rating each of the perceived emergent alternative on a three point scale. They also completed a semi-structured interview, and questionnaires on self-concept, attachment, personal growth, and well-being.. This mixed-method strategy will allow us to better understand how break-up narratives are related to outcome measures (self-concept and well-being). Finally, we will use gender to examine how men and women narrate their break-up stories differently.

The Emotional Impacts of Competitive, Cooperative, and Solo Gameplay in Adults

Leah Mancini (Psychology), Ariel Barter (Psychology), Vania Rolon (Psychology)

Faculty Mentor: Douglas Maynard (Psychology)

While there is plenty of research on the play of children, and on video game play, there is less research on non-digital play in adults. Engaging briefly in playful activities has been shown to provide a boost in positive affect. Our research examines changes in emotional state after playing one of three versions of a tabletop game: competitive, cooperative, and solo. College students played a card stacking game called Rhino Hero. Participants were randomly assigned to play either the original competitive version, a cooperative variant, or a solo variant. Participants completed a pre-game questionnaire measuring positive and negative affect, joviality, vitality, need for play, and the extent to which need for play had been met in the previous week. A post-game questionnaire measured these states again, self-reported interest, immersion, and feelings of relatedness to the other player. Finally, we measured trait competitiveness, subjective gameplay experience, and demographics. We hypothesize that participants will experience an increase in positive mood in all three conditions, but that this increase would be stronger in the two social gameplay conditions. We also expect that participants with higher competitiveness scores will benefit most from playing the competitive version of the game. Finally, we hypothesize that play-deprived participants will benefit more from play than those who have had sufficient play recently.

Play Among Nursing Home Residents

Leah Mancini (Psychology)

Faculty Mentor: Douglas Maynard (Psychology)

Adults over the age of sixty-five are the quickest growing population in the United States, and every state has experienced growth in adults over the age of eighty-five. This population faces a distinct set of concerns, including increased risk of physical ailments and mental illness. Research suggests that play can have positive outcomes in adults, but limited research has been done on this phenomenon. The aim of this study was to better understand how nursing home residents play, opening the door for possible therapeutic interventions. A qualitative approach to grounded theory was used to analyze interview data from nursing home residents. Fifteen residents, ranging from 72-97 years old, were interviewed about their experience with play before entering, and in the nursing home. Various themes were identified including reading as a play, maintaining play preferences, barriers to play, adapting to barriers, and the nursing home creating play opportunities. Reading has previously been defined as leisure, but some residents displayed characteristics of play while reading. While in the nursing home, residents wished to play as they did before entering the home. Residents faced various barriers, keeping them from playing, including physical, social, and institutional barriers. Some residents were able to adapt to these barriers, while others were not. Although the nursing home often created barriers, it also created opportunities for play that would not have otherwise existed.

Do young infants react with surprise, curiosity or puzzlement when viewing optical illusions?

Danielle Longo (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 on a TV screen. Previous studies in our lab demonstrated that four-month-old infants can differentiate between possible and impossible figures. They look longer at the impossible figures and fixate to a greater extent within the problematic region of the impossible shape, relative to its possible mate.

The goal of this study is to determine if increased looking co-occurs with facial expressions of curiosity, intrigue, surprise, and/or puzzlement. These affective expressions could be used as an indicator of the infant observers' internal conceptual understanding of real, coherent objects. Therefore, their facial expressions of surprise toward impossible objects relative to possible ones may reveal that impossible figures violate inherent expectations about 3D structure.

Here, we coded existing video data in a frame-by-frame fashion. Individual behaviors and expressions consistent with surprise and puzzlement (e.g., raised eyebrows, wide eyes, rounded mouth, double-takes, puckered lips, furrowed brows, reaching and leaning in) were tallied and totaled for each stimulus trial across all infants.

We hypothesize that infants will display more expressive forms of response particularly when viewing the impossible objects relative to their possible mates. Additional detailed coding and data analyses are currently underway.

Eye Movements in 4-month-olds Viewing Impossible Objects

Julie Planke (Psychology)

Faculty Mentor: Sarah Shuwairi (Psychology)

Previous work showed that 4-month-olds respond with longer looking toward pictures of impossible cubes relative to possible ones, suggesting that infants selectively attend to vertex information that is diagnostic of global coherence. However, it left open the question of whether infants would systematically respond with increased visual interest to other geometrically impossible figures. We tested 4-month-olds in an eye-tracking paradigm with novel pairs of possible and impossible objects. We hypothesized that impossible figures would evoke increased visual attention as infants attempt to ascertain their structural integrity. Infants again fixated longer on the impossible cube relative to possible one and produced a greater number of transitional saccades between the central interior juncture and peripheral regions of the impossible cube. Infants responded with similar dwell times for possible and impossible items across other object pairs. However, there were reliable differences in shifts of gaze between critical regions of the ovals and rectangles as a function of possibility. Additionally, infants produced reliably more fixations per second in response to the impossible shapes, categorically combined, relative to their respective possible mates. The high degree of variability in infants' fixation behaviors may be due to individual differences in selective looking, or, a stimulus-dependent response manifesting only with certain shapes.

How Do We Form Categories of Pictures, Objects and Words?

Julie Planke (Psychology)

Faculty Mentor: Sarah Shuwairi (Psychology)

In order to understand the conceptual nature of our ability to categorize ordinary everyday objects in the physical world, we investigated what types of perceptual information people use and actively rely on to organize pictures, objects and words into similar groups. We used a series of category formation tasks in which subjects freely sorted pictures of paintings and printed words into groups that seemed most natural to them. Previous studies found that when subjects engage in free sorting, they typically define their groups by one critical or unique feature. Subjects were instructed to sort pictures of paintings that differed in both semantic contents (e.g., people, objects, vistas) and artistic style (e.g., realism vs. impressionism), and to sort words that differed in both semantic contents and font type (e.g., serif vs. sans serif). In the first attempt, only 7 subjects (12%) sorted by artistic style, and 4 (7%) by font type. Most identified these higher-level perceptual properties after engaging in multiple sorting attempts. Overall, 43% (n=25) of the sample sorted by artistic style and 36% (n=21) sorted by font type at some point during the sorting tasks. This suggests global properties may not be readily obvious or salient to observers, and individual local features may dominate perceptual judgments. Category formation is an implicit way to assess saliency of features, and may clarify how we perceive, and ultimately conceive of, object information.

Low Income Communities in Long Island, NY Affected by Sea Level Rise

Katherine Matus (Student- SUNY New Paltz)

Faculty Mentor: Judith Halasz (Sociology), Huicheng Chien (Geography)

Climate change is a controversial issue that impacts all sectors of society, some more than others. For those with fewer economic resources and less social capital, climate change will cause additional distress. The effects of climate change will come in the forms of extreme temperatures and weather events such as droughts, hurricanes, tornadoes, and sea level rise. As weather becomes more intense at a quickly increasing rate, social problems such as affordable housing, physical health, employment, healthcare, transportation, among others will only be exacerbated. This project will discuss how low income communities are already disadvantaged in contrast to those with greater economic resources, examine the impacts of coastal inundation, and display an original case study of low income neighborhoods in Long Island, NY that will be affected by sea level rise over the next century. In order to measure these neighborhoods in Long Island, I have used ArcGIS software and U.S. Census Bureau data to visualize how these communities will be impacted by inundation. By using ArcGIS software, U.S. Census Bureau data, and meta-analysis of sociological literature I have developed cross-disciplinary research combining critical geography and applied sociology.

Immersive Audio in Virtual Reality

Brian Cahill-Assenza (Theatre Arts)

Faculty Mentor: Sun Hee Kil (Theatre Arts)

Goal: To learn, create and execute 360 Degree Binaural Audio in a way that is theatrically viable as well as practical.

Process: We will learn how to use Facebook 360 Spatial Workstation to create Virtual Reality content with 360 Degree Binaural Audio with the use of Pro Tools and Virtual Reality Hardware.

The process of understanding and creating content for virtual reality is a new concept with new rules and new technology. Explore what situations different technologies work in for virtual reality.

Oklahoma! Set Design

Caitlynn Barrett (Theatre Arts)

Faculty Mentor: Ken Goldstein (Theatre Arts)

A set designer's job is to create the visual vocabulary and aesthetic of a theatrical production by conducting a substantial amount of research and collaborating with the production team to create a cohesive environment. For Oklahoma!, the focus was to support and propel the emotional journey of the characters and highlight their struggles and successes. After finding historical research that was evocative of the time period, location, and emotion of the piece, the process moved toward creating sketches for each scene that were later finessed in Adobe Photoshop. As the process evolved further, a quarter-inch scale model was built based off of mechanical draftings of each scenic element that were developed in the CAD program, Vectorworks. Under the direction of Joe Langworth, our team created a cohesive production of Oklahoma! that effectively captured the struggles and strife of the people of the Oklahoma territory and created a world for them to thrive in. The final product was a direct result of the extensive research done with the help of the AYURE grant.

Shadow of a Gunman Costume Design

Samantha Guglielmo (Theatre)

Faculty Mentor: Andrea Varga (Theatre)

A significant amount of research needs to be done to create a cohesive design for a theatrical production. Research into the silhouettes, textiles and aesthetic of the period is central to the design process. The production team's goal was to recreate a pivotal point of Irish history in 1921 as reflected in playwright Sean O'Casey's *Shadow of a Gunman* written in 1923. Ireland was at war with Britain in an attempt to gain independence. This war led to the destruction of many parts of the city of Dublin and the fear of the Irish people-this is the world *Shadow of a Gunman* exists in. A costumer for this production asks what clothes would the people in the middle of a revolution wear as their "armor" in day-to-day life, and tell the individual stories of these people's lives and aspirations? The designer begins with preliminary research then moves on to detailed sketches, inspired and based on research, and creates paperwork to outline the costumes of a production. Under the direction of Jack Wade and with the collaboration of the other designers a unified world for Sean O'Casey's *Shadow of a Gunman* was created on stage. Using inspiration from the visual metaphor of chipped and peeling paint, a cohesive aesthetic was achieved to help tell the story. In Dublin, all that was once new and beautiful began to show the wear and tear on the inhabitants due to this war. The final product was a direct result of the extensive research done with the help of the AYURE grant.

Unmasked Costume Designs

Matthew Limerick (Theatre Arts Technology and Design/ Theatre Arts)

Faculty Mentor: Andrea Varga (Theatre Arts)

A large amount of work goes into each theatrical stage production, but when working on a world premier the creative team must build the world of the play from the ground up for the first time. For Raine Grayson's *Unmasked* the team was asked to wade into the world of New York City's Queer Club Counter Cultures, by exploring gender, and what it means to be Trans in contemporary America. In a generation living beyond sexuality and gender, it was imperative that the team find the most genuine and truthful way to represent the characters within a cohesive production design. The costume designer for this show focused on studies in Sexual Psychology, contemporary pop culture and fashion, as well as developing an understanding of life within the Transgender Community. At its base is the design is about of safe spaces, because each day when people get dressed they are building a personal safe space within their garments. This started the primary research process, and by delving into the 1980's club kid culture and moving through contemporary queer counter cultures within art, music, and fashion, detailed sketches were created, additional paperwork was created to track specific needs and changes within the play. By working with a costume shop the visual world for *Unmasked* was created by combining contemporary high fashion and abstract art in garment form. The final product on stage was a direct result from the exhaustive research done with the assistance of the AYURE grant.

Publication Opportunities for Undergraduates

Stanford Undergraduate Research Journal is an annual peer-reviewed publication of research articles written primarily by Stanford undergraduates, but also well-qualified students at other institutions, from all academic fields. <http://surj.stanford.edu>

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>

Journal of Science and Health at the University of Alabama - JOSHUA includes topics with societal or ethical implications, emerging methodologies or fields, et cetera.

<http://www.bama.ua.edu/~joshua/index.htm>

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

BIOS to publish their undergraduate biology work <http://www.tri-beta.org/publish.html>

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 Undergraduate Psychology Journal (UPJ) at the University of California Los Angeles is a publication which features outstanding research work performed by undergraduate students at UCLA and around the country <http://www.studentgroups.ucla.edu/psychjournal/>

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/>

Morehead Journal of Applicable Mathematics MEJAM accepts papers which are outside the realm of the typical undergraduate curriculum and which emphasize the applicability of mathematics while maintaining significant mathematical interest. <http://www.moreheadstate.edu/mejam/>

Rose-Hulman Undergraduate Mathematics Journal is devoted entirely to papers written by undergraduates on topics related to mathematics <http://www.rose-hulman.edu/mathjournal/index.php>
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&ekmense1=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>

Undergraduate Journal of Service Learning and Community-Based Research <http://www.bk.psu.edu/Academics/33679.htm>.

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/>

2016 SURE Award Recipients

Edward DeRamon, Chemistry, '17 (Mentor: Daniel Freedman, Dean, Science and Engineering)
Studies of Molecular Recognition by Synthetic Receptor Molecules

Kate Cushen, Biology/Geology, '18 (Mentor: Alexander Bartholomew, Geology)
Description of Middle Devonian Plant Specimens from the Plattekill Fm., Shokan, N.Y.

Devin Tobin, Psychology, '16, (Mentor: Lisa Bauer, Psychology)
How Sexism Can Bolster or Depress Self-Esteem, by Type and by Gender

Troy Ellick, Biology, '17 (Mentor: Kara Belinsky, Biology)
Using a Bird Feeder Network to Characterize Bird Diversity across a Suburban Campus

Kieran Pierce, Environmental Geochemical Science, '17 (Mentor: Huicheng Chien, Geography)
The Impacts of Storm Events on Water Quality

Alicia Scott, Electrical Engineering, '18 (Mentors: Reena Dahle and Mike Otis, Engineering)
3D Printed Smart Micro-channels Cooling Panel for Improved Solar Panel Efficiency

Nikolai Rigaud, Chemistry, '19 (Mentor: Megan Ferguson, Chemistry)
Applying the AdG Model to Quantify Steric Forces of Bacterial Biopolymers

Lauren Shea, Geology, '17 (Mentor: Gordana Garapic, Geology)
Processes at the Mantle-Crust Transition of Mid-Ocean Ridges

Kimberly Roman, Elementary Education, '17 (Mentor: Kiersten Greene, Elementary Education)
Foggy Mirrors and Broken Windows: Investigating Colorblindness in Young Series Readers

Miquael Williams, Art History, '17 (Mentor: Keely Heuer, Art History)
Beneath the Surface: Ancient Greco-Roman Influences on Minimalist Art

David Foote, Mechanical Engineering, '18 (Mentor: Heather Lai, Engineering)
Acoustical Modeling and Auralisation of Classrooms and Performance Spaces at SUNY New Paltz

Elizabeth Palmer, Chemistry, '17 (Mentor: Michael Machczynski, Chemistry)
NMR investigation of Laccase Reaction Intermediates

Tobin Mathew, Biology/Physics, '17 (Mentor: Spencer Mass, Biology)
Kinematic Studies of Metamorphosed Axolotl Salamanders

Leah Mancini, Psychology, '17 (Mentor: Doug Maynard, Psychology)
Exploratory Research of Play in Nursing Home Residents

Jackie Greco, Secondary Education, '18 (Mentor: Kate McCoy, Education)
Problems and Promise: A Preliminary Study on Charter Schools

Emily Gutierrez, Political Science and WGSS, '17 (Mentor: Jessica Pabon, WGSS)
Locating Latina Feminisms

2016 SURE Award Recipients continued....

Cailey Burnett, Geology/Astronomy, '17 (Mentor: Kaustubh Patwardhan, Geology)
Analog Experimental Models of Lava Lake Crystallization

Lindsay Loforte, BFA Sculpture, '17 (Mentor: Emily Puthoff, Sculpture)
Designing for Bees - Sculpting Resilient Pollinator Communities

Brandee Williams, Mathematics, '16 (Mentor: Anca Radulescu)
Fractal Properties of hybrid Mandelbrot Sets

Anthony Hollander, Biology, '18, and **Heather Wander**, pre-Biology, '19 (Mentor: David Richardson and Jannett Dinsmore, both Biology) Ecological Changes in the Sky Lakes: Largemouth Bass diets and Salamander Communities in Lake Minnewaska

Julian Chipkin, Mechanical Engineering/Physics '18 (Mentor: Kevin Shanley, Engineering)
Simulations of Newtonian and non-Newtonian Fluids Undergoing Sudden Expansions and Contractions

William Rosenkranz, Chemistry/Philosophy, '17 (Mentor: Pamela St. John, Chemistry)
Atomic Force Microscopy of Cytoskeletal Proteins in the Presence of Xenoestrogens

Matthew Chason, Psychobiology, '17 (Mentor: Aron Wiegand)
Moral Stage Development as a Factor Predicting Depressive Symptomology: An Exploration For Informing Intervention

Fall 2016 AYURE Award Recipients

John Kuhling, Electrical Engineering, '17
(Mentor: Reena Dahle, Electrical Engineering)
Wireless Power Transfer for Powering Passive Implantable Biological Devices

Brianna Best, English/Creative Writing, '17
(Mentor: Vicki Tromanhauser, English)
A Relative Canon: Twentieth-Century Woman Writers and the Discourse of Physics

Reshma Gheevarghese, Biology, '19
(Mentors: Kara Belinsky, Jennifer Waldo, both Biology)
Using DNA Fingerprinting to Understand Songbird Family Structure

Colin Wakeford, '17, and **Robert Weiland**, '16, both Computer Science
(Mentor: Min Chen, Computer Science)
Applications of k-means Algorithm on Experiment Analysis

Aakriti Ramayani, Biochemistry, '17
(Mentor: Preeti Dhar, Chemistry)
Facile Ring Opening of Cyclic Ethers Using Sodium Borohydride/Iodine

Andrew Zlotnick, Chemistry, '17
(Mentor: Megan Ferguson, Chemistry)
Preparing and Characterizing LPS Monolayers by AFM

Caitlynn Barrett, Theatre Arts/Communications, '16
(Mentor: Ken Goldstein, Theatre Arts)
Set Design for Department of Theatre Arts' Production of Oklahoma!

Matthew Cattani, Physics, '19
(Mentor: Catherine Herne, Physics and Astronomy)
Implementing a Position-Sensitive Detector for Optical Manipulation

Lucas Tracy, Physics, '18
(Mentor: Catherine Herne, Physics and Astronomy)
Measuring Rotation Rates of Graphite Flakes in Laguerre-Gauss Modes

Ani Coram, Anthropology, '17
(Mentor: Benjamin Junge, Anthropology)
PrEP and Masculinity

Bethany O'Hara, Biology, '17
(Mentor: Maureen Morrow, Biology)
The Effect of Atrazine on the Cytoskeletal structure of Jurkat Cells

Jessica Piga, Biology, '16
(Mentor: Maureen Morrow, Biology)
Microbial Source Tracking of *Enterococci* from Local Waterways

Fall 2016 AYURE Award Recipients continued...

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 2017 AYURE Award Recipients

Troy Moody, Biochemistry/Philosophy, '19

(Mentors: Pamela St. John, Chemistry and Spencer Mass, Biology)

Correlation between BPA absorption and regeneration in planaria

Carmina Chloe Taturan, Biology, '18

(Mentor: Lydia Bright, Biology)

Comparative Rab GTPase protein localization in Paramecium cells

Jonathan Colon, Mathematics, '17

(Mentor: Francis Valiquette, Mathematics)

Point Equivalence of Second-Order Scalar Finite Difference Equations

Laura Scarimbolo, Biology, '18

(Mentors: Maureen Morrow and Spencer Mass, both Biology)

The Effect of Modeled Microgravity on Cytoskeleton and Gene Expression

Chyanne Dieujuste, '17, and **Amber Funk**, '18, both Biology

(Mentor: Spencer Mass, Biology)

Comparing Atrazine to known Xenoestrogens in Regenerating Planaria

Zanyell Garmon, Adolescent Education, '16

(Mentor: Mary Sawyer, Teaching & Learning)

The Walk Poem Lesson: Connecting Teens to Nature

Student Travel Award Recipients

URETA

-Undergraduate Research Experience Travel Award: conference travel funding provided to students who participated in AYURE or SURE.

Nineteen URETA students presented at professional conferences during the 2016/2017 Academic Year.

STA

-Student Travel Award: conference travel funding provided to students who have not participated in AYURE or SURE

Eleven STA students presented at professional conferences during the 2016/2017 past year.

NCUR

RSCA is proud to announce that New Paltz student, Katrina Scarimbolo, '18, was accepted to present the results of her faculty mentored research project at the 31st **National Conference on Undergraduate Research (NCUR)** held **April 6-8, 2017** at the University of Memphis, TN. Katrina is a Psychology major and minoring in Creative Writing & Disaster studies. Congrats on being accepted to this competitive conference.



SURC

Fourteen New Paltz students (12 separate projects), listed below, presented the results of their faculty mentored research projects at the annual **SUNY Undergraduate Research Conference (SURC East)**. This year the conference was hosted by two SUNY locations: **SURC West** was held at SUNY Fredonia, and **SURC East** was at Suffolk County Community College. The conference was held on April 21, 2017.



Abel, Joseph
Cahill-Assenza, Brian
Chipkin, Julian
Fisher, Ashley
Keogan, Natalia

Krause, Christina
Longo, Danielle
Mensah, Nathalie
Scarimbolo, Laura
Schotte, Greg

Scott, Alicia
Danielle Longo
Christina Krause
Christopher Cabral