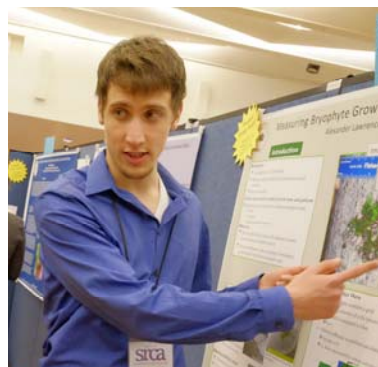


**srca**  
2015

**STUDENT RESEARCH &  
CREATIVE ACTIVITY DAY**



**THURSDAY, APRIL 16  
HUNT UNION BALLROOM**



**SUNY  
ONEONTA**



# 2015 Student Research & Creative Activity Day

**April 16, 2015**

**10:00 AM – 4:30 PM**

**Hunt Union Ballroom**

## **Sponsored by:**

College at Oneonta Foundation, Inc.

Division of Academic Affairs

Division of College Advancement

Grants Development Office

Office of Alumni Engagement

2014/15 College Senate Committee on Research

Thomas Beal (History)

Kelly Gallagher (Chemistry & Biochemistry)

Melissa Godek, Chair (Earth & Atmospheric Sciences)

Mette Harder (History)

Toke Knudsen (Mathematics, Computer Science & Statistics)

Florian Reyda (Biology)

Kathy Meeker, *ex officio* (Grants Development Office)

<http://www.oneonta.edu/a/srd/>





STUDENT RESEARCH &  
CREATIVE ACTIVITY DAY  
2015

## PROGRAM

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10:00 AM – 12:00 PM

*Viewing of student posters, computer displays and other exhibits  
spotlighting student scholarship and creative activity*

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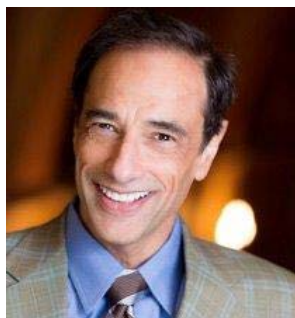
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12:00 PM – 1:00 PM

*Luncheon and Keynote Address*

**Hal Luftig '79**

### **SUNY Oneonta – A Lot Closer to Broadway Than You Think**



SUNY Oneonta alumnus **Hal Luftig** (class of 1979) is one of the leading theater producers in New York and around the globe. After receiving an MFA in Arts Management from Columbia's School of the Arts, his career began in downtown Manhattan, launching up-and-coming talents like Eric Bogosian and Charles Busch in shows like *Sex, Drugs and Rock and Roll* and *The Lady in Question*. Soon, Luftig began to also produce on Broadway. Among his many credits are *Catch Me If You Can*, *Legally Blonde*, and *Thoroughly Modern Millie*, as well as Broadway revivals of *Evita*, *The King and I*, *Annie Get Your Gun* and, most recently, *The Elephant Man* starring Bradley Cooper. He was the lead producer of *Kinky Boots*, the multi 2013 Tony Award-winning musical written by Harvey Fierstein and

Cyndi Lauper. Other credits include *Death & the Maiden*, *Jelly's Last Jam*, *Angels in America*, the 20th Anniversary production of *The Normal Heart* at the Public Theater, the revival of *The Diary of Anne Frank*, and Twyla Tharp and Billy Joel's *Movin' Out*. Currently, Luftig is working on *The Last Goodbye*, a retelling of *Romeo and Juliet* using the music of the late Jeff Buckley. He has won four Tony Awards, including two as lead producer, and London's Olivier Award, also as lead producer.

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**1:00 PM – 4:00 PM: *Viewing of student exhibits continues***

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### **3:45 PM: *CSSR Student Paper Awards***

As part of its fifth annual student paper competition, the Center for Social Science Research (CSSR) will recognize two students for their award-winning papers on the theme of "Social Entrepreneurship: Creative Responses to Social Problems." The winning papers will be edited and published on the CSSR website: [www.oneonta.edu/academics/ssr/](http://www.oneonta.edu/academics/ssr/).

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### **4:00 PM: Student Grant-funded Project Performance/Demonstration** *Stylistic Comparison of Mallarmé Song Settings by Claude Debussy and Maurice Ravel*

Conductor: John-Anthony Barnas (student grant recipient)

Vocalist: Cynthia Donaldson  
Piano: Timothy Newton  
1<sup>st</sup> Violin: Uli Speth

2<sup>nd</sup> Violin: Deborah Devine  
Viola: Ellen Murphy  
Cello: Hakan Hromek

1<sup>st</sup> Clarinet: Robin Seletsky  
2<sup>nd</sup> Clarinet: Kristin Kelly Hahn  
Flute: Anna Clark

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**SUNY Oneonta**  
**2015 Student Research & Creative Activity Day**

**STUDENT PARTICIPANTS**

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Matthew Acquavella.....	1	Stephen Grosso.....	13
Laura Adams .....	1,1	Oliver Gulian .....	12
Dan Ainspan.....	2	Tyler Habib.....	14
Michael Alavanja.....	2	Melissa Haig.....	14,14
Kaitlyn Alongi.....	2	Rosemary Harris.....	14
Gordon Andrews.....	9	Matthew Hartwell.....	15
Tara Aprill.....	12	Nathan P. Heller.....	15
Danielle Armaniaco.....	2	Elaine Herron.....	15
Erin Avery.....	3,16	Weston Honicker.....	24
Samara Ballard.....	3	Jackson Hoppey.....	16
John-Anthony Barnas.....	3	Zach Horowitz.....	16
John Beach.....	7	Ben Hultman.....	16
Amanda Bellinger.....	4	Merlyn Jeanty.....	17
Jennifer Benamati.....	4	Christian Jenne.....	17
Alanna Bergstrom.....	1	Michael Jones.....	22
Shannon Bergstrom.....	1,4	Nicholas Juliano.....	17
Bridget Boland.....	5	Renee Karr.....	17
Sara June Bouillon.....	5	Maria Keable.....	38
Kristen Boyd.....	22	Dan King.....	18
Marina Brown.....	36	Daniel Kopec.....	18
Camden Bushen.....	5	Rick Kretschmer.....	18
Jessica Calamusso.....	5	Edward Kwietniewski.....	18
Arielle Carmel.....	6	Robert LaMay.....	19
Brianna Carosi.....	6	Rebecca LeFebvre.....	14
Derek Casanas.....	6	Nanhee Lee.....	19
Kaitlyn Castle.....	31	Denisse Leon-Saravia.....	19
Bridget Chartrand.....	7	Jenna Leskovec.....	20
Allyson Church.....	7	Christopher Linkletter.....	20
Michael Coleman.....	7	Rachel Llanes.....	20
Hope Costa.....	8	Christine LoFaso.....	21
Victoria Costa.....	8	Samantha Lorette.....	21
Jansen Costello.....	8	Hayley Lovett.....	24
Benjamin Coyle.....	9	Devin Luna.....	21
Mark Crosby.....	9	Kyle Madden.....	22
Kimmy Cushman.....	9	Iliana Maldonado.....	22
Ben Dalecki.....	9	Jessica Mallozzi.....	32
Jaleesa Davis.....	10	Kathleen Marean.....	22
Andrea Day.....	8	Justine Marinello.....	31
Elsie Dedrick.....	10	Steve Marion.....	32
Illari Delgado.....	10	Anthony Marmet.....	23
Jarred DiPaola.....	10	Michael Masino.....	23
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Kevin Flessa.....	11	Stefan Mirvil.....	24
Kathryn Forti.....	12	Elliot Moore.....	24
Tegan Fox.....	14	Lyndsay Moore.....	25
Victoria Gander.....	12	Hannah Morier.....	25
Luke Gervase.....	12	Nicholas Muehlbauer.....	5
Sebastian Gomez.....	12	Kelley Murphy.....	25
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Brandon Panensky .....	26,26	Erika Stopler.....	33
Colleen Parker .....	31	Kevin Sutton.....	26
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Jordan Perry.....	27	Tiffany Taylor .....	33
Joseph Perry.....	27	Christopher Teter.....	33
Bill Platt.....	27	Mason Tiffany .....	34
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Hunter Reed.....	28	Matthew Vedete.....	14
Brian Reeves.....	16	Micaelina Velardi .....	35
Alejandro Reyes .....	28	Maxine Verteramo.....	35
Emilie Richard.....	29	Jacquelyn Victoria .....	35,36
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Marvin Rodriguez.....	26	Camera Walrond.....	36
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Jennifer Rushlow .....	30	Craig Wert .....	37
Serena Sackett .....	33	Jessica Williams .....	37
Jounia Sara Saint-Juste .....	30	Jenna Wood .....	38
Megan Sheridan.....	30	Kaitlyn Woods.....	38
Kyle Sisco.....	31	Crystal Wyllie.....	26
Kayla Slater .....	31	Jillian Young .....	13
David Snyder.....	31	Taylor Zelka .....	14,14

**FACULTY SPONSORS**

Tracy Allen (Geography/Environmental Sciences).....	1,1,2,4,8,26,28,34,34
Don Allison (Mathematics, Computer Science & Statistics).....	35
Sven Anderson (Art).....	24,36
Nancy Bachman (Biology) .....	11,23,30,37
Paul Bauer (Economics, Finance & Accounting).....	1,13,30,34
Thomas Beal (History) .....	20
Jacqueline Bennett (Chemistry & Biochemistry) .....	11,29,33
Paul Bischoff (Secondary Education & Education Technology).....	38
Jerome Blechman (Earth & Atmospheric Sciences).....	25
Michael Brown (Psychology).....	9,12,18
Keith Brunstad (Earth & Atmospheric Sciences).....	20
Jennifer Bueche (Human Ecology).....	31
Devin Castendyk (Earth & Atmospheric Sciences).....	8,34
Yun-Jung Choi (Human Ecology).....	13
Charlene Christie (Psychology).....	35
Amanda Connell (Communication Arts).....	4
Maryann Dowdell (Human Ecology) .....	31
Jill Fielhaber (Biology).....	19,21
Paul French (Physics & Astronomy) .....	24
Hugh Gallagher, Jr. (Physics & Astronomy).....	7
Andrew Gallup (Psychology) .....	7,15,24,33
Heike Geisler (Chemistry & Biochemistry) .....	6,16
Melissa Godek (Earth & Atmospheric Sciences) .....	13
Dawn Hamlin (Education Psychology, Counseling & Special Education) .....	4
Mette Harder (History) .....	28
Willard N. Harman (Biology/Biological Field Station).....	12,17,18,18,20,22,28,35
Rebecca Harrington (Health Education).....	8
Les Hasbargen (Earth & Atmospheric Sciences).....	18,37
KelLee Hassman (Biology) .....	37

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## 2015 Student Research & Creative Activity Day PARTICIPANTS

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Jeffrey Heilveil (Biology).....	36
Brett Heindl (Political Science).....	19
Nevin Henderson (Earth & Atmospheric Sciences).....	20
Kirsten Hilpert (Human Ecology).....	2
Fanli Jia (Psychology).....	16
Wayne Jones (Chemistry, Binghamton University).....	3
Andrew Kahl (Theatre).....	35
Toke Knudsen (Mathematics, Computer Science & Statistics).....	14,26,31
Michael Koch (Philosophy).....	36
Tami LaPilusa (Biology).....	17
Sunil Labroo (Physics & Astronomy).....	5,27
Ho Hon Leung (Sociology).....	3,5,5,10,10,16,19,21,22,23,25,30
Julie Licata (Music).....	2
Paul Lord (Biology).....	9
Brian Lowe (Sociology).....	15
Patrice Macaluso (Theatre).....	35
Tsitsi McPherson (Biology).....	29
James Michels (Physics & Astronomy).....	5
María Cristina Montoya (Foreign Languages & Literatures).....	12
Laura Munteanu (Mathematics, Computer Science & Statistics).....	2,24
Timothy Newton (Music).....	3
Joshua Nollenberg (Physics & Astronomy).....	9,17
Tyra Olstad (Geography/Environmental Sciences).....	26
Geoffrey O'Shea (Psychology).....	22
Florian Reyda (Biology/Biological Field Station).....	10,12,15,37
David Ring (Economics, Finance & Accounting).....	6,7,27
Sean Robinson (Biology).....	1,33,36
Elliot Ruggles (Gender & Sexuality Resource Center).....	4
Keith Schillo (Biology).....	6
Brenda Seery (Human Ecology).....	17,27
Pragnyadipta Sen (Earth & Atmospheric Sciences).....	23
Dona Siregar (Economics, Finance & Accounting).....	14,21
Philip Sirianni (Economics, Finance & Accounting).....	1,26,29,31
Frank Thornton (Education Psychology, Counseling & Special Education).....	25
Donna Vogler (Biology).....	5,29
Jen-Ting Wang (Mathematics, Computer Science & Statistics).....	14
William Wilkerson (Political Science).....	8
Jennifer Withington (Biology).....	27
Kiyoko Yokota (Biology/Biological Field Station).....	27,31
Fred Zalatan (Biology).....	11,17,25,33
Sen Zhang (Mathematics, Computer Science & Statistics).....	9
James Zians (Psychology).....	16,32



# PRESENTATION SUMMARIES

*Student:* Matthew Acquavella

*Faculty Sponsors:* Paul Bauer, Philip Sirianni (Economics, Finance & Accounting)

## **Do Oneonta Rents Exceed Property Values?**

The City of Oneonta is unique in that over fifty percent of housing units are renter-occupied, and roughly half of the population is between 15 and 24 years of age. The purpose of this thesis is to gain an in-depth understanding of the financial and economic makeup of the rental market in Oneonta. This paper seeks to determine whether the market is in balance such that the estimated sales price of a rental property is in sync with the sum of the discounted present value of future rental incomes, less expenses. This information could be of use to current and potential renters and landlords, as well as to property owners, as it also seeks to determine whether homes are over- or under-valued relative to their potential rental income. I hypothesize that the discounted present value of rental incomes will exceed property values in this market. The research employs the collection of recent sale data and hedonic regression analysis to estimate a pricing function. I will then use net present value of cash flow modeling to discount current and future rental incomes. The results of these models will be compared and used to formulate a response to the proposed question.

*Student:* Laura Adams

*Faculty Sponsor:* Tracy Allen (Geography/Environmental Sciences)

## **Reducing Ammonia Levels Naturally in Aquaponic Systems**

An aquaponics system is a food production system that combines conventional aquaculture (raising fish in tanks) with hydroponics (cultivating plants in water). This system creates a symbiotic environment where fish excrete in the water, which is then pumped to the plants, where they gain necessary nutrients for growth. Bacteria in the water break down byproducts into nitrates and nitrites, influencing the amount of ammonia present. This study collected the pH, ammonia levels and nitrate levels of two aquaponic systems over the course of two months. The purpose of this research was to determine why two seemingly identical aquaponic systems produced significantly different concentrations of ammonia and to adjust both concentrations for optimal growing conditions. One system had a higher amount of ammonia than the other. I tried to pinpoint the cause of this and develop a solution. I found that the rate of water flow moving throughout the system had a large influence on the nitrification process, which affected the ammonia levels in the water. By putting the system on a timer, with water flowing for two hours on, then off for two hours, I was able to achieve a system with low levels of ammonia and nitrates.

*Students:* Laura Adams, Shannon Bergstrom, Alanna Bergstrom

*Faculty Sponsors:* Tracy Allen (Geography/Environmental Sciences), Sean Robinson (Biology)

## **Sustainable Greenhouse Producing Crops Year Round for the Oneonta Community**

Greenhouse systems improve growing conditions of vegetable, fruit and ornamental crops. Greenhouse production is the most intensive form of crop production with a yield per cultivated area up to ten times superior to that of a field crop. The upkeep of a greenhouse year round can total up to thousands of dollars in energy costs, especially in colder climates like New York. A way to heat a greenhouse using no outside electricity is by using passive solar heat from the sun. This project explores solar greenhouses and examines if they can sustainably produce crops year round in the State of New York. Fifty-five gallon black barrels of water will be placed around the house, and during the day, they will gain heat from the sun. At night, the heat will slowly leach out, maintaining temperatures above freezing. This building will be built on SUNY Oneonta's campus, allowing students to use the site for future projects and experiments. The crops produced will be donated to the dining halls, Oneonta students, or local food pantries. This past fall, construction of the greenhouse started, but because of complications, it will be completed this spring.



*Student:* Dan Ainspan

*Faculty Sponsor:* Julie Licata (Music)

**Creative Drumming for Modern Pop Music**

The purpose of this project is to demonstrate the capacity for creative drumming to alter, transform, and transcend simple pop compositions. In modern popular music, it is often the case that percussion tracks are simplified and stripped down in order to appeal to the masses. Through the layering of custom percussion tracks over several select pop tunes, this project serves to break those boundaries by demonstrating more intricate percussive ideas that these compositions naturally suggest.

*Student:* Michael Alavanja

*Faculty Sponsor:* Tracy Allen (Geography/Environmental Sciences)

**Developing a Comprehensive Public Utilities GIS Database for Oneonta, NY**

The objective of this research is to map public utility networks for the City and Town of Oneonta. The maps will be used to inform future development. ESRI ArcMap was used to map the following utility networks: storm water drainage, sanitary sewer, electrical wiring above and below ground, water networks, culverts, and gas lines. Surveyed data was collected in the field, additional data was uploaded from internet websites like GIS Clearinghouse, and US Census. Trimble Global Positioning System (GPS) survey grade unit and satellite imagery was used to record field data, which uses multiple satellites to record waypoints accurate to within several centimeters. The Trimble data was uploaded in ArcMap to illustrate areas subject to flooding during the wet season. Results from the analysis aid City and Town engineers to develop improved drainage systems.

*Student:* Kaitlyn Alongi

*Faculty Sponsor:* Kirsten Hilpert (Human Ecology)

**Effect of Dairy Foods on HDL, LDL and Total Cholesterol**

High LDL and total cholesterol paired with low HDL cholesterol increases risk of cardiovascular disease. Using data from a clinical trial conducted by Dr. Hilpert, we investigated the effects of dairy products on cholesterol levels. Adults with hypertension (n=23) consumed three experimental diets in a randomized crossover study design. Diets included a dairy-rich, high fruits and vegetables diet (D-F&V, 30% fat, 7% saturated fat [SFA], 3.4 servings [svg]/d dairy, 9.6 svg/d F&V), a high fruits and vegetables diet (F&V, 30% fat, 7% SFA, 0.4 svg/d dairy, 9.6 svg/d F&V), and an average Western diet (AWD, 36% fat, 15% SFA, 0.4 svg/d dairy, 3.6 svg/d F&V). Effects of diet for total, LDL and HDL cholesterol were significant (all P's<0.04). Compared with AWD, total and LDL cholesterol levels were lower on the F&V and D-F&V diets (P's<0.001). HDL cholesterol was significantly higher on AWD compared to both the F&V and D-F&V diets. Cholesterol levels did not significantly differ between D-F&V and F&V diets. Triglyceride levels were similar among all diets. In conclusion, addition of 3 servings of dairy to a healthy diet rich in fruits, vegetables, whole grains and low in saturated fat does not elicit further improvements in lipids.

*Student:* Danielle Armaniaco

*Faculty Sponsor:* Laura Munteanu (Mathematics, Computer Science & Statistics)

**The Linearity Number**

The geometry of the triangle and its associated points, lines, and circles has often been viewed as inexhaustible. In particular, the computation of the linearity number and the application of the Theorems of Ceva and Menelaus helped in the discovery of important points of concurrency as well as in providing a different perspective on Simson's Line. In this presentation, we will illustrate some of these concepts.

**Student:** Erin Avery

**Faculty Sponsor:** Wayne Jones (Chemistry, Binghamton University)

**Solution-Processed Templated Organic Semiconductor Nanowires**

One of the most promising fields of alternative energy research is photovoltaics. In the field of photovoltaics organic solar cells arguably have the most potential to propose a cheap, flexible, easily processable alternative to inorganic solar cells. With the most room for improvement, this is a promising field. One of the biggest disadvantages organic solar cells currently have is efficiency. With an improved cell architecture this problem could virtually be solved. In this experiment a slow templated method was used to create organic semiconductor nanowires. Nanowires of different size and material were created using different pore sizes of the anodic aluminum oxide template. Using this process with the addition of a surface functionalization treatment with hexamethyldisilazane (HMDS), we were able to achieve smaller, fuller, and more consistently made nanowires. This new process was shown to be qualitatively effective on the production of nanowires made from poly(3-hexylthiophene-2,5-diyl) (P3HT) and 6,6-Phenyl C61 butyric acid methyl ester (PCBM). We were able to achieve 55nm diameter wires using this new method. These findings could potentially be used in future applications of nanowire architecture based photovoltaic cells.

**Student:** Samara Ballard

**Faculty Sponsor:** Ho Hon Leung (Sociology)

**Examining the Meaning of Community in Trailer Parks**

The purpose of this study is to examine the history of trailer parks and how they impact our world today. This project specifically focuses on Lantern Hill Trailer Park in rural Oneonta, New York. The importance of this study is to focus on the impact both in Lantern Hill Trailer Park and outside, the sense of home and community in the trailer park, the social stigma placed on Lantern Hill community members, the importance of the source of affordable housing, and the repairs and health risks that come with living in a trailer home. The research methods to be used for this study will utilize a combination of data collecting techniques. One of the methods I will be using is an ethnographic face-to-face interview with members of the Lantern Hill Trailer Park community. Next, I would like to construct random ethnographic interviews with members of the community of Oneonta, NY, to see if the stereotypes I predicted about trailer park communities do truly exist within the general population. I will also be providing visual data with pictures of Lantern Hill.

**Student:** John-Anthony Barnas

**Faculty Sponsor:** Timothy Newton (Music)

**Stylistic Comparison of Mallarmé Song Settings by Claude Debussy and Maurice Ravel**

Stylistic analyses of composers' musical works are an integral part of the study of music. These studies allow musicologists to better understand a composers' compositional voice and ultimately draw important conclusions about their personal style. It is rare in these studies when parameters such as genre, year of composition and source of inspiration are identical. In 1913, under Durand Publishers in Paris, France, both Claude Debussy (1862-1918) and Maurice Ravel (1875-1937) published a set of three song settings using the poetry of renowned French Symbolist Poet, Stéphane Mallarmé. Both composers set the poems "Soupir" and "Placet Futile" within these sets, presenting a unique opportunity to compare the stylistic approaches of Debussy and Ravel. There are currently two specific parameters being considered in our comparison of Debussy and Ravel's approaches: form of the music and treatment of the poetic text. As these individual analyses are completed, it will become apparent what other parameters are relevant to consider for comparison. This research will contribute important information about the similarities and differences between two of the most renowned composers of the 20th Century. Its importance is highlighted by a lack of in-depth studies of this topic. *A live performance illustrating this research is scheduled for 4:00 p.m. on the stage of Hunt Union Ballroom.*

*Student:* Amanda Bellinger

*Faculty Sponsors:* Amanda Connell (Communication Arts),  
Elliot Ruggles (Gender and Sexuality Resource Center)

**Gender Identity and Sexual Orientation Research Activity**

When it comes to the subject of gender, there is a conglomeration of factors that affect the way our society has lived in the past, lives today, and will continue to live on in the future. In my personal opinion, I think gender affects just about every aspect of our lives. Gender affects our identity, roles, sexual orientation, social constructs, culture, and so on. My purposes here are not only to develop and upgrade my own knowledge on this particular subject, but also to spread insight and awareness, and to enlighten others who are uninformed about gender. Again, besides spreading this consciousness to others, it can also help people to learn more about their own sexuality, identity, and who they really are. Optimistically, by the few experiments, surveys, research, analysis, and results I compile from this study, I hope to achieve at least a small change in the mindsets of others when it comes to the way they think about, understand, and define gender. In this study, my first plan of action is to create a survey I will distribute to randomly selected interviewees on the subject of 'Gender Differences' and the effects it has on people's relationships. I then will continue to have in-depth quantitative interviews with my randomly selected interviewees. Overall, there are many benefits that come along with understanding gender, not to mention the benefits one can possess by becoming a better communicator. In addition, I anticipate my new developed ability to relate this specific field with my own major, communications, as well as relating to others and the LGBTQA community (and all other letters included).

*Student:* Jennifer Benamati

*Faculty Sponsor:* Dawn Hamlin (Education Psychology, Counseling & Special Education)

**Going to "College" – Post-Secondary Possibilities for Students with Disabilities**

There are different options for students with disabilities that provide adapted college experiences in New York State. These post-secondary college and adapted college experience programs are options that are available for students with disabilities in New York State. In order to meet the challenges of typical work environments, people with disabilities often need more additional schooling/training opportunities to develop necessary skills to be productive employees. Having knowledge of programs such as the following will help pave the way for parents and educators to promote post-secondary options for students with disabilities: New York TPSID, Pathfinder Village, The Arc–Oneida Lewis Chapter, United Cerebral Palsy of NYC, College Internship Program, ACCES-VR.

*Student:* Shannon Bergstrom

*Faculty Sponsor:* Tracy Allen (Geography/Environmental Sciences)

**Rooftop Agriculture in Urban Settings**

Rooftop agriculture in urban settings is rapidly gaining popularity as we look for ways to make cities more sustainable. It can provide a sustainable food source in an urban environment where available land is limited. In order to reap the highest yields from the space as possible, it is important to incorporate a myriad of sustainable urban cropping practices. During my time as an intern for Living Restoration, a non-profit company based in Brooklyn that develops rooftop gardens and hydroponic systems, I researched some of these practices to be utilized on rooftop gardens. I, along with the other interns, researched the best way to utilize rooftop garden space to incorporate as many sustainable urban agriculture practices as possible. Living Restoration received a grant to maintain and develop a rooftop garden on the Staten Island Ferry Terminal. We were asked to create a project proposal with ideas and plans to recreate the rooftop space with a number of sustainable agricultural practices. We researched different growing methods, the best crops to grow in this environment, flowers to plant to attract biodiversity, and compost methods. We developed price quotes for building materials and supplies we would need to see our plans move forward onto the green roof. Our research will serve as a model for future small scale rooftop garden spaces.

*Student:* Bridget Boland

*Faculty Sponsors:* Sunil Labroo, James Michels (Physics & Astronomy)

**Testing and Calibration of the Software Used in the MMR Technologies Hall Effect Apparatus**

The MMR Technologies Hall Effect Measurement Systems was acquired through a recent SUNY Oneonta Strategic Allocation of Resources (StAR) award. The software provided with the apparatus had compatibility issues with the Windows XP operating system. This project dealt with these issues in order to get the software properly installed onto the computer and post-installation testing. The application installed from the apparatus provides more data than required for our experiments. In order to separate the relevant data from the irrelevant, the software's coding must be modified. Once separated, that data can be extracted into an excel sheet for organization.

*Students:* Sara June Bouillon, Nicholas Muehlbauer

*Faculty Sponsor:* Donna Vogler (Biology)

**SUNY Oneonta Campus Invasive Plant Survey, Removal, and Replacement Plan**

College campuses encompass a variety of habitats subject to a high level of invasive plant introductions, from frequent soil disturbance during construction projects, to non-native horticultural plantings. Last fall, students of Plant Ecology (BIOL 381) researched 24 invasive plants from the New York State list of Prohibited and Regulated Invasive Species (6 NYCRR Part 575). Our 250-acre campus is within the Catskill Regional Invasive Species Partnership (CRISP) region, and the project was developed in cooperation with CRISP. Students were assigned portions of campus to survey. Many of the 20 invasive species located were horticultural plantings (e.g., Japanese Barberry, Burning Bush), but in several of the minimally managed woodlots they found extensive Norway Maple and Garlic Mustard in the understory. GPS locations were reported to the NYS online iMapInvasives dataset. Our current study expands the previous work to include ground-truthing of GPS locations and species identification. We are collaborating with our SUNY Oneonta Facilities Office to initiate an invasive plant removal and replacement plan that includes an outreach event to replace some of the invasive shrubs on campus with native species. This plan will replace Japanese Barberry with suitable, deer resistant, native, and non-invasive shrubs over a period of years.

*Student:* Camden Bushen

*Faculty Sponsor:* Ho Hon Leung (Sociology)

**Analysis of the Tioga County Courthouse in Relation to Community and Architectural Sociology**

The purpose of this research project is to examine the symbolic meanings of the Tioga County Courthouse Building in Owego, NY, United States and to study its connection to the society it is placed in. The objective is to better understand how individuals of a close-community gather, use, and give meaning to the Tioga County Courthouse. The importance in studying this topic is to reveal the impact that the historic Courthouse building, which stands directly in the center of Tioga County, has had on and continues to have upon the surrounding inhabitants. In addition, I will explore the significance of the title "Coolest small town in America" awarded by nationally recognized Budget Travel Magazine in 2009. In my study I will reveal the meaning of community from the point of view of the townspeople from the tight-knit community of Owego, New York. I will connect this ideology to the sense of community that the townspeople share. Part of my study is to uncover what the community of Owego's strong connection is to the historical Tioga County Courthouse, specifically the symbolic significance of the Courthouse to the community members. Finally, I will unearth how the Tioga County Courthouse services the community's war veterans.

*Student:* Jessica Calamusso

*Faculty Sponsor:* Ho Hon Leung (Sociology)

**The Importance of Preserving Historical Sites to Maintain a Community's Identity**

The relation of a community's identity to an architectural structure is an influential setting for humanity's cognitive processing. In communities, architecture can show a direct reflection of what

history has deemed as vital knowledge for the future. The purpose of this proposed study is to examine the importance of how an historic building can hold meaning to a town's identity. This study will also examine how revitalization of a significant building holds importance in maintaining the historical teachings for community members as well as tourists. The conducted research will seek to examine what aspects of the building are most crucial to the town's identity and why is it so important to preserve the history of this building. Further, an understanding of the physical importance of the building as well as the local's psychological perceived emotional attachment to conserving the historical site will be examined. In researching this proposed study, the sociology of culture and environmental sociology will help to better understand the importance of preserving historical sites to conserve a community's identity. Methods that will be used will include comparative historical analysis and in-depth face-to-face interviews.

**Student:** Arielle Carmel

**Faculty Sponsor:** Keith Schillo (Biology)

#### **Food Addiction and Memory**

The purpose of this study was to determine if food addiction disrupts spatial memory in mice. Twelve male mice (35-40 days of age) were randomly assigned to two treatments: control and binge eating. We used the "limited access model" of food addiction to induce bingeing behavior. Controls were allowed to consume a mixture of vegetable shortening and cookies ("highly desirable food") for 2 h each day for 28 days. The limited-access mice were given access to this food only three times per week during the experiment. By the end of the study the limited-access mice consumed much more shortening per exposure than those that had it each day, that is, they bingeed. All of the mice had free access to chow and water. Before exposing mice to highly desirable food each one was trained to use spatial cues to locate an escape shelter on a Barnes maze. Spatial learning was assessed by recording the time required to locate the escape shelter and the number of errors committed in locating the target. At the end of the study each mouse was again subjected to the Barnes maze to determine if it remembered the location of the escape shelter. In spite of showing signs of bingeing, this behavior did not appear to affect spatial memory of mice.

**Student:** Brianna Carosi

**Faculty Sponsor:** Heike Geisler (Chemistry & Biochemistry)

#### **Synthesis and Characterization of Graphene Oxide**

This research sets out to improve the synthesis of high grade Graphene Oxide from graphite. According to the Hummer's method\* graphite was oxidized with a mixture of potassium permanganate (KMnO<sub>4</sub>) and concentrated sulfuric acid (H<sub>2</sub>SO<sub>4</sub>) to produce graphite oxide. Through this oxidation process the distance between the existing carbon layers is enlarged. Additional exfoliating results in a single-atomic layer of graphene oxide. The surface functionality of graphene oxide is believed to be composed of hydroxyl (-OH), epoxy (-COC), and carboxyl (-COOH) groups directly bound to the graphene layer. The resulting structure changes through the exfoliation process. For this study a variety of washing and exfoliating procedures were performed and systematically compared. The resulting products were characterized with X-ray Photoelectron Spectroscopy (XPS).  
\*W.S. Hummers and R.E. Offeman, J. Am. Chem. Soc., 1958, 80, 1339.

**Student:** Derek Casanas

**Faculty Sponsor:** David Ring (Economics, Finance & Accounting)

#### **Housing in the Current Expansion**

Consistent growth in Real GDP has followed the Great Recession that devastated the United States economy from 2007-2009. Despite growth, a sluggish housing sector remains an impediment to a more robust recovery. Weakness in this industry during the expansion has been primarily a result of struggling residential investment. Residential investment is significant during recoveries due to the fact it has historically recovered quickly, and growth in residential investment also spurs growth in consumption-related sectors. Thus, it is essential to know why residential investment continues to

lack growth. In this paper, I use a theoretical framework to determine the variables that effect residential investment in the United States, and which are the most relevant in the current expansion. By running a multivariate regression of the determinants, I will conclude the reasons that growth in residential investment has not followed historical patterns and the implications for monetary policy.

*Students:* Bridget Chartrand, John Beach

*Faculty Sponsor:* Hugh Gallagher, Jr. (Physics & Astronomy)

#### **Deducing the Breakdown Field of Air from Van de Graaff Electrical Discharges**

The Van de Graaff generator is ubiquitous in electrostatic demonstrations because of the large static charge and dramatic sparks that it produces. Sparks occur when the Van de Graaff generator produces an electric field that exceeds the dielectric strength of air or breakdown field. The overall goal of this research is to develop a technique to determine the breakdown field using the Van de Graaff generator. To do this, we measure the force of attraction between the Van de Graaff and a grounded sphere at the moment the spark occurs. Using a technique known as the method of images, we are able to deduce the charge distribution on the two spheres when the spark occurs from the measured force. The electric field in the vicinity of the spheres is then calculated from the charge distribution and its maximum value is the breakdown field. We will report on the breakdown field determined using this method and discuss the validity of the results in terms of accepted values, experimental limitations and sensitivity to the charge distribution model.

*Students:* Allyson Church, Heather Miller

*Faculty Sponsor:* Andrew Gallup (Psychology)

#### **The Effect of Social Presence on Measuring Contagious Yawning in the Laboratory**

Previous research has suggested that humans yawn less frequently under laboratory conditions while being observed by a researcher. Here we present the first study to systematically investigate the effects of social presence on self-reported contagious yawning (CY) in humans. A total of 105 participants were recruited to watch a CY stimulus on a computer monitor in an isolated room. Participants were randomly and evenly assigned to one of five conditions while watching the video: by themselves with no social presence (control), by themselves with a picture of a person's eyes on the computer monitor looking at them, by themselves with a webcam on the computer monitor, by themselves with a webcam on the computer monitor stated to be recording their behavior, or with a researcher in the room with them observing their behavior. Results show that CY varied consistently across the intensity of social presence, both with and without controlling for factors previously shown to influence yawning. In particular, CY frequency was significantly diminished in the webcam and researcher observation conditions. These results support previous research on the negative effect of social presence on CY in humans, and further research is underway to investigate the mechanisms contributing to this outcome.

*Student:* Michael Coleman

*Faculty Sponsor:* David Ring (Economics, Finance & Accounting)

#### **Effects of Quantified Forward Guidance on Market Rates**

The Federal Reserve System plays a pivotal role in the U.S economy through its ability to control the Federal Funds Rate and, thus, indirectly influences longer-term interest rates and asset prices. In recent years, however, the Federal Funds Rate has been pegged to the Zero Lower Bound and the Fed's ability to manipulate longer-term asset prices has been hindered. The communication of future policy intention to the public, known as forward guidance, has become an increasingly more important tool as it allows the Fed to influence the expected path of shorter-term interest rates and, thus, bolster control over longer-term rates and asset prices. It does this qualitatively through the use of carefully worded oral and written "language" and quantitatively through the publishing of the Summary of Economic Projections which contains the FOMC's GDP, unemployment rate, inflation and Federal Funds Rate expectations over the next one, two and three years, as well as over the "longer run." This paper aims to shed light on the effectiveness of the data contained in the SEP by

examining the correlation between revisions in economic projections and changes in interest rates at the time SEP releases.

**Student:** Hope Costa

**Faculty Sponsor:** William Wilkerson (Political Science)

**The Politics of Dissents and Concurrences on the U.S. Supreme Court: An Application to the Roberts Court**

In 1999, political scientists Paul Wahlbeck, James Spriggs II, and Forrest Maltzman published an article entitled, "The Politics of Dissents and Concurrences on the U.S. Supreme Court" in *American Politics Research*. This research determined why Supreme Court justices authored or joined separate court opinions using data from the Burger Court. They concluded that justices base their decisions on whether or not to author or join a separate opinion on their policy preferences while keeping in mind the institutional and strategic framework of Supreme Court decision making. Ultimately, they decided that Supreme Court justices are rational actors who pursue their policy goals within constraints; strategic and institutional factors temper justices' pursuit of their policy preferences (Wahlbeck, 507). This project is a replication of the research conducted by Wahlbeck, Spriggs, and Maltzman, but will be applied to the Roberts Court using data from the Supreme Court Database. It is important to understand why Supreme Court Justices author or join separate opinions in order to aid public policy research in determining the decision making process of the Supreme Court.

**Students:** Victoria Costa, Andrea Day, Nikki Fioretti

**Faculty Sponsor:** Rebecca Harrington (Health Education)

**Factors Contributing to Picky Eating Habits of College Students**

Each semester dietetics students hold outreach events in campus dining halls with the goal of encouraging students to try new and healthier foods. They found that many students are resistant to trying new foods. The data collected by this study will be used to identify common barriers that keep college students from trying new foods and inform better practices for those working on the development of healthy eating outreach events.

**Student:** Jansen Costello

**Faculty Sponsors:** Devin Castendyk (Earth & Atmospheric Sciences),

Tracy Allen (Geography/Environmental Sciences)

**Arsenic and Trace Metals in Common Pesticides in Lake Atitlán, Guatemala**

Lake Atitlán in Guatemala is the main drinking water source for several communities situated along the shoreline. Studies by SUNY Oneonta show that the lake water has dissolved arsenic concentrations of 11-13 micrograms per liter (ug/l). The World Health Organization's drinking water guideline for arsenic is 10 ug/l, suggesting that lake water may pose a health risk. This study seeks to determine whether local pesticide use may contribute to observed arsenic levels. The watershed surrounding Lake Atitlán is heavily used for agriculture. Farmers apply pesticides to crops in order to increase yields. These pesticides many contain inorganic constituents which are harmful to humans at high concentrations, such as arsenic, copper, and mercury. Rain rinses these constituents from crops and into streams, which then flow into the lake. This experiment measured the composition of the four most common pesticides used in the watershed which we purchased from a farm supply store in Sololá in 2014, plus two unknown pesticides collected from farmers. We prepared these solutions at SUNY Oneonta and submitted them to Actlabs in Ontario for ICP-MS, ion chromatography, and FIMS analysis. By testing each pesticide for 70 parameters, we will define their geochemical signature, and evaluate their contribution to arsenic in lake water.

*Student:* Benjamin Coyle

*Faculty Sponsor:* Paul Lord (Biology)

**Potassium Permanganates Effect on Zebra Mussel Adult and Veliger**

Municipalities worldwide are experiencing problems caused by invasive mollusks. An infestation of *Dreissena polymorpha* (zebra mussel), a mussel invasive to Otsego Lake, NY, is causing problems for water treatment plants, including the Cooperstown Water Treatment Plant. Zebra mussel colonization of water intake pipes impedes water flow and clogs filters. Chemical control of aquatic pests is currently necessary to maintain efficiency at municipal plants. Monitoring PVC and cast iron substrates determined the seasonality of zebra mussel fouling. Observed adherence rates of the two substrata show the greatest mussel colonization occurred on cast iron substrates at the end of the summer. These data delineate the seasonality of Otsego Lake's infestation. In conjunction, laboratory experiments exposed adult mussels and veligers to varying concentrations of potassium permanganate (KMnO<sub>4</sub>). We determined mortality rates based on time of exposure and KMnO<sub>4</sub> concentration. Targeting the veliger is more effective than targeting the adult mussel because veliger mortality occurs at a lower concentration and in a shorter amount of time than adult mussels. For maximum effectiveness as a zebra mussel control method, we recommend that KMnO<sub>4</sub> dosing should occur from late June to early September when veligers are able to settle on water intakes and pipes.

*Student:* Mark Crosby

*Faculty Sponsor:* Sen Zhang (Mathematics, Computer Science & Statistics)

**Fundamental Concepts of MakerGear M2 3D Printer**

This presentation aims to teach some fundamental concepts behind 3D printing from both the hardware and software perspectives. In particular, we will discuss how 3D printing works, the hardware setup of a MakerGear M2 3D printer, filament materials, how to safely operate the device, STL mesh model formats, 3D printing software configurations (such as Pronterface), programming the device using G-code, and how the slicing process is used for printing.

*Student:* Kimmy Cushman

*Faculty Sponsor:* Joshua Nollenberg (Physics & Astronomy)

**Modeling Dust in the Intracluster Medium**

We study the forces acting on dust and gas in the interstellar medium of dwarf galaxies in order to understand how they affect the yields of dust reaching the intergalactic gas between galaxies in galaxy clusters, the intracluster medium (ICM). Dwarf galaxies' low masses increase the probability of gas and dust to be expelled from the galaxy by combined stellar winds. Stars within the galaxy blow particles off their surfaces in the form of stellar winds. They also radiate electromagnetic radiation, which essentially blows charged dust and gas particles away from the galaxy. However, in order to escape the influence of the galaxy, the wind must be strong enough to overcome the force of gravity. The goal of this portion of the project in modeling gas and dust near the edge of a galaxy in the interstellar medium is to analyze the forces of gravity, radiation, and magnetism caused by a mock galaxy. Our model consists of a system with a mass of approximately  $5 \times 10^{10}$  solar masses in an exponential disk with an assumed uniform magnetic field. We also presume a light-to-mass ratio which is characteristic of dwarf galaxies, approximately 10 times that of solar.

*Students:* Ben Dalecki, Gordon Andrews

*Faculty Sponsor:* Michael Brown (Psychology)

**Prenatal Androgen Exposure is Associated with Sex Role Identity and Physical Preferences in Potential Mates Among Straight Males**

This study examines the relationship between the 2D:4D ratio (a crude biological marker of prenatal androgen exposure), gender role identity, and physical preferences in potential mates among straight participants. One hundred and thirty-two (33% male and 67% female) undergraduate students served as participants in this analysis. Among male participants, higher (more 'feminine') 2D:4D ratios on the right hand were associated with more 'feminine' sex role identities, a greater preference for



'masculine' physical traits in potential mates, and greater sexual attraction to the same sex. There were no significant correlations between these variables and 2D:4D ratios among female participants. Our results suggest that prenatal androgen exposure is related to sex role identity and sexual attraction in straight males, but not straight females. Data collection is ongoing.

**Student:** Jaleesa Davis

**Faculty Sponsor:** Ho Hon Leung (Sociology)

**Port Chester's Branding Faced with Demographic Challenges**

The purpose of this study is to examine how the city of Port Chester, New York brands its main street, Westchester Avenue. Every city has a main street with attractions, but every city has a different connection and importance given to their main street icons. Through an in-depth study of Westchester Avenue, preliminary findings show the connection between the architecture and the surrounding communities. This study is important because it will shed light on buildings that have gone from flourishing with business to being abandoned, then reconstructed and remodeled back into a thriving entity for the community. The iconic value of the Capitol Theatre connects back to the individuals of the location, and the data shows the importance of this structure to the very diverse community. Observations, individual interviews, and visual images help illustrate the dynamic of the atmosphere. The city of Port Chester normally has a reputation for being racially split, like many suburban communities. Here, you can find mostly Hispanic and Caucasian people. Westchester Avenue is run mostly by the Hispanics, which can be seen by all the shops on the street. Because people are different and come from different backgrounds, each building or store will mean something different depending on who's experiencing it. Research on the evolution of Westchester Avenue and the Capitol Theatre will show what impact the city has on the way the theatre brands itself.

**Students:** Illari Delgado, Elsie Detrick

**Faculty Sponsor:** Florian Reyda (Biology/Biological Field Station)

**Examination of a New Species of Rhinebothriidean Cestode from *Himantura pastinacoides* (Round Whipray)**

This study of a new species of rhinebothriidean cestode is part of a continuous survey of parasites, including cestodes, from elasmobranchs in Borneo, Australia, and Senegal. In this study, a morphologically unique species of tapeworm from a rhinebothriidean genus referred to by Healy et al. (2009) as new genus 3 was collected from several specimens of *Himantura pastinacoides* in Borneo. Unique characteristics for this species were identified using methods such as light microscopy, histological sectioning, and scanning electron microscopy. Through analysis using these methods it was observed that the arrangement of loculi on the bothridia showed a pattern of anterior, posterior, and marginal loculi, with marginal locui specific to the posterior end. Other unique features found were filitriches and spinitriches in restricted areas along the posterior margin of the proximal bothridial surface. The unique combination of locular arrangements and microtriches enable distinction of this new species from other members of the new genus to which it belongs. This work, among numerous other studies, further emphasizes the diversity of cestodes that still exist and have yet to be defined in elasmobranchs.

**Student:** Jarred DiPaola

**Faculty Sponsor:** Ho Hon Leung (Sociology)

**A Community Without Borders: How Music Festivals Become a Temporary Village that People Call Their Home for a Weekend**

Music festivals bring like-minded people together to celebrate their otherwise borderlines community. Between preparations on the part of the festival and the festival goers, an atmosphere of strong communal bonds is created almost instantly and between strangers. This study seeks to understand this bond by examining what makes the festival feel like home for its goers.

*Student:* Marie Dowd

*Faculty Sponsor:* Nancy Bachman (Biology)

#### **Creutzfeldt-Jakob Disease**

Few studies have investigated the cause and effects of the serious neurological brain disorder, Creutzfeldt-Jakob disease (CJD). This literature review project focused on the normal function of prions and the mutation of the PRNP gene, which causes the development of many neurological brain disorders such as Alzheimer's and Mad Cow Disease. Research was conducted to develop further knowledge about the forms of CJD that are known and the history of this disease. The study of prions is fairly new to the scientific community, making it difficult for medical professionals to know how to treat their patients. This study examines the range of symptoms as well as the duration of the illness for each form of CJD. Among the four forms (Iatrogenic, Sporadic, Familial, Variant), Sporadic CJD varies the most in the duration of the illness as well as the age of the patients affected. Research is currently being done to develop diagnostic tests that will let patients know that they are infected with CJD before symptoms appear. Tests are also being done in hopes of developing a cure for the disease.

*Students:* Danielle Dragotta, Kevin Flessa

*Faculty Sponsor:* Jacqueline Bennett (Chemistry & Biochemistry)

#### **Preparation of Thiosemicarbazones Using Green Chemistry**

Thiosemicarbazones are a class of compounds with antibacterial, antifungal, and antiviral properties. Recently, they have been found to be useful in the development of antitumor drugs, which makes them a topic of interest. The purpose of this project was to synthesize thiosemicarbazones using green chemistry methods, as opposed to traditional, more hazardous methods. Green chemistry focuses on the development of products and processes that minimize the use and production of hazardous materials. The traditional methods for synthesizing these compounds requires boiling in an organic solvent for several hours. These traditional solvents are often corrosive and highly flammable, and must be disposed of appropriately. The compounds created using these methods also require extensive purification. Our newer, green method uses mostly water containing some lactic acid as the solvent. Lactic acid is an additive and preservative for food products, and is found naturally in many foods, especially dairy products. This makes it a safer alternative than traditional solvents. The reactions in our green method do not require boiling, are complete in less than 15 minutes, and result in good to excellent purities and yields without any purification necessary. A total of 20 thiosemicarbazones have been made so far using this method.

*Student:* Gregory Eisenhut

*Faculty Sponsor:* Fred Zalatan (Biology)

#### **Potential Host Vesicle Components Involved in Yeast Transposition**

Transposons are genetic elements that have the ability to replicate and insert themselves elsewhere in the genome. Retrotransposons, such as the Ty1 element in yeast, use an RNA intermediate. Ty1 retrotransposons are the most common insertional mutagens in yeast, and their mechanism of replication shares similarities to retroviruses including HIV. With Ty1 transcripts having only a few genes, many host proteins are thought to play a role in this process. Mutations affecting vesicle components have been found to impact the frequency of transposition. In our study we measured the frequency of transposition in a SEC1 knockdown mutant strain of yeast. SEC1 is involved in encouraging vesicle fusion to membranes in the secretory pathway. This mutant reduced transposition efficiency, suggesting that this host protein may play a role in the transposition mechanism. In future studies we will test the effect of other mutated proteins that have known roles in vesicle trafficking, including SEC10, CLC1, and CHC1.

**Students:** Kathryn Forti, Tara Aprill

**Faculty Sponsor:** Florian Reyda (Biology/Biological Field Station)

**Examination of a New Species of Rhinebothriidean Cestode from a New Species of Stingray (*Himantura uarnak 2*) from Coastal Australia**

Recent survey work of elasmobranch parasites in northern Australia led to the discovery of several new cestode species. This study utilizes light and scanning electron microscopy to characterize a new species of the cestode order Rhinebothriidea, belonging to an undescribed genus referred to by Healy et al. (2009) as "new genus 3." This cestode was found in an undescribed species of stingray referred to by Naylor et al. (2012) as *Himantura uarnak 2*. Examination using light microscopy demonstrated that this new cestode possesses bothridia with three horizontally oriented loculi on the anterior region and seven vertically oriented loculi on the posterior region, a feature similar to that seen in another new species of this genus collected from Borneo. The vagina of the species in the present study, however, is distinctive in that it does not recurve anteriorly. This study is part of a broad international endeavor to discover and classify parasites, including cestodes, of elasmobranchs around the world.

**Student:** Victoria Gander

**Faculty Sponsor:** María Cristina Montoya

**A Dollar A Day**

During the 2014 spring semester, I engaged in a service learning experience in Cartagena, Colombia. Upon being there, I learned that many people have to survive with less than a dollar a day. This fact about poverty and survival really impacted me; I could not imagine it was possible. For this reason, I decided to implement a project that would symbolize such a restricted living experience. Through flyers around campus and pitches to various classrooms, I recruited ten Oneonta college students to partake in this economic exercise with me. For thirty consecutive days, these volunteers and I committed to living on only one dollar a day for anything but basic survival needs. Participants were allowed to spend the money as they pleased and accumulate their dollars for as little or as long as they chose, but they were not allowed to use or receive any additional funds. The purpose of this project was to gain a greater understanding and awareness about poverty through this first-hand experience and educational presentations revolving around such issues. I initiated a forum on Blackboard for us all to discuss our thoughts and feelings throughout the experience, both positive and negative. I believe that as a result of this experiential learning, the participants became more educated on the existence and impact of poverty, developed a more open mindset, and learned to better budget their spending, distinguishing personal needs and wants.

**Student:** Luke Gervase

**Faculty Sponsor:** Willard N. Harman (Biology/Biological Field Station)

**Millsite Lake: Coping With an Invasion**

Millsite Lake is an oligotrophic lake located in Jefferson County within the town of Theresa, NY. The lake has an approximately two-to-one watershed to lake ratio and supports a diversity of wildlife including birds of prey and multiple salmonid species. The Millsite Lake Property Owners Association (MLPOA) has been in existence since 1973 and currently faces a number of problems. These issues include the growth of Eurasian watermilfoil (*Myriophyllum spicatum*), degraded septic systems, and undesirable land use. The MLPOA views Eurasian watermilfoil at the forefront of their issues and has treated the lake with different herbicides since 1990. In order to preserve current quality of Millsite Lake, it is necessary for lake residents to strengthen their lake association, utilize personal property management practices, and manage the lake in an adaptive manner.

**Students:** Sebastian Gomez, Oliver Gulian

**Faculty Sponsor:** Michael Brown (Psychology)

**Cyberchondria: Health-Related Internet Use by Individuals with High Hypochondriasis Scores**

Using 120 undergraduates (82 women and 38 men) as participants, we tested whether people with higher scores on the Whitely Index, a well-validated measure of hypochondriasis, were more likely to

report frequent health-related Internet use, and report experiencing anxiety and fear during and after such Internet use. Using linear regression models, we found that participants with higher hypochondriasis scores researched health online more frequently, and with more anxiety and fear. While several studies show that most people find the Internet a valuable and reliable source of health information, our findings suggest that people with high health anxiety should consider avoiding health-related Internet use, and physicians and psychologists should consider advising people with high health anxiety to resist health-related Internet use.

*Students:* Kelly Graham, Cassidy Wachtel, Jillian Young

*Faculty Sponsor:* Melissa Godek (Earth & Atmospheric Sciences)

**Independent Undergraduate Research Group in Meteorology: Precipitation, Hurricanes and Climate Oscillations**

Through a compilation of projects, this work aims to illustrate current research undertaken in meteorology at the sophomore to senior levels. First, a precipitation climatology for central NY is developed. The goal is to identify long-term trends in precipitation since 1950. Changes in patterns within storms will also be examined. The work is inspired by public questions about rainfall trends after the floods of 2006 and 2011. Next, the stage and track length changes of hurricanes are analyzed since 1980. Track durations and lengths of Category 2 through 5 hurricanes are evaluated to see if long-term changes are occurring alongside climate change. It is hypothesized that hurricanes intensify at a more rapid rate with a warmer ocean. Early results of Category 2, 4 and 5 hurricanes support this tendency. Finally, an investigation of the North Atlantic Oscillation index and impacts in Europe is conducted. Winter index values may serve as a forecasting tool for European springs. An analysis of daily index values and air mass frequency is performed across the continent in both seasons. Preliminary results indicate that winter climate can be warmer or colder based on the index phase. Results of all projects aim to increase long-term and seasonal forecasting skill.

*Student:* Simone Green

*Faculty Sponsor:* Yun-Jung Choi (Human Ecology)

**Beauty and Tech New Venture Creation: "Notebook Cosmetics"**

The beauty industry is ever changing and in greater shape than it has ever been, with a value of over \$56.2 billion in the United States. Today, technology is newly shaping consumers' beauty product purchasing behavior. Consumers seek the latest and most technologically convenient method to obtain and understand their purchases. I am creating a new venture business, "Notebook Cosmetics," an online cosmetics retailer that assists with the growth of young professionals, beginner-artist, and makeup enthusiasts in the fashion and beauty field. Notebook Cosmetics uses the premise of teaching to become a network of support to these individuals. Along with a website filled with tutorials, tips, glam services and a great product line, Notebook Cosmetics will use technology platforms to reach consumers and to develop brand loyalty. Because beauty products are preferably tested and tried on prior to purchase, virtual shopping options will be included as well. Consumers will be able to upload a picture and indicate skin specifics to get the best match possible. By utilizing various ways of bonding technology and beauty, I foresee Notebook Cosmetics being a successful venture.

*Student:* Stephen Grosso

*Faculty Sponsor:* Paul Bauer (Economics, Finance & Accounting)

**How do Features of New Urbanism Affect Housing Prices in Celebration, Florida?**

In this paper, I assess the impact of new urbanism on single-family home prices. I am comparing the master planned community in Celebration, Florida to the surrounding traditional suburban neighborhoods in Osceola County, Florida. I used the tools of Geographic Information Systems (GIS) and data on 44,000 home transitions in Osceola County, Florida to estimate a hedonic price function to determine whether residents are willing to pay a premium to live in a new urbanist community.

**Student:** Tyler Habib

**Faculty Sponsor:** Dona Siregar (Economics, Finance & Accounting)

**Corporate Governance and Liquidity of Firms**

Is there a relationship between corporate governance and the liquidity of firms? My paper analyzes the relationship between the two factors, using liquidity as a measure of firm performance. Liquidity is important to companies, as sufficient liquidity helps firms sustain adverse economics and business environment. While a firm may have a large total value of assets, it may also end up in trouble if the firm is unable to convert those assets into cash. Without sufficient liquidity, the firm can quickly get into trouble with its creditors as it may not meet the terms of contracts it has agreed upon. At the same time, some firms believe more than others that good corporate governance is very important. Good corporate governance is very important for sustainable development, not only for the individual company, but also for the economy as a whole. Corporate governance quality may influence managerial decisions in such a way that will result in the variation of liquidity a firm is holding.

**Students:** Melissa Haig, Taylor Zelka, Tegan Fox

**Faculty Sponsor:** Toke Knudsen (Mathematics, Computer Science & Statistics)

**Mathematics in the Student Newspaper**

We have been working on an independent study for three consecutive semesters (starting in Spring 2014) under Dr. Toke Knudsen. During the first semester of the project, we searched for and recorded articles about mathematics in *The Oneontan*, which ranged from 1893 to 1920. Last semester, we went through *The Pen Dragon*, which ranged from 1928 and 1945, to find articles about mathematics. All articles found were scanned, recorded, and are in the process of being analyzed. We were interested in investigating what topics in mathematics students and faculty at the Oneonta Normal School wrote about or reported on. Furthermore, we wish to investigate if the focus of mathematics-related articles have shifted over time, and whether the presence of certain mathematics faculty influenced the volume of mathematics-related material published in the student newspapers. The topics of the mathematics-related articles found range from deliberations on how to teach division of fractions to school children, to esteemed mathematics professors speaking at conferences, to quick jokes referencing mathematics. We will present our findings thus far, sharing some of the history of mathematics in the school newspaper.

**Students:** Melissa Haig, Rosemary Harris, Rebecca LeFebvre, Matthew Vedete, Taylor Zelka

**Faculty Sponsor:** Jen-Ting Wang (Mathematics, Computer Science & Statistics)

**Campus Safety**

In the fall of 2014, Dr. Wang's Introduction to Sampling class conducted a survey on campus safety. We were interested in seeing how safe students felt on SUNY Oneonta's campus while taking into consideration the University Police Department's services, how safe students feel during the day versus at night, and suggested improvements. With IRB approval, the survey was developed and later distributed online to enrolled students. Over three hundred responses were recorded. The responses were then compiled and analyzed. The results produced valuable information on topics such as the use and placement of the blue lights throughout campus, use of the escort system through the University Police Department, how males and females feel on different topics associated with our campus safety procedures, and the overall sense of safety among the students on our campus. These results will be very valuable for the University Police Department and those administrators who have a hand in deciding safety procedures, as they can provide valuable insight into how students really feel about the current procedures in place as well as the overall sense of safety among SUNY Oneonta's campus community.

**Student:** Matthew Hartwell

**Faculty Sponsor:** Brian Lowe (Sociology)

**Topography of Hashtag Activism**

The creation of social spaces that accompany technological advancements has increased accessibility to more people, resulting in virtual environments like Twitter being utilized by activists to disseminate claims and market messages for support to address social issues. In a study of hashtag campaigns, Big Data methodologies, including quantitative word count analysis using RapidMiner, were utilized to look at tweets to make qualitative judgments based on subjective claims of social problems by the claim's originator. Social issues studied included minorities, environment, inequality, and health. Analysis provided insight into discourse surrounding each campaign, highlighting parallels among campaigns deemed successful based on activity. Three components of successful campaigns were identified. The presence of victim, villain, and call to action framed in shared moralities influenced the ability of campaigns to convince an audience to become involved in the social issue. Hashtag campaigns can be classified using a dual spectrum. One axis is the assistance requested by the campaign ranging from material support to its opposite, non-material support. The second axis is the cause of the issue being addressed. This ranges from whether it is a one-time event, specific and finite, to its opposite, a systemic problem requiring long term effort.

**Student:** Nathan P. Heller

**Faculty Sponsor:** Florian Reyda (Biology/Biological Field Station)

**The Histopathology of *Catostomus commersoni* (White Sucker) Infected with *Pomphorhynchus bulbocolli* (Acanthocephala)**

This study was undertaken in order to assess the damage caused by *Pomphorhynchus bulbocolli*. Three specimens of *Catostomus commersoni* (white sucker) were collected during early September 2014 via gill net from Canadarago Lake (Otsego County, New York) and dissected for intestinal parasites. Upon dissection, damage to the fish intestine was macroscopically visible, with the intestine perforated when infected with *P. bulbocolli*. Intestines observed to be infected with *P. bulbocolli* were opened with a longitudinal incision and fixed in neutral buffered formalin with the acanthocephalans remaining attached. Histological sections of intestinal tissue infected with *P. bulbocolli* were generated according to conventional methods. Histological sections of intestine with *P. bulbocolli* attached were compared with histological sections of intestine in which no worms were present. Examination of sections revealed extensive damage in the form of profound tissue destruction, as well as proliferation of cells at the sites of wounds. These changes were observed at the mucosa, submucosa, and muscularis layers of the fish intestine, eventually penetrating the connective tissue.

**Student:** Elaine Herron

**Faculty Sponsor:** Andrew Gallup (Psychology)

**Experimental Methods for Assessing Empathic Capabilities in Budgerigars (*Melopsittacus undulatus*)**

Empathy can be defined as the ability to share in the emotional state of others without directly participating in a given action (Preston and de Waal, 2002). Despite the importance of understanding the biological mechanisms contributing to this capacity, investigating the presence of this response in non-human animals has been largely unexplored. Here we describe the methods of an upcoming study in which we plan to investigate the presence of empathic capabilities in captive budgerigars (*Melopsittacus undulatus*). This particular species is a good candidate for exploring empathy due to the fact that they form lasting bonds with group members and show forms of both automatic imitation and behavioral cognition. Building from an experiment recently demonstrating emotional contagion in mice (Gonzalez-Liencrez et al., 2014), we will investigate whether budgerigars are capable of sharing an emotional state with conspecifics subjected to a stressful interaction. Furthermore, based on in-group biases previously demonstrated for empathic processing, the stress response of the budgerigars will be assessed between the observation of familiar (i.e., cage mates) and unfamiliar conspecifics.

*Student:* Jackson Hoppey

*Faculty Sponsor:* Ho Hon Leung (Sociology)

**Setauket Presbyterian: A Study of a Spiritual Community through the Lens of Architectural Sociology**

The purpose of this research will be to gain an understanding of how attendants of Setauket Presbyterian create a unique sense of community from their relationship to the site as well as one another. This research will be important in identifying the symbolic meaning that this historical church holds for those in the congregation, as well as the larger Setauket community. The research will be conducted from a symbolic interactionist perspective, which seeks to understand the way in which people interact with objects (or in this case a building) based on the meaning they attach to them. The study will be conducted with qualitative research methods consisting of in-depth interviews with church goers, staff and ministry, as well as church historians.

*Students:* Zach Horowitz, Brian Reeves, Garrett Abrams

*Faculty Sponsors:* James Zians, Fanli Jia (Psychology)

**Attitudes and Concerns of Parents Living in Otsego County about Local Youth Risk Issues**

Empirical research shows that youth who live in rural areas and feel more connected to and engaged with their communities are at less risk for problem behaviors such as mental illness, suicide risk, truancy, vandalism, alcohol or drug use problems, juvenile delinquency and other conduct problems and problems involving legal issues and local court systems. This study focused on youth risk behaviors in Otsego County. There are two phases to this study: Phase One consisted of a youth-risk questionnaire completed by parents age 18 or older residing with their child/children in Otsego County. Phase Two involved the collection of archival data on youth arrests and youth risk behaviors that included police involvement during the past two years. These archival data were provided by the Oneonta Police Department and were part of the public record. Results presented here are from Phase One. These preliminary results represent the first 160 parent participants from a sample of convenience. Research participants, who received a five-dollar gift card for their participation, were recruited at the Southside Mall in Oneonta, NY. This parent survey attempted to assess the attitudes, beliefs and behaviors of Otsego County parents regarding youth risk behaviors such as alcohol/drug abuse, youth violence, vandalism, and youth mental illness. Participation in the study was anonymous. Research participants were asked to complete a six-page questionnaire following consent for participation in the study. Only one questionnaire was completed by each family unit. Parent dyads who were present during recruitment were encouraged to complete the questionnaire together. The survey asked parent respondents to rate levels of risk and concern for youth in Otsego County on domains of interest such as: alcohol problems, drug abuse, community vandalism, bullying, tobacco use, school problems, and knowledge about local community services targeting youth for treatment of mental illness. The survey also asked parent respondents to compare their attitudes and concerns with perceived attitudes and concerns of other parents in Otsego County (e.g., Do you think that your above rating of drug abuse risk is higher or lower compared to ratings of risk by other parents in Otsego County?). Next, parent respondents gave ratings about their own sense of 'community connectedness' and they rated how they perceived their child/children's 'community connectedness.' Finally, parent respondents were asked to give personal ratings on a parenting efficacy questionnaire.

*Students:* Ben Hultman, Erin Avery

*Faculty Sponsor:* Heike Geisler (Chemistry & Biochemistry)

**Graphene Growth on Copper Surfaces**

Graphene is considered to be the material of the future. It shows great promise for use in a variety of technical applications. It can be used to make touchscreens harder than steel or allow phone batteries to be charged in a matter of seconds. However, the production of large area graphene is still a challenge. The purpose of this project was the systematic investigation of graphene growth on a variety of copper surfaces. Cu(111) has a hexagonal surface structure and Cu(110) a rectangular structure. The graphene was grown in an ultra-high vacuum (UHV) using chemical vapor deposition (CVD). The results of the growth were monitored with Low Energy Electron Diffraction (LEED).

**Student:** Merlyn Jeanty

**Faculty Sponsors:** Fred Zalatan, Tami LaPilusa (Biology)

**Environmental Sequencing of Otsego Lake**

Water samples were collected from Otsego Lake in order to analyze the bacterial species present. Samples were collected at different times of the year and from different locations to compare possible seasonal and geographical differences. Genomic DNA was extracted from these samples and a segment of DNA that codes for the 16s ribosomal RNA was amplified using the polymerase chain reaction. Upcoming experiments will utilize DNA sequencing of the amplified DNA, and the resulting sequencing data will be entered into a DNA database to identify the bacteria present in the original sample. This procedure, known as environmental sequencing, is necessary in examining and identifying bacterial species in a site since approximately 90% of microorganisms cannot be easily cultured in a laboratory setting.

**Student:** Christian Jenne

**Faculty Sponsor:** Willard N. Harman (Biology/Biological Field Station)

**The State of Truesdale and Its Fight Against Eutrophication**

Truesdale Lake, located in Westchester County, New York, has a 2,000 acre watershed, with 51% located in the state of New York and 49% located in the state of Connecticut. Surrounding Truesdale Lake is a community that has two primary Lake Associations, the Truesdale Estates Association (TEA) and the Truesdale Lake Property Owners Association (TLPOA). Over the past 30 years Truesdale has been treated with copper sulfate to treat Harm Algal Blooms (HABs) in the summer and multiple herbicides to treat Curly Leaf Pondweed (*Potamogeton crispus*). Although these symptoms are being treated, the overarching problem is the amount of phosphorus in the water system. Phosphorous naturally will be added into a lake based on the surrounding landscape, but in a situation like Truesdale the ill effects of phosphorous loading can be heavily attributed to anthropogenic influences. To improve these adverse effects, the TLPOA and TEA should adopt Best Management Practices (BMPs), such as using non-phosphorous-based fertilizers, implementing rain barrels, using buffer strips around edges of lawns and water retention areas in streams.

**Student:** Nicholas Juliano

**Faculty Sponsor:** Joshua Nollenberg (Physics & Astronomy)

**Utilizing the SUNY Oneonta Planetarium for Scientific Education**

The SUNY Oneonta Planetarium is a digital fulldome system equipped with state-of-the-art Digistar 5 software. This system provides for an expansive and customizable show experience, which can permit both an educational and entertaining experience for guests. Using this upgraded software, many scientific concepts can be explained, from plate tectonics to marine animal migration. Topics addressed in this study include the anatomy of our solar system and our universe.

**Student:** Renee Karr

**Faculty Sponsor:** Brenda Seery (Human Ecology)

**Gender Neutral Restroom Opinion Survey**

Research and theory in gender studies has called attention to the variety of expressions of gender identity, including those who are transgender or gender nonconforming. Increasingly, colleges and universities across the country have moved to make facilities comfortable and accommodating for all students regardless of gender identity and expression. There are 43 gender neutral restrooms on the SUNY Oneonta campus, with the highest number (12) in Fitzelle Hall. The goals of this study are two-fold: (1) to explore the opinions of those in the SUNY Oneonta community concerning gender neutral restrooms, and (2) to prompt thought around the need for gender neutral restrooms. We employed an on-line survey to explore the opinions of students and faculty/staff at SUNY Oneonta concerning their attitudes toward gender neutral restrooms.



*Student:* Dan King

*Faculty Sponsor:* Les Hasbargen (Earth & Atmospheric Sciences)

**Variability in Firn Densification Rates on the Taku Glacier, Southeast Alaska**

Firn densification modeling plays an important role in several types of glaciology and ice dynamics studies. However, some processes that affect firn densification rates have not yet been thoroughly described. Prior studies of firn densification processes have widely focused on the effects of temperature and accumulation; the impact of regional ice stress on these processes has been largely overlooked. Using standard methods of seismic refraction on the Taku Glacier in Southeast Alaska, we have created firn density profiles for areas of both low and high strain. Through comparison of these profiles, we are able to analyze the effects of strain on firn densification rates for a particular glacial setting.

*Student:* Daniel Kopec

*Faculty Sponsor:* Willard N. Harman (Biology/Biological Field Station)

**Cazenovia Lake: Monitoring Groundwater Phosphorus**

Cazenovia Lake is a 1,184 acre lake in the Seneca/Oneida/Oswego Rivers drainage basin, located entirely within Madison County, New York. It has provided the community with recreational opportunities, drinking water, economic prosperity, and enhanced natural beauty for centuries. Currently, comparison of Citizens Statewide Lake Assessment Program (CSLAP) data from 2006 and 2011, along with observations of surrounding residents, indicates that Cazenovia Lake is becoming more productive. The lake was listed on the New York State Priority Waterbody List (PWL) in 1996 as being 'threatened' by excessive weeds and algae, and continues to exhibit symptoms of eutrophication. In 1990, the Town of Cazenovia contracted Coastal Environmental Services Inc. of Princeton, NJ to develop a comprehensive management plan for Cazenovia Lake and its watershed. The firm developed a phosphorus budget for the lake, estimating the internal and external sources of phosphorus. The management plan was completed in 1992 and has not been updated since its publication. The Town of Cazenovia and SUNY Oneonta have arranged to update the plan, specifically focusing on phosphorus loading from internal and groundwater sources.

*Student:* Rick Kretschmer

*Faculty Sponsor:* Michael Brown (Psychology)

**Socio-demographic Predictors of Support for Lesbian and Gay Civil Rights**

This study examined the socio-demographic variables associated with support for civil rights for lesbians and gays. Participants were 537 straight individuals (26% male, 74% female). Men reported less support for lesbian and gay civil rights than did women. Also, black participants reported less support than did white or Hispanic participants. Religiosity, political ideology, gender role beliefs, and attitudes toward lesbians and gays were all significantly correlated, in the predicted directions, with support for lesbian and gay civil rights, however, age was not. Regression analysis showed that participants' attitudes toward lesbians and gays was the strongest predictor of their support for lesbian and gay civil rights. By examining the individual characteristics that predict support for gay and lesbian civil rights, we gain a better understanding of the nature and causes of anti-gay prejudice. This knowledge, in turn, may help us better identify and address the inequalities gays and lesbians continue to experience in our society.

*Student:* Edward Kwietniewski

*Faculty Sponsor:* Willard N. Harman (Biology/Biological Field Station)

**Rushford Lake: An Extreme Drawdown, But Good Management?**

Rushford Lake of Allegany County, NY is a 700 acre reservoir located in Western New York. The reservoir is a unique system in that it draws down its water level up to 60% on an annual basis, an occurrence that is rare to find in New York State. The reservoir has a fairly large agricultural presence in terms of its watershed land-use, which appears to export a large amount of phosphorus (P) into the lake. Internal loading from an anoxic summer hypolimnion and P loading may lead to late summer

nuisance algal blooms. However, stakeholders around the lake have not expressed any concerns about algal blooms. This inspires the question: does Rushford Lake's drawdown have an influence on algal populations in the lake? Although much scientific literature seems to point away from drawdown control of algal populations, Rushford Lake may be a more unique case because of the severity of the drawdown. For the future, continual monitoring of Rushford Lake's algal populations is necessary to dictate their response before, during, and after drawdown.

**Student:** Robert LaMay

**Faculty Sponsor:** Jill Fielhaber (Biology)

**Assessing the Production of Interferon- $\beta$ , and the Regulation of Apoptotic Gene Expression in a Mouse Model of *C. difficile* Infection**

*Clostridium difficile* (*C. difficile*) is the most common cause of antimicrobial and hospital-acquired diarrhea, which occurs due to damage to the large intestine. This damage is caused by cells committing suicide through apoptosis. Apoptosis is important for immune responses, and is controlled in part by signaling molecules made by the immune system. One such group of molecules are Interferons (IFNs). While it has been established that IFNs are important regulators of apoptosis during some types of infections, the production of and role of IFNs in *C. difficile* infection are unknown. We hypothesized that *C. difficile* infection causes expression of IFNs, and that IFNs regulate the expression of genes which control apoptosis. To determine if IFNs are produced during *C. difficile* infection, C57/BL6J mice received either a "mock" infection or  $10^5$  colony forming units of *C. difficile*, before measuring the amount of IFN $\beta$  mRNA using real-time PCR. Mice treated with *C. difficile* had elevated levels of IFN $\beta$  mRNA when compared to control mice. This indicates that IFN $\beta$  is produced in response to *C. difficile* infection. Future work will address the role of IFN $\beta$  in controlling the expression of genes involved in apoptosis in the large intestine during infection with *C. difficile*.

**Student:** Nanhee Lee

**Faculty Sponsor:** Brett Heindl (Political Science)

**The Internalization of Global Governance: A Focus on Internet Governance**

A great deal of study is being carried out to cope with internet governance. This paper aims to find out the trend and characteristics of internet governance research by using social network analysis. Also, the research attempts to explore some characteristics in climate change research with a sixteen-year time span. Content analysis and social network analysis are adopted as the methodology of this empirical study. This article reflects that various research on internet governance covering a wide range, from engineering to social science. This research uses content analysis and social networks analysis surrounding some of the main bodies underpinning internet governance and shows a strong relationship between national governments and the main regulatory body, ICANN. ICANN is a transnational non-governmental organization that deals with internet registries. In particular, the United States has a very strong influence over internet governance. Based on this research, I conclude that internet governance is unevenly developed around the globe and has not produced an equal, horizontal internalization of internet governance. In other words, internet governance is primarily dominated by the United States, to the detriment of developing economies.

**Student:** Denisse Leon-Saravia

**Faculty Sponsor:** Ho Hon Leung (Sociology)

**Symbolic Meaning of Restaurants in Monticello, NY**

The purpose of my study is to examine the symbolic meaning of restaurants to the community of Monticello, NY. It is important to study the symbolic meaning of restaurants because many restaurants have failed in the community, but only a few have remained opened for several years. Monticello is one of the largest communities in the Sullivan County Catskills, therefore restaurants failing raises the question of why they are failing, and what do the restaurants that are still open today symbolize to the community? The methods used for this study will be a qualitative exploratory

approach. I will prepare myself by first gathering online or printed information as well as visual data regarding restaurant businesses in Monticello. I will then conduct face-to-face interviews with members of the community and restaurant owners.

*Student:* Jenna Leskovec

*Faculty Sponsor:* Willard N. Harman (Biology/Biological Field Station)

**Windover: Managing a Private Lake in the Adirondack Park**

Windover Lake is a quaint 100-acre private lake, located in the town of Johnsbury, NY. The lake was formed in 1916 using a man-made dam, making it an artificially formed lake. For this reason, the lake is very shallow and prone to excessive aquatic plant growth. Surrounded completely by the 6 million acre Adirondack Park, Windover Lake and its stakeholders are subject to both the regulations of the NYS Department of Environmental Conservation (NYSDEC) and the Adirondack Park Agency (APA). Efforts to limit aquatic plants have been constrained to those techniques permissible within the Adirondack Park. The effectiveness of these past management techniques is discussed here.

*Student:* Christopher Linkletter

*Faculty Sponsors:* Keith Brunstad, Nevin Henderson (Earth & Atmospheric Sciences)

**Petrology and Geochemistry of a Transect along the Marcy Anorthosite Massif and Meta-igneous Contact Zone, Northeastern Adirondack Highlands of New York**

Massif-type anorthosites worldwide are mineralogically and compositionally diverse, and have been petrologic enigmas for decades. Numerous samples of anorthositic rocks have been collected and analyzed from the Adirondack Highlands of New York, but the geochemical data is scattered. When samples are dispersed throughout the largest state park in the contiguous United States, surface to subsurface correlations become debatable. This study examines the petrology and geochemistry of the Marcy anorthosite massif, and neighboring meta-igneous lithologies along transects across the margin of the massif. A total of 34 samples were collected and analyzed using inductively coupled plasma-mass spectroscopy and X-ray fluorescences. These geochemical data will be compared to over 300 samples of the AMCG suite from the literature. Gabbroic anorthosite with gneissic foliation and metaluminous mineral assemblages show an overall theoliitic trend. REE spider diagrams exhibit significant depletion in Nb, Pb, and Zr. The goal of this study is to gain insight into how the Marcy anorthosite was emplaced and evolved through time, and what are the massif's contact relationships with adjacent rocks. Current data suggests that the rim zone may provide key insight into the evolution of the Marcy massif and provide insight into the age relations between the core and marginal zones.

*Student:* Rachel Llanes

*Faculty Sponsor:* Thomas Beal (History)

**Alcohol in the Urban Shadow: The Temperance Movement on Long Island, 1800 to 1860**

The main objective of my project was to develop an understanding of the temperance movement on Long Island from 1800 to 1860. Although historians have written on temperance (the voluntary abstention from alcohol), none had considered how it developed on Long Island. It appears that most historians assumed temperance's popularity there mirrored what they found in other parts of New York State. My research took me to a number of historical societies on Long Island and in Brooklyn. In archives, I found documents describing the activities of Long Island temperance groups. I uncovered aspects of the temperance movement that other historians had overlooked. I read meeting minutes, letters of correspondence, and some of the literature these men and women helped publish. My research shows that many of the temperance groups grew exponentially at a time that coincides with the Second Great Awakening. This allowed me to draw several important conclusions. The Second Great Awakening's religious revival had a direct effect on the growth of the temperance movement, especially on Long Island. The awakening swept through Long Island during the 1800s, at the same time that the temperance movement grew exponentially, thus indicating that the temperance movement grew out of support from the religious revival.

**Student:** Christine LoFaso

**Faculty Sponsor:** Jill Fielhaber (Biology)

**Activation of STAT transcription factors during *C. difficile* infection**

Interferons (IFNs) are substances that activate the immune response during infection. IFNs activate STATs, which are proteins that bind to DNA and turn on the expression of genes. IFNs activate STATs through phosphorylation at specific amino acids, which allow them to turn on the expression of genes that control the immune response to infection. Therefore, the phosphorylation of STATs can serve as markers for the effects of IFNs. IFNs appear to be produced during infection with *Clostridium difficile*, a common hospital-acquired infection, but the function of the IFNs is unknown. My research will determine if IFNs produced during *C. difficile* infection causes the activation of STATs. To do this, wildtype and IFNR-deficient mice (which cannot respond to IFNs) were used to measure activation of STATs during *C. difficile* infection. Mice received a mock infection of  $10^5$  *C. difficile*, and proteins from the colon were extracted to monitor the phosphorylation of STATs using Western blot. I expect that *C. difficile* infection will induce the production of IFN, causing phosphorylation of STATs in wildtype, but not in IFNR-deficient mice. This will provide evidence that IFNs are important for the regulation of the immune response to *C. difficile* infection, and act through STATs.

**Student:** Samantha Lorette

**Faculty Sponsor:** Ho Hon Leung (Sociology)

**Outdated Buildings Get a New Take on Life with Repurposed Meanings**

The purpose of this project is to study the repurposed historical buildings within the city of Oneonta, not only taking into consideration their past historical importance but also their newly found purpose to the community members who have daily or yearly interactions among the select buildings. In hopes of not only better understanding and explaining the symbolic meaning of the buildings but also the symbolic impact on the community members, the study seeks to understand and further explain the benefits that repurposing buildings can have within a community, not only for smaller cities such as Oneonta but for even larger cities and communities. Preserving a city's historical importance is essential to shaping a unique sense of culture for tourism and community members, and may also economically help a community. The research methods used throughout the study will not only include detailed ethnographic interviews but also old photos from Oneonta's historical society as well as current photos of the selected buildings, along with taking into consideration select secondary data that can further help in the advancement of the study. The study will also look at scholarly articles that explain the economic benefits or costs associated with repurposing buildings within a community. For example the cost of repurposing may be greater than the cost of demolishing the building and constructing a new structure that is perfectly designed to fit the desired purpose. The study will seek to examine and understand the reasoning of communities to spend the money to change the desired purpose of a building and why certain historical buildings are selected.

**Student:** Devin Luna

**Faculty Sponsor:** Dona Siregar (Economics, Finance & Accounting)

**Internet IPOs, Underwriters, and Long-Run Performance**

The purpose of this paper will be to examine the relationship between underwriter quality and long-run performance of Internet initial public offerings (IPOs). I will run a regression of market adjusted initial returns and long-run returns over a period of three years using the Carter and Manaster (1990) rankings as a proxy for underwriter quality. My methodology will be similar to that of Carter, Dark, and Singh (1998) except for a few minor adjustments to the proxies for size and age. I believe my work will be consistent with previous studies in that long-run performance of IPOs is positively correlated to prestigious underwriters.

**Students:** Kyle Madden, Michelle Spencer, Steven Doolittle, Lexington Swartwood, Kristen Boyd, Michael Jones

**Faculty Sponsor:** Geoffrey O'Shea (Psychology)

**Implicit Learning Performance as a Function of Energetics**

It is well known that memory performance can be affected by energetics in the form of internal psychological states such as mood, as well as physiological states such as sleepiness. The effects of energetics on non-conscious memory are less well-known. One view predicts that non-conscious memory would exhibit a similar pattern of performance due to a sharing of cognitive resources with conscious memory. The second view, positing separate resources for conscious and non-conscious memory processes, predicts that energetics would exert separate effects on conscious and non-conscious memory processes. Using an incidental learning paradigm, the Hebb Digits task, which involves separate conscious and non-conscious memory components, it was found that mood intensity was negatively correlated with non-conscious memory such that less intense moods led to greater implicit learning. Mood intensity was not correlated with conscious memory performance. Sleepiness was not related to conscious memory processes, but showed a non-significant trend toward correlation with non-conscious memory performance. Taken together, the results suggest that energetics affects non-conscious memory processes in an inverse way such that greater sleepiness and less intense moods benefit implicit learning. Furthermore, these results suggest a dissociation between conscious and non-conscious memory processes.

**Student:** Iliana Maldonado

**Faculty Sponsor:** Ho Hon Leung (Sociology)

**The Gentrification and Archeological Perspective on Washington Heights**

This literature review indicates the intertwining relationship among the existing network in the community/neighborhood where the people interact and construct meaning of their lives. The purpose of the study is to gain an understanding of meaning of the historical church, Our Lady Queen of Martyrs in Uptown Manhattan, which is located in a rapidly gentrified community. Gentrification plays an important role in the growth of this community. Furthermore, I will examine the role the church plays in the community that is being gentrified daily. This will include a comparison of the neighboring schools to show how even students interact and develop with the influences from the school and the neighborhood. While using the church, the middle school, and the community, I will examine the gentrification in the area while measuring how much the community has changed. While using my evidence and proper questioning, I will be able to answer the questions and theories posited. Another important aspect in my research will concern demographics. Measuring the ethnic groups in the community is vital information to determining the effects of gentrification, the neighborhood church, and the education system.

**Student:** Kathleen Marean

**Faculty Sponsor:** Willard N. Harman (Biology/Biological Field Station)

**Sixberry Lake: A Case Study in Protecting an Oligotrophic Lake from Anthropogenic Eutrophication**

Sixberry Lake is found in the Jefferson County portion of the Indian River Lakes region of New York State. It is a deep, cold, and oligotrophic lake with a number of ground water springs supplying it. The watershed contains little development; therefore, the lake has not suffered from noticeable anthropogenic eutrophication as have other lakes in the region. The majority of the development in the watershed are summer or three season camps (source: Jefferson County Department of Planning), all with septic systems that cause a potential threat to Sixberry Lake's waters as the shores surrounding the Lake are fairly steep and composed of soils with very limited suitability for septic systems (source: U.S. Department of Agriculture, Natural Resource Conservation Service).

**Student:** Anthony Marmet

**Faculty Sponsor:** Nancy Bachman (Biology)

**Tagged HSF1 Gamma as a Tool for Tracking Heat Shock Components in Mouse Cells**

Organisms must survive a variety of stressful conditions, including sudden temperature increases that damage important cellular structures and interfere with essential functions. Proteins activated in response to elevated temperatures are called heat shock proteins (hsps). Heat shock proteins bind to misfolded proteins to repair them, promoting survival. The main regulator of genes for hsps is called Heat Shock Transcription Factor 1 (HSF1). Humans, mice, and other vertebrates express four different isoforms of HSF1, which differ structurally in the presence or absence of either of two short regions of 28 and 22 amino acids. We have constructed sets of plasmids, which enable the individual mouse HSF1 isoforms to be expressed in tissue culture cells, with or without an activating deletion. Each set contains specific protein tags [either FLAG or HA] with one set tagged at the beginning (N-FLAG or N-HA) and another set tagged at the end (C-FLAG or C-HA) for each tag. We are investigating the subcellular localization and hsp70.1 target gene activation of HSF1 isoform Gamma ( $\delta$ ) and Gamma Delta ( $\delta\Delta$ ) using N-FLAG, C-HA, and C-terminal green fluorescent protein tagged versions. Based on immuno-fluorescence, in the absence of heat shock, CHA-tagged HSF  $\delta$  is mainly present in the nucleus of cells. In contrast, CHA-tagged HSF  $\delta\Delta$  is majorly present in the cytoplasm. In the presence of Heat Shock, CHA-tagged HSF  $\delta$  is distributed more in the cytoplasm of a cell than in the nucleus. CHA-tagged HSF  $\delta\Delta$  is entirely located in the cytoplasm when Heat Shock is present. This work was supported by an award from the SUNY Oneonta Student Research Grant Program to A. Marmet and an NIH NIGMS grant (R15 BM096231) to N.J. Bachman.

**Student:** Michael Masino

**Faculty Sponsor:** Ho Hon Leung (Sociology)

**Feeling at Home in Brooks BBQ**

This study is designed to examine the small business sector of family owned restaurants by using one in particular that goes by the name of Brooks BBQ and how people might feel at home in a public restaurant. There are several existing studies on the sense of home and BBQ, however none of them have tied them together to show how community members may feel just as much at home sitting in a family owned restaurant as they would sitting in their actual home. This study will use the works of others based on family owned restaurants, the sense of home and one of America's most cultural foods, BBQ. Several methods will be utilized to ascertain how people feel at home while dining at Brooks. Of these, the most practical and beneficial methods are the use of interviews and observations. I will be both a participant and complete observer by engaging in the dining experience while simultaneously observing those around me. In addition, I will conduct several interviews with multiple people within the Brooks restaurant such as the owner, employees and customers, if granted permission.

**Student:** Casey McManus

**Faculty Sponsor:** Pragnyadipta Sen (Earth & Atmospheric Sciences)

**Three-dimensional Geometry and Sequence of Faulting in the Feura Bush Quarry Duplex in Selkirk, New York**

The Hudson Valley fold-thrust belt (HVB) is a north-south trending, 2 to 4 km-wide belt between Kingston and Albany, NY involving deformed Silurian through Devonian strata. Outcrops along the Helderberg Escarpment, a 20 to 50m high cliff representing the eastern boundary of the HVB, expose segments of the geometry of the HVB. One such exposure at the Feura Bush quarry near Selkirk, NY provides an excellent opportunity to study the underlying geometry of the northern HVB. Our analysis indicates deformation in the quarry is accommodated along at least three detachments in the duplex. The folded nature of the two exposed detachments indicate the presence of an unexposed lower third detachment. The middle detachment separates intensely deformed rock below it from less intensely deformed rocks above. Between the lower and middle detachments, two sets of thrust faults intersect which we interpret as two faulting events as a result of progressive deformation. In the

western wall of the quarry, the thickness of the thrust sheet between the exposed detachments is markedly smaller than the thickness of the thrust sheet exposed in the northern wall of the quarry. We interpret this as the termination of the upper detachment against the middle detachment.

*Students:* Janine Militello, Lexington Swartwood

*Faculty Sponsor:* Andrew Gallup (Psychology)

**Using Thermal Imaging Technology to Assess Behavioral Thermoregulation and Stress-induced Hyperthermia in Budgerigars (*Melopsittacus undulatus*)**

The use of thermal imaging technology provides an opportunity to collect non-invasive measurements of behavioral thermoregulation and stress-induced hyperthermia in laboratory animals. In this study we used a handheld thermal imaging camera to assess skull temperature changes in captive budgerigars (*Melopsittacus undulatus*) following capture and removal from a home aviary. Following a similar design to a study conducted on Sprague-Dawley rats (*Rattus norvegicus*), budgerigars were removed from group aviaries and placed into a single-housed testing cage in an adjacent room. An initial 15-min acclimation period was provided before thermal images were recorded at 10-second intervals for 1-hour by a researcher present in the room. A laptop computer screen was placed in front of the cage and a contagious yawning stimulus was played on a loop to induce yawns during testing. This design allows us to determine proper acclimation length for future research and testing by tracking reductions in stress-induced hyperthermia following capture, while also assessing the correlation between yawning, a previously documented brain cooling mechanism, and skull temperature in this species. In our analysis we plot macroscopic changes in skull temperature across the testing period, as well as compare microscopic changes in skull temperature immediately surrounding yawning events.

*Student:* Lauren Miranda

*Faculty Sponsor:* Laura Munteanu (Mathematics, Computer Science & Statistics)

**Napoleon-Like Theorems**

Napoleon's Theorem states that if we construct equilateral triangles externally on the sides of any arbitrary triangle, the centroids of those equilateral triangles also form an equilateral triangle. As it turns out, a coordinate proof of this result is relatively difficult to write, and a synthetic proof is almost impossible to handle. As such, we will present the geometric transformation concept and also present a proof of Napoleon's Theorem, as well as proofs of some related results, based on transformation theory.

*Student:* Stefan Mirvil

*Faculty Sponsor:* Sven Anderson (Art)

**Subtlety In Motion**

This project uses digital animation in still life painting to suggest a story within each piece. "Subtlety in Motion" also takes the digital animation to the streets and public spaces through drawing and painting using a graphics tablets and a laptop.

*Students:* Elliot Moore, Hayley Lovett, Weston Honicker

*Faculty Sponsor:* Paul French (Physics & Astronomy)

**Optics in Education**

A science outreach workshop using a variety of optical devices to illuminate several aspects of light has been designed for K-8 students. Reflection, refraction, and diffraction will be demonstrated at this event, which coincides with our campus's NanoDays celebration. This presentation will focus on all aspects of the workshop planning and implementation processes, including a description of the activities and their effectiveness in conveying concepts to and fostering curiosity among participants.

*Student:* Lyndsay Moore

*Faculty Sponsor:* Frank Thornton (Educational Psychology, Counseling & Special Education)

**Mathematics Instruction for Culturally Linguistically Diverse Exceptional Learners**

This poster focuses on evidence-based practices to teach students from different backgrounds with exceptionalities in a way that is correlated to their previous experiences and specific needs. One aspect of "Culturally Responsive" teaching to students with disabilities that is often overlooked is in the teaching of mathematics. Many teachers feel that because math is a "neutral" subject it does not have to be related to a students' lifestyle. This way of thinking is a contributing factor to why many cultural and linguistically diverse students have difficulties with mathematics. It has been proven that when linking mathematical concepts to students' culture, language, traditions, and interests, they are more likely to be engaged in learning tasks.

*Student:* Hannah Morier

*Faculty Sponsor:* Ho Hon Leung (Sociology)

**Elderly Residents in a Nursing Home Setting: What Does it Mean to Feel At Home?**

The purpose of this comparative study is to find out how the interior and exterior design and architecture in certain geographic locations affect the sense of home for residents who have transitioned to and are living in a nursing home setting. A sense of home may be shaped by memories, the present, and the perceived future. The quality of care can also affect how a resident copes with the transition to a new home. This research will be carried out using interviews of several residents and staff of the Teresian House Nursing Home in Guilderland, New York and The Plains Nursing Home in Oneonta, New York. The topics that this study will research are the meanings and feelings that we associate with home, how the location affects the architectural design, and the perceptions of the residents and staff living in these homes.

*Student:* Kelley Murphy

*Faculty Sponsor:* Jerome Blechman (Earth & Atmospheric Sciences)

**Severe Thunderstorm Winds and Lightning Location in a Severe Squall Line on 4 April 2011**

On 4 April 2011, a severe squall line passed through northern Alabama, producing numerous lightning strikes and severe weather reports. Using the Integrated Data Viewer (IDV), lightning strokes were superimposed onto the composite reflectivity data from 1800 UTC 4 April until 0600 UTC 5 April. Severe weather reports for wind were taken from the Storm Prediction Center (SPC) and superimposed onto the radar reflectivity as well, using their latitude and longitude to place them. In doing this, it could be investigated as to whether or not there was a correlation between the location of the severe wind reports and the lightning strikes. It was concluded that lightning strikes were centered around the areas of highest reflectivity, and these high reflectivities within this storm were due to the size and amount of hydrometers detected associated with strong updrafts. The strong updrafts correlated with strong downdrafts which, in turn, produced strong straight line winds which were reported by the SPC. The location of most wind reports on the IDV in relation to the radar reflectivity and lightning clusters corresponded well to this conclusion.

*Student:* Adam Myer

*Faculty Sponsor:* Fred Zalatan (Biology)

**Identification of Host Factors Involved in the Ty1 Transposon of Baker's Yeast**

A transposon (also referred to as a "jumping gene") is a small segment of DNA that inserts itself into other places of the genome, while the original piece of DNA stays in the same location. Yeast is a great model organism due to its eukaryotic simplicity, which can be utilized for studying the genetic and biochemical effects of transposons. The Ty1 transposon, a retrotransposon from Baker's Yeast (*Saccharomyces cerevisiae*), are of a particular interest of study because of their distinct structural and replication similarities to retroviruses, such as the Human Immunodeficiency Virus-1 (HIV-1). The Ty1 transposon requires host factors for its replication cycle. Host factors are genes encoded by the host cell that are needed for the replication cycle. Three host factors are being tested, Sec 6, Sec



10, and Sec 15. These genes code for proteins involved in vesicle transport across a cell and vesicle fusion to the plasma membrane. By mutating a host factor, so that the function of that protein is now reduced or ineffective, the effect of the mutation on Ty1 retrotransposon can be analyzed.

**Students:** Anthony Nichols, Marvin Rodriguez, Kevin Sutton

**Faculty Sponsor:** Toke Knudsen (Mathematics, Computer Science & Statistics)

**Word Frequencies in Theatrical Works**

This project involves an exploration of the Digital Humanities, an emerging field of study which encompasses the intersection of computing and the humanities. A program written in C++, provides a means of textual analysis of theatrical works. The program takes two files as input. The first is the play to be studied (in HTML or TXT format). The second is a dictionary of the words to be studied (in TXT format). The program produces an output file of word frequency data that can be used with graphical and analytical software to study the word usage. A prototype of the program is being used to compare the speech patterns of two female characters in different plays, Nora from Henrik Ibsen's *A Doll's House* and Ophelia from Shakespeare's *Hamlet*. The goal of this project is to give students and faculty in Theatre or related areas a new tool for their research. Future research includes the opportunity to look at the speech patterns and word usage of specific characters in a variety of plays as well as to explore answers to a variety of questions that would be of interest.

**Student:** Sean O'Hara

**Faculty Sponsor:** Philip Sirianni (Economics, Finance & Accounting)

**Oil Price Shocks and Green Energy Stocks**

With the price of oil hitting a six-year low at the beginning of 2015, natural intuition would lead us to believe that investment in green energy would also be at a similar low point. Lower oil prices reduce production costs for firms and transportation costs for consumers and, therefore, suppress the demand for green energy alternatives. The purpose of this study is to test for a relationship between oil price shocks and the stock prices of green energy companies. To assess whether a correlation exists, a vector autoregressive model is employed using oil prices, interest rates, GDP, PCE, high-technology stock prices, and green energy stock prices. These variables are chosen due to their macroeconomic relationships and interdependencies. It is hypothesized that falling oil prices should lessen the demand for green energy which will, in turn, decrease the price of green energy stocks.

**Student:** Brandon Panensky

**Faculty Sponsor:** Tyra Olstad (Geography/Environmental Sciences)

**Deer Population Impacts on Biodiversity at Glimmerglass State Park**

This presentation will cover field work done at Glimmerglass State Park to assess the numbers that make the local deer population and the biodiversity of local wildlife. It will compare the numbers of deer counted through a set period of time, and the species richness of predators captured on a trail camera for another set period of time. Past records will be analyzed to see how much the deer population has grown. It will outline the effects that connect the deer to the other wildlife, as well as recommendations to manage the growing deer population.

**Students:** Brandon Panensky, Crystal Wyllie

**Faculty Sponsor:** Tracy Allen (Geography/Environmental Sciences)

**Habitat Selection and Conservation of Bluebirds at SUNY Oneonta**

Otsego County is a known habitat for bluebirds; however, since they have become a threatened species, their numbers are not fully known and much is being done to protect the song birds and increase their numbers. Our presentation will show an estimate of the campus and College Camp Eastern Bluebird population ascertained through field work. Methods include using bluebird nesting boxes, trail cameras, and comparative analysis of other areas to show if the population in the area is healthy or not. We will also provide an explanation as to why the bird's population is, or is expected to be, low.

*Student:* John Perruna

*Faculty Sponsor:* David Ring (Economics, Finance & Accounting)

**Inflation Expectations: Accuracy of Market Based Measures vs. Survey Based Measures**

This paper examines the accuracy of inflation expectations, both market measures and survey measures, by looking at several different forecasting techniques including: The Cleveland Federal Reserve expected inflation, The University of Michigan Expected Inflation, Breakeven Inflation, forecasts done by The Survey of Professional Forecasters. The Consumer Price Index and Personal Consumption Expenditures, along with the core measures of both, are used as the measures of inflation. I will be looking at actual inflation as a product of expected inflation using several different forecasts to ascertain which method of predicting expected inflation is more accurate, market-based predictors or survey-based predictors of inflation. Up to this point it can be said that market-based predictors of inflation are further from actual levels of inflation over the long term, while survey-based measures are more accurate, as they are more anchored in the long term.

*Student:* Jordan Perry

*Faculty Sponsor:* Brenda Seery (Human Ecology)

**The College Hook-Up Culture's Effects on the Psychological Well-Being of College Women**

Over the past decade researchers have acknowledged that intimate relationships at colleges across the country have changed in form, with a shift from "going steady" in the 60s to the more recent practice of "hooking up" (Harden, 2013; Heldman & Wade, 2010). Casual sex has become widely accepted on college campuses and romantic relationships have become seen as less desirable (Fielder et al., 2013; Harden, 2013; Heldman & Wade, 2010). This fairly new phenomenon has been documented by research showing that between two-thirds and three-quarters of college students report having hooked up at some point in their college career (Heldman & Wade, 2010; Lewis et al., 2012). With such a high incidence of the student population involved in this new trend, our goal in this study is to examine the psychological affects and the attitudes toward the hook-up culture of heterosexual women. Recent research indicates that female college students have twice the level of negative emotional reaction to the hook-up culture than men (Owen et al. 2010). This research is important to higher education in order to better our understanding what resources may need to be developed on campuses to assist female students through this social realm of college.

*Student:* Joseph Perry

*Faculty Sponsor:* Jennifer Withington (Biology)

**Phenolic Transport by Mycorrhizal Fungi**

Allelopathy is an ecological phenomenon through which certain plants affect their competitors by releasing harmful chemicals into their environments. One important class of allelochemicals are the phenolics, which have been implicated in various ecological and agricultural problems. Produced by a vast number of plants in the course of their regular metabolism, these chemicals are only considered allelopathic if they meet certain criteria, including their effective release and dispersion. Recent studies have shown that the range of these chemicals may be facilitated by soil-bound fungal symbionts known as mycorrhizae. Their means of facilitation is unknown, but it has been proposed that transport may be surficial or internal, and may rely on diffusion or active uptake. The objective of this study is to acquire clues for either method by exposing isolated mycorrhizae to three phenolic chemicals: gentisic acid, vanillic acid, and pyrocatechol.

*Student:* Bill Platt

*Faculty Sponsors:* Kiyoko Yotota (Biology/Biological Field Station),  
Sunil Labroo (Physics & Astronomy)

**Efficiency of Photosynthesis in Algae at various Frequencies of Light**

Photosynthesis is a process in which light energy is converted to stored chemical energy in the form of adenosine triphosphate (ATP). The chemical energy from ATP is then used to convert carbon dioxide and water into glyceraldehyde 3-phosphate (G3P) through a process called the Calvin Cycle.

G3P is then synthesized into the larger organic molecules, which make up the biomass of an organism. The purpose of this project is to experimentally determine the efficiency of photosynthesis in algae at various frequencies of light. While algae are not plants, they are eukaryotic organisms that perform photosynthesis. Three genera of algae will be used, *Chlorella*, *Navicula*, and *Batrachospermum*. The algae will be exposed to light for a set period of time, and then the dry biomass will be measured. The energy required to produce that amount of biomass will be calculated. The total light energy incident of the algae will also be calculated. From this, the overall efficiency of photosynthesis can be determined for each genus of algae.

**Student:** Joseph Raguzin

**Faculty Sponsor:** Tracy Allen (Geography/Environmental Sciences)

**A Comprehensive Guide to the Environmentally Sustainable Initiatives on the Campus of SUNY Oneonta**

This project is to concisely and adequately describe the elements that make our campus environmentally sustainable. The sustainable initiatives at our campus are numerous, and this project seeks to research them all on an in-depth level and report on how each different program contributes to a sustainable campus. Furthermore, the information gathered will be displayed in an organized manner on a GIS map of the campus. This research will be visually portrayed to see where on campus the sustainable aspects are located, the details of each, what exactly makes them environmentally sound and why these practices make SUNY Oneonta unique. Through research gathered from personal sources closest to SUNY Oneonta's sustainability efforts, supplemented by academic research into sustainability, this project comes together to organize all the information we can gather on our sustainable campus.

**Student:** Hunter Reed

**Faculty Sponsor:** Mette Harder (History)

**The French Republic vs. the Friend of the People: Marat on Trial**

Jean-Paul Marat was both a writer and political figure during the French Revolution. Marat was front and center during the stage of the Revolution when the French royalty was officially removed from power and Louis XVI was executed. His writings, particularly *L'Ami du peuple*, was a well-known work during this time. It was a radical pamphlet that was widely distributed among the citizens of France and also became known for attacking more conservative leaders of the Revolution following Louis XVI's death. In April 1793, Marat was the first politician to be placed on trial, setting a precedent for all other political trials that followed in the 1790s. This project closely examined the writings of Marat, shedding light on an understudied aspect of his trial. Based on manuscripts, books, personal letters, and newspaper articles, I learned about Marat and what aspects of his political writings were radical enough to place him on trial. Understanding the significance of contemporary writing contributes to current research examining the nature of political trials in the French Revolution.

**Student:** Alejandro Reyes

**Faculty Sponsor:** Willard N. Harman (Biology/Biological Field Station)

**Managing Eurasian Watermilfoil in Brant Lake: Can Pulling Weeds Produce Results?**

Eurasian Watermilfoil (*Myriophyllum spicatum*) is a non-native submerged macrophyte widespread throughout the northeast. Its ability to rapidly colonize habitats and form dense monocultures makes it a superior competitor against native flora and can impede lake recreation. Brant Lake (Warren County, NY), has been using a combination of benthic barriers and hand harvesting to manage milfoil since the early 90s. The Brant Lake milfoil story is a unique one due to the fact that management was implemented before milfoil reached nuisance densities, contrary to traditional invasive species management. This early intervention made it possible to prevent milfoil from becoming a serious problem. In 2008, the Brant Lake Association hired Aquatic Invasive Management LCC to harvest milfoil from the lake. From 2010 to 2014, 13,683 pounds of milfoil have been removed from the lake,

with most of the pounds being removed in 2009 (8,825) and 2014 (4,794). Despite the large amounts of milfoil removed, there are still large knowledge gaps concerning milfoil distribution, overall size of the population and the role septic systems play in milfoil growth. An understanding of these characteristics should lead to a more cost effective management of the Eurasian Watermilfoil population in Brant Lake.

**Student:** Emilie Richard

**Faculty Sponsors:** Tsitsi McPherson (Biology), Philip Sirianni (Economics, Finance & Accounting)

#### **SUNY Oneonta Ecological Footprint Assessment Survey**

The objective of ecological footprint assessments is to measure the environmental impact of the actions of individuals. While surveys exist that allow home owners and non-students to assess their ecological impact, a survey tool that allows for an assessment of University students has not been developed. University serves as formative years where behaviors are learned and environmental consciousness can be awakened. Student perception of their impact on the environment can be assessed and environmentally beneficial behaviors proposed. We report on the development of a studentcentric ecological footprint assessment for the State University of New York College at Oneonta (SUNY Oneonta). The objective of the footprint assessment was to measure the environmental impact as well as the environmental costs of each student on an individual level. In addition, the survey sought to validate and utilize the results from a previously conducted commuter survey, which measured the campus population's 'willingness-to-pay' to protect the environment. Results illustrate that many students are unaware of the dollar cost of their energy use and many use more energy than an average student in their dorm. Students were also not aware of the amount of garbage they produced. Survey respondents did indicate a willingness to change their behavior relation to energy consumption and garbage production.

**Student:** Alexander Robillard

**Faculty Sponsor:** Donna Vogler (Biology)

#### **Determining the Status of the Wood Turtle (*Glyptemys insculpta*) in Central New York State**

At a pivotal time for the Wood Turtle (*Glyptemys insculpta*), we recently uncovered a collection of roughly 260 dried specimens from SUNY Oneonta storage which date back to the late 1950s. Collected by the late Dr. John New, the assemblage serves as a genetic cache which we will use to identify changes in Wood turtle populations across New York State. Preliminary genetic screens indicate the preserved specimens can yield sufficient DNA for evaluation. Unlike previous Wood Turtle studies, the existence of the historical data set provides rare context, which will be compared to contemporary population data acquired over two summer field seasons (2015 & 2016). Specifically, we will identify parameters such as the effective population size ( $N_e$ ), the fixation index ( $F_{st}$ ), and the inbreeding coefficient ( $F$ ) for both contemporary and historical populations. Genetic information will be paired with mark-recapture field data to assess the viability of our New York's populations. By doing so we will recommend the most appropriate course of management to maintain the Wood Turtle in central New York State. We hope to incorporate our findings in a report to both the state and private land conservancies.

**Student:** Neil Rosenfeld

**Faculty Sponsor:** Jacqueline Bennett (Chemistry & Biochemistry)

#### **Greener Synthesis of Electroluminescent Compounds**

Imines are a family of compounds known to have a variety of uses. For example, imines have been shown to have antibacterial, antifungal, and antiviral activity. In addition, some imines are used to create common prescription drugs used to lower cholesterol or to fight cancer (e.g., Zetia and Taxol). Outside of their medical applications, some imines have found use in organic light emitting diodes (OLEDs). OLEDs are used in many display screens, such as flat screen TVs and mobile devices. This project was undertaken to identify simple imines that exhibit electroluminescence (emission of light due to an electrical current), improve the synthesis of imines known to be electroluminescent from the

literature, and to synthesize new imines as OLED candidates. Organic chemistry students currently do not learn about OLEDs in lecture or lab. Ultimately, we hope to develop a project where students synthesize electroluminescent imines and create a simple OLED in an organic chemistry laboratory.

*Student:* Jennifer Rushlow

*Faculty Sponsor:* Paul Bauer (Economics, Finance & Accounting)

**How Stable is the Error Correction Model Cointegrating WTI and Brent Crude Oil Prices?**

Oil prices are an important aspect of a household's budget and a key driver of inflation month-to-month. West Texas Intermediate (WTI) and Brent are crude oil price indexes for sweet, light oil, ideal for gasoline production. WTI is used to price U.S. oil while Brent is used to price European oil. Due to arbitrage, the prices of the two should be fairly close. Statistically, they should be cointegrated and should move back together when spread too far, indicating an error correction model is appropriate. These indexes tracked closely until around December of 2010, at which time the indexes spread. This time period corresponds with a sharp increase in U.S. crude oil production. Using daily data on the index prices, as expected, I find the two series are cointegrated. Using the Engle-Granger two-step error correction model, I will estimate three error correction models. One will be estimated from 1987 to the most recent data. Another will be estimated from 1987 to December 1, 2010. Finally, a third will be estimated from December 1, 2010 to the most recent data. I will determine if the error correction model has changed, or if the original error correction still holds.

*Student:* Jounia Sara Saint-Juste

*Faculty Sponsor:* Nancy Bachman (Biology)

**Zinc Ion Activation of Heat Shock Proteins in Mouse NIH3T3 Cells**

The ability to handle low levels of environmental stressors is a key adaptive capacity of living things. Heat shock transcription factor 1 (HSF1) is the main regulator of stress pathways in response to heat, peroxide, and heavy metals such as zinc ion. The goal of this project was to identify levels of zinc ions that would induce a stress response in mouse NIH3T3 cells, then test whether Hsf1 isoform mRNAs as well as heat shock protein targets (hsps) vary in response to zinc treatment. To demonstrate that zinc induces the expression of hsp genes, real-time RT-PCR (Taqman) assays were carried out. When cells were treated with 160  $\mu$ M zinc sulfate for 90 min, six different hsp genes were activated compared to a control gene. To compare levels of expression of Hsf1 isoforms after zinc treatment, we amplified the individual isoforms using PCR in the presence of SYBR green and compared their levels of expression to a control gene. Little change was seen in levels of Hsf1 mRNA upon zinc treatment, with the exception of Hsf1 delta, which showed a 1.6 fold increase in expression. These experiments have identified distinct molecular targets of zinc activation.

*Student:* Megan Sheridan

*Faculty Sponsor:* Ho Hon Leung (Sociology)

**Saint Elizabeth Ann Seton Church and its Connection to the Community**

Architecture is important to any community because it's a reflection of a society's culture and helps with identity, whether it's a location or a person's identity. Saint Elizabeth Ann Seton Church, located in Lake Ronkonkoma, NY, is a place where people of the same religious belief come together to worship. Not only does the building itself contain meaning, but also the interior belongings are key components within the architectural building. The question that can be asked is how does the architecture of this church help bring the community together and how does it allow people to consider it a home? The objective of this study is to identify the ways people feel connected to this location and why it's important to the community. Qualitative research methods will be used along with the use of reconnaissance survey methods to gather representations of the building. Secondary data, such as pamphlets and newspapers, will also be used to obtain information. Pictures will be taken of the church to help further understand its importance. Using semi-structured questions, a skill called probing, and informed consent, interviews will be set up with church staff members and people who are involved with the church regularly.

*Student:* Kyle Sisco

*Faculty Sponsor:* Philip Sirianni (Economics, Finance & Accounting)

**High MPG Vehicle Demand Determinants: A Household-Level Analysis**

This paper aims to reveal insights into the demand for high miles per gallon (MPG) vehicles by auto-consumers based on the demographics of the purchasers of these vehicles and which of these demographics drive the consumer to purchase a high-MPG vehicle.

*Student:* Kayla Slater

*Faculty Sponsors:* Maryann Dowdell, Jennifer Bueche (Human Ecology)

**Cooking with Kids: Nutrition, Food, and Fun**

According to the CDC (2014), childhood obesity has more than doubled in the past 30 years. Previous studies have shown that nutrition health programs involving meal preparation may be beneficial in decreasing the rates of obesity/overweightness among elementary school children. Meal preparation involving children increases healthy eating behavior. The purpose of this study was to teach young children about nutrition, healthy eating, and cooking to increase healthy eating behaviors. The outcome objectives coincided with participation in 6 cooking lessons: (1) at least 90% of students will be able to follow a recipe and use two cooking skills, (2) at least 90% of students will be able to name a new food or meal they learned how to prepare, and (3) at least 90% of students will eat one more fruit or vegetable a day. Participation involved 10 fourth graders of the afterschool RISE program at McGraw Elementary school in 6 cooking lessons focused on the 5 food groups and fats/oils. A pre- and post-test were given to the subjects containing 10 multiple choice/short answer questions. The results of the post-test showed that only 61% of students knew how to read a recipe, 90% of students were able to use two cooking skills, 100% named a new food or meal they learned how to prepare, 12.5% ate one more fruit a day, and 37.5% ate one more vegetable a day. The goal was met for cooking skills and naming a new food or meal, but was not met for reading a recipe or eating one or more fruit or vegetable a day. Even though all objectives were not met, this study shows that meal preparation may be beneficial for youth and contributes to previous studies on children, meal preparation, and healthy eating behaviors.

*Students:* David Snyder, Colleen Parker

*Faculty Sponsor:* Kiyoko Yokota (Biology/Biological Field Station)

**Mercury Concentration in Fish Tissue Relative to Length and Weight: Goodyear Lake, Otsego County, NY**

A 2011 Fish Advisory published by the NYS Department of Health listed several lakes and rivers in Central New York as a concern for mercury. Goodyear Lake in Otsego County was among these waters. Children and women of childbearing age were advised to not consume any of the fish listed, and men should limit their intake to 4 meals per month. As a baseline study, we chose to investigate how mercury is accumulating in fish tissue, based on fish species, length and weight in Goodyear Lake. Fish tissue samples were collected from *Sander vitreus*, *Sander vitreus*, *Micropterus dolomieu*, and *Micropterus salmoides*, and were sent to Syracuse University Lab for mercury analysis. All 29 fish tissue samples were above the U.S. Environmental Protection Agency methylmercury fish tissue criterion of 0.3 ppm. Four of these samples were above the U.S. Food and Drug Administration action level of 1.0 ppm. We are investigating if these values show any trends based on species, length and weight, and are hoping to collect more fish tissue from Goodyear and other lakes in the future.

*Students:* Stephanie Spellman, Kaitlyn Castle, Justine Marinello

*Faculty Sponsor:* Toke Knudsen (Mathematics, Computer Science & Statistics)

**Exploring the Notebooks of Edith Sturgess, Laurette Lyon, and the History of the Oneonta Normal School**

The Alden Room located in the library on the SUNY Oneonta campus is filled with an immense amount of books, some that are even centuries old! With the guidance of our professor, Dr. Toke Knudsen, we are examining two notebooks found in the Alden Room from previous students who

attended The Oneonta Normal School in the early 1900s. The two notebooks belonged to Edith Sturgess and Laurette Lyon. As part of our research, we have already typed up each notebook. One of our goals for the research is to get our typed-up versions of the notebooks published. Currently, we are working on developing a formal introduction for our publication that introduces the notebooks. We have found a number of references that we are utilizing to provide us with information as to how math was taught in the early 1900s. We are interested in comparing how math was taught in the 1900s to how math is taught now. We are also in the process discovering as much information about The Oneonta Normal School as possible, including about their mathematics program, how many students were enrolled, and the faculty who worked there. All of this information will be incorporated into our introduction. We hope that with all of our research we can create an introduction to the notebooks that will intrigue a publication company to help us reach our goal of getting our introductions, research, and the notebooks of Edith Sturgess and Laurette Lyon published.

*Students:* Alexandra Stark, Paul Rus, Steve Marion, Jessica Mallozzi

*Faculty Sponsor:* James Zians (Psychology)

### **Differences Between Trait Anger and Depression on Key Variables of Personality and Temperament**

Anger has not been in the forefront of research and theory development during the past century. In fact, anger has been coined "the forgotten emotion" mostly due to overlap and confusion with other constructs such as hostility, aggression and violence. Trait anger, a relatively new construct describing someone with high proneness and frequency of angry mood, has emerged as a distinct entity, as researchers have attempted to measure it. Clinically, it is unclear whether the pervasive experience of angry mood is truly the core affective disorder, such as high trait anger, or whether angry mood belongs within the spectrum of either anxiety or depression. It is also unclear what other psychological constructs remain comorbid when an individual has the sole experience of angry mood, (without angry behaviors or angry interpersonal communication). Anger has never emerged as a diagnostic category unto itself. Instead, it is mentioned as a list of anger-related symptoms of various disorders, either of character (Personality Disorder) or affect (Mood Disorder). Although most trait anger individuals are diagnosed with depression, it seems the two pathologies operate very differently in individuals. One purpose of this study was to explore this issue specifically in the context of the underlying question, should anger have its own diagnosis? This research compared sample groups high in depressive symptoms with sample groups high in trait anger. Early results of a cross-sectional study of the first 161 participants using a 2 (Anger: high vs. low defined by upper & lower 30%) by 2 (Depression: high vs. low defined by upper & lower 30%) between groups design looked at several variables of interest related to personality and temperament. This phase of the study attempted to identify clear distinctions between anger and depression. It was hypothesized that anger mobilizes physical and psychological resources as a response to interpersonal conflict. Anger, more than depression, focuses on how one has been treated unfairly by others (make external attributions), and high trait angry individuals are motivated toward their perception of increased empowerment and interpersonal justice. In contrast, depressive individuals tend to internalize blame (make internal attributions) and retreat from empowerment. Using static group comparisons, the study explored whether high trait anger individuals have a greater 'need for power,' externalize blame more frequently and lack cooperativeness compared to other groups. On measures of appetitive motivation it was predicted that high trait anger individuals would demonstrate higher behavioral activation toward goals than high depression individuals, yet these goals would be in the context of seeking a sense of perceived justice. Other comparisons explored differences on measures of personality: openness, conscientiousness, extroversion, agreeableness and neuroticism. The study also assessed differences or similarities between high trait anger individuals and high depression individuals on measures of resilience, and exposure to protective factors while growing up.

**Student:** Erika Stopler

**Faculty Sponsor:** Jacqueline Bennett (Chemistry & Biochemistry)

**Development of a Simple, Qualitative Tyrosinase Inhibition Assay for Organic Chemistry Laboratory**

When plant tissue is damaged, oxygen in air reacts with compounds in cells, along with the enzyme tyrosinase, to carry out a process that ultimately changes the injured tissue to brown. Our research group has recently developed a greener synthesis for 20 compounds known as thiosemicarbazones (TSCs), some which are known inhibitors of tyrosinase. This synthesis project was designed to be performed in a one- or two-semester organic chemistry course. We wanted to include a simple screening assay that would tell us how our TSCs affected tyrosinase. Since our students do not yet have the skills to isolate an enzyme nor the equipment to do so, we developed a bioassay where solutions of TSCs and appropriate control compounds were applied directly to fresh plant slices for a qualitative analysis of inhibitory activity. TSCs were analyzed in this way to identify those that had the greatest inhibitory activity against tyrosinase. The most promising compounds were then passed on in a collaboration with biochemistry laboratory students, who quantitatively analyzed these compounds for their inhibitory activity.

**Students:** Lexington Swartwood, Janine Militello, Serena Sackett

**Faculty Sponsor:** Andrew Gallup (Psychology)

**Experimental Evidence of Contagious Yawning in Budgerigars (*Melopsittacus undulatus*)**

Experimental evidence of contagious yawning has been documented in only four mammalian species. We report the results from two separate experimental studies designed to investigate the presence of contagious yawning in a social parrot, the budgerigar (*Melopsittacus undulatus*). In Study 1, birds were paired in adjacent cages with and without visual barriers, and the temporal association of yawning was assessed between visual conditions. In Study 2, the same birds were exposed to video stimuli of both conspecific yawns and control behavior; yawning frequency was compared between conditions. Results from both studies demonstrate that yawning is contagious. To date, this is the first experimental evidence of contagious yawning in a non-mammalian species. We propose that future research could use budgerigars to explore questions related to basic forms of empathic processing.

**Student:** Tiffany Taylor

**Faculty Sponsor:** Fred Zalatan (Biology)

**Determining Whether Sec1 Protein is Associated with Ty1 Gag Protein in *Saccharomyces cerevisiae***

Transposable elements are comprised of DNA sequences that have the ability to move to new sites in a host cell's genome. Ty1 is a transposable element in the yeast *Saccharomyces cerevisiae*. Expression of Ty1 genes produces a group specific antigen (Gag) and a reverse transcriptase. Ty1 is structurally and functionally similar to retroviruses such as HIV. Gag forms a virus-like particle (VLP) that functions to replicate itself, similar to retroviruses. Unlike viruses, however, the VLP never leaves the host cell. Previous studies have suggested that Sec 1, which functions in intracellular vesicle fusion, is involved in the replication of Ty1. Current studies involve constructing a yeast strain that has Sec 1 fused to a red fluorescence tag and Gag fused to a green fluorescence tag. This will help determine whether Sec1 and Gag are associated with each other when cells of the strain are viewed with fluorescent microscopy.

**Student:** Christopher Teter

**Faculty Sponsor:** Sean Robinson (Biology)

**Another Naturalizing Exotic Tree: Populations of *Syringa reticulata* (Japanese Tree Lilac) in New York**

Invasive plants species are known to affect plant diversity on multiple scales worldwide. It is often unknown to what scale a new invasive species will affect. These species are often shade tolerant, have rapid growth, survive in poor soils, and propagate easily. These characteristics are what makes the



Japanese Tree Lilac (*Syringa reticulata* (Blume) H. Hara var. *reticulata*) an increasingly recommended street tree in the United States, and may also enable its naturalization. This species has escaped from cultivation in Wyoming, Ontario, Massachusetts, Pennsylvania, Vermont, and Minnesota. My graduate thesis work involves the study of naturalizing populations of *Syringa reticulata* in New York State. I am collecting demographic data from forests located near these populations. At each site I am collecting point quarter intercept data to determine general forest composition and Tree Lilac density. Tree Lilac diameter at breast height and tree height data are recorded to calculate importance values and growth rates. My first plots have shown forests where *S. reticulata* is the most common, dense, and important tree species. This gives evidence of a negative impact on the riparian forest community. This study will give land managers information to better control invasive populations of *S. reticulata*.

**Student:** Mason Tiffany

**Faculty Sponsor:** Paul Bauer (Economics, Finance & Accounting)

#### **Openness to Trade and Long-run Economic Growth: A Cross Country Study**

Trade liberalization has been the subject of much economic debate, with no general consensus. Older studies like Sachs and Warner (1995), a much cited work on trade liberalization, and newer ones like Wacziarg and Welch (2008) and Estevadeordal and Taylor (2013) all have positive results associated with trade liberalization. This paper analyzes the effects of barriers to trade on long-run economic growth using a modified form of the Cobb-Douglas production function that includes measures of openness to trade over a multi-country study and will find significant evidence that either indicates positive long run growth or negative long-run growth.

**Student:** Alexa Tumbarello

**Faculty Sponsor:** Tracy Allen (Geology/Environmental Sciences)

#### **Environmental Education in the National Park Service**

This project explores the complexities of environmental education within the National Park Service (NPS) through the course of a summer internship. Interpreters in the NPS provide visitors with the information they need to appreciate the parks on their own. During the summer of 2014, I interned as an interpretation ranger at Devils Tower National Monument in the Black Hills of Wyoming. I created and implemented original lessons plans about the geologic history of the tower and surrounding Black Hills. The goal of my lessons was to make science relevant to everyone through concise and accurate information. By the end of the internship, I had developed written interpretive material, guided tours, and lecture-style presentations for future use by interpretation rangers at Devils Tower National Monument.

**Student:** Alexa Tumbarello

**Faculty Sponsors:** Devin Castendyk (Earth & Atmospheric Sciences),

Tracy Allen (Geology/Environmental Sciences)

#### **Geochemical Evolution of Caldera Lake Waters**

This project explores the geochemical evolution of the water of Lake Atitlán, Guatemala. The goal of this research was to determine if the weathering of volcanic pumice into clay increases the pH of rain water (4.2-4.5) as it flows to the lake. We are interested in pH reactions for two reasons: First, Lake Atitlán is unusual among volcanic lakes because it has a neutral pH (7.1-7.8), whereas many are acidic. Second, from a public health perspective, lake water is a source for drinking water. Certain metalloids that are harmful to human health, specifically arsenic, are mobile at neutral to basic pH, and our data show that arsenic concentrations in the lake exceed the World Health Organization's drinking water guideline of 0.01 mg/L. We conducted a humidity cell test to mimic the weathering of pumice. We reacted pumice with three different waters (i.e. local rain water, de-ionized water, dilute sulfuric acid). To simulate wetting and drying cycles, we saturated the pumice with water for 48 hours, drained the water, allowed the pumice to dry for 48 hours, and added the drained-water back. The pH and electrical conductivity of the water was measured over time following drainage. We repeated this for two-months.

**Students:** Jennifer Uretsky, Carlena Reagan

**Faculty Sponsor:** Charlene Christie (Psychology)

**Reacting to Gender Stereotypes: The Impact of Expectations and Performance on Self-Esteem**

This research investigated the impact of negative gender stereotypes on collective and individual esteem under varying conditions of difficulty. We examined the consequences of exposure to a positive or negative group stereotype as distinct from actual performance. Whereas membership in a positively or negatively stereotyped group would be expected to influence collective esteem (assuming some level of identification with the group), we predicted this would interact with actual task performance (an index of ability).

**Student:** Micaelina Velardi

**Faculty Sponsors:** Patrice Macaluso, Andrew Kahl (Theatre)

**Design and Creation of Nagamandala Masks and Puppets**

The design and fabrication for the puppets and masks used in the recent SUNY Oneonta theatrical production of *Nagamandala: Play with a Cobra* had been given to me with a rough idea from the faculty in a production meeting. I was given the responsibility to take what they had imagined and create it in less than two weeks. My journey from the renderings, to testing with bits of materials, to the final product has been documented and recorded. The evolution of the puppets and masks is a project I had spent long hours into the morning sitting in the Design Room of the Fine Arts building experimenting and creating. I have accomplished a task that I believe has made me grow intellectually and artistically. The presentation consists of a step-by-step documentary and behind-the-scenes creation of the puppets in the form of the poster. I also plan to provide a video presentation with clips from the play and a model of the puppets and masks.

**Student:** Maxine Verteramo

**Faculty Sponsor:** Willard N. Harman (Biology/Biological Field Station)

**Three Lakes, One Management Plan**

Emerald Green is a 1400 acre community located in Rock Hill, New York in the southwestern portion of Sullivan County. The private community encompasses a diverse three-lake hydraulic system adding up to 330 acres. Each lake is unique in its ecological functions and resource use. Louise Marie, the largest of the three lakes at 224 acres serves as the community water supply. The most adamant responsibility of the governing Property Owners Association is building invasive aquatic species awareness in order to prevent ecological and economic damage to their reservoir. Adjacent to Louise Marie is Treasure Lake, which is surrounded by protected wetlands. Treasure, totaling 66 acres, has bog-like features providing a vital wildlife refuge. Both Lake Louise Marie and Treasure Lake drain into Davies Lake. Also draining into Davies is the community waste water treatment plant effluent. Currently, Davies has high phosphorus and nitrogen levels feeding an over-productive algal community. This may be indicative of being a small 40 acre lake with a big watershed in addition to point source pollution. The goal of this research project is to create a cohesive plan that will address each lake's distinctive characteristics while also managing them as a collective watershed.

**Student:** Jacquelyn Victoria

**Faculty Sponsor:** Don Allison (Mathematics, Computer Science & Statistics)

**The Use of K-Level Clustering Algorithms in Fingerprint Verifications**

Fingerprints are considered one of the best unique bio-metrics to use in an identification or verification situation. Although ridge comparison through k-nearest-neighbors clustering is the most commonly used minutiae comparison method, this report explores the use of k-means clustering for fingerprint verification. K-means clustering is a machine-learning clustering algorithm that attempts to cluster points by k distance, adjusting k until the most accurate and efficient cluster comparisons can occur. This report explains the procedure of processing fingerprint images, extracting minutiae, k-means clustering, and cluster comparisons in contrast to pure minutiae comparison.

**Student:** Jacquelyn Victoria

**Faculty Sponsor:** Sven Anderson (Art)

**Crochet as an Exploration of the Human Bust**

Crochet can be used as a medium to portray organic three-dimensional objects. This presentation explores the process of creating human figures through crochet, from picture to plan to project.

**Student:** Camera Walrond

**Faculty Sponsor:** Michael Koch (Philosophy)

**The Purpose of Universality in Science and How It is Implemented Through International, Non-Profit Organizations**

This project investigates the purpose of universality in science and how it is implemented through international, non-profit organizations. To accomplish this, the topic of asteroid mining is analyzed throughout. The missions of the American Association of the Advancement of Science (AAAS) and the International Council for Science (ICSU) are explored to establish the foundational principles used throughout this project. From these principles some kind of implementation process will be shown to follow. Implementation mediums such as scholarly journals and popular science magazines are used to analyze their relationship with the ideals of the AAAS and the ICSU. This project then examines how the topic of asteroid mining is delivered to the public through these mediums, how their influence impacts what is known about the topic and, subsequently, what is done about the topic. Lastly, this project analyzes the consequences of this process overall and whether or not it is effective in the distribution of scientific knowledge in the ways advocated for by the initially examined principles and ideals.

**Student:** Jeromy Wegrzyn

**Faculty Sponsor:** Jeffrey Heilveil (Biology)

***Hemerocallis fulva*, an Unusual Dispersal Method Studied via a Population Genetic Snapshot**

Invasive plant species are not uncommon in the State of New York. In fact, there may be many invasive populations which are not studied to their fullest extent. The common tiger lily, *Hemerocallis fulva*, is no exception. This invasive grows in moist environments within NYS and has the ability to reproduce and spread easily in an unconventional, yet advantageous, way (Swearingen et al., 2010). *H. fulva* from random populations were collected from West Point, NY to Albany, NY along the Hudson River. DNA from daylilies were isolated and, specifically, 8 microsatellite loci per individual were amplified and then compared using the stepwise mutation model to determine relatedness (Rst). This model serves best in order to understand how populations of *H. fulva* are related, and is imperative to understanding if the Hudson River is indeed a tract for daylily dispersal.

**Students:** Jeromy Wegrzyn, Marina Brown

**Faculty Sponsor:** Sean Robinson (Biology)

**The Jewell and Arline Moss Settle Herbarium Database Project**

Herbaria, collections of preserved plants and fungi, are valuable sources of data essential to studies in a number of fields within the biological and environmental sciences, including taxonomy, systematics, anatomy, ecology, and conservation biology. In particular, small local herbaria play a critical role in the study of regional biodiversity. In addition, they are important to supporting faculty and student research, teaching, and the training of future organismal biologists. The Jewell and Arline Moss Settle Herbarium at SUNY Oneonta currently contains over 14,000 specimens including algae, bryophytes, lycophytes, ferns, gymnosperms, angiosperms, and fungi, representing collections from central New York and Adirondack Park spanning from 1906-2015. Over the last two years, we have begun work on reorganizing and databasing the SUNY Oneonta herbarium collection in an effort to improve/increase its use by students, faculty, and the broader research community. Here we present the work completed thus far, and what we hope to complete over the coming years.

**Student:** Britney Wells

**Faculty Sponsor:** Les Hasbargen (Earth & Atmospheric Sciences)

**A Record of Environmental Change in Otsego Lake from Sediment Cores**

This project investigates environmental change as revealed in sediment cores from Otsego Lake in upstate New York. The lake sediment holds the remains of siliceous diatom valves, mollusk shells, algal material, woody debris, mineral particles, and charcoal. All of these components provide a mosaic of lake processes and changes in the local environment over the last 90 centuries. Various places around Otsego Lake, NY were previously cored. Microscope slides of the sediment provide a means of characterizing the abundance of various types of diatoms, many of which are representative of trophic conditions in the lake. In addition to microscopic analysis, this project utilizes the bench top FlowCAM imager at SUNY Oneonta's Biological Field Station in Cooperstown. This instrument photographs each individual particle in a flow stream of water and lake sediment. The particles can be characterized by shape to isolate diatom properties. Methods for isolating diatoms from the rest of the sedimentary components are established. Additional sediment analyses include loss on ignition to obtain the relative abundance of carbon in the sample, and charcoal levels, which could reflect a fire history of the landscape around Otsego Lake. Dissolving samples in hydrogen peroxide will remove organic matter, allowing easier diatom identification.

**Student:** Craig Wert, Ashley Mills

**Faculty Sponsor:** Florian Reyda (Biology/Biological Field Station)

**Cryptogonimid Trematodes of the Fishes of Otsego Lake, New York**

This study is part of a survey of the intestinal parasites of fishes of Otsego Lake and its tributaries (Cooperstown, New York) that began in 2008. To date, over 500 individual fish were collected by hook and line, seine, gill net, or ElectroFisher, and subsequently examined for intestinal parasites and, in many cases, for parasites in other fish organs. The survey included a total of 27 fish species, consisting of six centrarchid species, one ictalurid species, eleven cyprinid species, three percid species, three salmonid species, one catostomid species, one clupeid species, and one esocid species. Intestinal trematodes were studied by light microscope examination of specimens that were whole-mounted using conventional methods. Scanning electron microscopy was also used. The survey work revealed a relatively low diversity of trematodes occurring as adults in the alimentary canal of fishes in Otsego Lake; for the first six years a total of only six species of trematodes were encountered, including one species of cryptogonimid, *Cryptogonimus chili*, from *Ambloplites rupestris* and *Micropterus dolomieu*. In winter 2014, however, a second as yet unidentified species of cryptogonimid was found in the intestine of *Esox niger* that were collected via ice fishing. This specimen, which possesses an elongated body and a terminally oriented oral sucker, is recognized as a member of Cryptogonimidae because of its possession of a ventral sucker that is embedded in a pouch. The discovery of an additional species of trematode after six years of routine survey work is testimony for the importance of the continued acquisition of parasitological data in water bodies.

**Student:** Jessica Williams

**Faculty Sponsor:** Nancy Bachman (Biology), **Staff Sponsor:** KelLee Hassman (Biology)

**Subcellular Localization of Heat Shock Factor 1 Alpha and Beta Isoforms**

Heat shock causes proteins to denature or unfold, altering their function. Heat shock transcription factor 1 (HSF1) is responsible for controlling heat shock proteins which protect cells from induced stress. Research has been done on different isoforms of HSF1, predominantly alpha and beta isoforms, with little regard for the specific isoform used. Isoforms are versions of a protein that are similar, but not identical, and they may serve distinct functions. This research aims to discover the subcellular localization pattern of HSF1 alpha and beta, in the presence or absence of heat shock. NIH3T3 cells were grown on protein coated coverslips. Separate dishes were transfected with plasmid DNA encoding the isoform. Coverslips were then incubated with primary (anti-HA-tag) and fluorescent secondary antibody (green Alexa 488). Isoform localization was viewed using fluorescent microscopy. Different patterns of localization for alpha and beta were observed. Nuclear localization

signal (NLS) mutants of the HSF1 alpha isoform tagged with HA were constructed and tested to see how they affected localization. Essentially all fluorescent staining was found in the cytoplasm, consistent with previous studies. NLS mutants of HSF1 beta are being constructed to see if the beta isoform is imported by the same pathway.

*Students:* Kaitlyn Woods, Jenna Wood, Maria Keable, Kaitlyn O'Flynn

*Faculty Sponsor:* Paul Bischoff (Secondary Education & Educational Technology)

**An Analysis of Chemical and Physical Soil Properties along Two Parallel Transects in an Agricultural Buffer Zone in Otsego County, NY**

Riparian buffer zones function to diminish the flow of agricultural fertilizers and soils from agricultural areas into waterways. Characteristics of successful buffer zones include diverse plants with root systems capable of nutrient absorption, a moderate terrestrial slope from the agricultural zone towards the waterway, and a heterogeneous soil rich in organic matter. The goal of this study was to examine and compare the chemical and physical soil properties along two parallel buffer zone transects in Otsego County, NY. One transect (Site A) was characterized by the presence of thickly populated seasonal shrubs and plants. The second transect (Site B) contained deciduous trees and dense seasonal shrubs. Nitrate and phosphate testing was conducted using a DR 890 colorimeter. Other methods of research included measuring the slope of each transect; examining soil composition and particle size; calculating the water retention capacity of the soils; and determining the percentage of organic matter within the soils. Both transects were effective at buffering agricultural runoff. For example, at site B, nitrate and phosphate levels decreased significantly ( $F = 3.8$ ;  $P < .05$ ) across the buffer zone and a high clay composition (53%) was accompanied by a high water holding capacity.