

2008 Student Research Day

April 16, 2008
2:00 PM – 5:00 PM
Morris Conference Center



Student Research Day is funded through charitable gifts and grants made to the College at Oneonta Foundation and is sponsored by the Faculty Committee on Research, the Grants Development Office and the College at Oneonta Foundation

Members of the 2007-2008 Faculty Committee on Research:

Kim Muller, Chair (Grants Development Office),
Thomas Beal (History), Devin Castendyk (Earth Sciences),
April Harper (History), Kathy Meeker, Treasurer (Grants Development Office),
Randy Lynk (Student Representative), David Mase (Student Representative)

SUNY College at Oneonta
2008 Student Research Day

PROGRAM

2:00 PM – 5:00 PM

*Poster, PowerPoint and
other presentations by students*

Welcoming Remarks

Kim Muller

Chair, Faculty Committee on Research

Keynote Address

Introduction: **Dr. William Pietrafesa**

Chair, Biology Department, and Vice President of the College at Oneonta Foundation Board of Directors

Dr. Margie Lee Clapper '80

Promising Strategies for the Prevention of Cancer



Dr. Clapper is currently Director of Chemoprevention Research at Fox Chase Cancer Center in Philadelphia, PA. After receiving a B.S. in Biology from SUNY Oneonta and a Ph.D. in Genetics and Cell Biology from the University of Connecticut at Storrs, she completed her postdoctoral training in the Department of Pharmacology at Fox Chase Cancer Center. In 1991, Dr. Clapper established a basic research program at the Center (one of the first of its kind nationally) to develop therapies for cancer chemoprevention. The program has been funded continuously by grants from the National Institutes of Health and recently received a multi-million dollar award from Fox Chase Cancer Center to accelerate the discovery of both molecular markers of cancer risk and personalized cancer prevention strategies. Dr. Clapper serves on a number of review panels and professional committees for the National Cancer Institute and advisory boards at several universities. She is a member of the editorial boards of *Cancer Prevention Research*, *Clinical Cancer Research* and the *Journal of Clinical Oncology*. Her contribution to the scientific community includes over 70 research articles and several patents.

SUNY College at Oneonta

2008 Student Research Show

PRESENTATIONS

Student Presenters: Antonio Alvarado, Matthew DePierro, Yun Ge, Aissa Hamim

Faculty Sponsor: Christine Harrington (Economics, Finance & Accounting)

Foundation Funds Analysis II

Student Presenters: Scott Azar, Sarah Barsukoff, Robert Fitzgerald, David Lustberg, Alyssa Schaller

Faculty Sponsor: Paul Bischoff (Secondary Science Education)

Water Quality Analysis of Three Creeks Leading into the Susquehanna River in Oneonta, New York and their Effects on the River's Water Quality

Student Presenters: Charles Bailey, Allyson Kiss

Faculty Sponsor: April Harper (History)

Sources for the Study of Medicine before 1500 C.E.

Student Presenters: Christina Barone, Lauren Weil

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

Physiological Effects of Water vs. Gatorade

Student Presenter: Robert Barton

Faculty Sponsor: Paul French (Physics & Astronomy)

An Automated Two-Dimensional Lens Distortion Correction Technique in Video Based Motion Analysis

Student Presenters: Sean Batewell, Mike Hinman, James Neil, Travis Richards

Faculty Sponsor: Paul Bischoff (Secondary Science Education)

Acidity of Precipitation: Relationships Between Ion Concentrations, Type of Precipitation and Origin of Weather Fronts

Student Presenter: Eric Bedell

Faculty Sponsor: Ho Hon Leung (Sociology)

The New Globalization: Fair Trade Theory or Reality?

Student Presenter: Elizabeth Bidell

Faculty Sponsor: Moussa Traore (Human Ecology)

Tidal Waves from the East? The "China Factor" on the Apparel Trade Sector Following the Elimination of the Quota System

Student Presenter: Gwennan Booth

Faculty Sponsor: Christine Quail (Communication Arts)

Celebrity Politicians: "Those Who Have Run and Won"

Student Presenters: Glen Calvin, Wynter Weyrauch-Newman

Faculty Sponsor: Paul Bischoff (Secondary Science Education)

The Effects of Car Effluents on Microorganism Stream Ecology

Student Presenter: Raymond Castronovo

Faculty Sponsor: Jennifer Bone (Communication Arts)

Breaking the Boundaries: Barack Obama's and Hillary Clinton's 2008 Campaign Rhetoric

Student Presenter: Ember Chabot

Faculty Sponsor: Jeffrey Heilveil (Biology)

Restoration Genetics: A Phylogeographic Approach to Reintroducing an Important Aquatic Insect to a Central Midwestern Drainage Basin

Student Presenters: Ember Chabot, Lori Crane, Thomas Lansing, Jay Barra

Faculty Sponsors: Donna Vogler (Biology), James Ryder (Mathematics, Computer Science & Statistics)

A Student-Developed Database of Invasive Plant Rankings

Student Presenter: Elizabeth Cousineau

Faculty Sponsor: James Ebert (Earth Sciences)

The Effect of Inquiry-Based Instruction on Conceptual Growth in an Introductory Geology Class and an Analysis of Student Perceptions of Non-Traditional Pedagogy

Student Presenter: Lori Crane

Faculty Sponsor: Thomas Horvath (Biology)

Hydrodynamic Force Impacts on Zebra Mussel (*Dreissena polymorpha*) Veligers

Student Presenter: Joseph DelGrosso

Faculty Sponsor: Shih-Ming Hu (Human Ecology)

Effects of Flaxseed Flour Fortification in Pastry Products

Student Presenter: Daniel DeThomas

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

Convertible Debt and Its Use to Reduce Agency Costs

Student Presenter: Michael DeVasto

Faculty Sponsor: Tatiana Vislova (Earth Sciences)

Geochemistry of the Banker Pond Metabasalts

Student Presenters: Allison Dilzer, Samantha Avenengo, Rebecca Kennedy, Aaron Manzer

Faculty Sponsors: James Bercovitz (Psychology), Lawrence Guzy (Psychology), William Proulx (Human Ecology), Lynn Evans (Biology)

An Exploratory Study on Levels of Hydration/Dehydration and its Effects on Attention Span, Cognition and Mood with Elementary and High School Students

Student Presenters: Allison Dilzer, Lauren Howe, Alyssa Sorrentino, Peter Ilczyszyn, Megan Miraglia, Jenna Smith, Ashley Gebczyk, Kari Cubito

Faculty Sponsors: Lawrence Guzy (Psychology), William Proulx (Human Ecology)

Exercise-Induced Dehydration and its Effect on Mood, Sleepiness and Perception in Fit Subjects

Student Presenter: Peggi Dudley

Faculty Sponsor: Albert Sosa (Physical Education)

Development of Trail Maps for the Oneonta, New York Area

Student Presenter: Jill Eichler

Faculty Sponsor: Les Hasbargen (Earth Sciences)

The Framework for the Development of a Lake Management Plan for Canadarago Lake

Student Presenter: Carissa Fairbairn

Faculty Sponsor: Thomas Horvath (Biology)

Zebra Mussel Vertical and Substrate Preference in Otsego Lake and Goodyear Lake (Otsego County, NY)

Student Presenter: Tabetha Forster

Faculty Sponsor: Jacqueline Bennett (Chemistry & Biochemistry)

Inquiry-Based IR Spectroscopy

Student Presenter: Christopher Fremgen

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

An Integrated Tool to Build Phylogenetic Trees Using Online Databases

Student Presenter: Theresa Gannon

Faculty Sponsor: Fred Zalatan (Biology)

Environmental Sequencing of Bacterial Species

Student Presenter: Brian Green

Faculty Sponsor: Nancy Bachman (Biology)

Chemiluminescent Detection of DNA-Protein Complexes

Student Presenters: Andrew Greene, Christopher Fremgen

Faculty Sponsors: Sunil Labroo (Physics & Astronomy), Sen Zhang (Mathematics, Computer Science & Statistics)

PC-Controlled Hall Effect Measurement Set-up with Graphic User Interface

Student Presenters: Andrew Greene, Corey Lemley

Faculty Sponsor: Sunil Labroo (Physics & Astronomy)

Hall Effect in Thin Metal Films

Student Presenters: Theresa Greiner, Rebecca Kurdziolek, Heather Maenza, Karen Prior, Christianna Shaffer

Faculty Sponsor: Steven Gilbert (Psychology)

The Relationship Among Traditional and New Measures of the Field Dependence/Independence and Analytic/Holistic Constructs

Student Presenter: Anthony Grimes

Faculty Sponsor: Les Hasbargen (Earth Sciences)

An Exploration of Sediment Entrainment Theories using the June 2006 Flood Conditions: A Preliminary Investigation

Student Presenters: Alexis Gunipero, Amber Horning, Amanda Spink, Jessica Spellman

Faculty Sponsor: Peter DiNardo (Psychology)

Anxiety Sensitivity and Isolated Sleep Paralysis (ISP) in a College Sample

Student Presenters: Louis Hall, Stacey Washington

Faculty Sponsor: Nigel Mann (Biology)

A Playback Experiment to Investigate the Unique Singing Behavior of the Stripe-Breasted Wren

Student Presenters: Robert Hildebrand, Robert Shepard

Faculty Sponsors: Paul Bischoff (Secondary Science Education), Hugh Gallagher (Physics & Astronomy)

Using Electric Potentials and Field Lines to Determine Boundaries of Underground Layers with Different Conductivities

Student Presenters: Lauren Howe, Karen Prior, Rebecca Kennedy

Faculty Sponsor: Lawrence Guzy (Psychology)

Time of Day as a Factor in the Intensity of the Somatogyral Illusion (Graveyard Spin)

Student Presenter: Jillian Hubbard

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

Momentum Investing for Individual Investors

Student Presenter: Peter Ilczyszyn

Faculty Sponsor: Lawrence Guzy (Psychology)

The Autokinetic Effect or the Wandering Light Phenomenon as a function of Dark Focus and Dark Vergence

Student Presenter: Micah Ilowit

Faculty Sponsor: Brian Lowe (Sociology)

Understanding Moralization

Student Presenters: Emmon Johnson, Anthony Grimes

Faculty Sponsor: James Ebert (Earth Sciences)

Sedimentary Provenance of the New Scotland Formation with a Note on Helderberg Chitinozoans

Student Presenter: Nick Juliano

Faculty Sponsor: Rick Grimaldi (Earth Sciences)

The Effect of Barometric Pressure on a Pitched Baseball

Student Presenters: Nick Juliano, Jarrod Constantino, Kenny Fisch, Matt Jones, Mary Ellen Dunn, Trisha Hosmer, Breanne Kempton, Chris Nallan, Dana Riglioni, Christina Mangiacapre, David Lustberg, Heather O'Neill, Erik Mason, Steve Feldman

Faculty Sponsor: Rick Grimaldi (Earth Sciences)

The Podcasting Efforts of the SUNY Oneonta Weather Center

Student Presenters: Elena Kirillova, Anthony Delia, Jessie Friedman, Jillian Hubbard

Faculty Sponsor: Christine Harrington (Economics, Finance & Accounting)

Foundation Funds Analysis I

Student Presenter: Kristina Kissner

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

Correlation Between Integration of Equity Markets and Benefits of International Diversification

Student Presenter: James Lauzun

Faculty Sponsor: Kelly Gallagher (Chemistry & Biochemistry)

Effect of Snow Flea Antifreeze Protein on Behavior & Structure of Water

Student Presenter: Corey Lemley

Faculty Sponsor: Joseph Chiang (Chemistry & Biochemistry)

Solar Energy from Unconventional Materials

Student Presenter: Chun Kit Lo

Faculty Sponsor: Ho Hon Leung (Sociology)

Hong Kong Ethnic and Cultural Identities: Perspectives from Young Adults

Student Presenter: Suzanne Lomax

Faculty Sponsor: Karen Joest (Human Ecology)

Cry for Freedom: The Legacy of Apartheid

Student Presenters: Patrick Macrae, Rebecca Kennedy, Kayla Gottobed

Faculty Sponsor: Charlene Christie (Psychology)

The Influence of Supportive vs. Deviant In-group Members on Group Identification

Student Presenter: Anthony Martinez

Faculty Sponsor: Jeremy Wall (Music)

Penumbra

Student Presenters: David Mase, Richard Greenemeier

Faculty Sponsor: Devin Castendyk (Earth Sciences)

Investigation of Hydroxide Mineral Precipitation and the Fate of Trace Metals in an Acid Pit Lake, Anthracite District, Pennsylvania

Student Presenters: David Mase, Randall Wilson, Michael DeVasto

Faculty Sponsor: Tatiana Vislova (Earth Sciences)

Petrography and Geochemistry of Rand Hill Mafic Dikes, Adirondack Mountains, New York

Student Presenter: Erik Mason

Faculty Sponsor: Rick Grimaldi (Earth Sciences)

A Comparison of El Niño and La Niña Late-Winter Snow Events in Upstate New York

Student Presenters: Erik Mason, David Lustberg

Faculty Sponsor: Rick Grimaldi (Earth Sciences)

An Environmental Chamber Designed to Reformulate the Heat Index

Student Presenters: Amanda Minnock, Emily McDermott, Rebecca Zobre

Faculty Sponsor: William Vining (Chemistry & Biochemistry)

Forensic Chemical Analysis

Student Presenter: Corrine O'Connor

Faculty Sponsor: Rhea Nowak (Art)

Collared: A Visual Narrative of Women and Stitch

Student Presenters: Aaron Payne, Bonnie Cooper

Faculty Sponsor: Nigel Mann (Biology)

The Effect of Banana Plantation Effluents on Water Quality and Macroinvertebrates

Student Presenters: Phillip Pearson, Emily Cole

Faculty Sponsor: Yun-Jung Choi (Human Ecology)

Understanding College Students' E-Shopping Behaviors

Student Presenter: Karen Prime

Faculty Sponsor: Thomas Horvath (Biology)

Environmental Factors Effects on Colonization Dynamics of Vernal Pools

Student Presenter: Ashley Renko

Faculty Sponsors: Paul French, Hugh Gallagher (Physics & Astronomy)

The Effects of Atmospheric Conditions on the Breakdown Field of Air

Student Presenter: Jillian Richards

Faculty Sponsors: Thomas Horvath (Biology), William O'Dea (Economics, Finance & Accounting)

Paying for Carbon Offsets on Campus via Parking Fee Increases: A Contingent Evaluation Method Approach

Student Presenters: Dana Riglioni, Heather O'Neill, Lauren Christian, Christopher Gorman

Faculty Sponsor: Rick Grimaldi (Earth Sciences)

Inversion Structure Associated with Five Radiation Fog Events in Oneonta, NY

Student Presenters: Lorenda Rush, AnnMarie Hilfiker, Samantha Avenengo

Faculty Sponsor: Geoffrey O'Shea (Psychology)

A Reevaluation of Learning and Awareness in the Hebb Digits Task

Student Presenter: Christopher Schwarz

Faculty Sponsor: Vicky Lentz (Biology)

Purification and Characterization of Large Mouth Bass IgM

Student Presenter: Shayne Spencer

Faculty Sponsor: Janet Nepkie (Music)

Second Life Concert Hall: Scarlet House of Music

Student Presenter: Elijah Spina

Faculty Sponsor: Jacqueline Bennett (Chemistry & Biochemistry)

Green Synthesis of Aryl Imines

Student Presenter: Chelsea Spring

Faculty Sponsor: Nigel Mann (Biology)

Conservation of the Leatherback Sea Turtle

Student Presenter: Adrian Sullivan

Faculty Sponsor: Nancy Bachman (Biology)

Deletion Analysis of the Human Cytochrome Oxidase Subunit IV Promoter

Student Presenter: Jessica Vecchione

Faculty Sponsor: Elizabeth Small (Foreign Languages & Literatures)

A Thriving Mexican Community in Fleischmanns, New York

Student Presenter: Jenny Vokral

Faculty Sponsor: Jeffrey Heilveil (Biology)

Chromosome Distribution of Nigronia serricornis (Say)

Student Presenter: Amber Warren

Faculty Sponsor: Brian Lowe (Sociology)

Narrative of Wealth: Mapping Conflicting Economic Ideologies in the Public Imagination

Student Presenter: Jonathan Wasser

Faculty Sponsor: Tracy Allen (Geography)

The Oneonta Creeks Water Quality Assessment Project

Student Presenters: Megan White, Stephanie DeCelle, Gregory Page, Theodore Roberts

Faculty Sponsor: Christine Harrington (Economics, Finance & Accounting)

Men's Wearhouse

Student Presenter: Roy Widrig

Faculty Sponsor: Les Hasbargen (Earth Sciences)

Erosion of Low Order Drainages in the Glacial Sediments of Central New York

Student Presenter: Graham Willsey

Faculty Sponsor: Nancy Bachman (Biology)

Heat Shock Transcription Factor I (HSF1) Alpha Isoform

Student Presenter: Alexander Wilson

Faculty Sponsor: Thomas Beal (History)

Documenting the 1712 Slave Rebellion in New York City

Student Presenter: Dan Yanik

Faculty Sponsor: Nancy Bachman (Biology)

Phylogenetic Analysis of Cytochrome Oxidase Subunit IV Isoform 2

STUDENT PARTICIPANTS

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Charles Bailey.....	30
Christina Barone	1
Jay Barra	5
Sarah Barsukoff	1
Robert Barton.....	2
Sean Batewell.....	2
Eric Bedell	2
Elizabeth Bidell.....	3
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Raymond Castronovo.....	4
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Randall Wilson.....	20
Dan Yanik.....	30
Rebecca Zobre.....	22

FACULTY SPONSORS

Tracy Allen (Geography).....	27
Nancy Bachman (Biology).....	11,26,29,30
Thomas Beal (History).....	29
Jacqueline Bennett (Chemistry & Biochemistry).....	10,25
James Bercovitz (Psychology).....	8
Paul Bischoff (Secondary Science Education).....	1,2,4,14
Jennifer Bone (Communication Arts).....	4
Devin Castendyk (Earth Sciences).....	20
Joseph Chiang (Chemistry & Biochemistry).....	19
Yun-Jung Choi (Human Ecology).....	30
Charlene Christie (Psychology).....	19
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Lynn Evans (Biology).....	8
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Hugh Gallagher, Jr. (Physics & Astronomy).....	14,23
Kelly Gallagher (Chemistry & Biochemistry).....	18
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Lawrence Guzy (Psychology).....	8,14,15
April Harper (History)	30
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Thomas Horvath (Biology).....	6,10,23
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Sunil Labroo (Physics & Astronomy)	11,12
Vicky Lentz (Biology)	24
Ho Hon Leung (Sociology).....	2,19
Brian Lowe (Sociology).....	16,27
Nigel Mann (Biology).....	13,22,25
Janet Nepkie (Music)	25
Rhea Nowak (Art).....	22
William O’Dea (Economics, Finance & Accounting).....	23
Geoffrey O’Shea (Psychology).....	24
William Proulx (Human Ecology)	8
Christine Quail (Communication Arts).....	4
James Ryder (Mathematics, Computer Science & Statistics).....	5
Dona Siregar (Economics, Finance & Accounting)	7,15,18
Elizabeth Small (Foreign Languages & Literatures)	26
Albert Sosa (Physical Education)	9
Moussa Traore (Human Ecology).....	3
William Vining (Chemistry & Biochemistry)	22
Tatiana Vislova (Earth Sciences).....	7,20
Donna Vogler (Biology)	5
Jeremy Wall (Music).....	20
Jen-Ting Wang (Mathematics, Computer Science & Statistics)	1
Fred Zalatan (Biology).....	11
Sen Zhang (Mathematics, Computer Science & Statistics)	10,11

PRESENTATION ABSTRACTS

**Antonio Alvarado, Matthew DePierro,
Yun Ge, Aissa Hamim**

Faculty Sponsor: Christine Harrington
(Economics, Finance & Accounting)

Foundation Funds Analysis II

The College at Oneonta Foundation was created on March 19, 1982 with the objective to provide more funding for the College beyond the State budget. A \$31 million endowment has been developed over the past twenty-five years to provide resources for scholarships and other priorities (e.g. faculty and student research). The endowment is sustained by various means such as contributions and investments. It is important to make sound investments to provide continued support for the programs and services offered. The College Foundation Fund currently holds twenty funds that have investment objectives that satisfy the College Foundation Finance Committee's expectations. Our objective was to investigate alternative investments for two of the twenty endowment funds with similar objectives of the current holdings that potentially offer more attractive rates of return. The two endowment funds researched for comparison were the American Washington Mutual and iShares SmallCap Value securities. We found many fund alternatives that were very similar to the Foundation's funds. The criteria used for evaluating each alternative to the original two endowment funds were: similar if not better expected returns, risk, annual turnovers, expense ratios, minimum initial investments, and loads and fees. Based on our evaluation of a wide array of possible alternative investment opportunities, we offer two more attractive securities that the College Foundation Finance Committee may wish to further evaluate. We found that, over the last five years, the returns on ING Corporate Leaders Trust B and SPDR DJ Wilshire SmallCap Value have been similar and that the returns of their holdings have been steadily higher than the endowment funds. Our proposal is comprised of similar risk with slightly higher returns that could benefit the College Foundation Finance Committee and SUNY Oneonta as a whole in the long run.

**Scott Azar, Sarah Barsukoff,
Robert Fitzgerald, David Lustberg,
Alyssa Schaller**

Faculty Sponsor: Paul Bischoff
(Secondary Science Education)

***Water Quality Analysis of Three Creeks
Leading into the Susquehanna River in
Oneonta, New York, and their Effects on
the River's Water Quality***

The Susquehanna River is the main water body for the Chesapeake Bay, and monitoring the quality of the water is very important to ensuring the ecological stability of that ecosystem. A water quality index is one way of measuring water quality. It takes into account nine different tests and each one is weighted to ultimately give a final index ranging from excellent to very bad. In this study we tested the water quality in three tributaries of the Susquehanna River. Each tributary was measured five times over a five week period in the spring of 2008 at both the origin and the point at which it discharges into the River. Additional samples were taken from the Susquehanna before and after the City of Oneonta sampling. In total, forty samples were collected and analyzed for water quality. The samples were tested for: pH, conductivity, fecal coliform, phosphorus, nitrate and dissolved oxygen content. Details of the results are provided in the poster presentation.

Christina Barone, Lauren Weil

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

Physiological Effects of Water vs. Gatorade

The purpose of this study was to investigate the physiological effects of water vs. Gatorade during regular exercise. Participants consisted of 13 subjects who exercise three to five times a week. We randomly assigned each participant to walk three miles in one hour or jog five miles in one hour. Each participant completed two

trials; one where they drank 20 oz of water and the other where they drank 20 oz of Gatorade. Blood pressure, heart rate and Rating of Perceived Exertion (RPE) were taken at 20-minute intervals. The data suggests there is no statistical difference between water and Gatorade when participants walked three miles in one hour. However, among participants who jogged five miles in one hour there was a statistical difference in diastolic blood pressure ($p=0.039$).

Robert Barton

Faculty Sponsor: Paul French
(Physics & Astronomy)

***An Automated Two-Dimensional Lens
Distortion Correction Technique in Video
Based Motion Analysis***

As time progresses, the prominence of computation in the physical sciences becomes increasingly evident. The computer has given scientists a means of performing complex processes that would otherwise be infeasible, by means of automation. In video based motion analysis, the correction of lens distortion becomes exceedingly difficult as it is expanded to two dimensions. In the past this has caused the process to be highly time consuming and, thus, to be rendered impractical. This paper presents several techniques that have been used to automate the processes performed during lens distortion correction. Automated techniques include: 1) cleaning of video data; 2) extraction of fixed position information from video files; 3) calibration of lens distortion based on the extracted data; and 4) correction for lens distortion in experimental data. These techniques have been used in conjunction with newly developed correction and testing methods to produce drastically improved results. Additionally, procedures have been created to automatically detect the position of an object in motion in video data.

**Sean Batewell, Mike Hinman,
James Neil, Travis Richards**

Faculty Sponsor: Paul Bischoff
(Secondary Science Education)

***Acidity of Precipitation: Relationships
between Ion Concentrations, Type of
Precipitation and Origin of Weather Fronts***

Acid precipitation is a result of the modern industrial age's generation of pollutants such as nitrogen oxide and sulfur dioxide. In upstate New York, acid precipitation deposition has been extensively studied and is believed to be the primary cause of the decline of loons and many fish species. The purpose of this research was to determine the pH and ion concentrations of different types of precipitation in central New York. To date, ten different samples of precipitation have been collected and analyzed. The samples of precipitation were of different forms including rain, snow, and mixed. The pH of each sample was recorded using a waterproof electronic pH meter, and the concentrations of sulfate, nitrate and chloride ions were recorded using an ion chromatograph. According to the Department of Environmental Conservation, the average pH in New York is between 4.0 and 4.5. The average pH of our samples was 5.01. Our results provide strong support for the research of the University of Maryland and the Environmental Research Center that found snow has higher concentrations of nitrates than other forms of precipitation, including rain. The average concentration of nitrates was 0.471 ppm in our rain samples and 1.58 ppm in our snow samples. However, we found that there was only a 5% correlation between sulfate concentration differences in rain and snow, which does not support other findings in the University of Maryland study.

Eric Bedell

Faculty Sponsor: Ho Hon Leung
(Sociology)

***The New Globalization: Fair Trade Theory
or Reality?***

This research study investigated the recent past of the Fair Trade movement, as well as the effects it has had on distributors, consumers and producers. The main goal of the project was to accumulate substantial data regarding the benefits perceived by the Fair Trade movement's participants. The methodology utilized face-to-face interviews with individuals directly related to the Fair Trade movement, as well as those uninvolved with it. The data was compiled after a series of interviews with product retailers and consumers in areas including, but not limited to, Oneonta, New York City, and Long

Island, NY. Since uncovering the origin of the Fair Trade movement as a resistance movement to ever expanding capitalist Free Trade, a solid conceptual foundation was built that facilitated the study. Because coffee was the first fairly traded commodity, and is still the largest, it seemed significant to interview a retailer of Fair Trade coffee to begin the data collection (Jaffee, 2007). Understanding figures that explain the differences not only in amount of price guarantee to Fair Trade farmers, but also the stability of the pricing, urged this research study further along. The interview with the coffee retailer from Long Island, NY, gleaned the benefits of running and supporting a sustainable coffee shop. After just three interviews overall, the preliminary results provided substance for the goals of the study. With interview participants ranging from a middle-aged sustainable coffee retailer, to an operator of a Fair Trade co-op, and finally a staff member of a non-Fair Trading corporation, a thematic analysis was concluded. It was noted after speaking with the coffee retailer that Fair Trade certified beans can provide a more stable sense of income and efficient means for regulation; however, direct trading without a label certification can provide even higher profits for the farmers under certain conditions. It was also unveiled through interviews that a common belief is that producers must maintain the best quality crop yield and follow exact sustainability guidelines in order to be accepted as a possible Fair Trade partner in the future. Furthermore, a theme that developed through data collection was an understanding that Fair Trade needs to widen its scope. Not enough, if any, attention is really paid where many feel it is needed. Independent retailers of Fair Trade items are not supported, despite investing hard earned money into opening a business. In conclusion, the preliminary results of this study provide sufficient examples for the positive benefit of the Fair Trade movement, although it has not yet reached its ultimate potential.

Elizabeth Bidell

Faculty Sponsor: Moussa Traore
(Human Ecology)

Tidal Waves from the East? The "China Factor" on the Apparel Trade Sector Following the Elimination of the Quota System

In today's economy, market boundaries between countries are slowly melting, giving way to a planetary market with shrinking borders. Since the elimination of quota restrictions on textiles and apparel imports in 2005, the apparel industry has been at the forefront of many global trade issues. While importers are free to purchase surplus quantities of apparel products from an ever-increasing number of countries, the decision as to where to

buy is based almost solely on competitive pricing (Bond, 2004). The labor-intensive nature of the apparel sector, paired with the low wage rates of less developed countries, tends to give certain nations a comparative advantage in apparel manufacturing. Generally, the countries with the lowest wages are more likely to win out. It has been the widespread belief of many that China will become the major beneficiary at the expense of most other developing nations (Gelb, 2007). As the apparel exports from Central America and Sub-Saharan Africa as a whole tend to be on the decline, a thorough examination of how individual countries adjust their apparel industry to adapt (if not flourish), despite the intense onset of competition, should be undertaken in order to shed light on the boundaries of the emerging map of the global trade of apparel products. The objective of this project is to research the effects of the World Trade Organization's Agreement on Textiles and Clothing that established a ten-year period phase-out of the quota system. Many industry specialists predicted that the final eradication of quotas in 2005 would have a devastating effect on the apparel industries of less powerful developing countries, while simultaneously boosting the economies of more powerful developing countries, specifically China. Because the apparel industry plays a major role in the global economy, it is critical to assess and reflect on trade issues affecting this industry. This project outlines the new map of apparel trade in the global economy.

Gwennan Booth

Faculty Sponsor: Christine Quail
(Communication Arts)

Celebrity Politicians: "Those Who Have Run and Won"

This project investigates why and how celebrities have been able to make their way into the American political arena. Two research questions were formulated in an attempt to understand this aspect of our culture: "What characteristics do celebrity politicians possess that persuade people to vote for them?" and "How do celebrity politicians make themselves appear knowledgeable enough to be in public office and, therefore, receive votes?" In order to address these questions, I examined many different factors. Initially, I reviewed literature, both academic and the popular press, to ascertain what the general thoughts were on how celebrity politicians get elected into office. I found that the main factors consistently presented were charisma, media exposure, charm, public speaking ability, and the ability to *project* the image of being knowledgeable enough to hold office (even if they are not necessarily knowledgeable enough). In order to further the study, I conducted two independent research experiments. First, I distributed a survey to 100 individuals on the SUNY Oneonta campus. The results overwhelmingly fit in with the opinions I had previously found in my preliminary research. The majority of people surveyed agreed that the previous attributes noted explained why celebrities are able to gain votes. Overall, the population surveyed also felt that fame also greatly contributes to success. Second, I conducted a focus group of seven people. In short, the group expressed that the skills celebrities learn from their careers in the media are what essentially propel them forward in the political arena. In other words, if someone is able to successfully portray a particular image with confidence, then the general American population will believe it. Through this research, I gained a better understanding of how celebrities have infiltrated such an essential part of American culture.

Glen Calvin, Wynter Weyrauch-Newman

Faculty Sponsor: Paul Bischoff
(Secondary Science Education)

The Effects of Car Effluents on Microorganism Stream Ecology

Car chemicals can be hazardous to stream ecology. The purpose of this project is to test the effects of car effluents on microorganisms and ultimately determine the concentration at which 50% of the organisms die (LC₅₀). We chose microorganisms as our test subjects because they play a significant role in stream ecology, are readily available and respond quickly to laboratory tests. We use five different car effluents, including gasoline (87 Octane), oil, brake fluid, power steering fluid and anti-freeze. The concentrations of the effluents tested are 0%, 6.25%, 12.5%, 25.0%, 50.0% and 100%. To date we have collected data for oil, anti-freeze and gasoline. The results for gasoline indicated a LC₅₀ at the 25.0% concentration level. Oil did not have a LC₅₀ (some studies have shown that microorganisms thrive in oily environments). The results for anti-freeze showed a LC₅₀ at the 100.0% concentration level. We plan to finish the remaining effluent tests, and then re-run all of the data by creating new wells and re-examining them with a microscope. We will then take these two sets of data for each effluent and compare them in a T-test using the SPSS program.

Raymond Castronovo

Faculty Sponsor: Jennifer Bone
(Communication Arts)

Breaking the Boundaries: Barack Obama's and Hillary Clinton's 2008 Campaign Rhetoric

The 2008 political environment has shifted away from the traditional white male perspective to include a more diverse pool of candidates vying for the Presidential ticket. For the first time in United States history, Americans have the opportunity to observe an African American and a woman fight for the Democratic nomination for President. Studying the campaign discourses of Barack Obama and Hillary Clinton exposes alternative rhetorical styles used throughout political campaigns. Our study analyzes debates and campaign speeches given by Obama and Clinton to determine if they fulfill

rhetorical strategies deemed Afrocentric and feminine. The changing trend in American political discourse illustrates the willingness of the American people to accept and warrant new styles of communication within politics.

Ember Chabot

Faculty Sponsor: Jeffrey Heilveil
(Biology)

Restoration Genetics: A Phylogeographic Approach to Reintroducing an Important Aquatic Insect to a Central Midwestern Drainage Basin

Before the 1940's the Vermillion River in Illinois was a high quality river. After that time, the habitat was impacted by sand-pit mining and runoff from agricultural pesticide use. The ecosystem was drastically degraded until mining ceased and pesticide usage declined. The Vermillion River has since been designated a National Scenic River. To some, it appears that all damage has been undone; however, some environmentally sensitive species have

never returned to their historical habitat. One important species is *Acroneuria frisoni* (Stark and Brown), a poorly dispersing golden stonefly that is an important member of the riverine food web. This study will use genetic information to map out relatedness and migration patterns, a technique referred to as phylogeography. By sequencing part of the mitochondrial gene Cytochrome Oxidase I from *A. frisoni* populations throughout the Midwest, we can compare these sequences and build a map identifying which populations are most closely related. In doing so, our aim is to locate the population most genetically similar to those extirpated from the Vermillion and use that population as a source of individuals for reintroduction.

**Ember Chabot, Lori Crane,
Thomas Lansing, Jay Barra**

Faculty Sponsors: Donna Vogler
(Biology), James Ryder (Mathematics,
Computer Science & Statistics)

A Student-Developed Database of Invasive Plant Rankings

In the fall of 2007, two undergraduate classes at SUNY Oneonta developed an invasive plant database as a collaborative class project. The 18 students in Professor Donna Vogler's Plant Ecology course (BIOL 381) each researched two to three species of greatest threat to the Catskill region using various governmental websites and primary literature. Each of the 40 species was given a ranking for nine traits of innate invasibility using the National Park

Service protocol of Heibert and Stubbendieck (1993). The traits included numbers of seeds, mode of reproduction and competitive ability. These data were then placed into a searchable website developed by Computer Science students. The collaboration resulted in an efficient compilation of a useful data set applicable to a wider community. A list of target species was provided by Meg Wilkerson of The Nature Conservancy. Under the direction of Professor James Ryder, Computer Science students developed the web-based format for the database so that it can accommodate the growing catalog of information. Data were first transferred from its original location, a Microsoft Excel workbook, into a Microsoft Access database. A web site interface and navigation hierarchy was developed to provide general and password-controlled administrative access to information about the invasive plant species. The database can be viewed, added to and corrected using standard web browsers. Because the data is online, biologists worldwide have ready access to the information. It is our hope that, as information on these species becomes more available, it will stimulate research that will further contribute to the accuracy of the database.

Elizabeth Cousineau

Faculty Sponsor: James Ebert
(Earth Sciences)

The Effect of Inquiry-Based Instruction on Conceptual Growth in an Introductory Geology Class and Analysis of Student Perceptions of Non-Traditional Pedagogy

Qualitative and quantitative data from an experimental section (ES) of an introductory geology course were used to evaluate the effects of inquiry-based instruction and affective factors on student learning. Traditional sections of this course meet for two 50-minute lectures and a 110-minute lab weekly. The ES met for two 110-minute sessions per week to facilitate more lab work and inquiry-based learning. The ES was comprised of 25 students

with various backgrounds, interests, and skills. Twenty-eight percent of the students had science or science-related majors. This study sought to: 1) track the effectiveness of group learning on forming relationships where students view their peers as friends (affective domain) and educational resources (cognitive domain); and 2) assess whether these factors influenced students' progress in developing an understanding of geoscience concepts. Students worked in groups on various projects that required them to form and support their own conclusions. Through this process, students developed research skills and an ability to question, understand and explain problems. The group structure of the class was designed to promote social interaction as well as learning. Seventy-three percent of the students reported a preference for group learning, and 80% preferred the nontraditional learning environment to lecture-based instruction. Growth of students' understanding of geoscience concepts was evaluated through GCI pre- and post-testing. Our null hypothesis was that there would be no significant growth of student understanding. T-test results for paired samples led us to reject the null hypothesis. The inquiry-dominant ES group showed substantial gains in conceptual understanding. GCI mean scores increased from 35.27 ± 15 (pre test) to 44.17 ± 11 (post test) ($n=21$). Published GCI data (Libarkin and Anderson 2005), dominated by lecture-based instruction, show means of 43 ± 11 and 47 ± 12 for matched pre- and post-tests ($n=930$). Our results indicate that inquiry-based, constructivist pedagogy produces greater conceptual growth than lecture-based instruction, especially when instructional design includes affective considerations. These results are consistent with the observation of Libarkin and Anderson (2006) that some non-traditional approaches are more effective than lecture alone.

Lori Crane

Faculty Sponsor: Thomas Horvath
(Biology)

Hydrodynamic Force Impacts on Zebra Mussel (*Dreissena polymorpha*) Veligers

Zebra mussels (*Dreissena polymorpha*) continue to invade new aquatic habitats throughout North America including, recently, California. Lakes appear to be sites of initial colonization within watersheds. These lake populations serve as sources for propagules available to colonize downstream connected systems via passive veliger drift. Distribution

patterns of adult mussels in most lake outlet streams are consistent. Density decreases exponentially with distance from the source population. Exposure to harsh hydrodynamic forces may be increasing mortality of veligers during downstream dispersal. We tested the viability of this hypothesis by exposing veligers to different degrees and durations of hydrodynamic forces. Aliquots (100 ml) of veligers were placed in Erlenmeyer flasks and spun on an orbital shaker at 3 speeds (0 - control, 100, 400 RPM) and 3 durations (1, 24, 48 hours). Proportions of live and dead veligers were quantified using microscopy. At 100 RPM, no significant differences existed compared to controls for 1, 24 and 48-hour trials. At 400 RPM differences in the 24 and 48 trials were found compared to the 1 hour. The 24-hour trial treatment data showed 79% alive, with 87% alive in the control. The greatest discrepancy was in the 48 hour run; having only 5% left alive in the treatment, but 61% alive in the control flasks. Duration and intensity of hydrodynamic forces combine to increase veligers' mortality. These results support the hypothesis that patterns of zebra mussel colonization of downstream reaches in lake outlet streams are affected by the flow conditions they are experiencing.

Joseph DelGrosso

Faculty Sponsor: Shih-Ming Hu
(Human Ecology)

Effects of Flaxseed Flour Fortification in Pastry Products

Low dietary fiber intake has been implicated for diverticular disease, constipation, appendicitis, obesity, diabetes, coronary heart disease, and bowel cancer. Flax contains a high percentage of fiber, which reduces hypercholesterolemic atherosclerosis and, thus, the risk of heart attack and strokes. This study investigates the potential acceptability of flaxseed flour fortification in three popular pastry products at 15%, 20%, and 30% of their original flour content. If acceptable with the sample population, flaxseed fortification offers a unique way for foodservice professionals and food chemists alike to greatly improve the nutritional quality of their baked products.

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Daniel DeThomas

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

Convertible Debt and Its Use to Reduce Agency Costs

The question as to whether to finance firm operations through debt or equity has been studied and debated for decades. With the increasing size of corporations in the global market, this question is as important as ever for management. However, as corporations continue to grow, management continues to become further separated from the owners (or, rather, the shareholders) of the corporation. This separation between management and shareholders can result in conflicting objectives between these stakeholders, creating the principle-agent problem. Agency costs generally arise from this information asymmetry between management and shareholders. In turn, this information asymmetry brings about the agency costs of moral hazard and adverse selection. Firms take many courses of action to try to reduce these agency costs. Convertible debt is a hybrid security that has been well recognized as a mechanism with the ability to reduce agency costs. The objective of this project is to determine whether convertible debt can reduce agency costs by analyzing the correlations between executive compensation, board independence, and debt structure.

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Michael DeVasto

Faculty Sponsor: Tatiana Vislova
(Earth Sciences)

Geochemistry of the Banker Pond Metabasalts

Banker Pond is one of a few isolated localities of metabasaltic rocks exposed within the Rensselaer Plateau slice of the Taconic Allochthon in eastern New York. These metabasaltic rocks are intermixed with greywacke of the Nassau Formation, the age of which is uncertain. Formation of metabasalts was previously explained by rifting at the North American craton margin during opening of the Iapetus Ocean in late Proterozoic. The above hypothesis was supported by geochemistry of basalts from all the localities with the exception of the Banker Pond (Ratcliff, 1987). The purpose of this study is to gain a better understanding of the tectonic environment of the formation of the Banker Pond metabasalts. We obtained new representative major and trace element data by X-ray fluorescence analysis from various locations within the Banker Pond outcrop, and compared it to geochemical data from modern plate tectonic settings from the GEOROC database using discrimination diagrams.

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**Allison Dilzer, Samantha Avenengo,
Rebecca Kennedy, Aaron Manzer**

Faculty Sponsors: James Bercovitz,
Lawrence Guzy (Psychology), William Proulx
(Human Ecology), Lynn Evans (Biology)

***An Exploratory Study on Levels of
Hydration/Dehydration and its Effects on
Attention Span, Cognition and Mood with
Elementary and High School Students***

morning when they arrive for school and once at the end of the school day. We will also administer a self-report survey on their hydration habits. Study #1: We will screen students to identify a sample whose normal status is to be dehydrated. Study #2: We will recruit an equal number of boys and girls who are chronically dehydrated. They will be randomly assigned to either the control or experimental group. In the control condition, they will not be informed as to the hydration protocol. They will be allowed to drink their usual beverages at the same ad-lib rate that they previously established. In the experimental condition, they will be asked to follow the hydration protocol and be encouraged to drink water based on their weight at predetermined times during the day. On the day of testing, saliva samples obtained from participants and the results from the Impedimed will be recorded. They will be administered the Test of Variables of Attention (TOVA), a computerized test of attention. Other tests that we will administer include code substitution, the Positive and Negative Affect Scale, and the Stroop Color Identification Test. We will also require teachers to record their observations of the students.

**Allison Dilzer, Lauren Howe,
Alyssa Sorrentino, Peter Ilczyszyn,
Megan Miraglia, Jenna Smith,
Ashley Gebczyk, Kari Cubito**

Faculty Sponsors: Lawrence Guzy
(Psychology), William Proulx (Human Ecology)

***Exercise-Induced Dehydration and its
Effect on Mood, Sleepiness and Perception
in Fit Subjects***

predetermined volume of water based on their weight. At 6:00 AM on the day of testing, food and water intake was stopped. At 7:00 AM baseline saliva and body weights were obtained. Subjects performed their regular exercise program for 1-1.5 hours without fluids. Post-exercise saliva samples were collected from each subject immediately following exercise. Perception tasks and sleepiness and mood scales were administered. Saliva samples were obtained one and two hours after psychological testing. For the hydration phase, the above conditions were repeated, except that subjects maintained their pre-exercise weight by consuming water throughout the 1-1.5 hours of exercise. The following perception tasks and scales were administered: 1) the Autokinetic Illusion; 2) Rod-Frame Task; 3) eye alignments; 4) Epworth Sleepiness Scale; and 5) Positive and Negative Affect Scale. **Results:** Only positive mood was significantly reduced after exercise-induced dehydration ($M = 31.1$ to 23.4), $t(7) = 5.8$, $p < 0.0001$). No changes were found for negative affect, sleepiness, and the perception tasks. Osmolality of saliva accurately reflected the pre-exercise hydrated states ($M = 58$) and post-exercise dehydrated state ($M = 89$), $t(8) = 3.05$, $p < 0.02$. **Discussion:** A 2% level of dehydration significantly reduced positive affect but not negative affect, perception & sleepiness. Salivary osmolality detected dehydration in seven of nine participants. Salivary osmolality returned to pre-exercise levels after 1 hour of hydration.

Problem: Dehydration may have serious consequences on mood, cognition, and performance in an elementary and high school setting. **Purpose:** We will use two devices to identify physiological levels of hydrations. The Impedimed is one device capable of identifying intracellular and extra-cellular hydration status. A second device, the freeze-point depression osmometer, requires a small amount of saliva to determine hydration level. Over a period of three school days, we will collect these samples from our subjects twice per day: once in the

Purpose: To determine 1) the impact of dehydration on perception, mood and sleepiness; and 2) the ability of salivary osmolality to detect hydration status. **Method:** Six women and three men (20-25 yrs) who self-reported regular exercise of at least one hour/day volunteered. Acute states of dehydration were generated by requiring hydrated participants to exercise until weight was reduced by two percent of pre-exercise weight. All subjects were hydrated during a 48 hour period before testing by consuming a

Peggi Dudley

Faculty Sponsor: Albert Sosa
(Physical Education)

***Development of Trail Maps for the
Oneonta, New York Area***

The purpose of this project was to develop a multi-layered geographic information system (GIS) database for the production of detailed trail maps of the Oneonta, New York, area that could eventually be utilized by the local community and by college students. Building the trail maps was a challenge since many of these areas had never been previously mapped. To create these maps it was first necessary to gather the appropriate data. This included going into the field and taking waypoints along the trails using a global positioning system (GPS). Once the trail data was gathered it was downloaded to a computer. The New York State Clearing House website made it fairly simple to gather the appropriate county, city, and United States Geological Survey data, as well as geo-referenced aerial photography that would be necessary for building the database to create each individual trail map. The next step was compiling all of the information gathered into the GIS software ArcMap. This software allows the user to produce maps of various types, in this case, trail maps. ArcMap software is very complex and offers a variety of options for the map's display and settings. After the first map was created, I continued to use a similar format for each map that followed. A goal of this project was to create clear and easy-to-read trail maps. The creation and distribution of this collection of trail maps will provide the Oneonta public with an outlet to become physically active and promote healthier lifestyles. The trails have various uses including hiking, mountain biking, trail running, cross-country skiing, and snowshoeing. The trail maps that were completed thus far during this project include: Wilber Park Trails, Renwick Hill Trails, SUNY Oneonta College Camp Trails, the Susquehanna Greenway Trail, New Island Trails, and Job Corps Hill Trails. Soon, these maps will be readily available to Oneonta's community and college students.

Jill Eichler

Faculty Sponsor: Les Hasbargen
(Earth Sciences)

***The Framework for the Development
of a Lake Management Plan for
Canadarago Lake***

Canadarago Lake is situated in Northern Otsego County, New York, and is part of the Upper Susquehanna Drainage Basin. The Towns of Richfield, Exeter and Otsego border the Lake and it is recognized by the residents as a valuable resource. It contributes to the area's economy by way of its recreational uses. Ecologically the Lake, its streams and wetlands provide habitats to countless flora and fauna. The protection of these habitats is of concern to many who enjoy the pristine environment. Among the many issues that concern Lake residents, the most pressing is that of flooding of low lying properties that has caused property damage and compromised septic systems. The flooding can potentially pose a health threat and jeopardize water quality. The flooding problem has worsened in recent years, partly due to the deficiencies of a dam on Oaks Creek (an outlet at the southern end of the Lake). The condition of the dam has deteriorated and it has sustained damage from flooding. An additional contributing factor is a sand bar that has accumulated at the mouth of Oaks Creek. Correction of these problems has been in a quagmire. The creation of a lake management plan would enable various groups to converge and allow for grant opportunities that could correct various problems. The plan would identify the specific needs, which would include mitigating flooding. Managing the Lake in a proactive way would address issues now and in the future. The Canadarago Lake Improvement Association has expressed interest in creating a plan but is unsure how to proceed. The framework is an outline to educate stakeholders on lake management and how to create a lake management plan.

Carissa Fairbairn

Faculty Sponsor: Thomas Horvath
(Biology)

Zebra Mussel Vertical and Substrate Preference in Otsego Lake and Goodyear Lake (Otsego County, NY)

Zebra mussels (*Dreissena polymorpha*) are a bivalve mussel native to freshwater lakes in southeastern Russia. They are an invasive species and, locally, have become quite a nuisance. Just this past summer (2007), the mussels were discovered in Otsego Lake, in Cooperstown, NY. Zebra mussels live within the benthic layer of lakes, attaching themselves

to various substrates. The benthic layer is the lowest level in a body of water. Professor Horvath believes that zebra mussels prefer to attach themselves to substrate already occupied with other mussels. It is commonly believed that mussels release a chemical cue that attracts other mussels, causing them to aggregate upon one another. However, it may be that the mussels prefer complex surfaces. It is important to look at two or more lakes and observe general trends. Current lakes of interest are Otsego Lake and Goodyear Lake. As an added value, Lake Otsego is a naturally occurring lake, whereas Goodyear Lake is a manmade lake. Of final note is the vertical positioning of zebra mussels. It is important to see what level of the water column the mussels prefer. Placing a weight into the water with floatable polypropylene rope simulates a macrophyte growing up and would allow a general determination of preference of vertical positioning. Another potential factor in zebra mussel attachment is sunlight. Overall the main goals of the project are to: 1) Determine the preferred substrate of zebra mussels (complex or smooth); 2) Compare rocks already inhabited with zebra mussels to ones without in the same general area and determine which rocks more mussels attach to (to test for presence or absence of chemical cues); 3) Compare rocks in areas of shade as compared to areas of sun and determine which the zebra mussels prefer; and 4) Determine if zebra mussels preferred vertical positioning within the water column.

Tabetha Forster

Faculty Sponsor: Jacqueline Bennett
(Chemistry & Biochemistry)

Inquiry-Based Infrared Spectroscopy

With the help of Professor Bennett, I developed an inquiry-based lab for learning infrared spectroscopy (IRs) interpretation where students use actual spectra to discover the patterns and differences between functional groups. Students are given cards containing different chemical structures and corresponding

IRs. Students sort the cards into functional groups and can then look at the similarities within certain functional group IRs to distinguish the general patterns associated with the group. Since students are discovering these patterns on their own, they will be more likely to retain the knowledge and apply it correctly in the future.

Christopher Fremgen

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

An Integrated Tool to Build Phylogenetic Trees Using Online Databases

This project aims to develop an integrated environment to crawl online biological databases, extract sequences from web pages, calculate sequence distance matrices, generate Phylogenetic trees and display those trees. Rooted Phylogenetic trees are used to depict the hypothetical evolutionary relationship among species that are suspected to derive from a

common ancestor. The root represents the common ancestor; internal nodes represent speciation; and the known species are the leaves of the tree [1]. In the past, practitioners needed to go through several separate tools and resources to collect sequence data and reconstruct Phylogenetic trees. When large amounts of Phylogenetic trees are desired, the traditional process can be daunting and very time consuming. In this project we aim to build an integrated environment by utilizing the ad hoc online biological sequence repositories, which are becoming more complete and stable, and automating the entire process with the goal of reconstructing the trees. This is an implementation-oriented project that integrates nontrivial data mining techniques such as dynamic programming for sequence alignment, distance normalization, and agglomerative hierarchical clustering algorithms

to reconstruct Phylogenetic trees. The project also uses web-mining techniques, such as online information retrieval through socket programming and information extraction using regular expression. Another feature of this project is the implementation of a tree viewer to display the trees obtained in Newick format. The online database used in the project is NCBI [2]. The input consists of a set of sequence IDs and the output are represented in Newick format as well as JPEG images of the rooted trees. This project was implemented from scratch in C#. The future work will take into consideration unrooted trees, tree branch lengths, and more tree reconstruction methods. REFERENCES: [1] Durbin, Eddy, Krogh and Mithison: *Biological Sequence Analysis*, Cambridge University Press, 1998; [2] <http://www.ncbi.nlm.nih.gov>

Theresa Gannon

Faculty Sponsor: Fred Zalatan
(Biology)

Environmental Sequencing of Bacterial Species

From previous research in the spring of 2006, soil samples treated with and without herbicide were collected in order to determine any differences in the microbial populations present. Analysis involved a procedure termed environmental sequencing, where bacteria in the soil are analyzed without having to grow microbes in a laboratory setting. DNA was

extracted from the soil and amplified using the polymerase chain reaction (PCR). The PCR product was then cloned into a plasmid vector using the TA cloning method. This TA cloning procedure converts the DNA of the plasmid into double stranded DNA, having thymine nucleotides on one restriction site end and an overhang of adenines on the 3' end of the plasmid restriction site. This is done so by the enzyme Taq polymerase. Ongoing studies are being done to sequence the DNA on the plasmid. The sequenced DNA will then be entered into a bacterial genome database to either identify the known bacterial species present or to discover a new bacterial strain or species.

Brian Green

Faculty Sponsor: Nancy Bachman
(Biology)

Chemiluminescent Detection of DNA-Protein Complexes

This experiment was run in order to detect protein-DNA binding at the HCOX4 (the human cytochrome oxidase subunit IV) gene, and produce evidence using a chemiluminescent detection method. This chemiluminescent method is used to detect the binding of a select protein to a DNA region. The DNA structure is then run on electrophoresis and transferred to a

membrane. The structures are then tagged with an enzyme and reacted with substrate to produce luminal, a light-emitting chemical. The membrane is then exposed to film to produce the data. In this experiment, the nuclear extract of HeLa cells was added to the DNA of the HCOX4 gene. The data produced identified that the nuclear extract of HeLa cells contains a protein that binds to DNA on the HCOX4 gene. This protein-DNA complex was found to be specific because addition of excess site DNA would compete out the bound complex.

Andrew Greene, Christopher Fremgen

Faculty Sponsors: Sunil Labroo (Physics & Astronomy), Sen Zhang (Mathematics, Computer Science & Statistics)

PC Controlled Hall Effect Measurement Set-up with Graphic User Interface

IEEE-488 interface was used to control a Keithley source meter and nanovoltmeter for the Hall Effect measurement set up. C++ programming language was used to write the GUI (Graphic User Interface) with a real time graphing capability for easy data analysis. This GUI uses manual current inputs that can be switched in direction, and reads the data from the nanovoltmeter. Through a user-friendly

interface this program makes it possible to take multiple measurements for data averaging and display this data in real time. In this presentation, we will demonstrate the various features of this program and how it is used for Hall Effect measurements on metallic thin films.

Andrew Greene, Corey Lemley

Faculty Sponsor: Sunil Labroo
(Physics & Astronomy)

Hall Effect in Thin Metal Films

up. Film thickness of a pure copper sample was calculated to be $11.5 \pm 2.0 \mu\text{m}$ and a standard was set up for the deposition rate for subsequent films. Magnetic films were then deposited with cobalt to copper ratios at 5, 10, and 25 atomic % to examine the effect of cobalt moments on the Hall Coefficient (R_H) of copper. For the 25% sample, the Hall Coefficient is $R_H = -5.392\text{E-}11 \text{ m}^3/\text{C}$ and we find that it correlates with the amount of Co impurity. The Hall voltage versus current graphs shows some deviation from the pure Cu data. This deviation may possibly be due to spin dependent scattering of the charge carriers as described by the "Anomalous Hall Effect."

**Theresa Greiner, Rebecca Kurdziolek,
Heather Maenza, Karen Prior,
Christianna Shaffer**

Faculty Sponsor: Steven Gilbert
(Psychology)

***The Relationship among Traditional and
New Measures of the Field Dependence/
Independence and Analytic/Holistic
Constructs***

and the other version requiring the subject to manually draw the answer. For the RFT we have a traditional computerized version in which the subject is asked to manually move the rod to the vertical position. We also have a multiple choice computerized version of the RFT. The AHS and the Big Five are given as web surveys. We ran the multiple choice RFT, computerized EFT and multiple-choice FLT in a group setting, which allowed for more participants. Each participant was given the manual RFT, the AHS and Big Five, the paper and pencil EFT and the manual FLT that were run on an individual basis. We are predicting that all of these tests are part of the same overall construct; however, they may be part of several subcategories. These include analytic/holistic dimensions, as well as how we use or ignore the contextual environment. We are predicting a strong correlation between each version of each test (for example, a strong correlation between both versions of the EFT test). There should also be a strong correlation between the RFT and EFT, as previously found here at SUNY Oneonta to be strong measures of field dependence. Another correlation we believe exists is between the two FLT tests and the AHS survey, as they are both strong measurements of analytic/holistic dimensions.

Anthony Grimes

Faculty Sponsor: Les Hasbargen
(Earth Sciences)

***An Exploration of Sediment Entrainment
Theories using the June 2006 Flood
Conditions: A Preliminary Investigation***

Goals in this project include the measurement of flood heights and channel geometry at several locations in Otsego County; mapping of gravel that was moved by the flood; and measurement of gravel characteristics. Bedrock erosion of layered sandstone in local channels often results in platy cobbles, with a strongly non-spherical shape. This project will take advantage of this property to characterize the entrainment of these shapes of gravel. The ultimate goal is to provide some clarity on the influence of sediment particle shape on grain mobility that is lacking in the geologic literature. In addition, data recovered in flood stricken areas can be used in possible flood prevention plans, as well as being added to the hydrologic literature.

**Alexis Gunipero, Amber Horning,
Amanda Spink, Jessica Spellman**

Faculty Sponsor: Peter DiNardo
(Psychology)

***Anxiety Sensitivity and Isolated Sleep
Paralysis (ISP) in a College Sample***

In Isolated Sleep Paralysis (ISP), REM sleep muscular paralysis occurs while falling asleep or awakening. There is awareness of surroundings, inability to move and unusual perceptions. ISP is often accompanied by fear, and has been linked to anxiety disorders, particularly panic disorder. College samples show higher rates of ISP than general populations. We hypothesized that in a non-clinical sample of students ISP would be related to positive and negative affect and anxiety. Specifically, measures of negative affect, anxiety, and anxiety sensitivity would be related to the presence of ISP, but anxiety sensitivity would be more closely related to fear during the episode and to worry about future episodes. Introductory psychology students completed online surveys including the Positive and Negative Affect Scale-General (PANAS-G, PA, NA), the Anxiety Sensitivity Index (ASI), the State-Trait Anxiety Index-Trait, and the Epworth Sleepiness Scale (ESS), as well as a screening question about ISP. Thirty-two ISP subjects and 46 controls were interviewed about ISP episodes, including fear during the episode and level of worry about having further episodes. The ISP group showed significantly higher scores on PANAS NA (24.03) and STAI-Trait (47.5) than the non-ISP group (NA, 19.89; STAI, 42.82), and marginally higher ASI scores (23.3 and 19.6, respectively, $p = .097$). The groups did not differ on PANAS PA, or ESS scores. Among ISP subjects, ASI was the only measure significantly related to fear during the episodes ($r(31) = .396$, $p = .027$). Worry about having another episode was positively correlated with NA and with anxiety sensitivity. Results suggest that ISP is related to tendencies to experience NA and to worry about further episodes. Sleep disturbance was unrelated to ISP, nor to fear and worry in response to ISP episodes. The results indicate that ISP is an anxiety-related phenomenon that may have some parallels with panic.

Louis Hall, Stacey Washington

Faculty Sponsor: Nigel Mann
(Biology)

***A Playback Experiment to Investigate the
Unique Singing Behavior of the Stripe-
Breasted Wren***

In tropical latitudes, sex roles tend to converge, with rearing of young and territory defense being shared more equally (Stutchbury & Morton 2001). One consequence of this is that females often also sing, combining their songs with those of their partner to form tightly coordinated duets. Although many hypotheses have been suggested to explain why duetting occurs (as opposed to males and females singing independently of one another), this phenomenon is still not fully understood (Hall 2004). The Stripe-breasted Wren (*Thryothorus thoracicus*) is a rainforest species occurring across much of the eastern slope of Central America. These birds, in common with many tropical wrens, produce song duets (Mann et al., submitted). We plan to conduct a project during summer 2008 in Costa Rica aimed at understanding the function of their vocalizations. In addition to studying their duets, our project will focus on another feature of the songs of the Stripe-breasted Wren. Males sing two quite different types of song. The first is a sequence of 2-3 note phrases and is called the 'complex song.' The second, called the 'hoot song,' is a set of repeats of just a single, low-pitched note. Having two song forms is highly unusual for any songbird, and we will attempt to work out the meaning of these acoustic signals. Our strategy for the project is to use simulated intrusions of rivals into territories of Stripe-breasted Wrens to determine song function. To gain insight into the projected behavior of the Striped-breasted Wren, we have been analyzing various songs to familiarize ourselves with their components, as well as learning skills for the needed analytic software involved in creating spectrogram images of their response.

Robert Hildebrand, Robert Shepard

Faculty Sponsors: Paul Bischoff (Secondary Science Education), Hugh Gallagher (Physics & Astronomy)

Using Electric Potentials and Field Lines to Determine Boundaries of Underground Layers with Different Conductivities

As physicists, our physical understanding of electric fields and electric currents could be a highly valuable tool for other scientific fields. In the area of geophysics, this knowledge of electric fields and electric currents could be applied to the problem of inferring horizontal stratification in soil composition. Simulations were run for different depths of conductivity layers. We find that as the high conductive layer rises, the surface potentials out at the edges of our grid tend to decrease. Variations in the conductivities could be associated with layers such as the wet and dry soil of the water table or an underground pipe and the soil surrounding it. The focus of our investigation is to determine if changes in subsurface conductivities produce a significant difference in the surface electric potential when a potential difference is applied. In this project we applied a potential difference to the surface of a realistic physical model of the varying subsurface conductivities. This conductivity model consists of a 100 x 100 grid of subsurface conductivities. When constructing the said model, however, one must understand the Relaxation Technique and how to use it in solving the current continuity equation for the potential of every square in the grid. Once we came to an understanding of this technique, we allowed our computer software of MatLab 7.0 to solve the current continuity equation for all 10,000 squares in the grid. To check that the program was accurate, we took an arbitrary box and solved the equation ourselves to ascertain if the value we obtained was the same as what the software reported. We were able to find that surface electric potential measurements are useful in finding when the height of the conductivity gradient changes. Using a model such as the one described here would help to interpret actual field measurements, and it is our hope to be able to take this knowledge into the field and put it to real use.

**Lauren Howe, Karen Prior,
Rebecca Kennedy**

Faculty Sponsor: Lawrence Guzy
(Psychology)

Time of Day as a Factor in the Intensity of the Somatogyral Illusion (Graveyard Spin)

Introduction: The Somatogyral Illusion is a form of spatial disorientation in which a pilot accidentally steers the aircraft into a spin which, if less than 2 deg/sec, will not likely stimulate the semicircular canals. The pilot will assume that the aircraft is still traveling straight and level. If the problem is noticed in time and the aircraft is directed out of the spin, the pilot now believes he is spinning in the opposite direction (the illusion). If relying on vestibular inputs and not the instruments, the pilot will return to the direction of the original spin and fly into the ground. **Problem:** In a previous laboratory experiment using a rotating chair to simulate the somatogyral illusion, Guzy, et al. (2006) required participants to take part in multiple sessions. He found that several of his subjects who initially participated in the afternoon session requested to be reassigned to the morning session. Possibly, they may have been experiencing a more intense illusion. **Method:** Participants will be required to attend three sessions. Using the rotating NeuroKinetic chair, Session 1 will be a training session in the use of the cancellation knob to stop all perceived rotations of the chair. For Session 2, half of the participants will be tested in the morning and the other half tested in the evening; this will be reversed for Session 3. Two different tasks will be required during testing: canceling perceived movements and using a six-point scale to identify intensity and duration of perceived rotation. **Results:** Data are presently being collected.

Jillian Hubbard

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

Momentum Investing for Individual Investors

This research addresses the question as to whether or not momentum investing is a viable strategy for the individual investor. Many investors search for stocks that have recently outperformed the market and made extremely large profits. Investors tend to jump on the bandwagon and are likely not to think about other aspects of their investing decision, including risk. For instance, these investors tend to think that the current economic trend will continue as is forever, and do not realize that the good times will not last. Momentum investing is defined as “the practice of investing in securities that have substantially outperformed the market in recent periods.” And, a viable strategy is defined as a strategy one can use to beat the market returns. This study concentrates strictly on individual investors using the momentum strategy, as opposed to professional investors. Data was collected from CompuStat, and different types of equations and calculations were performed to determine whether individual investors can profit from momentum investing. This research tests whether momentum investors are successful in earning a higher return on their stocks than the market. It is important to point out that this study addresses short term and not long-term returns. This is accomplished by selecting at least thirty securities that had more than 100 percent returns during the sub periods of June 1, 2004 to December 30, 2004; June 1, 2005 to December 30, 2005; and June 1, 2006 to December 30, 2006. This topic is important because individual investors, as well as professional investors, are always trying to earn the best returns possible on their investments. The average return of the security, the maximum return, the minimum return, and the portfolio beta will all be calculated for each cycle.

Peter Ilczyszyn

Faculty Sponsor: Lawrence Guzy
(Psychology)

Is the Variability of the Autokinetic Illusion a Function of Dark Vergence and Dark Focus?

Background: A very unusual phenomenon occurs when you stare at a single point of light in an otherwise empty field. After a period of time that single point of light, which is stationary, appears to wander about, moving in unpredictable directions and magnitudes. You are experiencing the autokinetic effect. Individuals report different degrees of the effect, seeing no, little, moderate or large movements. To date, no one has been able to explain the variability of movement amongst observers. **Purpose:** Our study focuses on a possible explanation for differences among observers experiencing the autokinetic effect, and investigates whether dark focus and dark vergence may explain the variability. Dark Focus (DF) refers to the accommodation of the lens when sitting in a dark environment. Dark Vergence (DV) refers to the two eyes automatically converging to some unknown distance in the dark. DV may be coupled with DF. We are examining whether the degree of the autokinetic movement is related to the distance of the autokinetic light source relative to the DF and DV of an individual. **Method:** Fourteen men and women volunteered their participation. Five different distances for the autokinetic light source were used (0.33m, 0.5 m, 1 m, 4 m, 8m). We measured DF with a Canon RF-1 Optometer and DV with a Verg-a-matic. The non-dominant eye was occluded. Each observer received three trials at each of five distances. **Results:** Preliminary analyses showed a wide range of variability with DF, DV, and the autokinetic effect relative to distances. Final analyses will determine whether these are related. **Implications:** If autokinesis can be explained by DV and DF, these findings would explain the variability amongst observers and begin the process of reducing spatial disorientation.

Micah Ilowit

Faculty Sponsor: Brian Lowe
(Sociology)

Understanding Moralization

both legal changes (e.g., civil rights movement, anti-abortion legislation) as well as the creation of social taboos (e.g., boycotts against the fur industry). Examples of moralization can be found throughout the American political and cultural climate, but in this project we focused on one particular animal rights group, *Farm Sanctuary*. *Farm Sanctuary* is an animal rights organization whose main focus is to change current cultural and, to a lesser extent, political views of farm animals. They operate farm animal shelters in New York and California, and spread their messages through a network of volunteers, newsletters, animal rights conferences, and the Internet. During our research, several members, both volunteer and paid, were interviewed. We were also given a tour of the New York Farm Sanctuary. Our presentation will describe in detail the theory and anatomy of moralization and provide specific examples of the theory through excerpts from our interviews. We will also be available to discuss other areas in which the study of moralization is proving its importance.

This research project, by providing living examples, expands upon previous studies of *Moralization*. Moralization is the act of changing or attempting to change the “Moral-Landscape” of a society or culture. Successful attempts at moralization can be reflected by

Emmon Johnson, Anthony Grimes

Faculty Sponsor: James Ebert
(Earth Sciences)

Sedimentary Provenance of the New Scotland Formation with a Note on Helderberg Chitinozoans

bryozoans, trilobites, bivalves, sponges, rare corals) occurs as disarticulated, unabraded bioclasts. Skeletal debris increases up section. Rickard (1962) and Laporte (1969) both mapped these strata as Kalkberg. However, these beds resemble the New Scotland Fm. more than they do the Kalkberg Fm. Lithology and regional stratigraphic relationships indicate that the “Kalkberg” at Cherry Valley is, in fact, the New Scotland Fm. Recognition of these strata as New Scotland will open new questions on the deposition and age of the beds. X-ray diffraction analysis has shown that the insoluble residues are not composed of quartz silt, as previously presumed, but are, in fact, dominated by dolomite. Analysis of thin sections has further revealed that the non-dolomitic component of insoluble minerals is mainly diagenetic chert with subordinate quantities of quartz silt. Thin sections also reveal the presence of glauconite throughout most of the strata. Glauconite is an authigenic mineral that forms under conditions of sediment starvation, giving further insight into the depositional conditions that prevailed during New Scotland deposition. Microscopic examination of New Scotland insoluble residues failed to yield any chitinozoans or other organic-walled microfossils. Preliminary examination of samples from stratigraphically lower (older) units has revealed a sparse chitinozoan fauna of as yet undetermined age. Beyond the broad generalization that the New Scotland is Lower Devonian in age, a more detailed age assignment remains to be accomplished. Establishing a specific biostratigraphic age for this important K-bentonite-bearing interval will assist in further refinement of the Devonian time scale.

Helderberg strata mapped as the Kalkberg Fm. on U.S. 20 at Cherry Valley, NY, comprise limey siltstones, silty carbonate mudstones to wackestones with chert, calcareous shale interbeds and six K-bentonites. Insoluble residues from these beds range from 35 to 83%. Intense bioturbation is prevalent with many burrows displaying linings up to 5 mm thick. A sparse but diverse shelly fauna (brachiopods,

Nick Juliano

Faculty Sponsor: Rick Grimaldi
(Earth Sciences)

The Effects of Barometric Pressure on a Pitched Baseball

The human body cools itself through a combination of radiation, conduction, and convection at room temperature. However, when the ambient temperature rises above body temperature, these modes of heat transfer all contribute to warming the human body rather than cooling it. Since there must be a net

outward heat transfer, the only cooling mechanism left under those conditions is the evaporation of perspiration. The rate at which perspiration evaporates is largely a function of dewpoint temperature which serves as a means to evaluating vapor pressure deficit. The current formulation of the heat index, sometimes called the apparent temperature, factors both temperature and dewpoint in order to determine how hot it actually feels to the human body. The current heat index formulation, however, does not take into account wind speed. Wind induced turbulence is known to increase evaporation rate by exposing our skin to ambient air rather than boundary layer air which is loaded with excess water vapor due to the ongoing evaporation process. The ventilating effect produced by wind can make the evaporative process proceed much more efficiently. In order to evaluate this effect, we plan to test evaporation rates in a sealed environmental chamber in which temperature, dewpoint, and wind speed will be precisely controlled. The rectangular chamber has approximate dimensions of 3.5 x 7 x 3.5 feet. Inside the chamber, saline water will be misted upon a fabricated surface and kept at body temperature inside the chamber where the dewpoint temperature is precisely controlled. The time it takes for the simulated sweat to evaporate yields cooling power, provided the mass and temperature are known. The same experiment will be repeated for various combinations of dewpoint and wind speed. Once the cooling power is established, calculation of a refined apparent temperature is then possible. This will allow the current two-dimensional chart of apparent temperatures to be transformed into a three-dimensional matrix of apparent temperatures.

Nick Juliano, Jarrod Constantino, Kenny Fisch, Matt Jones, Mary Ellen Dunn, Trisha Hosmer, Breanne Kempton, Chris Nallan, Dana Riglioni, Christina Mangiacapre, David Lustberg, Heather O'Neill, Erik Mason, Steve Feldman

Faculty Sponsor: Rick Grimaldi
(Earth Sciences)

The Podcasting Progress of the SUNY Oneonta Weather Center

plans to further expand, relocating this fall from Denison Hall to the third floor weather observatory in Science Building 1. We intend to incorporate a video element to the daily podcast and air our product on Internet media such as youtube.com as well as the Meteorology Department's homepage. This program has been met with great reception from the members of the WONY organization, to whom we are thankful. We anticipate great things to come in the future, including securing student internships at downstate news and radio studios.

Elena Kirillova, Anthony Delia, Jessie Friedman, Jillian Hubbard

Faculty Sponsor: Christine Harrington
(Economics, Finance & Accounting)

Foundation Funds Analysis I

This project evaluates the performance of two funds held by the College at Oneonta Foundation. We researched the following funds: iShares S&P SmallCap 600 Growth Fund and Stratton Small-Cap Value Fund. We found two alternative funds that are invested in similar sectors as the College Foundation's funds. They are: JPMorgan Dynamic Small Cap Growth Fund and Allianz NFJ Small Cap Value Fund. In order to obtain information about the funds, we used Yahoo! Finance and MSN Finance services. Our group also used the prospectus for each of the above-mentioned funds. JPMorgan Dynamic Small Cap Growth Fund is very similar to iShares S&P SmallCap 600 Growth Fund but, according to the information we found about the fund, it is not necessarily a better alternative. Although it looks as though iShares is a better choice based on fees and loads, it is no longer open to new investors. We chose JPMorgan Dynamic Small Cap Growth Fund because it is still open to new investors and has a higher yield to date. After

researching Allianz NFJ Small Cap Value Fund, we found that it would be a better alternative compared to the College Foundation's Stratton Small-Cap Value fund. Even though the initial information found that the fund's loads and fees suggests otherwise, Allianz NFJ Small Cap Value Fund has a higher yield to date. The expense ratio of the two funds is very comparable. Based on our research, we found that the two alternatives chosen were better investments for the College Foundation. Although the alternatives do not look attractive when compared using different methods and ratios such as risk and return measures, Sharpe and Treynor ratios, annual turnover, and beta, our research determined that their performance is better due to a greater yield to date.

Kristina Kissner

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

Correlation Between Integration of Equity Markets and Benefits of International Diversification

Prior literature suggests that globalization has had a great impact on equity markets throughout the world. As the number of multinational corporations in the market increases and international trade restrictions soften, equity markets have become increasingly integrated. Literature has examined both the level of market integration and the decreasing benefits of diversification. Yet, the

studies have never attempted to identify the exact relationship between these two occurrences. If the integration of equity markets is inversely related to the benefits of international diversification, the current investment strategies may show decreasing returns over time and investors may not be as shielded from risk as well as they had believed. This paper will show that an inverse relationship does exist and may signal a possible need to restructure current diversification strategies. Olienyk (1999) suggests that iShares serve as excellent market proxies. He argues the iShares construction eliminates problems that arise in other market proxies, such as fluctuating foreign exchange rates, discounts and premiums relative to net asset value, illiquidity and more. To measure the integration of equity markets, the Akdogan (1996) model of market integration scores will be computed by a ratio of the country specific risk to the risk of the market. To measure the changes in benefits of diversification, the Fooladi and Rumsey (2006) Lambda ratio will be used. Lambda is described as ratio of the standard deviation of a global market portfolio to the average standard deviation of all markets in the portfolio. Data will include daily closing prices of iShares as market proxies from 2000 to 2007. Data observations will be separated into quarters and regressions will be run between the integration score and the diversification score to identify the relationship between the two factors.

James Lauzun

Faculty Sponsor: Kelly Gallagher
(Chemistry & Biochemistry)

Effect of Snow Flea Antifreeze Protein on Behavior & Structure of Water

The snow flea (*Hypogastrua harveyi folsom*) has a special antifreeze protein. This protein (Snow Flea Antifreeze Protein sfAFP) has the ability to repress the freezing point of water, allowing the organism to live in sub 0°C climates. Without this protein the organism would not be able to survive in these conditions. Antifreeze Proteins have only recently been

understood by the scientific community. These proteins have a unique shape of their active site that makes the surface of an ice crystal less favorable to water molecules. This prevents water from freezing. For example, the sfAFP suppresses the freezing point to -2°C. This project studied the sfAFP using computer modeling and simulation technology to better understand the behavior and interaction of water and the sfAFP.

Corey Lemley

Faculty Sponsor: Joseph Chiang
(Chemistry & Biochemistry)

***Solar Energy from Unconventional
Materials***

The basics of photovoltaic cells will be discussed in the scope of structure, recent advances in materials used, and different types of photovoltaic systems that create electrical energy from sunlight. Our experimentation involves researching and designing a solar cell structure made from inexpensive films of various semiconductor materials that employ the photovoltaic effect in harnessing energy.

Chun Kit Lo

Faculty Sponsor: Ho Hon Leung
(Sociology)

***Hong Kong Ethnic and Cultural Identities:
Perspectives from Young Adults***

The purpose of this project is to study how Hong Kong young adults perceive their ethnic and cultural identities before and after 1997, the year in which the sovereignty of Hong Kong was returned to China from the British. We used focus group interviews to capture the perception of the participants. We have conducted two focus group interviews. Each

interview included four students from Hong Kong who visit Hong Kong frequently. The preliminary findings indicate that these Hong Kong young adults tend to switch their identities from a Chinese in Hong Kong to a Chinese in China as a whole. But they still strongly perceive themselves with a Hong Kong identity because they were born and grew up there. Bearing this in mind, work ethics, food, and pop culture nurture the development of Hong Kong identity.

Suzanne Lomax

Faculty Sponsor: Karen Joest
(Human Ecology)

Cry for Freedom: The Legacy of Apartheid

The European settlers in South Africa instituted the apartheid system to control the movement of black labor in the early twentieth century. The statutes created under this system designated where non-whites could travel, work and live. Willem F. de Klerk abolished apartheid as one of his first presidential acts. The first free and

democratic election in South Africa took place in 1994. More than a decade later, however, non-whites still endure severe economic apartheid. Poor infrastructure, lack of education, and high unemployment continue to limit opportunities for those who were oppressed under apartheid. The HIV and AIDS epidemic has escalated as the government fails to provide correct information and proper medical care. South Africans see hope for the future, however. The first group of non-white children completed 12 years of school in 2006. Disparities remain, but a complete education is available to more students every year.

**Patrick Macrae, Rebecca Kennedy,
Kayla Gottobed**

Faculty Sponsor: Charlene Christie
(Psychology)

***The Influence of Supportive vs. Deviant In-
group members on Group Identification***

This study investigated the effect of an individual's perception of their ingroup when exposed to a deviant ingroup member. Two hundred undergraduates were randomly assigned to a high- or low-status group, supposedly based on their performance on a given task. The legitimacy of their ingroup was later either supported or challenged by another group member. Participants' ingroup

identification, ingroup evaluations, and endorsement of group differences were focal dependent variables. As hypothesized, participants who were assigned a high status reported greater identification with the ingroup, especially when exposed to a legitimacy-supporting deviant group member. High-status participants also evaluated their ingroup more positively when exposed to a status-supporter than to a status-challenger. In contrast, low-status participants evaluated the ingroup more positively when exposed to a status-challenger than to a status-supporter. Finally,

group differences were more strongly endorsed by high-status participants and participants who were exposed to a status supporter. These results suggest that individual reactions to ingroup status information are influenced by opinions of other ingroup members, but only to the extent that the ideas of the other ingroup members are in the group's best interest.

Anthony Martinez

Faculty Sponsor: Jeremy Wall
(Music)

Penumbra

"PENUMBRA" is essentially a musical, written and performed by Anthony Martinez (a.k.a. Fascious), which incorporates various elements of Hip Hop Culture, Poetry, Dance and Theatre. This play explores politics and personal growth, as well as the customs and traditions of ancient Latin civilizations, specifically Tainos, in an

attempt to illustrate how understanding our history as individuals and the world around us can significantly influence our future.

David Mase, Richard Greenemeier

Faculty Sponsor: Devin Castendyk
(Earth Sciences)

***Investigation of Hydroxide Mineral
Precipitation and the Fate of Trace Metals
in an Acid Pit Lake, Anthracite District,
Pennsylvania***

The Pond Creek abandoned mine site in Freeland, Pennsylvania, contains a chain of over six pit lakes that range in pH from 4.33 to 3.65. Preliminary water quality data show elevated levels of Fe (3.21 mg/L), Mn (0.66 mg/L), and Al (2.22 mg/L) within surface and ground water. Concentrations of Fe, Al, Zn, Co, and Ni increase from the lake surface to a depth of 5 m, and decrease from a depth of 5 m to the bottom of the lake (25 m). We hypothesize that the Fe

and Al trends are the result of metal-hydroxide precipitation and sedimentation, whereas the Zn, Co, and Ni trends are the product of adsorption onto hydroxide surfaces. The geochemical speciation program PHREEQC_i shows ferrihydrite, goethite, and gibbsite to be near saturation at the lake bottom with mineral saturation indices ranging from -1 to +1. Quantitative X-ray fluorescence (XRF) analysis on lake sediments collected at both near-surface and bottom locations show potential increases in Fe, Al, and Mn. X-ray diffraction was used to identify the minerals which may be precipitating to cause the changes in metal concentrations observed. Additionally, measured values of Pb appear to increase between surface and bottom sediments, indicating the potential for adsorption onto hydroxide surfaces. Paradoxically, hydroxide precipitation reactions contribute to lake acidity and degrade water quality, whereas surface adsorption reactions remove trace metals from solution and, thus, improve water quality. Determining the mechanisms that control these reactions will be key to identifying strategies to improve pit lake water quality in this region.

**David Mase, Randall Wilson,
Michael DeVasto**

Faculty Sponsor: Tatiana Vislova
(Earth Sciences)

***Petrography and Geochemistry of Rand
Hill Mafic Dikes, Adirondack Mountains,
New York***

The objective of this study is a reconstruction of the plate tectonic setting of intrusion of mafic dikes in the Grenville gabbroic meta-anorthosites at the Rand Hill location near Plattsburgh, New York in the northeastern Adirondacks. To accomplish this, we obtained geochemical and petrographic data and compared it with data from two other locations with known age constraints: a lamprophyre dike

which cuts Crown Point Ordovician limestone near Plattsburgh, and a mafic dike at Big Nose location near Fonda, New York, which cuts Proterozoic gneiss but is not observed within the Cambrian cover. Samples were analyzed for major and trace elements composition by X-ray fluorescence (XRF) and inductively coupled plasma mass spectrometry (ICP-MS) techniques. This geochemical data, as well as obtained petrographic data, were used to classify the rocks, compare their compositions, and determine the possible plate tectonic setting of their formation and magma

source. Based on our analysis, eight out of ten Rand Hill dikes are alkali basalts with similar mineralogical, textural and chemical characteristics, probably genetically related to each other. On the discrimination diagrams they fall into “Within Plate Basalts” and/or “Oceanic Island Alkali Basalts.” The rare earth and trace elements distributions indicate the enriched deep mantle source of magma. Two of the Rand Hill dikes are different: one is categorized as tholeiitic mid-ocean ridge basalt, and the other has more felsic composition. The relationship of these two rocks to the rest is unclear. The petrographic characteristics and chemical compositions of Big Nose and Plattsburgh dikes are strikingly different from the Rand Hill ones and, therefore, are not genetically related. Our preliminary conclusion is that the Rand Hill dikes are related to the early stages of rifting. Comparative analysis with other mafic rocks and dating is needed to specify if this rifting was related to the opening of the Iapetus or Atlantic Ocean.

Erik Mason

Faculty Sponsor: Rick Grimaldi
(Earth Sciences)

***A Comparison of El Niño and La Niña
Late-Winter Snow Events in Upstate
New York***

Analysis of a 64-year climatologic record for the period of Jan 22 to Feb 22 in Syracuse, New York indicates a bias towards rain and mixed precipitation events during La Niña winters. Observations indicate that, while considerably more precipitation falls during the mid-winters of La Niña, very little of net increase is reflected as increased snowfall. The preference for liquid precipitation is likely a byproduct of

warm in-cloud temperatures at storm time as well the notable dearth of exceptional east coast winter storms. Such evidence is consistent with a westward displacement of the storm track that tends to provide warm-air intrusions at cloud level. The resulting elevated inversion layer favors rainfall and mixed precipitation over snow. Meteorological re-analysis is likely to reveal the dynamic and thermodynamic characteristics that typify the La Niña late-winter period. It is hoped that such information will isolate a physical forcing mechanism.

Erik Mason, David Lustberg

Faculty Sponsor: Rick Grimaldi
(Earth Sciences)

***An Environmental Chamber Designed to
Reformulate the Heat Index***

The human body cools itself through a combination of radiation, conduction and convection at room temperature. However, when the ambient temperature rises above body temperature, these modes of heat transfer all contribute to warming the human body rather than cooling it. Since there must be a net outward heat transfer, the only cooling

mechanism left under those conditions is the evaporation of perspiration. The rate at which perspiration evaporates is largely a function of dewpoint temperature that serves as a means to evaluating vapor pressure deficit. The current formulation of the heat index, sometimes called the apparent temperature, factors both temperature and dewpoint in order to determine how hot it actually feels to the human body. The current heat index formulation, however, does not take into account wind speed. Wind induced turbulence is known to increase evaporation rate by exposing our skin to ambient air rather than boundary layer air which is loaded with excess water vapor due to the ongoing evaporation process. The ventilating effect produced by wind can make the evaporative process proceed much more efficiently. In order to evaluate this effect, we plan to test evaporation rates in a sealed environmental chamber in which temperature, dewpoint and wind speed will be precisely controlled. The rectangular chamber has approximate dimensions of 3.5' x 7' x 3.5'. Saline water will be misted upon a fabricated surface kept at body temperature inside the chamber where the dewpoint temperature is precisely controlled. The time it takes for the simulated sweat to evaporate yields cooling power, provided the mass and temperature are known. The same experiment is to be run for various combinations of dewpoint and wind speed. Once the cooling power is established, calculation of a refined apparent temperature is then possible. This will allow the current two-dimensional chart of apparent temperatures to be transformed into a three-dimensional matrix of apparent temperatures.

**Amanda Minnock, Emily McDermott,
Rebecca Zobre**

Faculty Sponsor: William Vining
(Chemistry & Biochemistry)

Forensic Chemical Analysis

forensics use multiple sciences to accomplish such a task. Chemistry, which is sometimes described as the “mother of all sciences,” is extremely important in forensics. Our project focuses on the chemical analyses of trace evidence. Gas chromatography-mass spectrometry, thin layer chromatography and spectroscopy were used to identify various components of pen ink and perfumes. These techniques are used in hopes of finding an exact match to the trace evidence often left at crime scenes. A laboratory experiment utilizing these techniques for use in the introductory chemistry course is being developed.

Corrine O'Connor

Faculty Sponsor: Rhea Nowak
(Art)

***Collared: A Visual Narrative of Women
and Stitch***

needles. The structural idea emulates different collars from women's patterns through time, realizing the more abstract message of collars and deliberately used that meaning. The issue investigated for this project is a visual story of how women have collared themselves to the many areas of their lives, as well as to their attire. Drape collars express one view and circumstance and a studded leather collar from the 1980's yet another. More important is the unspoken issues women have allowed themselves to be restrained by – men's shirt collars, so that we may compete in the business world, turtlenecks that enable us to work alongside men in the less temperate climates. These collars, in part, define who we are and the roles we play in society and for society. Corrine O'Connor designed and created the printing plates under the watchful eye of Professor Nowak, who instructed the student in a method of printing (Collograph) that O'Connor had not previously used. While constructing the collars, O'Connor has learned an invaluable lesson in the ease with which fabric moves and paper does not! Additionally, she has learned a good deal more about herself as a woman, a student and an artist, and has developed another love affair ... this one with printmaking.

No criminal is so clever that he or she never leaves a trace: this is the guiding principle of forensic scientists. Forensic Science is the use of science to analyze evidence to determine what happened, where something happened, when something happened and who was involved. The analyzed evidence is then used in criminal or civil courts of law. Those who study

"Collared: A Visual Narrative of Women and Stitch" is the final product of the collaborative effort between Professor Rhea Nowak and Corrine O'Connor. As the Studio Art Department's printing instructor, Professor Nowak brought her extensive printing skills to the table, and Corrine O'Connor has a life-long love affair with all things fabric, thread and

Aaron Payne, Bonnie Cooper

Faculty Sponsor: Nigel Mann (Biology),
Kimberly Dingess-Mann (Anthropology)

***The Effect of Banana Plantation Effluents
on Water Quality and Macroinvertebrates***

The pesticide-containing effluents from banana plantations are rarely contained and, more often than not, permeate into the surrounding habitats. Such runoff can create drastic problems in small lotic systems that surround plantations. In this study, the effects of agricultural effluents on water quality and macroinvertebrate communities in a small stream adjacent to a plantation were evaluated. The study took place at the San Pedroa banana plantation in Primavera, Costa Rica. Water, soil and macroinvertebrate samples from four fifty-foot stream reaches were collected in January 2008. Basic chemical analyses coupled with various bioassessment techniques were used to evaluate any detriment caused by the plantation. Analyses of water and soil samples were conducted using various kits, and invertebrates were identified and counted. A comparison of upstream reach data (pH, phosphorus, nitrogen, potassium, substrate composition and macroinvertebrate numbers) to all other sites served to quantify any effect of the

The pesticide-containing effluents from banana plantations are rarely contained and, more often than not, permeate into the surrounding habitats. Such runoff can create drastic problems in small lotic systems that surround plantations. In this study, the effects of agricultural effluents on water quality and macroinvertebrate communities in a small

plantation effluents. Several flaws existed in the current study, making reproduction of previous findings inherently difficult. The lack of a large enough data set prevented the detection of statistically significant patterns; however, trends present in the data suggest that a future study may reveal significant results.

Karen Prime

Faculty Sponsor: Thomas Horvath
(Biology)

***Environmental Factors Effects on
Colonization Dynamics of Vernal Pools***

Vernal pools fill up with snowmelt and rain in the spring, and dry up in late summer and fall. The ephemeral water in the pools provides a habitat for a vast range of species with distinctive physiological and behavioral traits (Williams, 1987). Vernal pools dry up for most of the year, so fish are usually not present (Dodds, 2002). The vertebrates must adapt to the dry season by withstanding desiccation or emigration. No major predators at the pools make them an especially good habitat for amphibians and shrimp (Dodds, 2002). Eight vernal pools are available at Thayer farm, which I will use as my sample set. Activity traps (a canning jar with an inverted funnel) will be used to monitor colonization dynamics. In each vernal pool, three jars will be suspended from a stake above ground, with each set in a different position in the pool. In addition to catching organisms, I will also be monitoring other abiotic parameters: pH, temperature, conductivity, turbidity (YSI multi-meter) and water level (meter stick). The abiotic parameters will be used to determine if they have any impact on the colonization dynamics of the pool. Inter-pool distance will also be measured using GPS and ArcMap software. Vernal pools are like island habitats; however, land isolates them instead of water. Using the Island Biogeography Theory (IBT) formulated by MacArthur and Wilson (1967), Carl & Blumenshine (2005) concluded that ponds closer together shared more of the same organisms than pools more distantly located. The IBT states that as 'island' area increases, the organisms inhabiting the area will also increase. This aspect of the IBT was not significantly supported in the vernal pools (Carl & Blumenshine, 2005). Using the Island Biogeography Theory as a framework, I will make conclusions on colonization dynamics.

Ashley Renko

Faculty Sponsors: Paul French, Hugh
Gallagher (Physics & Astronomy)

***The Effects of Atmospheric Conditions
on the Breakdown Field of Air***

The Van de Graaff generator has been used for years in general physics courses to qualitatively demonstrate the principles of electric potential, capacitance, and the electric field. In this study, a method has been used to quantitatively verify the breakdown field for air. Variations due to atmospheric conditions have been determined. The field decreases with temperature by 2100 V/cm per centigrade degree. The field appears to increase with relative humidity by 1700 V/cm per PRH. And, the field decreases with pressure by 700 V/cm per mbar.

Jillian Richards

Faculty Sponsors: Thomas Horvath
(Biology), William O'Dea (Economics,
Finance & Accounting)

***Paying for Carbon Offsets on Campus via
Parking Fee Increases: A Contingent
Evaluation Method Approach***

Many human activities contribute to the release of carbon monoxide. In the atmosphere, carbon monoxide bonds with hydroxyl radicals and ultimately aids in the greenhouse effect. As people drive to and from places, they emit many harmful toxins into the atmosphere, such as hydrocarbons, nitrogen oxides and carbon monoxide. My project is to ascertain how much more people on campus would be willing to pay for their parking pass to offset their carbon footprint. I first showed students a PowerPoint presentation explaining what happens in terms of what is released when they drive their cars. I also explained what carbon offsets and carbon footprints were. The students and faculty were asked how much more they would be willing to pay

to offset their carbon footprint. These additional monies would be used to plant trees at College Camp. About 200 students and over 100 faculty members were surveyed. The data will provide insight into how much the SUNY Oneonta campus community cares about the environment and if the amount they are willing to pay does, in fact, cover their carbon footprint.

**Dana Riglioni, Heather O'Neill,
Lauren Christian, Christopher Gorman**

Faculty Sponsor: Rick Grimaldi
(Earth Sciences)

***Inversion Structure Associated with Five
Radiation Fog Events in Oneonta, NY***

the field on mornings where the forecast dew point depression at 12Z (7 and 8am LT) was less than 4°C and winds were light. Five events were analyzed. By manipulating thermodynamic variables we were able to generate relative humidity and potential temperature profiles. Our observations confirm that the warmest air lies above the top of the fog deck that is commonly located within 50 meters above the Hunt Union.

**Lorenda Rush, AnnMarie Hilfiker,
Samantha Avenengo**

Faculty Sponsor: Geoffrey O'Shea
(Psychology)

***A Reevaluation of Learning and Awareness
in the Hebb Digits Task***

repeated sequences is considered evidence of learning. Previous results have indicated that equivalent learning of the repeated digit sequence occurs irrespective of awareness of sequence repetition (McKelvie, 1987). However, McKelvie (1987) assessed awareness using only a self-report measure. In the present experiment, two forms of awareness of sequence repetition were assessed: Recognition Awareness (e.g., identifying sequences as familiar/unfamiliar) and Recall Awareness (e.g., examining knowledge of item positional information) using the process dissociation procedure (Jacoby, 1991). Results found learning of the repeated sequence was greater for aware than unaware participants, suggesting that information learned via implicit mechanisms may not be as strongly represented in memory compared to information learned via explicit mechanisms. Additionally, unaware participants were found to overestimate certain temporal aspects of the task such as the elapsed time for each trial and the total time engaged in the task. These results are discussed in terms of the role of awareness in directing serial learning, as well as how awareness can influence one's subjective experience of time. Finally, the present experiment is important in that it introduces alternative methods for assessing awareness in the HD paradigm.

Christopher Schwarz

Faculty Sponsor: Vicky Lentz
(Biology)

***Purification and Characterization of
Large Mouth Bass IgM***

Radiation fog is common during fall mornings in upstate New York. These stable early morning events feature the potentially coldest air pooling to the low-lying Susquehanna River valley. In order to determine the characteristics of the environment, and the fog itself, in situ observations of temperature dewpoint and pressure at various elevations in Oneonta were conducted. The team carried instruments into

The Hebb Digits (HD) task has been a useful paradigm for investigating the transfer of serial information from short-term to long-term memory. In the procedure for the HD task, participants are exposed to a total of twenty-four nine digit sequences with one digit sequence repeated every third presentation. In the HD paradigm, enhanced recall of the repeated digit sequence compared to the non-

IgM, an antibody that is thought to be the original antibody from which all other antibodies are derived, is found to be present in all members of the Kingdom Animalia, dating back to 460 million years ago. This includes all cartilaginous fish, bony fish, amphibians, birds and mammals. Many studies have been done on mammals (humans primarily) to uncover the

exact structure of immunoglobulin IgM. These studies have shown IgM to be comprised of two heavy chains and two light chains with a total molecular weight of 150,000 daltons, which are held

together by disulfide bonds. Past experiments on IgM from *Micropterus salmoides* in this lab have yielded results that show only heavy chain in the final product of the antibody purification process. This is incongruent to tests done on human and other animal IgM, where both heavy and light chain were purified using the same method. In order to shed light on this phenomenon, the serum of Largemouth Bass was collected and immunoglobulin IgM was purified using ammonium sulfate precipitation and size exclusion chromatography. The column was calibrated using three mixtures of proteins with known molecular weights. A standard curve was plotted using the obtained Kav values from the calibration kit. The results from the IgM run were then plotted alongside the standard curve and compared, and were then compared to the previous results.

Shayne Spencer

Faculty Sponsor: Janet Nepkie
(Music)

*Second Life Concert Hall: Scarlet
House of Music*

I have been currently working with an Internet based virtual world called Second Life. I leased 200 virtual square miles in Second Life to set up a concert venue. The land that I am using is being leased from the Alliance Library System for one year. I have designed and constructed the entire venue, and have also designed and

created virtual merchandise. Currently, I am scouting talented Second Life performers to perform at my venue. Second Life concerts are very much like the terrestrial world concerts. The performances are set for a specific time and location, and users are then encouraged to go to that location and enjoy the performance. My goal for the summer is to produce at least 25 successful concerts in Second Life. I believe this will help provide me with valuable hands-on experience in working with concert promotions as well as virtual marketing.

Elijah Spina

Faculty Sponsor: Jacqueline Bennett
(Chemistry & Biochemistry)

Green Synthesis of Aryl Imines

What is green synthesis? It can be generally described as various methods used to decrease the use and production of hazardous materials. This project is an implementation of the principles of conservation and sustainability. All of these ideas are ultimately geared toward leaving a smaller impact on our surroundings,

while continuing to improve upon existing knowledge and techniques. The goal of these experiments was to use greener methods in the preparation and subsequent reactions of several aryl imines. This leaves the question, what are imines? Imines are simply classified as compounds containing a carbon-nitrogen double bond usually formed from aldehydes and primary amines; thus, there were many options to choose from in selecting reactions. The reactions described here were performed using several different combinations of aryl aldehydes and aryl amines.

Chelsea Spring

Faculty Sponsor: Nigel Mann
(Biology)

Conservation of the Leatherback Sea Turtle

The Earthwatch Institute is an international non-profit organization that provides volunteers with opportunities to join research teams around the world. The Earthwatch Institute works closely in conjunction with fifty conservation organizations including The Leatherback Trust located in Playa Grande,

Costa Rica. This organization was established by James R. Spotila, Ph.D., nearly twenty-five years ago to gather data on the Leatherback Sea Turtle and to help stop its decline. In 1990, with the help of other scientists and the Costa Rican government, Las Baulas National Park was established and, since then, the Leatherbacks have been protected on the three beaches that make up the park. Through Earthwatch, volunteers take part in the research that is helping to save these ancient creatures. As a volunteer, I was given the chance to patrol the beaches with several of the biologists, count eggs as they were being laid, and take measurements of the Leatherbacks that came up on the beach at night. Other responsibilities included morning walks, hatchery shifts,

releasing hatchlings, and finding “lost” nests. The fieldwork was a valuable hands-on experience that gave an inside look into the effort that goes into saving these beautiful creatures.

Adrian Sullivan

Faculty Sponsor: Nancy Bachman
(Biology)

***Deletion Analysis of the Human
Cytochrome Oxidase Subunit IV Promoter***

identify regions of the human cytochrome oxidase subunit IV isoform 1 promoter (*COX4I1*) essential for gene expression. Previous studies demonstrated that human *COX4I1* is controlled by a 250 bp bidirectional promoter. In this project, we created three non-overlapping 50 bp deletions in the *COX4I1* promoter by site-directed mutagenesis. We confirmed the structure of the deletions using automated DNA sequencing. We are currently testing the effects of the deletions on *COX4I1* expression in human cervical cancer cells (HeLa cells). Each of the three deletion mutants reduced *COX4I1* expression to about one-twentieth that of the intact promoter. However, each retained about three to six fold more transcriptional activity than that of a minimal promoter construct. Future experiments will further characterize the contribution of putative regulatory elements encompassed by two of the deletions, including two binding sites for NRF-2/GABP and one for ATF/CREB transcription factors.

Cytochrome oxidase is a critical enzyme of the mitochondrial respiratory chain that transfers electrons from cytochrome *c* to molecular oxygen. The enzyme complex consists of numerous subunits; subunit IV is the largest nuclear-encoded subunit that regulates enzyme activity in response to cellular oxygen levels and energy demands. Our objective is to

Jessica Vecchione

Faculty Sponsor: Elizabeth Small
(Foreign Languages & Literatures)

***A Thriving Mexican Community in
Fleischmanns, New York***

to Puebla, a city of one million located south of Mexico City. There are three prosperous Mexican-owned businesses in Fleischmanns: a restaurant, a bodega and a gas station convenience store. In conversations with Delaware County residents aware of the Mexican community in Fleischmanns, I was told that these families help each other, and new Mexican arrivals assimilate both financially and socially in the village and the county. I will be exploring the roots of this community by interviewing its residents and telling their story in a 20 to 30 minute video documentary. Because of the lack of significant cultural diversity in Delaware County, it would be an asset to know more about this community. It has been my experience that most Delaware County residents know little, if anything, about this unusual enclave. Perhaps its story could help bring more awareness of Hispanic culture to a part of the country that is quite insulated from the prodigious effects of Latin American immigration and the widespread diffusion of Hispanic culture. The bulk of this project will be conducted in Spanish; the produced documentary will have English subtitles so it can be enjoyed by a wide audience. With the current xenophobic climate in the United States, it is important that the true story of its myriad immigrants be told. Too often immigrants, and particularly Mexicans, are portrayed as taking jobs away from Americans and refusing to adapt to the mainstream culture. Our country is changing in significant ways as the myth of the “melting pot” is replaced by dramatically expanding cultural realities. Carlos Fuentes, the well known Mexican essayist, calls the United States “La Cuarta Hispanidad” (The Fourth Hispanic World) because its Hispanic population is the fourth largest after Colombia, Mexico and Argentina. This documentary will provide a local picture of this astounding cultural change as it reaches upstate New York. I believe the Foreign Languages and Literatures Department, and particularly the Spanish program, will benefit by having this record of a thriving upstate Mexican community to show new students.

Located in the town of Middletown, Fleischmanns is in the southeastern section of Delaware County, New York, just a few miles from the border of Ulster County. As of the 2000 census, there were 351 people residing in the village. Twenty percent, or about 70 people, living in Fleischmanns are of Hispanic origin. Many of these Hispanic residents may have ties

Jenny Vokral

Faculty Sponsor: Jeffrey Heilveil
(Biology)

Chromosome Distribution of Nigronia serricornis (Say)

The number of chromosomes and their distribution in a species is critical information for maintaining biological relevance in genetic studies. While this information is common knowledge for model organisms, it is typically unknown for species not easily reared in the laboratory. *Nigronia serricornis*, the saw-combed fishfly, is an important indicator species of high water quality and is especially at risk for genetic isolation. Studies of chromosome distribution in related species found males to be XY and females XX (with one exception). The number of autosomes has been found to range between 10 and 11 pairs. In order to get the distribution and number of chromosomes, larval *N. serricornis* will be collected and imaginal gonadal tissue will be removed for a chromosome squash. The stained chromosome squash slides will be examined under a microscope and the number and distribution of the chromosomes will be determined. I expect to find that the males are XY and females are XX, and that their number of autosomes is the same as similar species (10-11 pairs). This information will allow us to look for male specific markers. Confirming the distribution of sex chromosomes will determine whether male-specific inheritance patterns can be tracked. This would allow some basic assumptions for many phylogeographic studies to be tested.

Amber Warren

Faculty Sponsor: Brian Lowe
(Sociology)

Narrative of Wealth: Mapping Conflicting Economic Ideologies in the Public Imagination

Neoliberal ideology claims that an ideal economy is one almost entirely run by market-forces that encourage business competition and efficiency without governmental regulations. Despite the fervor with which neoliberal concepts and theories are promoted, the evidence that these policies achieve what their proponents suggest is much more ambiguous and arguable. We must ask ourselves how neoliberals create and circulate such controversial ideas and recognize how critics and neoliberal proponents are viewed in public perception. This presentation first addresses particular definitions (e.g., what a neoliberal is and how social problems are created in Best's model). These are then broken down into historical contexts – how neoliberal ideology emerged from the New Deal and continued through the progressive era (1950's); how American political parties have changed and either embraced these ideas or criticized them; and how business plays a role in circulating neoliberal ideas in the public (which in turn affects elections). Particular issues, such as the privatization of war, health care, social security and/or education, are used as case studies to ascertain how these ideas play out. Also examined is how deregulation and the neoliberal agenda have historically affected other countries (South America, Poland, Russia, and China).

Jonathan Wasser

Faculty Sponsor: Tracy Allen
(Geography)

The Oneonta Creeks Water Quality Assessment Project

The Oneonta Creeks Program (OCP) was set up in 1999 to improve the water quality of the Oneonta area and to minimize contaminate breaches. This program was developed by the Oneonta Environmental Board so that data and water quality assessments can be conducted on a more regular basis. The program allows for a sound collection of data that provides a general overview of the health of the Oneonta Creeks. The water quality in the Oneonta Creeks can be affected by climate, resource use, agriculture and urban factors; these factors are unique to their specific environment and ecosystem. Events such as increased development in agriculture and urban areas, growth in housing construction, and clear cutting have altered the water quality condition for many years. For these reasons the Oneonta Environmental Board wants an accurate and detailed research plan so data collection can occur on a regular basis. The OCP is a significant

study because it is imperative that the Creeks are maintained to be healthy for human use and to preserve a strong ecosystem. The OCP will continue to keep an accurate record on any contamination leaks within the Oneonta Creek Watershed, concurrently assessing the water quality of Oneonta's drinking water. This study includes testing of temperature, pH, turbidity, dissolved oxygen, conductivity, alkalinity, phosphate, nitrate, total coliform, E.coli and hardness; by using each of these tests the overall water quality in the Oneonta Creek Watershed can be determined. This investigation of the Oneonta Creek Watershed will provide the backdrop for water quality assessment for future research. The continuation of data collection of the Oneonta Watershed is important because it will help the Oneonta Environmental Board in assessing water quality problems of the Susquehanna River.

**Megan White, Stephanie DeCelle,
Gregory Page, Theodore Roberts**

Faculty Sponsor: Christine Harrington
(Economics, Finance & Accounting)

Men's Wearhouse

This research is focused on men's dress apparel, a specific segment of the retail industry. The primary objective is to analyze a firm and compare it to its main competitors. The firm we are analyzing is The Men's Wearhouse whose two main competitors are S&K Famous Brands and Joseph A. Banks Clothiers, Inc. We gathered each of the firms' financial statements

and created common size statements by expressing each line item on the income statement as a percentage of revenue and each item on the balance sheet as a percentage of total assets. We then averaged the two main competitors' statements and converted them into common size statements. By comparing the common size statements, we conducted a preliminary analysis that guided our research. Men's Wearhouse has a higher percentage of assets held in the form of cash compared to the average of its main competitors. Cost of goods sold has steadily decreased, accompanied by increasing net income and total equity. Men's Wearhouse has more liquidity and better asset management. We calculated the liquidity ratios, debt ratios, and asset management ratios. Men's Wearhouse's current ratio and quick ratio were superior to the average of its main competitors. The Men's Wearhouse has better debt management, which results in higher liquidity ratios and a decreasing debt ratio. Increasing profit margins, enhanced by increasing revenues and efficient asset management displays the difference in performance between the three firms. With a higher price-to-earnings ratio, investors are willing to pay more for a dollar of earnings. A higher market-to-book ratio indicates that management has added more value to the company than that of its competitors. Our research clearly supports the idea that The Men's Wearhouse is the better investment vehicle.

Roy Widrig

Faculty Sponsor: Les Hasbargen
(Earth Sciences)

*Erosion of Low Order Drainages in the
Glacial Sediments of Central New York*

In October of 2007 an investigation began on a medium-sized (approximately 30m lateral) landslide that occurred in Vienna, New York, specifically located in a first order, spring-fed drainage of Fish Creek. Fish Creek, along with its tributaries, is incised within glacial lake sediments, most likely from the last advance of glaciers in the Mohawk Valley of New York

State. These sediments, the majority of which are fine sands, cause unstable slopes to become active in the Spring and Fall with the influx of groundwater from both snow melt and heavy rainfall events. Small to medium landslides have been the result of soil being removed from the toes of these slopes, thereby reducing support for the hillslope. A variety of methods, from field mapping to geo-spatial analysis has been used to correct topographic maps of the area of study to ensure greater accuracy locating the areas of susceptibility. Tree-ring analysis is also to be started in the future to develop a chronology and duration of these erosional events.

Graham Willsey

Faculty Sponsor: Nancy Bachman
(Biology)

***Heat Shock Transcription Factor 1
(HSF1) Alpha Isoform***

In mammals, the presence of environmental stressors such as extreme temperatures, toxins (heavy metals), mutagens and oxidants can lead to the production of malformed proteins that interfere with metabolic activities and may lead to cell death. Under these conditions, a series of proteins called molecular chaperones are produced in an attempt to restore the malformed proteins to their proper three-dimensional shape. This process, known as the heat shock response, is regulated by the transcription factor HSF1. In both mice and humans, the HSF1 protein exists in two different isoforms, (alpha and beta), the expression of which has been found to decrease in aging cells. We are characterizing the cDNA for the mouse HSF1-alpha isoform. We introduced the cDNA into DH5 competent *E. coli* cells and prepared plasmid DNA. We have obtained the sequence of the ends of the cDNA and are designing primers to complete its characterization. This vector will enable us to develop a mouse transgenic for HSF1, meaning it strongly expresses the protein. We are also developing a target vector that the expressed HSF1 transcription factor can interact with. This second construct contains the mouse Hsp70 heat shock element fused to the firefly luciferase gene (a luminescent reporter gene) in the pGL-3 basic vector, which we then used to transform DH5 competent *E. coli* cells. In the future, we plan on introducing both vectors into cultured mouse fibroblast cells (NIH 3T3) to test for the expression of the HSF1 protein via its ability to interact with the heat shock element of the pGL-3 construct.

Alexander Wilson

Faculty Sponsor: Thomas Beal
(History)

***Documenting the 1712 Slave Rebellion
in New York City***

“Documenting the 1712 Slave Rebellion in New York City,” is a transcribing, editing and research project. The 1712 slave rebellion was one of the most violent uprisings in New York City’s history. On a cold night in April 1712, a small band of slaves armed themselves with knives, guns and hatchets and set fire to an outbuilding. When residents arrived to put out the fire, the slaves (both men and women) attacked. After they killed several men and wounded even more, the rebels faced Governor Cornbury’s soldiers, a small jail cell, the court and eventually the executioner. To pacify and quell the fears of outraged residents, A Court Held for the Tryal [sic] of Negro and Indian Slaves passed sentence on the slaves. The court required many of the slaves to pay harsh penalties for their rebellious actions. The City’s High Sheriff chopped slaves into pieces (their body parts reportedly lined Broadway), burned some alive, hung another alive in a gibbet (so the slave might die days later of dehydration), and hung many at the gallows. The rebellion had profound and long-lasting historical implications; after the executions ended, the legislature passed a series of extremely harsh measures to prevent such insurrections. Until recently historians have overlooked slave rebellions (and slavery) in early New York. Aside from Kenneth Scott’s 1961 article in the New York Historical Society Quarterly, no historian has undertaken an in-depth examination of the uprising. The relative lack of primary source material is one of the key reasons for this dearth of scholarship on this rebellion. The goal of this project is to edit, transcribe and analyze one of the only sources that sheds light on this moment: the New York County Court of General Sessions, Minutes of the Sessions for 1712. At the conclusion of our project we plan to submit the Court Minutes to a historical journal for publication as historical documents. This will provide a means for urban historians to begin the process of developing a more complex understanding of the 1712 rebellion and the slavery’s role in New York City.

Dan Yanik

Faculty Sponsor: Nancy Bachman
(Biology)

***Phylogenetic Analysis of Cytochrome
Oxidase Subunit IV Isoform 2***

Cytochrome *c* oxidase is a mitochondrial enzyme involved in the reduction of molecular oxygen in energy metabolism. Of its 13 subunits in humans, subunit IV is thought to have regulatory effects on the protein, through the use of two different isoforms. In mammals, subunit IV isoform 2 is only expressed in lung, while isoform 1 is expressed in all other tissues.

It is thought that isoform 2 evolved to aid metabolism and minimize oxidative damage in the high oxygen environment of the lung. To better understand the evolution of the different isoforms, the phylogenetic similarity of the cDNA sequences and derived protein sequences of isoform 2 was determined in several species. Some sequences (*Drosophila melanogaster*, fruit fly; *Bos taurus*, cow; *Xenopus laevis*, clawed frog; and *Danio rerio*, zebrafish) were determined using automated dideoxy sequencing. Then, all known sequences of selected species were compiled with bioinformatics and phylogenetic computer software. The results show that the second isoform of the gene evolved early on, and is highly conserved in many species. This suggests that the cytochrome *c* oxidase subunit 2 plays a vital role, although its precise function in simple animals that lack lungs has yet to be determined.

Charles Bailey, Allyson Kiss

Faculty Sponsor: April Harper
(History)

***Sources for the Study of Medicine before
1500 C.E.***

This project is an exploration into the sources for the history of medicine before the year 1500 C.E. Works will include a variety of sources beginning with the work of Hippocrates and concluding with the Renaissance medical artist Vesalius. The Project is a unique agenda of research into not only the medical texts of the period, which include dietary regimens, surgical

texts, gynecologies, physicians' handbooks and compilations of folk medicine, but also research sources that are not typically used in the exploration of medicine, such as charters, legal codes, literature, theological works, art and architecture. The result of this project will be the publication of a collection of sources for students of the history of medicine.

Phillip Pearson, Emily Cole

Faculty Sponsor: Yun-Jung Choi
(Human Ecology)

***Understanding College Students' E-
Shopping Behaviors***

The technology acceptance model explains the behavior of individuals in acceptance of technology (Davis, 1989). By using the technology acceptance model, Oh, Ahn and Kim (2003) found that an individual's intention to adopt a technology was influenced by perceived usefulness and perceived ease of use. This study identifies demographic and lifestyle

characteristics as predictors of college students' E-shopping behavior. How do the college student's demographics, technology use and availability, and attitudes influence his or her E-shopping intention? This study suggests that more years of computer experience have a positive influence on the student's acceptance of E-shopping technology. E-shoppers highly value convenience, time saving, ease of using, and customer service.