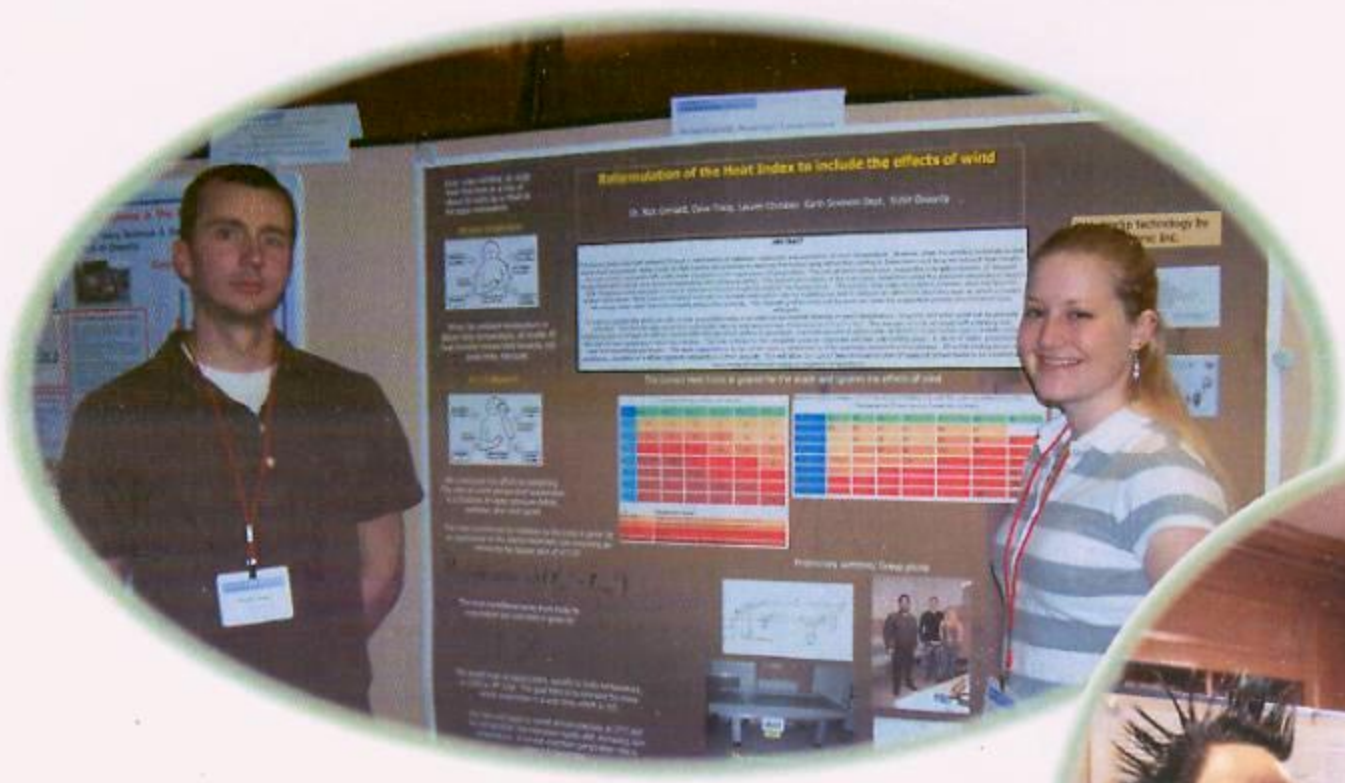
SUNY COLLEGE AT ONEONTA

2007 Student Research Day



Wednesday, 18 April 2007
2:00 PM - 5:00 PM
Morris Conference Center
SUNY College at Oneonta

2007 Student Research Day

April 18, 2007
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 College Senate Committee on Research, the Grants Development Office and the College at Oneonta Foundation

Members of the 2006-2007 College Senate Committee on Research:

Daniel G. Payne, Chair (English), Thomas Beal (History),
Nancy Cannon (Milne Library), Kim Muller (Grants Development),
John Schaumloffel (Chemistry & Biochemistry)

SUNY College at Oneonta

2007 Student Research Day

PROGRAM

2:00 PM - 5:00 PM **Student Poster Presentations**

2:10 PM **Welcoming Remarks:**

Dr. Daniel G. Payne
Chair, College Senate Committee on Research

Dr. Alan Donovan, President

Dr. F. Daniel Larkin, Provost

Kenneth Kellerhouse
President, College at Oneonta Foundation Board of Directors

2:15 PM **Keynote Address**
Introduction: **Dr. Lawrence Guzy**

Dr. John C. Scott '77

Leveraging Applied Research to Meet Critical Business Challenges

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Keynote Speaker:

Dr. John C. Scott '77

Vice President and Co-founder,
Applied Psychological Techniques, Inc.

Dr. Scott received his B.S. in Psychology from SUNY College at Oneonta and his Ph.D. in Industrial/Organizational Psychology from Illinois Institute of Technology. In 1995 he co-founded Applied Psychological Techniques, Inc. (APT), based in Darien, CT. APT designs sophisticated human resource systems for Fortune® 100 companies across a wide spectrum of industries. An expert in the field of human resource evaluation, Dr. Scott is an author and frequent lecturer on the subject. He is the chief architect of APT's innovative human resource platform, APTMetrics® (the recipient of *Human Resource Executive* magazine's Top Ten HR Products Award in 2001). Dr. Scott is a past convention program chair for Division 14 of the American Psychological Association and serves on several Professional Practice Book Series editorial boards.

SUNY College at Oneonta

2007 Student Research Day

PRESENTATIONS

Presenter: Jenna Lynn Baran (Communication Arts)
Faculty Sponsor: Christine Quail
The Explosion of *MySpace* and Other Online Social Networking Websites

Presenters: Robert Barton, Corey Lemley (Physics & Astronomy)
Faculty Sponsor: Paul A. French
Determining the Onset of Turbulent Flow Using Video-Based Motion Analysis

Presenter: Robert Barton (Physics & Astronomy)
Faculty Sponsor: Sen Zhang (Mathematics, Computer Science & Statistics)
A Graphic Interface to Display Phylogenetic Trees Developed During the Calculation of Grand Cardinality

Presenters: Joe Berlage, Justin Long, Steven Bayne, Andrew Hancock (Physics & Astronomy)
Faculty Sponsor: Allen Anderson
A New Look at an Old Experiment

Presenter: Kate Betz (Cooperstown Graduate Program)
Faculty Sponsor: Cynthia Falk
Arthur C. Parker and Angel DeCora: The Indian's Indian in Early Twentieth Century America

Presenter: Shaun Buchanan (Chemistry & Biochemistry)
Faculty Sponsor: Vitaliy Gubaydullin
Scope of Design of the Properties of Nanostructures Created by the Chemical Atomic Buildup Method

Presenters: Jessica Callahan, Larry Mendonca, Briegen Phetteplace (Earth Sciences)
Faculty Sponsor: Richard Grimaldi
The Observed Low-Level Thermodynamic Profiles During Three Fog Episodes in Oneonta, NY

Presenter: Lisa Canny (Human Ecology)
Faculty Sponsor: Yung-Jung Choi
The Effects of Fashion Advertisements on Teenagers

Presenters: Christopher Carille, Shaun Buchanon (Chemistry & Biochemistry)
Faculty Sponsor: Vitaliy Gubaydullin
Analysis of Low-Angle X-ray Diffraction of Nanostructures Constructed by the Chemical Atomic Build-up Method

Presenter: Lauren Christian (Earth Sciences)
Faculty Sponsor: Richard Grimaldi
The Relative Position of Tornadoes within Hurricanes

Presenter: Sean Cook (Foreign Languages & Literatures)
Faculty Sponsor: Gustavo Arango
The Land of the Crazy Trees (A Literary Translation)

Presenter: William Davidson (Chemistry & Biochemistry)
Faculty Sponsor: John Schaumloffel
Co-Precipitation of Arsenic with Zerovalent Iron Particles

Presenters: Allison Dilzer, Ashley Gebcczyk, Kari Cubito, Megan Miraglia, Jenna Smith (Human Ecology), Alyssa Sorrentino, Lauren Howe, Krysten Kellman, Christopher Siragusa, Lindsey Beckwith, Kyra McTighe, Randelle McUmber, Eric Bratt (Psychology), Peter Ilczyszyn (Biology)
Faculty Sponsors: Lawrence T. Guzy (Psychology), William Proulx (Human Ecology), Tracey Ranieri (Athletics)
Effectiveness of Freeze Point Depression Osmometry vs. Bio-Impedance Analysis in Measuring Acute Changes in Hydration Levels

Presenters: Philip Dolensek, Elizabeth Kent (Mathematics, Computer Science & Statistics)
Faculty Sponsor: Sen Zhang
Design, Implementation and Preliminary Results of an Annotation Based Online Bookmark System

Presenter: Willow Eyres (Biology)
Faculty Sponsor: Fred Zalatan
Herbicidal Effects on Soil Microbes

Presenter: Bryan Ezelius (Environmental Sciences/Biology)
Faculty Sponsor: Thomas Horvath
Winter Limnology in Otsego County

Presenter: Michael Fernandez (Biology)
Faculty Sponsor: Vicky Lentz
Effects of Transport Stress on Leukocyte Numbers in Largemouth Bass (*Micropterus salmoides*)

Presenter: Joseph Fiori (Chemistry & Biochemistry)
Faculty Sponsor: John Schaumloffel
Remediation Potential of a Reusable Solid-phase Adsorbant/Absorbant

Presenters: Jessica Green, Brian Benner (Environmental Sciences/Biology)
Faculty Sponsor: Donna Vogler
An Invasive Plant Database for Land Managers

Presenters: Caitlin Heuberger, Arthur Sy, William Davidson, Amanda Minnock (Chemistry & Biochemistry)
Faculty Sponsor: Jacqueline Bennett
Almond to Mint in Two Easy Steps

Presenter: Micah Ilowit (Psychology)
Faculty Sponsor: Brian M. Lowe (Sociology)
Understanding Moralization: How Objects, Processes, and Persons become "Moral"

Presenter: Josh Jagoda (Biology)
Faculty Sponsor: Vicky Lentz
Purification of Lymphocytes from Spleen and Headkidney from Largemouth Bass (*Micropterus salmoides*)

Presenter: Kurt L. Jandzinski (Chemistry & Biochemistry)
Faculty Sponsor: William Vining
Control of Metal-Ligand Bond Cleavage

Presenter: Kirby Jewette (Biology)
Faculty Sponsor: Vicky Lentz
Purification and Analysis of Immunoglobulins from Largemouth Bass (*Micropterus salmoides*)

Presenters: Emmon Johnson, Anthony Grimes, Rebecca Routh, Natalie Pechenik, Ross McCredy, Julia Bowler (Earth Sciences)
Faculty Sponsor: James R. Ebert
The Kalkberg Formation (Helderberg Group, L. Dev., Lochkovian) at Cherry Valley, New York, is Actually New Scotland – Preliminary Results of Sedimentologic and Stratigraphic Investigations

Presenter: Erica Jones (Communication Arts)
Faculty Sponsor: Christine Quail
DisgRACEful: Behind the Face of Reality TV

Presenters: Joseph Macura, Deidra Liddle, Peter Lucchio, Tiffany Mellor, Emily Gundlach (Psychology)
Faculty Sponsors: Peter A. DiNardo, Steven J. Gilbert
Correlates of Isolated Sleep Paralysis (ISP) in a College Sample

Presenters: David F. Mase, Daniel R. Nierenberg (Earth Sciences)
Faculty Sponsor: P. Jay Fleisher
The Enigmatic Occurrence of Glacial Lacunas

Presenters: Matthew R. Miner, Sandra A. Martin (Chemistry & Biochemistry)
Faculty Sponsor: Jacqueline Bennett
Development and Application of an Efficient, Home-Based Essential Oil Apparatus

Presenter: Amanda Minnock (Biology)
Faculty Sponsor: Nancy Bachman
DNA Testing Using a TaqMan Assay

Presenters: Megan Miraglia, Allison Dilzer, (Human Ecology), Alyssa Sorrentino, Anna Legname, Lauren Howe, Krysten Kellman, Christopher Siragusa, Samantha Marcinka, Eric Bratt (Psychology)
Faculty Sponsors: Lawrence T. Guzy (Psychology), William Proulx (Human Ecology), Tracey Ranieri (Athletics)
Dehydration and its Effects on Perception, Cognition, Mood, and Sleepiness

Presenter: Joshua Muse (Cooperstown Graduate Program)
Faculty Sponsor: Christopher Sterba
"The Show that May Save Your Life" – Fear, Security, and the Alert American Convoys

Presenter: John Olszowy (Environmental Sciences/Biology)
Faculty Sponsor: Donna Vogler
Microhabitat Preference of the Grey Tree Frog (*Hyla versicolor*)

Presenters: Graham Ostrander, Michael Barb, Rebecca Routh (Physics & Astronomy)
Faculty Sponsor: Hugh Gallagher, Jr.
Interpretation of Midlatitude Observations of Total Electron Content

Presenter: Michele Passonno (Psychology)
Faculty Sponsor: Rebecca Harrington (Office of Health Education)
Interpersonal Violence Experienced by College Students

Presenters: Joe Powers, Ashley Renko, Jeffrey Dascoli, Thor Kasenko, Andrew Paszko, Steven Button, Katie Moller (Physics & Astronomy)
Faculty Sponsor: Paul A. French
Video Demonstrations for the Science Discovery Center

Presenter: Thomas Pullen (Earth Sciences)
Faculty Sponsor: Devin Castendyk
Relationships Between Ground Water and an Acidic Pit Lake in the Middle Anthracite Field of Eastern Pennsylvania

Presenter: Erica Ridley (Human Ecology)
Faculty Sponsor: Rebecca Harrington (Office of Health Education)
College Student Caffeine Use and Perceptions

Presenters: Lorenda Rush, Samantha Avenengo, AnnMarie Hilfiker (Psychology)
Faculty Sponsor: Geoffrey O'Shea
A Reevaluation of Learning and Awareness in the Hebb Digits Task

Presenter: Jeremy Smith (History)
Faculty Sponsor: Julie Freeman
Researching the Holocaust and *Kristallnacht*

Presenter: Diane Sokerka (Human Ecology)
Faculty Sponsor: Annacleta Chiweshe
Download This!

Presenters: Alyssa Sorrentino, Lauren Howe, Krysten Kellman, Christopher Siragusa, Lindsey Beckwith, Kyra McTighe, Randelle McUmber, Eric Bratt, Joseph Simons, (Psychology), Peter Ilczyszyn (Biology), Megan Miraglia, Allison Dilzer, Ashley Gebcczyk, Kari Cubito, Jenna Smith (Human Ecology)
Faculty Sponsors: Lawrence T. Guzy (Psychology), William Proulx (Human Ecology), Tracey Ranieri (Athletics)
Does Exercise-Induced Dehydration Effect Perception, Cognition, Mood, and Sleepiness?

Presenter: Manuel Soto (Psychology)
Faculty Sponsor: Geoffrey O'Shea
Item Repetition in Go/No Go Reactions

Presenters: Edward Stephan, Brian Benner (Environmental Sciences/Biology)
Faculty Sponsors: Donna Vogler, Adam Ryburn
Flora of Franklin County

Presenter: Brandon L. Taylor (Earth Sciences)
Faculty Sponsors: P. Jay Fleisher, Arthur N. Palmer
Applying Karst Hydrologic Techniques to Calculate Englacial Tunnel Discharge, Bering Glacier, Alaska

Presenter: Jamila Thompson (Biology)
Faculty Sponsor: Nancy Bachman
Microscopic Image Databases in Coppermine

Presenter: Christopher Tilley (Chemistry & Biochemistry)
Faculty Sponsor: Vitaliy Gubaydullin
Chemical Atomic Buildup: A Method of Precision and Simplicity in Nanotechnology

Presenters: David Tracy, Lauren Christian (Earth Sciences)
Faculty Sponsor: Richard Grimaldi
Reformulation of the Heat Index to Include the Effects of Wind

Presenter: Kevin Vogler (Environmental Sciences/Biology)
Faculty Sponsor: Thomas Horvath
Survey of Water Chestnut (*Trapa natans*) Invasion in Goodyear Lake

Presenters: Katharine Warren, Karen Prior (Psychology)
Faculty Sponsor: Steven J. Gilbert
Alternative, Computer-Driven Measures of Field Dependence/Independence

Presenter: Jillian Zick (Biology)
Faculty Sponsor: Adam Ryburn
Echinacea: What It Is; Why It Works

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2007 Student Research Day

STUDENT PARTICIPANTS

Faculty Sponsors

PRESENTATION ABSTRACTS

Jenna Lynn Baran
Faculty Sponsor: Christine Quail
Communication Arts

The Explosion of *MySpace* and Other Online Social Networking Websites

Online social networking websites have become increasingly popular in our culture. Most people utilize these sites daily and treat them as an extension of themselves, constantly incorporating as much as they can about who they are into one webpage. The purpose of this study, which was conducted over a three month period, was to ascertain if online social networking websites, specifically MySpace, are becoming sub-cultures of society, and if they have crossed the line between what should be public and what should be private. The results were astounding and provide significant insight into our culture's progressive desire to be connected.

Robert Barton, Corey Lemley
Faculty Sponsor: Paul A. French
Physics & Astronomy

Determining the Onset of Turbulent Flow Using Video-Based Motion Analysis

Recent advancements in computing technology have drastically improved the interface between computers and video equipment, thus allowing for the improvement of video-based motion analysis. However, analysis of video data remains susceptible to errors caused by lens distortion, angular distortion, descaling, and discretization. In previous work, methods were developed to correct for some of these errors. This paper presents several improvements to these corrections, as well as additional methods to increase accuracy, including: 1) automation of the lens distortion correction technique, 2) a simulation method to test the correction of lens distortion error, 3) creation of an algorithm to correct for angular distortion, 4) extension of lens distortion correction to two dimensional motion, and 5) refinement of a two camera system to correct for descaling error. The methods were tested in the context of the measurement of the air resistance force on a high-speed projectile. This allowed for the determination of the onset of turbulent flow. These significant improvements in accuracy have made video-based analysis an even more powerful tool for the study of motion.

Robert Barton
Physics & Astronomy
Faculty Sponsor: Sen Zhang
Mathematics, Computer Science & Statistics

A Graphic Interface to Display Phylogenetic Trees Developed During the Calculation of Grand Cardinality

Phylogenetic trees are used to hypothetically depict the evolutionary relationship among species derived from a common ancestor. A rooted tree which contains only binary branch fanouts is known as fully resolved. Partially resolved trees contain internal nodes which possess more than two branches. The number of fully resolved trees represented by a partially resolved tree will be defined as cardinality. This work involves calculating the total number of fully resolved trees for a set of multiple partially resolved trees which will be defined as grand cardinality.

In order to calculate the grand cardinality among multiple trees, this program calculates the union of all data trees and their intersections. This calculation occurs in progressive steps using set union theory. Each intersection is formed by the union of two partially resolved trees into a further

resolved intersection tree. These intersection trees and the original input trees are stored as strings in Newick tree format within the program.

This project integrates a graphic interface which will allow the user to select from a list of all valid input and intersection tree strings. The selected tree string is converted into a general tree structure which is traversed to analyze the positions of each node. An image of a tree is created using position data extracted from the tree nodes. The interface was developed such that intersections between branches will not occur regardless of the size of the tree. This is done by modeling the maximum fanout width of each subtree as an exponentially decaying function using the equation $\frac{w}{2^n}$ where w is the total width and n is the integer displacement from the root.

Joe Berlage, Justin Long, Steven Bayne, Andrew Hancock
Faculty Sponsor: Allen Anderson
Physics & Astronomy

A New Look at an Old Experiment

The measurement of g, the acceleration of gravity, is a very popular introductory physics experiment. One device frequently used in the undergraduate laboratory is Atwood's machine, which was utilized in an experiment done on campus this past fall. It was noted that the majority of student results gave values of g greater than the expected nominal value of g, which is 9.81 m/sec^2. The result was surprising since the analysis suggests that results should be less than the nominal value because the elementary treatment does not take into account the rotational inertia of the pulley used in the experimental set up. This anomaly was the impetus for our group to take a closer look at the underlying analysis of the Atwood apparatus to determine why the results were generally greater than the accepted nominal value. The results found were both surprising and suggestive of a better experimental apparatus. Both aspects of the Atwood machine are explored in our investigation.

Kate Betz
Faculty Sponsor: Cynthia Falk
Cooperstown Graduate Program

Arthur C. Parker and Angel DeCora: The Indian's Indian in Early Twentieth Century America

Representations of Indians within popular American culture in the early twentieth-century were largely based on historical inaccuracy and sensationalism. White Americans created visual stereotypes of vanishing Indians—noble and savage—that had no place within modern society. Two people, Arthur C. Parker and Angel DeCora, both Indians themselves, sought to combat this stereotype within visual culture, presenting their own visions of modern Indians and, within political dialogues, working with the Society of American Indians, a reform group dedicated to improving the lives of Indians throughout the country.

Through their work, Parker and DeCora wrestled with the questions: how should we present ourselves, and how will Indians look in the future? Though sharing a common white westernized educational background and dedication to the same cause of improving the status of Indians within American society, Arthur C. Parker, a largely self-taught ethnographer and archeologist, and Angel DeCora, an artist and teacher, had fundamentally different goals for the ultimate inclusion of Indian art and culture in "modern" American life.

Parker was the product of an earlier age that understood Indians as inhabiting a lower step on the evolutionary ladder. His visual representations of Indians, were, therefore, essentially linked to proving that Indians had a vital culture in the past, but were prepared to overcome this culture and leave it behind in order to enter American society in a meaningful way. DeCora, on the other hand, embodied more progressive ideals and understood Indian art as not only an entrance into modern society but as a demonstration of the options for Indians to become self-sufficient and productive American citizens.

My research, largely based on the Arthur C. Parker collections at the University of Rochester and the State Museum of New York and the Carlisle Indian School Records held by the Cumberland County Historical Society in Carlisle, Pennsylvania, seeks to understand how these two individuals confronted issues of maintaining cultural traditions, receiving equal access to education, finding a voice within national dialogues, and questioning just what it meant to be Indian within a modernizing world. Though based in different philosophies, Arthur C. Parker and Angel DeCora have left legacies of visual representation that are only now beginning to be fully appreciated.

Shaun Buchanan
Faculty Sponsor: Vitaliy Gubaydullin
Chemistry & Biochemistry

Scope of Design of the Properties of Nanostructures Created by the Chemical Atomic Buildup Method

Nanotechnology poses special problems for the researcher and developer of new compounds. Those problems revolve around the very small distances involved. First, most nanostructures are invisible to all but the most sensitive of electron microscopes. Even these microscopes produce images that require interpretation by scientific specialists. Second, the manipulation of compounds constructed on a given substrate is difficult. However, our project demonstrates that the use of the Radical-Recombination Luminescence (RRL) method allows for both the immediate and clear graphic interpretation of a given compound created by the Chemical Atomic Buildup (CAB) method on a given substrate at the mono-atomic layer, as well as provides immediate assessment of the progress of the manipulation of each layer of the compound at the mono-molecular level through the CAB method. The RRL method reveals the configuration of nanostructures based on II-VI compounds made by the CAB method. The RRL method uses the changing spectrum properties of RRL to signal changes in the nature of the monocrystal compounds and the nanostructures being produced on thin film.

Most importantly, our project demonstrates the efficiency and versatility of the CAB method in generating precise mono-atomic layers on thin film, as well as generating nanostructures composed of alternating layers of multiple compounds on a periodic basis. Finally, we demonstrate the ability to create unique and predictable changes in the properties of compounds through the construction of multi-layered nanostructures using the CAB method.

Jessica Callahan, Larry Mendonca, Briegen Phetteplace
Faculty Sponsor: Richard Grimaldi
Earth Sciences

The Observed Low-Level Thermodynamic Profiles During Three Fog Episodes in Oneonta, New York

Radiation fog is a common occurrence during autumn in Oneonta, NY. During these events, the potentially coldest air is commonly found within 50 meters of the surface thereby establishing a radiation inversion. The purpose of this project was to verify the presence and ascertain the strength and character of such radiation inversions during three fog events which occurred in fall 2006. During these early morning fog events, temperature and dewpoint were measured at three locations around Oneonta. The locations, in order of increasing elevation, are the shore of the Susquehanna River behind the Neptune Diner, downtown Main Street, and at the highest point on the SUNY Oneonta campus near the baseball field. The three events occurred on September 22nd, September 27th, and October 4th. In all cases the dewpoint was within a few degrees of the temperature. This was especially true near the river and on Main Street. The highest location was above the fog deck in two out of three events and tended to have a greatest dewpoint depression, thus indicating lower relative humidity. Using extrapolated station pressures, vertical profiles of potential temperature verified the presence of the radiation inversion in all cases. The radiation inversion appeared to be most clearly defined during the two densest fog events.

Lisa Canny
Faculty Sponsor: Yung-Jung Choi
Human Ecology

The Effects of Fashion Advertisements on Teenagers

On average, people see approximately 300 to 400 advertisements each day (Treasure, 1997), which equates to well over 1.5 million by the time we are only 15 years old. Advertisements are everywhere; we cannot escape them; and, no matter what we do they affect us. Through advertisements our society has created a stereotype for women: the "perfect body." However, it is much more than just a perfect body – women are expected to not only have a tall, thin body type, but also to dress a certain way and to wear make-up to look beautiful. The effects of this stereotype are impacting our society. However, where does it start? Studies show that it begins with teenagers, actually from the moment we are young enough to understand who celebrities are. This project seeks to show the effects of fashion advertisements on teenagers.

A study done by Jung-Hwan Kim and Sharron J. Lennon (2007), *Mass Media and Self-Esteem, Body Image, and Eating Disorder Tendencies*, shows that there is a correlation between exposure to media and eating disorders, decreased self-esteem levels and body dissatisfaction in college students (pp. 3-19). Another study done by Gurari et al. (2006) entitled *Beauty in the "I" of the Beholder: Effects of Idealized Media Portrayals on Implicit Self-Image* shows that attractiveness is often associated with good careers, better relationships and higher popularity (p. 274). These studies illustrate that exposure to media affects young people in negative ways; however, they do not concentrate on how advertisements begin to directly affect people at an early age, when they are teenagers.

I began my project by collecting data from the commonly viewed teen magazines Cosmo Girl, Teen Vogue and Seventeen Magazine. I found that an astonishing average of 67% of Cosmo Girl magazines is comprised of advertisements. Throughout one entire issue there were 322 advertisements: 99 for cosmetics (make-up, perfume, hair accessories and products, etc.); 183 for fashion clothing, shoes, bags, watches, and sunglasses; and 40 for other (movies, weight loss, etc.). Teen Vogue is made up of approximately 70% advertisements, with 315 advertisements in total in one issue: 82 for cosmetics; 221 for fashion clothing, shoes, bags, watches and sunglasses; and 12 for other. And, approximately 82% of Seventeen Magazine is made up of advertisements, with 415 ads in one issue: 115 for cosmetics; 247 for fashion clothing, shoes, bags, watches and sunglasses; and 53 for other.

I also conducted a visual assessment of teenagers in Oneonta, Greene and Vestal, New York, randomly viewing 25 young teenage females to gain a better understanding of their body image in relation to images viewed in fashion advertisements in teen magazines. I found that all 25 girls had their hair done nicely and neatly (it was not messy or thrown into a pony tail or bun). Fifteen of the girls had their nails done. All 25 girls were wearing at least one type of make-up: 9 were wearing 4 types of make-up, 8 were wearing 3 types of makeup, 4 were wearing 2 types of makeup and 4 were wearing 1 type of makeup. All twenty-five girls were wearing sneakers, 15 of which looked brand new; 10 girls were carrying "brand name" bags; and all 25 were wearing jeans. Eleven of the girls were wearing nice shirts and the other 14 were wearing tee-shirts. Thirteen of the girls were between the height of 5'4" and 5'6" and weighed between 100 and 110 pounds; 10 of the girls were between the height of 5'2" and 5'3" and weighed between 110 and 120 pounds; 2 of the girls were between the height of 5'0" and 5'1" and weighed between 120 and 130 pounds. I found that there was no correlation between weight and appearance. All of the girls wore makeup, had their hair done nicely and cared about their appearance.

I found a strong correlation between the images shown in fashion advertisements in teen magazines and how teens react by acting in accord with them. As fashion advertisements represent teenagers looking fashionable, wearing nice clothes and wearing lots of makeup to look their best, teens are trying to emulate these looks. They are also trying to attain the "perfect body;" more than half of the girls I viewed were very thin and all of them were wearing make-up. Although it is only a teenager's normal instinct to follow what is "beautiful" and popular, fashion advertisements are

discouraging toward teenage girls, and do not encourage them to be creative and to find beauty within themselves and their own personal styles. Less advertising with the "perfect body" image and more with a diverse approach to beauty would show all girls that they are beautiful and accepted in our society.

References:
Gurari, I., Hetts, J. J., & Strube, M. J. (2006), Beauty in the "I" of the Beholder: Effects of Idealized Media Portrayals on Implicit Self-Image. Basic and Applied Social Psychology, pp. 273-282.
Jung-Hwan, K., & Lennon, S. J. (2007). Mass Media and Self-Esteem, Body Image, and Eating Disorder Tendencies. Clothing and Textiles Research Journal, pp. 3-19.
Treasure J. Eating disorders. Chapter 7 in Murray R, Hill P, McGuffin P (eds). The essentials of postgraduate psychiatry. Cambridge University Press. Cambridge. 1997. Retrieved 4/9/07, from The effect of the media on the prevalence of anorexia nervosa website: http://www.portfolio.mvm.ed.ac.uk/studentwebs/session1/group59/media.htm

Christopher Carille,
Shaun Buchanan
Faculty Sponsor: Vitaliy Gubaydullin
Chemistry & Biochemistry
Yuri Lvov (Louisiana Tech University, Ruston, LA)

Analysis of Low-angle X-ray Diffraction of Nanostructures Constructed by the Chemical Atomic Build-up Method

X-ray diffraction is one of the most important tools of solid-state chemistry, since it constitutes a powerful and readily available method for determining atomic arrangements in matter. Through the Chemical Atomic Build-up Method (CAB), nanostructures of layers of CadmiumSelenide or CadmiumSulfie and ZincSulfide with total thicknesses of 40nm, 30nm, and 15nm were constructed. Using low-angle x-ray diffraction, an angle of .9 degrees, these nanostructures were able to be analyzed and the bilayers determined. Using this low cost method of analysis, it was proven that the heterojunctions of these structures have sharp boundaries.

Lauren Christian
Faculty Sponsor: Richard Grimaldi
Earth Sciences

The Relative Position of Tornadoes within Hurricanes

Tornadoes that occur in the vicinity of landfalling hurricanes represent a hazard to life and property. While most tornadoes within hurricanes are weaker than their more vigorous cousins in tornado alley, hurricane induced tornadoes can strike suddenly and cause fatalities. The relative position of tornadoes within hurricanes is of key interest to the weather forecaster. In order to gain such insight we have extracted latitude, longitude and time coordinates for both the center of the hurricane and for each of their associated tornadoes for six tornado producing hurricanes that have occurred over the last 20 years. Using trigonometry, we are able to deduce the locations of tornadic touchdowns relative to the linearly interpolated position of the center (eye) of the associated landfalling tropical system. The data points are plotted using polar coordinates (range and azimuth). Our analysis reveals that the overwhelming majority of tornadoes occur in rainbands 100km to 500km to the north and east of the eye. In light of the fact that all six hurricanes analyzed made landfall in the northern Gulf of Mexico, our results are in agreement with previous research which notes that the front right quadrant of a landfalling hurricane is favored for tornadic occurrence.

Sean Cook
Faculty Sponsor: Gustavo Arango
Foreign Languages & Literatures

The Land of the Crazy Trees (A Literary Translation)

In the field of foreign languages, literary translation is a rich area that combines research and creative work. A collaborative effort between author and translator results in a work of art that captures the essence of the original text, but is also an interpretation of it. The translation of "The Land of the Crazy Trees" involves the challenge of preserving the complexities of structure and the poetic language of the original Spanish version. The story is, at the same time, a celebration of the literature of adventures and a personal journey in search of the meaning of life.

William Davidson
Faculty Sponsor: John Schaumloffel
Chemistry & Biochemistry

Co-Precipitation of Arsenic with Zerovalent Iron Particles

Arsenic ions, in particular arsenic (III), are quite toxic and a significant contaminant in some bodies of water. This contamination is especially prevalent in drinking water in developing nations such as Bangladesh. This project investigates a simple remediation method for removing arsenic from freshwater. The aim of these experiments is to partially mimic seasonal turnover and oxygenation of water in a laboratory setting while simultaneously introducing zerovalent iron in an attempt to create and improve upon existing techniques for arsenic remediation. Data on arsenic concentrations in water treated using this technique will be presented.

Allison Dilzer, Ashley Gebcczyk, Kari Cubito, Megan Miraglia, Jenna Smith (Human Ecology), **Alyssa Sorrentino, Lauren Howe, Krysten Kellman, Christopher Siragusa, Lindsey Beckwith, Kyra McTighe, Randelle McUmber, Eric Bratt** (Psychology), **Peter Ilczyszyn** (Biology)

Faculty Sponsors: Lawrence T. Guzy (Psychology), William Proulx (Human Ecology), Tracey Ranieri (Athletics)

Effectiveness of Freeze Point Depression Osmometry vs. Bio-Impedance Analysis in Measuring Acute Changes in Hydration Levels

Problem: A number of methods have been used to measure dehydration; for example, urinalysis, urine color and bio-impedance analysis (BIA). All of these are problematic. For example, urine analysis is time consuming and expensive; urine color can be aversely affected by vitamin supplements and diet; and BIA requires non-exercise activities eight hours prior to the test, and the participant must be in a supine position for at least 5 minutes, less jewelry and relaxed. Another problem with these techniques is that they may be measuring a chronic state of hydration and not acute or present-moment dehydration, a condition that may exist after intense exercise and/or exposure to heat.

A recent technique using osmolality of saliva may be a more accurate measure of present-moment hydration status. This would be an easier test to administer and to analyze, taking only seconds to determine levels of hydration. This technique requires a very small quantity of saliva from a person's mouth and a Freeze Point Depression Osmometer.

Purpose: We sought to determine if there is a difference in freeze point depression osmolality of saliva as compared with the BIA during acute dehydration. An acute state of dehydration was generated by requiring normally hydrated participants to lose 2% of their body weight through exercise.

Method: Thirteen men and women volunteers from the Advanced Research Class served as participants. They ranged in age from 20 to 25 years. All self-reported exercising for one hour plus at least three times/week. Two days prior to the study, participant were informed as to the optimum amount of water that needed to be consumed on a regularly basis for the next 36 hours.

Testing Day 1

- One hour prior to exercise, all food and water were stopped.
- Just prior to exercise, a saliva sample was collected, the BIA was administered, and the participant was weighed in their street clothes less shoes; they then changed to their exercise clothes and began to exercise.
- They were encouraged to perform any exercise that they felt comfortable with, including jogging, running, treadmill, stair climber, and/or elliptical trainer.
- When they felt they had lost 2% of their start weight, they changed back to their original clothing and were weighed. This continued until they lost a minimum of 2% body weight. Duration of exercise ranged between 1 to 1½ hours. No water was permitted during the exercise phase.
- At the termination of exercise the participants produced a second saliva specimen and proceeded to the location where testing of perception, mood, and sleepiness were conducted.
- After these tasks, the BIA was administered. Immediately afterwards, participants were permitted to hydrate.
- At the end of the first and second hour of hydration, saliva samples were obtained.

Results: Data are presently being analyzed and will be reported at Student Research Day.

Philip Dolensek, Elizabeth Kent
Faculty Sponsor: Sen Zhang
Mathematics, Computer Science & Statistics

Design, Implementation and Preliminary Results of an Annotation Based Online Bookmark System

Web users save the locations of interesting links that they find on the internet. Unless the user is predisposed to be particularly organized, these links usually just pile up in the bookmarks or favorites list of their web browser until they are not easily navigable, and finding any one particular link becomes difficult. In our ongoing research, we are creating an application that, with a high amount of transparency, allows the user to save links and annotate them with keywords.

The user can browse their links in a list format, as well as search through their URLs by keywords. The type of search we are proposing is different from a traditional web search in that it ranks pages by the keywords that the user has assigned to them, not by the self describing text or Meta tags on the page itself. Our system allows separate users to bookmark the same URL with different annotations. To improve the accuracy of bookmark retrieval, we are placing a special emphasis on the relative position of the keywords. Our system will also take into account clusters of keywords, allowing related items to show up even if they were not directly searched for. This can help with finding relevant links (improving the recall of the URL retrieval) even when the specific keywords are unknown or not remembered.

This project is being implemented on an Oracle 8 database server. The logical table design complies with the Third Normal Form or the Boyce-Codd Normal Form. Physical design aims at speeding up keyword and URL searching. An IIS server was used to serve the dynamic ASP web pages which use ADO to communicate with the database server. The stored components were written in PL/SQL and can, therefore, be easily reused by different front-end applications written in a number of other scripting languages or Java and C++. The next stages for our project include data mining functionalities, expanding the scope of the search function to include all of the links by any user, and reconciling differences in descriptions of links between users, as well as suggesting possible keywords as users add links which are new to them.

Willow Eyres
Faculty Sponsor: Fred Zalatan
Biology

Herbicidal Effects on Soil Microbes

In August of 2006, a quantity of 2,4-D herbicide was applied to a water chestnut (*Trapa natans* L.) infestation in an Oneonta, New York wetland. Four soil collections were made approximately 1-2 feet deep at both non-target sites and herbicide application sites. Through soil DNA isolation and PCR analysis procedures, we hope to detect any changes in soil microbial populations. Active herbicide breakdown by soil microbes is the primary way herbicides dissipate from a field because microbes use the herbicide molecules as an energy source in their life cycle.

Bryan Ezelius
Faculty Sponsor: Thomas Horvath
Environmental Sciences/Biology

Winter Limnology in Otsego County

Several abiotic factors were collected and analyzed from five separate lakes in Otsego County during late February and early March of 2007. The purpose of this study was to determine the ongoing processes in the lakes at this specific time of year. The parameters measured include dissolved oxygen, temperature, pH and conductivity, all of which were measured at 1 m intervals using a Hydrolab Scout 2®. The five lakes that were studied were Arnold Lake, Goey Pond, Gilbert Lake, Crumhorn Lake, and Youngs Pond. This study is part of ongoing research that examines the limnological data of lakes in Otsego County at different seasons of the year. The data collected during the time of this project indicate that the thermocline is not very distinct judging from these abiotic parameters, although there is a distinct change from the epilimnion to the hypolimnion.

Michael Fernandez
Faculty Sponsor: Vicky Lentz
Biology

Effects of Transport Stress on Leukocyte Numbers in Largemouth Bass (*Micropterus salmoides*)

Largemouth bass (*Micropterus salimoids*) is a popular game fish that has not been the subject of immunological studies. The intention of our investigation is to observe and record erythrocyte and leukocyte levels in Largemouth bass under an induced stress. Previous studies indicate that fish examined shortly after stress exhibited signs of immunosuppression. The Largemouth bass in our study were subject to a combination of handling and transport stress resulting from the transfer from a hatchery located an hour away to our laboratory. These fish were bled immediately after arrival and bleeds were repeated weekly for the duration of the experiment. To conduct the bleeds, the fish were anesthetized with Finquel and blood was drawn from the ventral aspect of the caudal vein using a sterile heparinized syringe. Cells were diluted and stained with Natt and Herrick's solution, counted using a hemocytometer, and differentiated into erythrocytes, leukocytes and thrombrocytes. Preliminary data indicates that Largemouth bass do not suffer from reduction in leukocyte numbers, an indicator of immunosuppression, following transportation stress, which suggests that no acclimation period is necessary before experimentation can begin.

Joseph Fiori
Faculty Sponsor: John Schaumoffel
Chemistry & Biochemistry

Remediation Potential of a Reusable Solid-Phase Adsorbant/Absorbant

Purifying contaminated water is an environmental issue that is addressed on a regular basis. The challenge of cleaning water lies in finding a cost effective process that will provide suitably clean water and have minimal environmental side affects. Polydimethylsiloxane (PDMS) is a viable option in environmental remediation. Commercially available PDMS is a solid-phase polymer that is easy to make, inexpensive, reusable, and has little to no negative impact on the environment. A contaminated sample of water can be percolated through the PDMS polymer to be cleaned. The polymer holding the water contaminants can then be cleaned with a solvent (the solvent choice being dependent on the solubility of the contaminating compounds) and then reused for another cycle. The reusability of the polymer to clean water in an acceptable range will be addressed in this project.

Jessica Green, Brian Benner
Faculty Sponsor: Donna Vogler
Biology

An Invasive Plant Database for Land Managers

Invasive plants are a problem throughout the country and the second most significant threat to rare species. The Invasive Plant Council of NY (IPC) has identified over 50 species that currently impact habitats; perhaps hundreds of other species that have not been researched sufficiently still threaten natural areas throughout the U.S. With the urging of The Nature Conservancy (TNC), we developed a database for land managers in the eastern U.S. (including TNC, the National Park Service, and NYS Parks) that organizes data on some invasive plants that are very well described and studied, and also those that have less information readily available but may become more invasive in the future. Our current database has information on 24 species, and we plan to add more in the future. The data will be used by land managers to develop strategies for prioritizing invasive plant controls. The database will subsequently be available via web access for multiple users. The focus of this project was to develop the prototype database for the one that will be web based when completed.

Caitlin Heuberger, Arthur Sy, William Davidson, Amanda Minnock
Faculty Sponsor: Jacqueline Bennett
Chemistry & Biochemistry

Almond to Mint in Two Easy Steps

Much of organic chemistry involves reactions and chemicals that are unfamiliar. We plan to take organic chemistry out of the laboratory and into real life by creating traditional organic reactions using nontraditional reagents. In two easy steps we can change the smell of a compound from almond to mint using only household products. Benzaldehyde, our starting compound, is a liquid known for its distinct almond-like odor which can be purchased in reasonably pure form as imitation almond extract. Methyl benzoate, our target compound, is used in perfumery and has a distinct minty smell. The first step is oxidation of benzaldehyde to benzoic acid using a supermarket oxidizing agent. Whereas the reactants are all liquids, benzoic acid is a solid with practically no odor. After isolating and purifying the benzoic acid, we then esterify it with methanol using an acid catalyst to reach our final goal of the mint smelling liquid methyl benzoate. The entire reaction sequence can be completed using only materials one can find in any large supermarket. And, as an added benefit, sophisticated equipment is not necessary to ascertain whether the reactions have worked or not. The phase changes between the steps and the changes in smells are sufficient to determine reaction success.

Micah Ilowit
Psychology
Faculty Sponsor: Brian M. Lowe
Sociology

Understanding *Moralization*: How Objects, Processes, and Persons become "Moral"

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 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. This particular project focuses on two groups within the animal rights movement – Tribe of Heart and Farm Sanctuary.

Tribe of Heart is an animal rights organization that delivers its message primarily through documentaries. They have produced two award winning films, *The Witness* and *Peaceable Kingdom,* both of which focus on changing current cultural views regarding animals typically used for food and clothing. Tribe of Heart also has a website, an online newsletter, and endorsements that include television celebrities, authors, and teachers associations.

Farm Sanctuary is an animal rights organization whose main focus is to change current cultural 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. Tribe of Heart's documentary, *Peaceable Kingdom,* is about Farm Sanctuary.

Josh Jagoda
Faculty Sponsor: Vicky Lentz
Biology

Purification of Lymphocytes from Spleen and Headkidney from Largemouth Bass (*Micropterus salmoides*)

Largemouth bass (*Micropterus salimoids*) are common catches in sport fishing. These species are susceptible to a disease caused by the trematode larvae of *Uvuliffer ambloplitis,* otherwise known as "black spot." Depending on the magnitude of infection, fishermen may throw away the fish; however, these infected fish do not cause infections in humans. Leukocytes play a critical role in maintaining health and protection of fish from disease. An immunological study, including a method of separation of the various cells of the immune system, is crucial in order to understand disease cause, prevention and susceptibility. Largemouth bass were obtained from a hatchery, given the proper environment and fed regularly in order to limit stress factors. Fish cells were taken by surgically removing the head kidney and the spleen. Cells taken from these organs were separated by mechanical straining. Techniques such as erythrocyte lysis and density gradient centrifugation were used in the isolation of leukocytes. Following isolation, differential staining and microscopic examination were used to determine if the separation techniques were successful.

Kurt L. Jandzinski
Faculty Sponsor: William Vining
Chemistry & Biochemistry

Control of Metal-Ligand Bond Cleavage

Transition metal chemical compounds are bonded via the donation of electrons from multiple ligands to a metal center. Most transition metal chemistry involves exchange or rearrangement of these ligands. This study explores the nature of control of reactions in which metal-ligand bonds are broken. In particular, two special types of reactions are studied: oxidation-induced cleavage of metal-arene multiple bonds, and cleavage of multiple ligands bonded to different metal centers in close proximity. In each case, we hope to discern the effects needed to break more than one metal-ligand bond to effect an overall reaction. The techniques employed involve exploring the displacing

ability of differing incoming ligands, and designing compounds where oxidation can be performed at different distances from the arene ring. The reactions are monitored by both spectroscopic and electrochemical techniques.

Kirby Jewette
Faculty Sponsor: Vicky Lentz
Biology

Purification and Analysis of Immunoglobulins from Largemouth Bass (*Micropterus salmoides*)

The Phylum Osteichthyes (bony fish) has more species than the rest of the vertebrates combined. Despite this enormous number, little is known about the immunology of bony fish. While some species have begun to be studied, the order containing Largemouth bass (*Micropterus salmoides*) is one lineage that has not been the subject of immunological studies. This study was undertaken to characterize the immunoglobulin found in Largemouth Bass. Blood was collected from six largemouth bass via the caudal vein. The serum was isolated and the immunoglobulins were precipitated with saturated ammonium sulfate. The precipitated protein was dialyzed against 1X PBS and was further purified by size exclusion chromatography. The purified serum proteins were analyzed using SDS Polyacrylamide gel electrophoresis (SDS-PAGE). All immunoglobulins (Ig), with the exception of one isotype found only in shark, are composed of a heavy and light chain. Quite unexpectedly, the serum protein purified from Largemouth bass appears to not have light chains. Further analysis via enzymatic fragmentation will be undertaken to further characterize the purified serum protein.

Emmon Johnson, Anthony Grimes, Rebecca Routh, Natalie Pechenik, Ross McCredy, Julia Bowler
Faculty Sponsor: James R. Ebert
Earth Sciences

The Kalkberg Formation (Helderberg Group, L. Dev., Lochkovian) at Cherry Valley, New York, is Actually New Scotland – Preliminary Results of Sedimentologic and Stratigraphic Investigations

Research conducted as a class project in Sedimentary Geology (GEOL 360) in the fall of 2007 was presented at the Annual Meeting of the Northeast Section of the Geological Society of America (GSA) in Durham, New Hampshire. The remainder of this abstract comprises the abstract that was published by GSA.

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 (predominantly quartz silt) 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, bryozoans, trilobites, bivalves, sponges, rare corals) occurs as disarticulated, unabraded bioclasts. Skeletal debris increases up section. Overall, these beds resemble the New Scotland Fm. more than they do the Kalkberg Fm.

The lower third of the U.S. 20 outcrop is characterized by dm-scale pinch and swell bedding, interpreted as broad, symmetrical ripples with remnants of low angle, form-concordant cross stratification, similar to HCS. The rest of the unit exhibits tabular dm beds which are commonly cherty.The sedimentology, paleontology, taphonomy and ichnology of the U.S. 20 strata suggest deposition on an open, storm-dominated shelf with significant siliciclastic input. Depths were below normal wave base but above storm wave base. Shallowing of the shelf is recorded by increased quantity, size and diversity of bioclasts in beds immediately below the Wallbridge Unconformity (base of Oriskany Sandstone). Quartz silt content (average 26%) is decreased in this subunit.

Westward from the Hudson Valley, onlap of middle Helderberg units onto the Punch Kill Unconformity (PKU, top of the Coeymans Fm.) is evident by the progressive disappearance of the 1) chert zone at the base of the Kalkberg Fm. (lower Hannacroix Mbr.), 2) upper Hannacroix Mbr. and 3) *Dicoelosia* shales at the base of the Broncks Lake Mbr. of the Kalkberg Fm. Skeletal packstones above the PKU north of U.S. 20 at Cherry Valley likely represent a thin remnant of the upper Broncks Lake Mbr. Therefore, the strata on U.S. 20 are correlative with the siltstone facies of the lower New Scotland Fm. The highest beds in the U.S. 20 exposure may correlate with the limier upper New Scotland.

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 facilitate correlation of the mid-Helderberg K-bentonites in the Appalachian Basin.

Erica Jones
Faculty Sponsor: Christine Quail
Communication Arts

DisgRACEful: Behind the Face of Reality TV

Reality TV has become a distinctive symbolism of what our culture encompasses. The study of reality television requires examination through triangulation. Through various methods of research, one is able to obtain a better idea of the perception of the viewers, input from professionals, and the misrepresentations of race, class, and gender in reality TV. The research from this project has been edited into an informative 10-minute video that will be presented on Student Research Day.

Joseph Macura, Deidra Liddle, Peter Lucchio, Tiffany Mellor, Emily Gundlach
Faculty Sponsors: Peter A. DiNardo, Steven J. Gilbert
Psychology

Correlates of Isolated Sleep Paralysis (ISP) in a College Sample

Isolated Sleep Paralysis (ISP) is an event in which the typical muscular paralysis associated with REM sleep occurs while falling asleep or upon awakening. The individual is aware of their surroundings, but is unable to move and often has hallucinatory-like experiences. College samples consistently show higher prevalence rates than the general population. ISP is often accompanied by fear, and has been linked to anxiety disorders, particularly panic disorder. We examined the relationship between ISP and positive and negative affect, and anxiety sensitivity in a sample of 50 college students, who completed an interview about ISP experiences and completed the Positive and Negative Affect Scale (PANAS) and the Anxiety Sensitivity Index (ASI). A specific prediction derived from the literature on panic was that anxiety sensitivity would be more strongly related to *worry about having* further episodes than with *fear during* the episode. Eleven students (22%) reported past and/or current ISP. The ISP group showed significantly higher scores on PANAS negative affect (25.2) and ASI (28.2) than the non-ISP group (negative affect, 19.1; ASI, 19.2). The groups did not differ on positive affect. None of the measures were related to the degree of fear experienced during ISP episodes. However, worry about having another episode was positively correlated with negative affect, $\underline{r}\ (11) = .65$, $\underline{p} = .03$, and was marginally correlated with anxiety sensitivity, $\underline{r}\ (11) = .59$, $\underline{p} = .06$. Pending replication on a larger sample, these results suggest that in a non-clinical sample, ISP is related to more general tendencies to experience negative affect and anxious anticipation. Among those who experience ISP, the degree to which the individual worries about having further episodes is also related to negative affect, and to a general tendency to develop anxious anticipation in response to uncomfortable physical or psychological sensations.

David F. Mase,
Daniel R. Nierenberg
Faculty Sponsor: P. Jay Fleisher
Earth Sciences
Palmer K. Bailey (US Army Corps of Engineers [retired], Anchor Point, Alaska)
Eric M. Natel (Research and Development, Eastman Kodak, Rochester, NY)

The Enigmatic Occurrence of Glacial Lacunas

Enigmatic elliptical depressions, known as lacunas, attaining lengths in excess of 100 meters and tens of meters in relief, are generally uncommon as supraglacial features, yet they always appear in clusters, as on the Lacuna Glacier in the Alaska Range. Probing their significance motivates this investigation on the surging Bering Glacier, Alaska, where lacunas are confined within a broad, 300–400 meter wide band of ice that parallels the eastern ice front, within a kilometer of its piedmont lobe terminus. Although this lacuna band was displaced 1.0–1.5 km during the 1993-95 surge, it began to reform within different ice, but at the same location as before within 4 to 6 years of downwasting and retreat. Testing for potential formative parameters, we mapped ice structures associated with the lacunas, including fractures (ablated crevasses), englacial foliation, and thrust faults, none of which are interrupted by passing through a lacuna. Lacunas appear aligned semi-parallel to the strike of fractures, and generally orthogonal to foliation and thrusts. Drainageways formed late in the surge are aligned with lacunas, some flowing through supraglacial ponds. However, the affinity of re-formed lacunas in the same location as before the surge suggests an origin unrelated to inherent ice properties. A measured downwasting rate of 10 m annually would place ice at the modern surface in a near-basal position, thus susceptible to physical alteration by passing englacial meltwater. This and other multiple working hypotheses are receiving equal attention.

Matthew R. Miner,
Sandra A. Martin
Faculty Sponsor: Jacqueline Bennett
Chemistry & Biochemistry

Development and Application of an Efficient, Home-Based Essential Oil Apparatus

Essential oils are widely known for their uses in the fragrance and aromatherapy industries. These essential oils can become quite expensive due to the fact that it requires a great deal of raw plant material to extract the quantities of essential oil usually sold to consumers. The goal of this project was to develop an apparatus for a consumer with the desire to make his or her own essential oils. Using this apparatus, a consumer can extract their favorite essential oil from a spice of their choice with no prior knowledge of distillation. Current at-home essential oils products are very expensive, not durable and very complex. Our apparatus aims to solve these problems as well as others. The apparatus was designed to be easy to use, safe, and cost efficient. A prototype will be presented as well as oils that have been extracted using our apparatus.

Amanda Minnock
Faculty Sponsor: Nancy Bachman
Biology

DNA Testing Using a TaqMan Assay

Cystic Fibrosis is one the most common autosomal recessive genetic disorders in Caucasians. This disorder occurs when an individual inherits two copies of a mutated CFTR gene, one from each parent. When only one copy is inherited, the individual is a carrier. There are ways to detect the presence of this gene to see if an individual is affected or could potentially pass on the gene. One example would be PCR run with fluorescent probes. PCR is a way to replicate DNA, amplifying the amount you already have. The probes are designed to bind to the mutated strand of the template DNA or RNA that is created. The probes contain a florescent dye and a quencher. The quencher suppresses the florescence of the dye. Only when the two are taken apart will the dye fluoresce. We are creating an assay using this technology to detect the presence of the CFTR gene. There are many different probes we can choose from, and in the process of deciding we have learned the

workings of many different types. TaqMan is a dual labeled oligonucleotide probe with a reporter dye on the 5' end and a quencher on the 3'. Molecular Beacons are another type of florescent probe. This also contains a reporter dye and a quencher; however, this single stranded oligonucleotide has a stem-and-loop structure. Our first efforts will be with a TaqMan probe.

Megan Miraglia, Allison Dilzer, (Human Ecology), **Alyssa Sorrentino, Anna Legname, Lauren Howe, Krysten Kellman, Christopher Siragusa, Samantha Marcinka, Eric Bratt** (Psychology)

Faculty Sponsors: Lawrence T. Guzy (Psychology), William Proulx (Human Ecology), Tracey Ranieri (Athletics)

Dehydration and its Effects on Perception, Cognition, Mood, and Sleepiness

Background: A persistent sub-clinical level of dehydration has been reported to increase the probability of cognitive errors and anxiety. Results from a self-report survey conducted showed that most of the respondents in our present study were dehydrated, suggesting an increased susceptibility to negative changes in cognitive abilities and mood. Other researchers have noted fluctuations in alertness during the day. From self-reports from our college-aged students, evenings were associated with greater alertness than mornings. Possibly, lowered cognitive ability and dehydration interact negatively so that mornings coupled with a dehydrated state may show worse performance.

The primary focus of this research involves the possible impact that hydration status has on the ability to perform a perceptual task. Perception relies on how we see the world from our unique perspective.

Purpose: The purpose of this study was to determine whether hydration status and alertness (based on time of day) affects perception, cognition, mood and sleepiness.

Methods:

- Subjects were recruited from an introductory psychology course (N=22) and were selected based on self-reported fluid intakes indicating chronic dehydration levels. All participants were instructed to maintain their normal fluid intakes for several days prior to testing. Subjects were then tested on four occasions: Day 1 – morning and evening and Day 3 – morning and evening. Immediately after the evening session of Day 1, one half of the participants were randomly chosen to follow a rehydration schedule during days 2 and 3.
- Hydration status was assessed using bioelectrical impedance (BIA) and self-reported fluid intakes. Perception was assessed using the Rod and Frame Task (RFT). Cognition was assessed with the Stroop task, where the color of ink that a word is printed is either the same (the word green printed in green ink) or different (the word green printed in red ink). Mood was assessed with the Positive and Negative Affect Schedule (PANAS) and sleepiness with the Epworth Sleepiness Scale (ESS).

Results: An analysis of variance showed a significant effect ($p < 0.05$) on perception with dehydration and hydration for sessions 3 and 4. This difference was present in sessions 1 and 2, as well, where both groups were assumed to be dehydrated. We removed two subjects from subsequent analyses as their data indicated that they didn't understand the task of aligning the rod to the upright in the first session. No differences were found affecting the two groups. Cognition, mood, and sleepiness were not affected by time of day or hydration status.

Discussion: Difference in perception of the upright for our hydrated and dehydrated participants showed no difference. Replication of this study is being undertaken using additional visual perception tasks; an exercise induced dehydration procedure, a cross-over design, and inclusion of two independent measures of hydration (salivation for acute hydration levels and BIA for chronic levels).

Joshua Muse
Faculty Sponsor: Christopher Sterba
Cooperstown Graduate Program

"The Show that May Save Your Life" – Fear, Security, and the Alert American Convoys

In 1951 and 1952, three convoys of brightly-marked civil defense trucks traversed the United States. These traveling exhibits stopped at eighty-two major cities, and presented displays on modern warfare, the atomic bomb, and steps that the public could take to protect themselves. Beyond the exhibits, each visit included parades, speeches, demonstrations, and a general media blitz.

Though the program may at first appear a circus-like oddity, in truth its planning and implementation keenly reflected the historical context, public attitudes, and political preoccupations of the time. Though public and governmental attitudes and interest in civil defense varied throughout the Cold War, many of its most defining traits were determined in the early post-World War II period. Early policy making and initiatives placed the impetus on the individual and state and local organizations, leaving the federal agency to provide leadership. This strategy remained for the most part unchanged when American civil defense effectively disappeared at the end of the Cold War. The government's emphasis on planning rather than implementation was a primary cause of the Federal Civil Defense Administration's (FCDA's) chronic underfunding.

Combined, these operating assumptions determined the form that Alert America would take. The FCDA chose to create a traveling program in order to directly reach as many members of the public as possible. However, the agency's limited budget meant that each visit had to be brief, with no more than a few days in any location. In addition, the FCDA depended heavily on donations from corporations, extensive participation of state and local civil defense agencies, and volunteering by numerous service and social organizations.

Alert America was an impressive creation: a nationwide traveling convoy with enough spectacle and flash to attract significant visitors, expressing the civil defense information that the FCDA felt was so vital. However, while the program undoubtedly increased public awareness in towns that it visited, it did not result in a broad long-term effect. Alert America was under too many constraints of time, money, and mission. The average individual may have learned about atomic bombs and air raid sirens, but was unlikely to dramatically change his or her behavior.

John Olszowy
Faculty Sponsor: Donna Vogler
Environmental Sciences/Biology

Microhabitat Preference of the Grey Tree Frog (*Hyla versicolor*)

The Gray Tree Frog (*Hyla versicolor*) is one of the few tree frogs found in North America. This particular frog is unique because it spends much of its time in the trees until the breeding season when large numbers of these frogs congregate to mate. Several locations from around Albany and Otsego County were chosen for investigation in order to gain a better understanding of the Grey Tree Frog's core habitat; specifically, information regarding the size of area and type of topography in which this frog inhabits. Among the five sites the terrain varied from gentle slopes along the vernal pools to steep ravines directly to the waters edge. The vegetation present at these locations also ranged from saplings to large deciduous and coniferous trees. It was hypothesized that the frogs would prefer areas with large deciduous trees near the waters edge. The purpose of this study was to better define a Tree Frog's ideal habitat during the breeding season. The differences of area chosen with frog calls and frog activity suggests that these frogs prefer a variety of different micro niches ranging from large Oak stands along the waters edge to small and large conifers at further locations from the breeding sites.

Graham Ostrander, Michael Barb, Rebecca Routh
Faculty Sponsor: Hugh Gallagher, Jr.
Physics & Astronomy

Interpretation of Midlatitude Observations of Total Electron Content

In October 2004, a Coherent Ionospheric Doppler Receiver (CIDR) was installed at SUNY Oneonta. The CIDR measures Doppler shifts on 150 MHz and 400 MHz signals from beacons on a series of low earth orbiting satellites as these signals transect the ionosphere. The integrated number of electrons between the satellite and the receiver (known as the total electron content, TEC) is derived from the difference in the Doppler shifts of the 150 MHz and 400 MHz signals. Observations of TEC as a function of satellite elevation angle are fit to a model of the ionosphere to infer the ionospheric electron density. The goal of this technique is to make an improved determination of the location of electron density boundaries observed in the ionosphere. The technique is then used to examine the relationship between the midlatitude density trough and subauroral ion drifts.

Michele Passonno
Psychology

Faculty Sponsor: Rebecca Harrington
Office of Health Education

Interpersonal Violence Experienced by College Students

A survey seeking to measure the prevalence of interpersonal violence experienced by college students at SUNY Oneonta was administered online during the Fall 2006 semester (n=517). The survey collected data regarding physical, verbal, sexual and psychological/emotional abuse experienced. The data reveals that a majority of students, both male and female, have experienced behaviors in both intimate and non-intimate relationships that would be categorically classified as abusive.

Joe Powers, Ashley Renko, Jeffrey Dascoli, Thor Kasenko, Andrew Paszko, Steven Button, Katie Moller
Faculty Sponsor: Paul A. French
Physics & Astronomy

Video Demonstrations for the Science Discovery Center

The Science Discovery Center is a resource for the campus and local community where children and adults can learn about science through dozens of hands-on demonstrations. In this project, we have created videos of several of the demonstrations which help pique interest, as well as guide the viewer through some of the theoretical aspects. These videos will be made accessible online for use by educators and others.

Thomas Pullen
Faculty Sponsor: Devin Castendyk
Earth Sciences

Relationships Between Ground Water and an Acidic Pit Lake in the Middle Anthracite Field of Eastern Pennsylvania

Ground water discharge from a water-filled abandoned surface anthracite mine near Freeland, PA, may significantly contribute to the volume of acid mine drainage contamination received by a tributary of the Lehigh River. Hydrogeologic investigations of the acidic Pond Creek pit lake show a complex relationship between lake water, ground water inputs, and ground water outputs. The lake exhibits a low pH (4.1) with elevated acidity and sulfate concentrations (Fe = 0.69 mg/L, Al = 1.5 mg/L, Mn = 0.59 mg/L, and SO4 = 130 mg/L). A spring located 9.5 meters above the lake surface discharges cold (9°C) ground water with notably higher concentrations of iron and sulfate (pH = 4.1, Fe = 2.4 mg/L, Al = 2.0 mg/L, Mn = 0.59

mg/L, and SO4 = 150 mg/L). Surface water from this spring becomes the largest surface water input to the lake. Current meter measurements on June 23 and August 4, 2006 recorded spring discharge rates of 0.15 m^3/sec and 0.08 m^3/sec, respectively. Seismic refraction and electrical resistivity profiles above the spring identified discontinuous voids overlain by shallow silt which is consistent with historic maps that illustrate the presence of one or more mine tunnels in this area. The elevation of the spring implies that these voids do not directly connect to the lake; otherwise the spring would not exist. Despite several high rainfall events, the lake surface dropped over 2 meters between August 5 and October 2, 2006, corresponding to an estimated volume loss of 190,000 m^3. Because the lake surface continued to drop below the lake overflow elevation, ground water outflow from the lake was largely responsible for this decline. Between October 2 and November 20, 2006 the lake surface rebounded above its August 5, 2006 level. These large fluctuations highlight the variability of ground water input and output fluxes to the lake. Since the chemistry of the ground water outflow will be similar to the lake chemistry, efforts to improve water quality in the Lehigh River must address ground water quality throughout the recharge area. Pit lakes may provide a unique mechanism to capture and treat contaminated ground water prior to baseflow discharge.

Erica Ridley
Human Ecology
Faculty Sponsor: Rebecca Harrington
Office of Health Education

College Student Caffeine Use and Perceptions

Coffee consumption is as much a fashion as a believed necessity on college campuses. Do you sip coffee through two mini straws, use a travel mug, or are you happy sipping it straight from the cardboard? Perhaps you shun coffee altogether in favor of one the new hip alternatives such as green tea or energy drinks. Caffeine is not just for breakfast and is now found in an ever growing number of products, including lip balm and body wash. Results from a recent survey will show the caffeine consumption patterns of SUNY Oneonta students, how they compare to daily recommended maximum intake, what forms they come in, and the commonality of the dreaded caffeine headache.

Lorenda Rush, Samantha Avenengo, AnnMarie Hilfiker
Faculty Sponsor: Geoffrey O'Shea
Psychology

A Reevaluation of Learning and Awareness in the Hebb Digits Task

The Hebb Digits (HD) task, which involves incidental learning of a repeating nine digit sequence, 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. Learning is assessed by comparing recall performance of the final presentation of the repeating sequence to mean recall performance of the final two non-repeated sequences. In the HD paradigm, enhanced recall of the repeated digit sequence compared to the non-repeated sequences is considered evidence of learning. Previous results (O'Shea, 2005) with a visual HD paradigm, permitting separate examination of the perceptual and motor phases of performance, showed that perceptual rather than motor chunking processes more strongly contributed to learning of the repeated digit sequence. One explanation for the enhanced learning due to perceptual processes was that perceptual representations, compared to motor representations, lead to greater levels of awareness for the information being processed in memory. Thus, the present study investigated whether perceptual learning of the repeated digit sequence is dependent on awareness of the repeated sequence. Previous results have indicated that equivalent learning of the repeated digit sequence occurs for participants who are aware, as well as unaware, 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). Results found learning of the repeated sequence under both forms of awareness assessment. However, unlike McKelvie's (1987) findings, learning of sequence repetition was greater for aware than unaware participants, suggesting that information learned via implicit mechanisms may not be as strongly represented in memory as compared to information learned via explicit mechanisms. These results are discussed in terms of the role of awareness in the acquisition and retention of serially-ordered information. Furthermore, the present experiment is important in that it introduces alternative methods for assessing awareness in the HD paradigm.

Jeremy Smith
Faculty Sponsor: Julie Freeman
History

Researching the Holocaust and *Kristallnacht*

My primary goal in this project was to gain experience in archival research. Undergraduate historians rarely have the opportunity to conduct this kind of research. One reason so few undergraduates are able to do archival research is the cost involved. In my case, the cost was offset through grants from the College Senate Research Committee and the Maynard Redfield Fund Committee. The research experience itself was extremely valuable because archival research is an important part of most history graduate school programs; and this research will thus prepare me for a graduate program in modern German history.

To accomplish the archival research I spent four days in the archives and library of the United States National Holocaust Memorial Museum in Washington, DC. While there, I consulted a variety of unpublished sources, including many unpublished survivor testimonies. Thus, the second major goal is to use these primary sources to write two papers for Dr. Freeman's class *The History of the Holocaust*. I consulted an unpublished memoir for a memoir assignment; however, most of my research contributed to a paper I am writing about how Germans reacted to *Kristallnacht*. *Kristallnacht* (German for 'night of broken glass') was the Nazi-initiated anti-Jewish pogrom of 9 November 1938, which occurred simultaneously across Germany. In the course of one night, about one hundred Jews were murdered, most Jewish-owned shops were heavily damaged with their windows broken, almost all synagogues were destroyed, and most adult male Jews were taken to concentration camps.

The use of these unpublished sources is a learning experience, as there is a significant difference between unpublished and published sources. In published sources there is generally an editor and other filters between the author and the reader (e.g. the publisher, translator, etc.). This can be both good and bad, as an editor and publisher can enforce a level of quality but can also alter or limit the author's original ideas and emotions.

In the case of unpublished sources, there are no filters between the researcher and the author; yet, the author's work may have significant limitations. One problem I encountered is imprecise or vague language, which the author might have corrected if there had been an editor. Another problem is that people who witnessed an important event often do not mention the specific things that historians are looking for in their accounts of that event. For example, in my research on *Kristallnacht*, some of the authors only discuss how the event affected their closest relatives; others mention onlookers, but generally did not describe them in as much detail as I would have liked. Thus every source, published or otherwise, has some kind of limitation, which historians can manage by using a variety of sources and by using the best sources they can find.

Diane Sokerka

Faculty Sponsor: Annacleta Chiweshe
Human Ecology

Download This!

The purpose of this creative project was to construct an outfit using non-traditional materials. The inspiration for the project was to make a statement about how consumed with computers and technology the people and products in our society have become. It seems as though everything has become computerized; therefore I thought it would be relevant to make clothing related to computer accessories. The fact that I was inspired to use CDs for this project is a statement to the wastefulness of advertising these days. To represent this fact I used this flashy, persuading "garbage" to create something useful. The materials used to create this project were denim, CDs, packing tape and computer cable. After drawing out the design, the first step was draping and constructing a base garment for the CDs. The top for this two piece outfit was made using cut up pieces of CDs. The skirt was made using pieces of cut up and uncut CDs. Using a mannequin, the CDs and pieces were carefully arranged on the garment and secured with packing tape. A halter neck was created using computer cable. This creative project will be presented at Student Research Day.

Alyssa Sorrentino, Lauren Howe, Krysten Kellman, Christopher Siragusa, Lindsey Beckwith, Kyra McTighe, Randelle McUmber, Eric Bratt, Joseph Simons (Psychology), **Peter Ilczyszyn** (Biology), **Megan Miraglia, Allison Dilzer, Ashley Gebcczyk, Kari Cubito, Jenna Smith** (Human Ecology)

Faculty Sponsors: Lawrence T. Guzy (Psychology), William Proulx (Human Ecology), Tracey Ranieri (Athletics)

Does Exercise-Induced Dehydration Effect Perception, Cognition, Mood, and Sleepiness?

Introduction: This project seeks to examine changes in perception, cognition, mood, and sleepiness as a result of exercise-induced dehydration. **Method:** We selected five individuals who exercise three or more times per week. They were in excellent physical shape. We required them to drink water to insure they were hydrated based on their weight over a period of two days. On the test day, they were presented with a series of tasks during the pre-test period. They produced a salivation sample, and were weighed and administered the bio-impedance test. They then exercised until they lost approximately 2% or more of their body weight. During this period they were closely monitored. They were free to do any exercise that they felt most comfortable in doing. Once they attained the targeted weight loss, we obtained a second saliva sample. The subjects then reported to the Perception Lab, where we conducted the same tests as those conducted prior to exercise: the Rod and Frame Task to evaluate the participant's ability to align a rod with the upright when the rod is surrounded by a frame presented at various off angles; the autokinetic illusion where a stationary spot of light appears to move; a vision test to determine if gaze is affected in vertically and horizontally aligning the two eyes; visual Guidance where vision was obscured and after several durations required to walk a path with vision occluded; present-moment mood using the Positive and Negative Affect Scales; and the Epworth Present Moment Sleepiness Scale. The bio-impedance test was conducted at the end of the series of tasks. Participants were required to rehydrate. One and two hours from the time they began rehydrating, they produced saliva specimens. For the control condition, the same procedure was followed with pre- and post-testing except that no exercise was required for a period of 60 minutes. They were required to hydrate during this period. **Results**: Data are presently being analyzed and will be presented at Student Research Day.

This project relies on known methods of precision measurement, including the use of the Piezo-Resonance Scale (PRS), which allows the researcher to verify and control the mechanism of the chemical reaction of each mono-atomic layer. In addition, the project features the results of initial research on the CAB method originally pursued in the Soviet Union.

David Tracy, Lauren Christian
Faculty Sponsor: Richard Grimaldi
Earth Sciences

Reformulation of the Heat Index to Include the Effects of Wind

The human body cools itself primarily 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 in 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 quantify 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 chamber approximates a rectangular volume with estimated dimensions of 3.5' x 7' x 3.5'. The chamber is to be equipped with a heating and moistening duct at its base, as well as a lateral duct through which airflow is generated. A precise amount of saline water at 98.6°F is to be misted upon a metallic surface also kept at body temperature inside the chamber. The time is takes for the simulated sweat to evaporate will then yield cooling power, in terms of watts, provided the mass and temperature are known. The same experiment is to be run for various combinations of temperature, dewpoint and windspeed. 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.

Kevin Vogler
Faculty Sponsor: Thomas Horvath
Environmental Sciences/Biology

Survey of Water Chestnut (*Trapa natans*) Invasion in Goodyear Lake

Water chestnut (*Trapa natans*), an aquatic plant originally from Asia, was first observed in North America near Concord, Massachusetts in 1859. The exact path for the introduction is unknown, but it is now invading many water bodies throughout the northeast. Water chestnut, different from the plant used in oriental cooking, is an annual plant that produces numerous seed pods that have extremely sharp spines. These spined pods can be a recreational nuisance as they can cause harm to swimmers and waders. The plant itself floats on the water surface and can reach very high densities, often clogging waterways, thereby causing recreational and navigational nuisances. Water chestnut was first noticed in Goodyear Lake in summer 2006. A group of interested citizens and the limnology class conducted an eradication by pulling as many knotweeds from the stumplot (an embayment at the lake's north end) of the lake as possible. As a follow up, using GPS, I began recording the location and density of chestnuts throughout Goodyear Lake. We now have a detailed map of its distribution, which will be helpful in further studies examining its dispersal in the lake, as well as any further eradication plans.

Manuel Soto
Faculty Sponsor: Geoffrey O'Shea
Psychology

Item Repetition in Go/No Go Reactions

In speeded choice reaction tasks, a well-known phenomenon is the repetition effect or the observation that reaction time (RT) to a stimulus that is identical to the previous stimulus is faster than RT to a stimulus that is different than the previous stimulus. In general, repetition effects are limited to a specific time period in the stimulus-response sequence. Specifically, when the response-to-stimulus interval (RSI) or the time elapsing between the response to one stimulus and the appearance of the next stimulus is less than 500 ms, a repetition effect is observed. However, for RSIs greater than 500 ms, an alternation effect is observed in which responses are faster to a stimulus that is different than the previous stimulus. There are two theoretical accounts of the repetition effect: 1) the repetition effect results from an automatic process in which less time is needed to select the response since it is the same response that was selected on the previous trial; or 2) the repetition effect reflects a conscious strategy on the part of the subject in which there is greater preparation to respond to the same stimulus as the previous trial rather than a different stimulus. The present experiment examined repetition effects in situations in which advance information is provided to subjects as to the nature of the forthcoming stimulus. Specifically, advance information was provided to subjects at intervals of either 250ms or 750ms before the appearance of the stimulus. It was theorized that continued repetition effects under conditions of advance information would support the idea of the repetition effect as an automatic process. However, the lack of a repetition effect under conditions of advance information would support the idea that the repetition effect may be due to strategic processes, since it would demonstrate that participants would be able to utilize the advance information to modify their responses. An additional question examined by the present research was whether repetition effects would be observed in situations where one of the stimuli was a no/go stimulus or one that did not require a response. Specifically, would a repetition effect be observed when the repeated sequence of stimuli was interrupted by a no/go stimulus? The results of the present research indicated that overall responding was faster when the RSI was 750ms than when it was 250ms, reflecting the greater ability to prepare a response based on the advance information. Importantly, there were no repetition or alternation effects observed under the 250ms and 750ms RSIs. However, repetition and alternation responses were significantly slower after trials featuring no/go stimuli. These results suggest that refraining to respond to a no/go stimulus impairs preparatory processes for the subsequent trial, even when advance information is provided regarding the nature of the forthcoming stimulus. In summary, the inclusion of advance information removes the repetition and alternation effects that are normally associated with the respective RSIs of 250ms and 750ms. However, despite the inclusion of advance information, response readiness to stimuli is reduced following the processing of a no/go stimulus.

Edward Stephan, Brian Benner
Faculty Sponsors: Donna Vogler, Adam Ryburn
Environmental Science/Biology

Flora of Franklin County

The New York State Flora Atlas is a state-wide record of both vascular and non-vascular plants organized by county. Many counties are highly underreported, in part because there have been limited botanical surveys of those regions. Of the 62 counties of New York State, Franklin County is one of the largest, yet it has one of the fewest numbers of documented (vouchered) specimens. For example, adjacent St. Lawrence County has 1,311 species, while Franklin County was listed as having only 535 species. Our goal was to update the number of documented occurrences of unlisted species present in Franklin County and to submit them to the New York State Flora Atlas. Our work, completed in fall 2006, increased the known flora of Franklin County by nearly ten percent. We documented three species on New York's top 20 invasive plant list and produced 70 voucher specimens for the SUNY College at Oneonta herbarium.

Brandon L. Taylor
Faculty Sponsors: P. Jay Fleisher, Arthur N. Palmer
Earth Sciences

Palmer K. Bailey (US Army Corps of Engineers [retired], Anchor Point, Alaska)
Eric M. Natel (Research and Development, Eastman Kodak, Rochester, NY)

Applying Karst Hydrologic Techniques to Calculate Englacial Tunnel Discharge, Bering Glacier, Alaska

A technique originally developed for use in limestone caves has been modified to estimate paleo-discharge through abandoned englacial tunnels at Bering Glacier, Alaska. As water moves in contact with tunnel wall irregularities, turbulent flow leads to uneven melting, thus resulting in the formation of a scallop pattern. Scallop asymmetry indicates paleo-flow direction and scallop wavelength may be used to yield velocity.

Paleo-flow velocity is estimated using a modified version of the Curl (1974) equation as follows:

$$Rn = [(\rho \, v \, \lambda)/\mu] = 21{,}000$$

where Reynolds Number (*Rn* anticipated at ~2100), fluid density (ρ), and fluid viscosity (μ) remain constant, thus establishing scallop wavelength (λ) to be entirely dependant on velocity (v). Although air currents may also move though a tunnel, they have no significant influence on scallop formation. Scallop studies in conjunction with multi-year mapping of tunnel expression on a continually declining surface offer new potential for defining and understanding the scale and magnitude of meltwater movement within glacial ice.

Jamila Thompson
Faculty Sponsor: Nancy Bachman
Biology

Microscopic Image Databases in Coppermine

This project used the motorized Olympus BX51 Microscope and digital camera to analyze histological slides. We took images of human cancer tissue slides as well as slides of normal human tissue. These were uploaded into Coppermine, a photo-gallery web application, and organized in the cancer histology album. We also captured forensic images to create a forensics album. The forensic images included those of human bones, blood, and sperm. Forensic images were used as part of a demonstration for the NSF-funded Preparation, Recruitment, Retention and Excellence in the Physical Sciences (PR^2EPS) summer high school science camp. A third album contains fluorescent images of bovine endothelial cells and human cervical cancer (HeLa) cells. Slides of HeLa cells were prepared by growing cells on cover slips and staining them with fluorescent dyes. HeLa cells were stained blue with DAPI to identify the nucleus and green with mitotracker to identify mitochondria. Using digital imaging, we also experimented with different color representations of the dyes to enhance contrast and better observe cell structures.

Christopher Tilley
Faculty Sponsor: Vitaliy Gubaydullin
Chemistry & Biochemistry

Chemical Atomic Buildup: A Method of Precision and Simplicity in Nanotechnology

Nanotechnology is a technology for physical, chemical, biological, medical or other processes that take place on a nanoscale level. The applications of this technology are limited by the versatility and costs associated with current methods of thin film production. The Chemical Atomic Buildup (CAB) method can be demonstrated to achieve higher levels of precision in the production of mono-layer and mono-molecular compounds on a given substrate. In addition, this method can be proven to be more environmentally attractive, as well as more efficient, than current technologies.

Katharine Warren, Karen Prior
Faculty Sponsor: Steven J. Gilbert
Psychology

Alternative, Computer-Driven Measures of Field Dependence/ Independence

Field dependence/independence is an individual difference dimension reflecting the extent to which one's perception of a focal stimulus is affected by contextual stimuli in which it is embedded. Field dependent individuals have difficulty disembedding a stimulus from its background (field).

Two kinds of tasks typically are used to measure field independence/dependence. One is the Rod and Frame Test (RFT), conducted in a dark room that contains an illuminated tilted frame surrounding a tilted rod. The participant's task is to rotate the rod to a vertical position, with errors reflecting greater field dependence. The second is the embedded figures test (EFT), in which participants must locate and trace a simple figure embedded in a more complex figure. Poor performance reflects greater field dependence.

Because both tasks require subjects to disembed a focal stimulus from a compelling field, performance on the two tasks should correlate highly. Witkin and colleagues (1954) reported a correlation of .76 between RFT and EFT. Most researchers, however, find correlations around .45 (Elliott, 1961; MacLeod, et al., 1986). An obvious difference between the two tasks, which may account for the attenuated correlations, is that the RFT implicates the visual-vestibular system (in judging verticality), and the EFT does not.

For the exploratory study reported here, we developed a computer driven version of the EFT (COMP-EFT) employing a progressively fading contextual mask, and two computer driven versions of the RFT (COMP-RFT), one an analog to the original and the other employing a multiple-choice format (MC-RFT). Subjects (33 women) were given each task individually, along with a version of the "Big Five" personality inventory. The results were mixed. There were significant correlations (in the expected direction) between the EFT and the titled frame trials of the COMP-RFT ($r = -.62$), and between the COMP-EFT and the titled frame trials of the MC-RFT ($r = +.46$). However, other expected correlations between the two embedded figures tasks and between the two RFTs, were not significant. An intriguing set of findings involved the trials in which the rod was presented surrounded by no frame at all. There were significant positive correlations with the titled frame conditions for both the COMP-RFT task ($r = +.35$) and the MC-RFT task ($r = +.56$), suggesting that Field Dependent people (as measured by error induced by the titled frame) experience both a strong "pull" from a disorienting field (titled frame), and a weak internal signal indicating verticality (in the absence of a frame).

Jillian Zick
Faculty Sponsor: Adam Ryburn
Biology

Echinacea: What It Is; Why It Works

Echinacea, also called the purple coneflower, has long been touted for its medicinal properties. This project, which involves extensive literature review, focuses on modern medicinal uses of Echinacea, including active constituents, acceptance of the medicinal community, and current research of efficiency.