

Faculty Senate Committee on Research



Student Research Day

Sponsored by ~

Alan B. Donovan (President),

Paul J. Adamo (Vice-President for College Advancement),

F. Daniel Larkin (Interim Provost)

Convivium Committee, Grants Development Office



Grant Recipients:

Dr. P. Jay Fleisher, Michael Senglaub, Evan Mankoff

Childs Glacier, Alaska, 2000

May 1, 2001

2:30 PM - 6:15 PM

**The Faculty Senate Committee on Research
is proud to present**

Student Research Day

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2:30 PM - 6:15 PM**



*Supported by the investment income of the College at Oneonta's
Unrestricted Endowment, made possible through charitable
gifts and grants to the College.*

**State University of New York
College at Oneonta
Oneonta, New York**

Current members of the Faculty Senate Committee on Research: Dr. Achim Koeddermann (Chair), Nancy Cannon (Secretary), coordinators of the Student Research Day; Dr. Kamala Mahanta, Dr. Hugh Gallagher (Treasurer), Dr. Bill Wilkerson (Webmaster).

PROGRAM

- 2:30** Poster sessions (listed on the next page)
- 3:00** Dr. F. Daniel Larkin, Interim Provost
- 3:15** *Sensory Diminution and Substitution: Seeing the World as a Dog*
Faculty: Dr. Don Allison, Dennis Higgins | Students: Sammie Lam, Yanshao Luan
- 3:25** *Tracking without Wires: Interacting with a Virtual World without Encumbrances*
Faculty: Dr. Don Allison, Dennis Higgins | Student: Didier Arango
- 3:35** *Hand Painted Photographic Murals*
Faculty: Charles Winters | Students: Justine Sefcik, Vincent M. Papandrea
- 3:45** *Meltwater Properties and Lake Basin Bathymetry, Sheridan Lake, Sheridan Glacier, AK: a Companion Study With Tsiu Lake, Bering Glacier, AK*
Faculty: Dr. P. Jay Fleisher | Student: Evan Mankoff
- 4:00** BREAK to view posters (listed on the next page)
- 4:30** *Study of the Output Characteristics of a Continuous CO₂ Laser*
Faculty: Dr. Sunil Labroo | Students: Daniel Logue, Richard Gray
- 4:40** *Transportation Induced Motion Sickness and Sleepiness In K-16 Students*
Faculty: Dr. Lawrence T. Guzy | Students: Donna Calabrese, Sheryl Goldberg, Lisa Putnam, Christina Zuill
- 4:50** *Use of Bioinformatics Tools in the Analysis of Proteins Encoded by the Neighbor of the Cytochrome c Oxidase IV Gene in Vertebrates*
Faculty: Dr. Nancy J. Bachman | Student: Craig M. Scott
- 5:00** *“Saraca”: a Study Into the Mind of Living With Our Ancestors*
Faculty: Dr. Donald Hill | Student: Justin Barrera
- 5:15** Dr. Alan B. Donovan, President
- 5:20** Guest Presentation: Jason Pelton, College at Oneonta Alumnus and Hydrogeologist, “A Student/Faculty Research Grant Jump Started My Career”
- 5:45-6:15** Poster Sessions (listed on the next page)

POSTER SESSIONS

Use of Bioinformatics Tools in the Analysis of Proteins Encoded by the Neighbor of the Cytochrome c Oxidase IV Gene in Vertebrates

Faculty: Dr. Nancy J. Bachman | Student: Craig M. Scott

Clashes in Political Ideology: The Foundations of Anglo/Mexican Conflict in Colonial Texas, 1820-1832

Faculty: Dr. Thomas D. Beal | Student: Michael S. Armstrong

Reading and Republican Motherhood: An Examination of Popular Fiction in the Early Republic, 1790-1825

Faculty: Dr. Thomas D. Beal | Student: Amanda M. Deloff

The Savanna as a Cultural Resource for Textile Design Inspiration

Faculty: Dr. Annacleta Chiweshe | Student: Hera Gnanadorai

Gastric Activity and Anxiety Sensitivity

Faculty: Dr. Peter A. Di Nardo | Student: Aimee Ellsworth

Meltwater Properties and Lake Basin Bathymetry, Tsiu Lake, Bering Glacier, AK: a Companion Study With Sheridan Lake, Sheridan Glacier, AK

Faculty: Dr. P. Jay Fleisher | Student: Michael Senglaub

An Investigation of the Magnus Force Using Digital Video Techniques

Faculty: Dr. Paul French | Students: Magdalena Nowicka, Michael Cornell, Steve Stewart, Colleen Wells, Luis Concha

The Study of Thin Film/Coating Technology Using the Thermal Evaporation High Vacuum System

Faculty: Dr. Kamala Mahanta | Students: Jason Blydenburgh, Robert Roback

An Examination of Female College Students' Choice of Nontraditional or Traditional Careers

Faculty: Dr. Cynthia Miller | Student: Lisa Putnam

An Examination of the Relationship Between Gender and Humor

Faculty: Dr. Cynthia Miller | Students: Marianne Grassi, Tricia Sleasman

Exploring Internet e-Business Programming Technologies

Faculty: Dr. James W. Ryder | Student: Minta S. Royster

Infrared Interface to Tom's Tool to Aid Motor Impaired User's in Reading

Faculty: Dr. James W. Ryder | Student: Walter V. Romero

*Sensory Diminution and Substitution:
Seeing the World as a Dog*

Faculty: **Dr. Don Allison, Dennis Higgins**
Students: **Sammie Lam, Yanshao Luan**

We have created a small (virtual) dog world with several rooms which a dog can explore using the software in which it was created (Cinema4DXL), using a C++ program, and using a headmounted display (HMD). Subject to time constraints we will implement some (or possibly all) of the following:

1. An outdoor area the dog can explore
2. Simulation of the dog's slightly different vision: A dog's eyes are placed at about a 20 degree angle which reduces binocular vision but increases peripheral vision and a dog's larger nose also affects the way its eyes work looking across the nose
3. Dog's only see two colors, plus grayscale
4. Dog's enhanced sense of smell might be simulated with light or sound cues

*Tracking without Wires: Interacting
with a Virtual World without
Encumbrances*

Faculty: **Dr. Don Allison,
Dennis Higgins**
Student: **Diedier Arango**

One problem in virtual reality worlds is "immersion", the feeling that what you are experiencing is real, not simulated. All your senses contribute to an overall feeling of immersion, including touch, smell, hearing, sight, balance. One aspect of this problem is addressed in this research project. A head mounted display (HMD) showing the modelled environment usually fails accurately to capture and reflect the movements of the subject herself: In other words, when wearing an HMD, if she holds an arm out in front of her, it does not appear in the simulated

environment (which is being computer generated). In this project we used USB-port cameras, C programming, and Open GL graphics to try to generate real-time imaging of a subject so that, in future work, this continually updated image information could be part of the simulated environment and consequently provide a better sense of immersion in the virtual world.

*Use of Bioinformatic Tools in the
Analysis of Proteins Encoded by
the Neighbor of the Cytochrome
c Oxidase IV Gene in Vertebrates*

Faculty:
Dr. Nancy J. Bachman
Student:
Craig M. Scott

Bioinformatics is the use of Internet and PC-based computer programs in the identification, analysis and characterization of genetic and molecular biology data. The goal of this research project was to use these tools to analyze cDNA clones of the Neighbor of the Cytochrome c Oxidase IV (NOC4) gene in two species – zebrafish (*Danio rerio*) and clawed frog (*Xenopus laevis*). The NOC4 gene encodes a cytoplasmic protein of unknown function. NOC4 is closely linked to the gene for a regulatory subunit (subunit IV) of the mitochondrial respiratory protein cytochrome c oxidase. The *NOC4* genes of vertebrates express approximately 1 kb transcripts encoding conserved

proteins with predicted molecular weight of 24 kilodaltons. These clones were sequenced in short segments and then aligned using computer software to produce the entire cDNA sequence. Further computer database searches identified another gene of unknown function named CGI-112. NOC4 and CGI-112 genes most likely arose by gene duplication of an ancestral gene. NOC4 and CGI-112 proteins are 40% identical in amino acid sequence. Amino acid sequence comparisons between NOC4 and CGI-112 proteins has identified regions shared by most members of the protein family as well as domains unique to each type of protein. A twelve amino acid consensus sequence (LVDFDNHLDDIR) is found near the carboxy terminus in all members of the protein family. We hope to use this conserved domain to help determine the functions of the NOC4 and CGI-112 proteins.

The Savanna As a Cultural Resource For Textile Design Inspiration

Faculty: **Dr. Annacleta Chiweshe**
Student: **Hera Gnanadorai**

The objective of this project is to create and implement a series of designs based on the Zimbabwean culture. Pieces of wearable art, wall hangings and soft sculpture will be designed and created using both traditional and non-traditional materials and techniques such as textiles and other found materials, machine embroidery, dyeing and painting. Designs from the project will be submitted to state, regional, national and international juried exhibitions.

The Relationship Between Anxiety Sensitivity and Gastric Activity In The Optokinetic Drum: Preliminary Findings

Faculty: **P.A. Di Nardo, C.L. Merced, L.T. Guzy, E. Muth**, Clemson University,
M. Osborne, Naval Aerospace Medical Research Laboratory, USN
Student: **A. A. Ellsworth**

Purpose: Anxiety sensitivity (AS) is the tendency to believe that sensations associated with anxiety or arousal (e.g., increases in heart rate or gastrointestinal sensations) are harmful. High AS is associated with anxiety disorders, and with more intense anxiety responses to biological challenges such as hyperventilation. Such findings suggest that AS is a vulnerability factor in anxiety disorders. High scores on the Anxiety Sensitivity Index (ASI), a widely used measure of AS, are associated with higher susceptibility to motion sickness as assessed by history, and by self-reported symptoms during exposure to a rotating (5 rpm) optokinetic drum (OKD). The present study examined the relationship between AS and gastric myoelectrical activity in response to the OKD. Method: Fifteen male and female volunteers (Mean age = 22 years) completed the ASI, then sat inside a rotating OKD with

obliquely oriented b/w stripes, and periodically reported on motion sickness symptoms. A Biolog electrogastrogram (EGG) monitored tachygastria (an electrical dysrhythmia that has been associated with nausea of motion sickness) during a 15 min pre-rotational baseline and during drum rotation. Post rotation, Ss completed the Nausea Profile (NP), a self report measure of motion sickness and related symptoms. Results: ASI scores were related to increases in tachygastria during rotation, $r = .56$, $p = .03$ indicating that Ss with high anxiety sensitivity showed a greater tendency towards motion sickness in the drum. Tachygastria during rotation was related to high scores on the NP, $r = .59$, $p = .02$, confirming that higher levels of tachygastria were related to increased levels of motion sickness symptoms. Conclusions: Although limited by a small N, these results suggest that AS may be a vulnerability factor in motion sickness. Taken together with the results of earlier studies, these results suggest that AS represents a risk factor common to both anxiety and motion sickness.

Contrasting Characteristics of Three Ice-Contact Lakes at Sheridan, Bering, and Mendenhall Glaciers, AK

Faculty: **P. Jay Fleisher Bailey, P. K.**,
Geology Department
University of North Dakota,
Grand Forks, ND
Students: **Evan T. Mankoff, Michael D. Senglaub, Monica J. Roth**

Moraines constrain Sheridan and Mendenhall Lakes, whereas the origin of Tsiu Lake basin, Bering Glacier, remains unresolved. A repeat bathymetric survey of Sheridan Lake confirmed 1999 data and provided new information from previously inaccessible segments of the basin. A persistent anomalous deepening of unknown origin within a wedge-shaped, ice-front declivity suggests low rates of sedimentation, as deduced from very low turbidity (<0.01 g/L). Water temperature uniformly ranges between (0.4-0.6°C) throughout the lake.

Tsiu Lake, monitored annually since 1990, shows pre-surge, surge, and post-surge changes in bathymetry, temperature, and turbidity. Venting of supercooled water common to other segments of the ice front is lacking and lake turbidity has diminished to 1.5/ g/L. Sediment influx from delta aggradation appears responsible for bathymetrically-determined, increased

annual accumulation (3 m/yr to 9 m/yr) as delta growth continues faster than ice front retreat, thus threatening to fill the lake.

Uniformly-low turbidity in Mendenhall Lake (0.1 g/L) may be attributed to a granitic provenance, although bathymetry suggests that sedimentation keeps pace with retreat. However, exceptionally low turbidity in Sheridan Lake must have alternate significance, because it occupies a graywacke terrain from which high sediment yield would be anticipated. Therefore, a lack of subglacial water movement is speculated.

These data indicate that although the general setting and sedimentary environment for each lake is similar, each location has its own set of conditions that reflect the influence of local controls.

Physical Characteristics and Bathymetry of Ice-Contact, Proglacial Sheridan Lake, Sheridan Glacier, Alaska

Faculty: **Dr. P.J. Fleisher**

P. K. Bailey

Geology Department, University of North Dakota
Grand Forks, ND

Student: **E. T. Mankoff**

Sheridan Lake evolved during retreat of Sheridan Glacier from an 18th century moraine. Separation from once confluent Sherman Glacier provided space for spreading of a small, 5 km wide piedmont lobe. Since 1950 (earliest topographic quadrangle) several ephemeral basins merged, and by 1965 three distinct and separate, ice-contact, proglacial lakes had formed, each with separate outflow streams.

Aerial photos show that continued retreat during the ensuing decade led to the coalescing of the western and southern basins, drained by Sheridan River, as the eastern basin filled with Sherman Glacier outwash.

The lake shore and ice front position are represented on a new 2000 GPS-based map. The ice front maintains a uniform trend where the gently sloping ice surface enters the lake, but consists of ice-wall promontories and wedge-shaped reentrants where calving along intersecting splaying crevasses occurs.

Bathymetric information reveals a common ice front depth ranging from 40-70 m. However, within a wedge-shaped reentrant reaching 400 m up glacier, the lake bottom plunges from 65 m to 130 m, thus placing the lake floor 85 m below msl. Comparison with 1999 depth data indicates negligible annual sediment accumulation. This may be related to very low turbidity (<0.01 g/L), a condition unexpected from a graywacke provenance. Low suspended sediment combined with uniform temperature values (0.4-0.6°C) throughout the water column suggest a lack of subglacial water inflow.

An Investigation of the Magnus Force Using Digital Video Techniques

Faculty: **Dr. Paul French**

Students: **Magdalena Nowicka,
Michael Cornell, Steve Stewart,
Colleen Wells, Luis Concha**

The effects of air resistance are recognized by scientists and non-scientists alike. Specifically, projectiles such as arrows have been the subject of numerous scientific studies dating back even as far as Aristotle, who postulated the concept of antiperistasis. In the context of sports, there are three basic effects that are all accepted as important to the motion of a projectile: gravity, standard air resistance, and the Magnus force. The Magnus force is the spin force created by the differential pressure due to differential air speed relative to opposite surfaces of a spinning object. Using modern, high-speed video capture techniques, the Magnus coefficient has been determined to increase

linearly with the product of velocity and angular velocity. In addition, the standard air resistance has also been extracted. This force increases quadratically with speed.

Transportation Induced Motion Sickness and Sleepiness In K-16 Students

Faculty: **Dr. Lawrence T. Guzy**
Students: **Donna Calabrese, Sheryl Goldberg, Daniel Guzman, Lisa Putnam, Christina Zuill**

Purpose: We examined the incidence of sleepiness and motion sickness as they relate to modes of travel to school. Method: We designed a questionnaire that was administered to 179 introductory psychology students. Results: Across the different age groups, walking produced the fewest reports of Motion Sickness (1%) and sleepiness (33%) and bus riding produced the highest incidence of Motion Sickness (13%) and sleepiness (60%). Students who reported Motion Sickness rarely reported sleepiness. Implication: Symptoms associated with bus riding may affect academic performance shortly after arriving to school.

"Saraca": a Study Into the Mind of Living With Our Ancestors

Faculty: **Dr. Donald Hill**
Student: **Justin Barrera**

Before heading out to Carriacou, I was asked by the funding committee what hard facts I would retrieve from the island. Ironically, my trip out to the Caribbean (as a field follow-up to classes taken at SUCO) was premised on the notion that the expected retrieval of facts was impractical precisely because the "Facts" would change in their tension, elasticity, and solidness in their movement from one culture to another.

Basing myself on the Stanley Fish notions of "Communities of Interpretation," my starting point would be the pursuit of distinguishing discrete elements of differentiation that would distance my semiotic system of interpretation with that of the Carriacouans. What I concluded from my experience there was that "loudness" and expression of the act was unnecessary because the statements were obviously objectifiable. What was needed was clarity or fluency in communication of the act. This can only be achieved through the accurate translation of life narratives, shifting from the signifiers and the coherence proper to one culture over to another. The fact (in the latin sense of "act") would be identifiable in any layer of clothing. The variation and the reason for variation in these clothings was the final focus of my still ongoing study.

Study of the Output Characteristics of a Continuous CO₂ Laser

Faculty: **Dr. Sunil Labroo**
Students: **Daniel Logue, Richard Gray**

We have assembled the various parts of a 2-meter CO₂ laser and it is now operational. Since the completion of the assembly stage, the laser output was studied as a function of electrical input power and gas flow rate to determine the most efficient working combination of this laser. Our results indicate that the laser performs most efficiently at a gas flow rate of about 3000 ml/min. The maximum power we were able

to extract at this stage was about 11 watts continuous, which is well below the capability. We believe that installing new windows and a better alignment will enhance the performance of this laser.

An Examination of the Relationship Between Gender and Humor

Faculty: **Dr. Cynthia Miller**
Students: **Tricia Sleasman, Marianne Grassi**

Some previous research has shown that women's and men's differential responsiveness to humor depends on many factors, including sexual explicitness and the use of gender stereotypes. The purpose of the present study was principally to test the hypothesis that women find jokes that use male stereotypes funnier than jokes that use female stereotypes, and that men find female-stereotyped jokes funnier than male-stereotyped jokes. Secondly, we were interested in whether the gender of the joke teller makes a difference to individuals' responses to gender-stereotyped humor. In the study, 43 participants (15 male

and 28 female Psychology undergraduates) heard a random order of 24 jokes, which included 8 jokes that used male stereotypes, 8 jokes that used female stereotypes and 8 jokes that were gender-neutral. Half of the participants heard these jokes told by a female speaker, and half by a male speaker. Each joke was rated on a scale of 1 to 10, where 1 meant "not funny at all" and 10 meant "extremely funny." Mean funniness ratings were computed for gender of joke target, gender of participant, and gender of speaker. Preliminary analyses indicated that men rated female-stereotyped jokes as funnier than women did, and that women rated male-stereotyped jokes as funnier than men did, and as funnier than female-stereotyped jokes. There were no significant main effects or interactions due to gender of speaker. Thus, the hypothesis that individuals would find humor funny when the target of the joke was the other sex was supported. These results, although supporting our hypothesis, need to be considered carefully, however, because of the small sample size, as well as other methodological issues.

*An Examination of Female
College Students' Choice of
Nontraditional or Traditional
Careers*

Faculty: **Dr. Cynthia Miller**

Students:

Lisa Putnam, Elizabeth Heagle

Nontraditional careers are those in which there is a gender imbalance, where less than 25% of the workers are either males or females (www.albany.edu/nontraditionalcareers/careers03.htm, 1/14/01). In a study done by Derryberry and others (1979), the issue of what factors functioned as barriers to the pursuit of women and men into nontraditional careers were examined. Some of these factors include student occupational aspirations, the role of parents and other adults in influencing occupational choice, and the reasons they would be reluctant to enter a nontraditional career.

The purpose of the present study is twofold. First, we intend to revisit some of the issues raised by the Derryberry et al. (1979) study (now 22 years old) by administering the same questionnaire to a more contemporary sample, and second, we will prepare an extensive literature review concerning nontraditional career choices by women. Female undergraduate students were recruited for this study based on their major and/or chosen course of study. A small monetary incentive (\$10) was provided for participants. The participants were given a questionnaire containing the career aspiration profile that was used in the Derryberry et al. study. The questionnaire took approximately 30 minutes to complete. Data analyses will focus on the similarities and differences between the current sample and that of Derryberry et al. (1979), as well as an analysis of how the current data fit into the larger picture suggested by our literature review.

Clashes in Political Ideology: The Foundations of Anglo/Mexican Conflict in Colonial Texas, 1820-1832

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