4-10-2001

Student Research Colloquium 2001

St. Cloud State University

STUDENT RESEARCH COLLOQUIUM 2001

Tuesday, April 10, 2001

SCSU Atwood Center, Upper Level, 2nd Floor

10:30 a.m. - 4:00 p.m.

ST. CLOUD STATE
UNIVERSITY
A tradition of excellence and opportunity

St. Cloud State University
Student Research Colloquium 2001

Acknowledgements

The Fourth Annual St. Cloud State University Student Research Colloquium was organized by the Student Research Colloquium 2001 Planning Committee. The members of the committee include:

- Leslie Valdes, Department of Psychology (Colloquium Coordinator)
- Niaz Ahmed, College of Fine Arts and Humanities
- Richard Brundage, Department of Physics, Astronomy and Engineering Science
- Juan Cabanela, Department of Physics, Astronomy and Engineering Science
- Susan Jensen-Cekalla, Office of Sponsored Programs
- Jennifer Kolden, College of Science and Engineering Applied Research Center
- Denise McGuire, College of Science an Engineering Applied Research Center
- Don Neu, Department of Chemistry
- Richard Rothaus, Office of Sponsored Programs
- Karen Wenz, Center for Information Systems
- Carolyn Williams, College of Social Sciences

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And a special thanks to

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College of Science & Engineering
Undergraduate Research Award Recipients 2000-2001

Student Title of Research Project	Faculty Sponsor	Faculty Department
1) **Jonathan Conder** *"Error Analysis of the Next Generation Radar Storm Total Precipitation Estimates"*	Tony Hansen	Earth Sciences
2) **Yaiza Diaz-De-Durana** *"Testicular and Brain Nitric Oxide Synthase (NOS) Gene Expression in Aged, Immobilized Rats"*	Oladele Gazal	Biological Sciences
3) **Melissa Link** *"Determination of Substrate Specificity of Polymorphic Human Class-3 Aldehyde Dehydrogenases (ALDH3A1), viz., nALDH3A1 and tALDH3A1"*	L. Sreerama	Chemistry
4) **Jeffrey Luxford** *"A Chemical Analysis of Cold-Weather Precipitation in St. Cloud, Minnesota"*	Tony Hansen	Earth Sciences
5) **Brandie McCray & Melissa Olson** *"The Effects of Declining Temperature Gradations on the Viability of Harmonia Axyridis (Coleoptera:Coccinellidae) Populations"*	Ralph Gundersen	Biological Sciences
6) **Bryan Meade** *"Simplified Purification of Cellular Retinol Binding Protein II"*	Nathan Winter	Chemistry
7) **Randy Mrozek** *"Chemical Modification of a Quartz Crystal Microbalance for Use as an Aqueous or Gas Phase Sensor"*	Donald Neu	Chemistry
8) **Sarah Reed** *"Determining Extinction Coefficients for the St. Cloud State Observatory"*	Maria Womack	Physics, Astronomy, and Engineering Science
9) **Michael Spinar** *"A Predictability Study Using a Non-Divergent Barotropic Vorticity Model"*	Tony Hansen	Earth Sciences
10) **Amy Weinzierl** *"An Eyewall Examination of a Rapidly Intensifying Tropical Cyclone: A Case Study of Hurricane Bret"*	Tony Hansen	Earth Sciences

Award recipients will receive an award stipend of $215.00, necessary funds for research supplies, and formal recognition by the College of Science & Engineering upon completion and presentation of their research project.

Schedule of Events

Time	Event	Location in Atwood Memorial Center (AMC)
	Oral Presentations	
10:00 to 10:30	Registration and set up	Atwood Center Upper Level
	Paper Sessions	
10:30 to 12:30	A: Science and Engineering III	South Glacier, 2nd floor
10:30 to 12:10	B: Science and Engineering I	North Voyageurs, 2nd floor
10:30 to 12:10	C: Science and Engineering II	South Voyageurs, 2nd floor
10:30 to 11:50	D: Behavioral Sciences I	Lewis-Clark, 2nd floor
10:30 to 12:35	E: Fine Arts and Humanities	Mississippi, 1st floor
10:30 to 12:10	F: Behavioral Sciences II	Watab-Sauk, 1st floor
10:30 to 11:50	G: Behavioral Sciences III	North Glacier, 2nd floor
	College of Science & Engineering Undergraduate Research Award 2000-2001	
12:15 to 12:45	Award Ceremony	North Voyageurs, 2nd floor

Keynote Address:

Dr. Nancy Walters received her bachelor's degree in biology from Virginia State College, a master's degree in education from Ohio State University, a master's degree in public administration from the University of Minnesota (supported by a Bush Fellowship) and a doctorate in educational policy and administration from the University of Minnesota. Dr. Walters is currently the program manager for the Minnesota Higher Education Services Office.

1:00 to 2:00	Developing Researchers for Emerging Technology	Little Theatre, 1st floor
	Poster Presentations	
1:30 to 2:00	Registration and set up	Atwood Center Upper Level
2:00 to 3:30	Session H: All Disciplines	Ballroom, 2nd floor

Program

Session A	South Glacier	Session Discipline: Science and Engineering III
Presentation Index		Moderated by: Diana Burlison, Assistant Vice President for Financial Management
10:30 AM A1	Alex Krueger Bridget Bethke Ray Melberg	Home Intercom System
10:50 AM A2	Nadeem Chaudhry Fahd Habeeb	BroadBand 3G Wireless Communications
11:10 AM A3	Mike Schock Jason Langfield Matt Ethen	Car Audio MP3 Player
11:30 AM A4	Todd Carlson	Economical Scrap Handling
11:50 AM A5	David Tax Aaron Bisek	Improving Vertran's Drivability
12:10 AM A6	Jacob Stock Benjamin Munt	Evaluation of the Letter Setting Process For The Production of Bronze Plaques

Session B	North Voyageurs	Session Discipline: Science and Engineering I
Presentation Index		Moderated by: Dale Williams, Associate Dean for the College of Science and Engineering
10:30 AM B1	Brian Henning	The Barn Yard Boogie Woogie
10:50 AM B2	Shawn Roering	How To Measure Fractals
11:10 AM B3	Kurt Koester Randy Mrozek	Aluminum Modification by the Sol Gel Process
11:30 AM B4	Alicia Spychala	Computational Chemistry
11:50 AM B5	Theron Blount	A Model For J/psi Suppression

Session C	South Voyageurs	Session Discipline: Science and Engineering II
Presentation Index		Moderated by: Annette Wilson, Special Assistant to the President - General Counsel
10:30 AM C1	Michael Spinar	A Predictability Study Using a Non-Divergent Barotropic Vorticity Model
10:50 AM C2	Jacob Gontesky	Error Analysis of the ASOS HTB PAS During Cold-Weather Precipitation Events
11:10 AM C3	Carrie Link	Photolysis of Phenylisocyanates and Phenylisothiocyanates
11:30 AM C4	Marcel Goldschen Brent Williams	Observations of Interstellar Oxygen
11:50 AM C5	Susan Hansen	Analysis of Disinfection Byproducts in St. Cloud Drinking Water

Session D	Lewis-Clark	Session Discipline: Behavioral Sciences I
Presentation Index		Moderated by: Robert Bayne, Interim Vice President for Student Life and Development
10:30 AM D1	Leslie Russell	Identification of Equine Emotions by Human Counterparts
10:50 AM D2	Mae Petrangelo	Prelinguistic Vocal Characteristics of Children with Cleft Palate
11:10 AM D3	Naomi Green	Experience in Spanish Speaking Cultures: Effect of Interest Level
11:30 AM D4	Jessica Walsh	Japanimation and the World of the Otaku

Session E	Mississippi	Session Discipline: Fine Arts and Humanities
Presentation Index		Moderated by: Judy Foster, Faculty Association President
10:30 AM E1	Hanni Baugh Bethany Urban Neil Dunn	Bringing Them to Us and Us to Them: Student-Produced Theatre Northern Irish Drama "Carthaginians"
10:50 AM E2	Guy Rice	The Irrationality of Belief
11:05 AM E3	Lawrence Giebenhain	Testimony, Rationality and the Belief in God
11:20 AM E4	Keith Johnson	Dilemmas of Reflective Equilibrium
11:35 AM E5	Michael Paggen	The Rationality and Objectivity of Science
11:50 AM E6	J. Christopher Joiner	Ascribing Rationality
12:05 PM E7	James Newman	Behaviorism and Rationality
12:20 PM E8	Justin Cox	Karl Popper

Session F	Watab-Sauk	Session Discipline: Behavioral Sciences II
Presentation Index		Moderated by: Michael Pesch, Associate Dean for the G. R. Herberger College of Business
10:30 AM F1	Bridget Keanery Mina Johnson Bill Hyers	Study of Survey Research Data on St. Cloud Students' Drinking and Drug Use
10:50 PM F2	Angela Bennett Sonu Kapoor Stefanie Morseth	SCSU: Up In Smoke?
11:10 AM F3	Matthew Heffron	Land Distribution as a Measure of Democracy
11:30 AM F4	Ming Chee Ming Tan Ulrik Nielsen	Building Effective Web Sites for Export Marketing
11:50 AM F5	Holly Dasinger	Women and Political Participation

Session G	North Glacier	Session Discipline: Behavioral Sciences III
Presentation Index		Moderated by: Mary Soroko, Director of Institutional Research and Planning
10:30 AM G1	Lisa Becker	Born to Rape?
10:50 AM G2	Laura Vobelt Lisa Fredricks Cheryl Willenbring	Family Violence and Youth Runaways
11:10 AM G3	Jon Cody Kim Kokett	Analysis of the Development of YMCA Programs and Services
11:30 AM G4	Charlotte Stokes Jeffrey Williams	Evaluating Family Peace

Keynote Address		Atwood Little Theatre
	Welcome to the 2001 Annual Student Research Colloquium by: Suzanne Williams, Academic Vice President	
	Introduced by: Carolyn Williams, Associate Dean for the College of Social Sciences	
1:00	Nancy Walters	Developing Researchers for Emerging Technology

Session H	Ballroom	Session Discipline: All Disciplines

Presentation Index

2:00 PM	H01	Jenny Fields Chris Busse	Effects of Regular Voluntary Exercise of Pregnant Spontaneously Hypertensive Rats (SHR) on the Development of Hypertension in the Subsequent Offspring
	H02	Jacie Swanson Bruce DeGrote	Distribution of Exon 2 Mutant Allele of Human Class-3 Aldehyde Dehydrogenase
	H03	Melissa Link	Substrate Specificity of Human Class-3 Aldehyde Dehydrogenase
	H04	Jacob Gontesky	Error Analysis of the ASOS HTB PAS During Cold-Weather Precipitation Events
	H05	Angela Nelson	Short-Term Memory: Effects of Long-Term Activation
	H06	Nadeem Chaudhry Fahd Habeeb	BroadBand 3G Wireless Communications
	H07	Carla Berg	Teen Peace Fair
	H08	Sarah Williamson Missy Hansen Krista Jorgensen Alison Seevers Nicole Propson	YMCA Donations
	H09	Angela Frelich	The Effects of Gender on Toxicology of 14 Days of Ribose Ingestion
	H10	Tracy Beil	Pressure Measurement During Ambulation Under Two Prosthetic Socket Conditions
	H11	Heather Gerdin Tara Hanson	YMCA Memberships
	H12	Matthew Nelson	Sand Prairie Vegetation Analysis
	H13	Joy Fitzsimons	Memory Strategies for Mental Health Practitioners
	H14	Craig Schapira Amanda Pfalzgraf	Non-Board Volunteers
	H15	James Burkham Brandon Maki	YMCA Board Members Research
	H16	Amy Magnuson	Students' Identification of Stuttering
	H17	Jeremy Frost	The Effects of a Heat-Exchange Mask on Physiological Function in EIA Subjects
	H18	Emily Rudrud	FI Schedules and Web Courses
	H19	Amy Weinzierl	Eyewall Examination of a Rapidly Intensifying Tropical Cyclone: Case Study of Hurricane Bret
	H20	Eric Hjelm	Quorum Sensing and Pseudomonads
	H21	Jonathan Conder	Error Analysis of the Next Generation Radar Storm Total Precipitation Estimates
	H22	Megan McNair Steve Vrieze	Predicting Heart Rate and Blood Lactate in a Roller Ski Biathalon Race Using Field Test Data
	H23	Tal Amasay	Can Digitizing be Used to Detect the SSC in Squat Jump that Cannot be Detected with the Force Plate?
	H24	Julia Devonish	The Glycemic Index of Sports Bars
	H25	Kate Lawrence Derek Schack	Junior High Students Get a Peace of Fun
	H26	Sarah Reed Kortlan Strom Peter Crandall	Determining Extinction Coefficients at St. Cloud State Observatory
	H27	Judith Peters	A Nuclear Fireball with Flow
	H28	Aaron Theis	Headspace Solvent Microextraction
	H29	Philip Tourand	Solvent Microextraction Combined with High Performance Liquid Chromatography
	H30	Beth Hecker	Peoples' Attitudes Towards AIDS and How They Attribute to Homophobia
	H31	Dylan Wojchouski	MDM1: A Question of Efficacy in Regard to Heat-inducible Degron
	H32	Michelle St. Clair	Gender Effects on the Sentencing of Criminals

Session H	Ballroom	Session Discipline: All Disciplines	

Presentation Index

2:00 PM	H33	Roman Marjamaa Deq Hussein	Wireless Millennium LED Light Bar with PC Interface
	H34	Jeffrey Luxford	An Investigation of Precipitation During the Winter in St. Cloud, MN
	H35	Sara Felten	Statistical Modeling of the Interarrival Times of Packets in a Computer Network
	H36	Taryn Cochran	Rights of Human Subjects
	H37	Matthew Steinbrink	Innocent until Proven Guilty: The Practical and Ethical Dilemmas of Wrongful Convictions
	H38	Bradley Ryan Westphal Range	Aviation Emergency Locator Receiver with GPS, Digital Compass, and a PC James Robert Graphical User Interface with Geographic Mapping Capability
	H39	Burton Afonja Jason Lunden	Short-term Fasting Effects on Plasma and Central Motilin Release in Cows – A Preliminary Report
	H40	Tony Dehn Hoon Yoo Nick DeLisi	Wireless Web Cam
	H41	Bryan Meade	Amplification and Expression of Cellular Binding Protein
	H42	Yaiza Diaz-De-Durana	Testicular and Brain Nitric Oxide Synthase (NOS) Gene Expression in Aged Immobilized Rats
	H43	Alyssa Braaten	Individual Differences in Attention and Memory: Use of Quantitative Electroencephalographs
	H44	Ghias Amer Ahmed Rashed Karin Fazlul	Wireless Vote Tallying
	H45	Hanh Vo Hieu Nguygen Nabin Sharma	Remote Controlled Robotic Arm
	H46	Krista Dillman	Perceived Mother-Infant and Father-Infant Attachment During Two Feeding Situations
	H47	Xie Huimin	Chinese English Tense
	H48	Brandie McCray Melissa Olson	The Effects of Declining Temperature Gradations on the Viability of Harmonia Axyridis
	H49	Joe Dunbar	P31 NMR Studies of the Reaction Catalyzed by Creatine Kinase

Abstracts

Home Intercom System

Alex Krueger, Bridget Bethke, and Ray Melberg

Sponsor: Ling Hou
St. Cloud State University, Electrical and Computer Engineering

Wireless home intercom systems are an excellent solution for in-home communication. They are not only portable, but are a cost effective way of providing communications between different rooms or floors within a house. The purpose of our Senior Design Project is to design and construct a Wireless RF (Radio Frequency) Home Intercom System. It incorporates a number of Electrical Engineering fields, including communications, analog circuitry, digital circuitry, signal processing, and microcontrollers. This system is designed for use in any situation where short-range communication between up to three parties is desired. It is easy to use and include power supplies operated by a 120V AC wall outlet. Our intercom devices have a number of features not present on most other marketed intercom systems. They include

- Lighted Rocker Selection Switches, one for each intercom, so the user of the intercom box can select which other intercom(s) will receive the message.
- An Incoming Signal Indicator light on each intercom tells the user if someone else is sending them a signal.
- A LED on each box allows the receiver-end unit to be able to identify the origin of the incoming signal being transmitted.
- Expandable: Any number of devices can be added to the existing system. Removable AC power cords.

Presentation Index: A1

BroadBand 3G Wireless Communications

Nadeem Chaudhry and Fahd Habeeb

Sponsors: Zheng Yi and Aiping Yao
St. Cloud State University, Electrical and Computer Engineering

The revolution in wireless communication is bringing fundamental changes to data networking, telecommunication, and integrated networks. Some of the most common implications of wireless technology are wireless LAN, mobile radio networks, and cellular systems. The wideband wireless communication system, third generation (3G) wireless, provides Internet accessing ability to a portable device. The 3G systems provide up to a bandwidth of 2MHz mobile applications. Considering that it is applied in a moving environment with a small device with an omni antenna, 2MHz is wideband comparing to current small portable devices with a bandwidth at KHz ranges. The 3G technology is still in the research development stage and may be implemented in the next few years. The objective of our Senior Design project is to design and develop a mobile broadband wireless communication system, operating at 2.4GHz, using most advanced wireless communication technologies including Orthogonal Frequency-Division Multiplexing (OFDM), Quadrature Amplitude Modulation (QAM), and Code Division Multiple Access (CDMA). OFDM is a relatively new technology, which transfers band-limited signals to orthogonal signals for multi-channel transmission, with the minimized Inter-Channel Interference (ICI), and Inter-Symbol Interference (ISI). Our system sends data from a PC via USB bus to a digital signal processing board and code the data in T1 format. T1 signal will be sent to a transmitter that codes the data by the QAM and CDMA and transmit the coded as radio frequency (RF) signal at 2.4GHz. Simulation for OFDM code will be done in the PC or the digital signal processing board prior to the transmission. At the receive terminal, the data will be decoded and converted from T1 to binary format and send to a receiving PC through the digital signal processing board and the USB interface. The final goal of the project is to transmit data from PC to PC, through our wireless system at a rate of up to 1.544 Mega bits per second. The project will evaluate the performances of the QAM, CDMA, and OFDM for wideband wireless communication systems and its applications for the 3G technologies.

Presentation Index: A2

Car Audio MP3 Player
Mike Schock, Jason Langfield, and Matt Ethen

Sponsor: J. Michael Heneghan
St. Cloud State University, Electrical and Computer Engineering

We are on the verge of a blooming digital music revolution. In the music industry we have seen CD's replace cassettes and LP's. Now we see the advancements of digital music, such as the MP3 format, which can store 650 MB of digital music from a CD in approximately 10% as much space without loosing music quality. The purpose of this project is to construct a car audio device to play MP3 music, allow the user to store music on a removable storage device, and also construct a docking station, which will allow the user to change the music that is on that storage device. To accomplish this task we not only must construct working hardware and software, but also take into affect the variety of automobiles available, and the extreme weather and temperature conditions encountered by an automobile in everyday operation.

Presentation Index: A3

Economical Scrap Handling
Todd Carlson

Sponsor: Steven Covey
St. Cloud State University, Mechanical and Manufacturing Engineering

There is an average of 250,000 pounds of aluminum chips produced annually by Alexandria Extrusion Company. Approximately ¼, or 75,000 pounds, of the chips produced are machining chips from the 15 CNC machining centers. The remainder of the chips is saw chips from the Oliver saws at the presses, and the Metlsaws in the saw shop, plus the addition of two miter saws. These chips are currently loaded into an enclosed semi-trailer, and sold to our scrap customer for $0.06 below the premium price for clean and dry turnings. AEC has expressed an interest in increasing the price obtained from the chips, lowering the labor costs associated with chip handling, and reducing environmental liability resulting from the current system.

Presentation Index: A4

Improving Vertran's Drivability
Aaron Bisek and David Tax

Sponsor: Warren Yu
St. Cloud State University, Mechanical and Manufacturing Engineering

Fena Design Incorporated, the makers of a standing/seated wheelchair, called Vertran, sponsored a design project to improve the drivability of the wheelchair in the seated position. Vertran has been designed and developed to be optimally driven in the standing position. Currently when the wheelchair is in the standing position the center of mass is closer to being over the drive wheels compared to when the wheelchair is in the seated position. Weight shifting occurs due to seat positioning of the operator between the seated and standing positions. Tracking and traction, in the seated position, was a concern for Vertran's current design. This makes it difficult for the operator to drive with ease. We wanted to find a way to eliminate the effects allowing the operator to have the same amount of control while driving in either the seated or standing position. The mobility that has been currently established in the standing position was maintained during any design changes. Some areas that were tested to improve the drivability included the use of different drive wheels, mechanical changes in the caster positions, and changing the weight distribution on the drive wheels. Final design changes were made based off the data collected from multiple tests to obtain improvements in the drivability.

Presentation Index: A5

Evaluation of the Letter Setting Process For The Production of Bronze Plaques

Jacob Stock and Benjamin Munt

Sponsor: Steven Covey

St. Cloud State University, Mechanical and Manufacturing Engineering

Several manufacturing processes in industry require the use of manual labor. One such labor intense practice is the production of patterns, which are to be used to make sand molds for the casting process. Cold Spring Bronze, a division of The Cold Spring Granite Company, produces bronze plaques, which are used as building and headstone memorials. To account for the large variety of words used on the memorial plaques, patterns are produced by securing letters in place on a blank pattern. This process is known as the letter setting process. Cold Spring Bronze is currently experiencing a large return rate due to letter setting errors. Cold Spring Bronze is also in the process of building a new manufacturing facility. It was the goal of this project to increase the quality of the plaques being produced while increasing the efficiency of the letter setting process to reduce floor space in the new facility. Seven options were evaluated: rapid prototyping, CNC milling of sand and wax, overhead projection, UV liquid polymerization, automated pick and place cell, adhesive dissolvable paper, and sandblasting. It was determined that the best solution involved a combination of 3 concepts: UV liquid polymerization, CNC milling in sand, and overhead projection. The UV liquid polymerization process will be used to produce patterns with large amounts of letters and/or very small font sizes. The CNC milling process will be investigated further for the use of producing letters with flat surfaces. The overhead projection process, which projects images of the letters onto a blank plaque, will be used on the remaining manual letter setting cells.

Presentation Index: A6

The Barn Yard Boogie Woogie

Brian Henning

Sponsor: Dale Buske

St. Cloud State University, Mathematics

Dr. Buske's three-year old daughter wants to play the Barn Yard Boogie Woogie game. The rules state that the youngest player always starts. As more games are played, Dr. Buske notices that his daughter is winning most of the time. Does she have an advantage by going first? How much of one? This talk will attempt to answer the question "What is the probability that the player who starts this game wins?" Cases involving different game boards, the number of animals to be collected, number of dice, faces on each die, and number of players will be considered.

Presentation Index: B1

How To Measure Fractals

Shawn Roering

Sponsor: Danrun Huang

St. Cloud State University, Mathematics

Everywhere around us, we are surrounded by naturally occurring patterns found in clouds, mountain ranges, trees, etc. Many of which can be considered as some types of fractals. Briefly, fractals are a rough or fragmented geometric shape consisting of parts that each present self-similarity (or at least approximately) in reduced-size to the larger whole. By studying fractals, we have discovered how to measure very complex structures (such as shorelines of islands) using fractal dimensions. In this talk, I will explain one such type of fractals created by Iterated Function Systems (IFS). I will also explain how to measure various fractals and how to construct or approximate them. Technology will be used for this talk. Come see how to make a SCSU logo using fractals.

Presentation Index: B2

Aluminum Modification by the Sol Gel Process

Kurt Koester and Randy Mrozek

Sponsor: Don Neu
St. Cloud State University, Chemistry

The focus of the research is to modify the aluminum surface of a quartz crystal microbalance so that it can be used as a water or gas phase sensor. A quartz crystal microbalance is a relatively inexpensive instrument that is very portable. This makes it an excellent tool for field research. The most important aspect of the instrument is not its portability but its ability to accurately measure masses on the order of a nanogram, 10-9g. The quartz crystal is able to detect such a small mass because it oscillates at a specific frequency depending on its thickness. This frequency will change proportionally with added mass. A very small frequency change can be measured and thus a very small mass change. By modifying the surface of the microbalance to absorb certain molecules we can detect a mass change verifying its presence. This modification is done by means of the sol-gel process and vapor phase deposition. The result is a uniform monolayer of functionalized glass that will absorb only certain molecules.

Presentation Index: B3

Computational Chemistry

Alicia Spychala

Sponsor: Dan Gregory
St. Cloud State University, Chemistry

Sulfinyl radicals have been proposed as important intermediates in both atmospheric chemistry and the chemistry of biological sciences. The self coupling reaction of several substituted phenyl sulfinyl radicals have been investigated using laser flash photolysis. Although several authors have estimated the rate of constants for self-termination reaction under various conditions, the mechanism for this reaction has not been resolved. There are three paths the sulfinyl radical might follow in the initial dimerization. However, these intermediates are not stable enough to be observed spectroscopically. Therefore, the focus of the study is to characterize the sulfinyl radical intermediates computationally in order to understand the role these chemicals play in the dimerization of sulfinyl radicals. By doing Hartree-Fock calculations with optimization of 6-311gdp we are able to calculate the energetics of the sulfinyl radicals and estimate the radical intermediates. By looking at the intrinsic reaction coordinate (IRC) method we can obtain the minimum energy path that connects the reactants to the products through the transition state. By looking at the multi configurational self consistent field (MCSCF) method we are able to formulize more information of our radical intermediates. Analysis of the energetics of all potential intermediates formed by the sulfinyl radical will be reported and discussed in this presentation.

Presentation Index: B4

A Model For J/psi Suppression

Theron Blount

Sponsor: Kevin Haglin

St. Cloud State University, Physics, Astronomy, and Engineering Science

High energy nuclear collisions create a hot and dense, short lived system of subatomic particles. The J/psi particle is comprised of a heavy charmed quark plus its antiquark and is consequently roughly three times more massive than a proton. When J/psi collides with other, more abundant particles, an absorption may occur, and then J/psi is effectively converted into a different species of particle. Modeling the rate of these individual conversions is critical in determining the overall production of J/psi from a typical nuclear collision. We study J/psi production since models predict that a decrease in the production of the J/psi particle signifies the presence of quark-gluon plasma (QGP). This QGP is of great interest because it is a unique and elusive phase of matter in which the constituents of protons and neutrons exist separately. Rather than modeling the behavior of the system with a full transport model, we use kinetic theory. We therefore do a probabilistic analysis using averages rather than considering the dynamics of each individual particle. We predict the probability of any random J/psi to escape the system "unharmed". We can predict the number of J/psi that initially existed, and finally the number that we expect to survive. This number can then be compared to experimental data.. Numerical results will be presented and discussed.

Presentation Index: B5

A Predictability Study Using a Non-Divergent Barotropic Vorticity Model

Michael Spinar

Sponsor: Tony Hansen

St. Cloud State University, Earth Sciences

The accuracy of the initial conditions in describing the current state of the atmosphere has a profound effect on the predictability of a numerical weather prediction model. In this study, a simple nwp model is used to examine the effects of missing data, and thus, imperfect initial conditions upon forecast skill.

Presentation Index: C1

Error Analysis of the ASOS HTB PAS During Cold-Weather Precipitation Events

Jacob Gontesky

Sponsor: Tony Hansen

St. Cloud State University, Earth Sciences

The Automated Surface Observing System (ASOS) is widely regarded as one of the great advancements in meteorological technology in recent decades. It has provided detailed, cost effective surface weather observations from a wide range of sites on a frequent basis. However, with the reliance on this technology, some drawbacks have been discovered. The automated instruments have shown some biases over previous manual observations. One of the instruments showing a systematic error is the heated tipping bucket precipitation accumulation sensor. This instrument consists of a heated funnel which collects and melts frozen precipitation. Once collected, the liquid is funneled into the tipping bucket apparatus. The tipping bucket then records the accumulated precipitation. Observations provide strong evidence that the heated tipping bucket instrument under-reports cold-weather precipitation accumulation. This research consists of measurements taken during precipitation events during the 2000-2001 cold season in St. Cloud, Minnesota. ASOS precipitation accumulation data was recorded during each precipitation event. A standard, 4" Tenite rain gauge was mounted approximately 30 meters from the St. Cloud ASOS station. Manual observations were taken from this instrument following each precipitation event. A regression analysis is performed comparing the data from the two gauges. A statistical model is constructed for correction of the ASOS measurements.

Presentation Index: C2

Photolysis of Phenylisocyanates and Phenylisothiocyanates

Carrie Link

Sponsor: Dan Gregory
St. Cloud State University, Chemistry

Photochemical study of isocyanates has been very limited even though these molecules are present in the atmosphere, soil fumigants, herbicides, and are released from broccoli and watercress when chewed. Isothiocyanates have shown anti-carcinogenic activity in rodents. Exposure to methyl isocyanate in Bhopal, India killed over 5000 people. For these reasons it is important to understand the ground state and excited state chemistry of these molecules. Research began with photolysis of phenyl isocyanate in a variety of solvents at a maximal absorption of approximately 250 nm. Using techniques such as Thin Layer Chromatography, Nuclear Magnetic Resonance, Infrared Spectroscopy, UV-Visible Spectroscopy, Gas Chromatography-Mass Spectrometry, and Column Chromatography the solutions were analyzed for the formation of a product. Photolysis in cyclopentadiene resulted in reaction of the solvent. No solid product formation was observed. One of the anticipated results was the release of carbon monoxide but as a method for monitoring the elimination of a gas was not feasible for this project, phenyl isothiocyanate was explored. The first photolyses of phenyl isothiocyanate utilized methylene chloride as a solvent and a product was observed with GC-MS. The product is similar to benzonitrile but a rearrangement may occur, resulting in isonitrile. Photolyses were performed with cyclohexene to imitate known episulfide formation on the double bond of isoprene. A product was formed: cyclohexane episulfide. None of the spectra from the starting material showed peaks at the same retention times as any of the products formed; the products are not the result of a contaminating species. The next step will be to use NMR and IR to determine the structure of the isolated products obtained by column chromatography. Cyclohexene should also be distilled in order to ensure purity. The quantum yield should then be established for each product.

Presentation Index: C3

Observations of Interstellar Oxygen

Marcel Goldschen and Brent Williams

Sponsor: John Harlander
St. Cloud State University, Physics, Astronomy, and Engineering Science

Ultraviolet spectra from interstellar ionized Oxygen [OII] were obtained from Pine Bluff Observatory, Wisconsin, during the summers of 1999 and 2000 and from Kitt Peak National Observatory, Arizona, during March 2001. The spectra were generated through Fourier analysis of images taken with a Spatial Heterodyne Spectrometer (SHS), which images interference patterns of input light. Data analysis performed at St. Cloud State University will be used in conjunction with results from Wisconsin Hydrogen Alpha Mapper (WHAM) to determine the temperature gradient of diffuse interstellar gas. Such observations will help in understanding the birth and death of stars.

Presentation Index: C4

Analysis of Disinfection Byproducts in St. Cloud Drinking Water

Susan Hansen

Sponsor: Michael Jeannot
St. Cloud State University, Chemistry

Since 1979 the Environmental Protection Agency (EPA) has regulated the levels of disinfection byproducts in tap water. These byproducts affect the palatability and health of the water. Those of interest are usually carcinogenic, so they present a health risk and affect the taste of the water, which alarms and worries the public. Water has a certain amount of natural organic matter (NOM) that, when mixed with disinfectants such as chlorine, goes through a series of reactions which create the byproducts. Between 50 to 60 percent of the byproducts produced, depending on the technique used, have yet to be identified or tested for. This has prompted researchers to study new and sometimes improved techniques for disinfection and analysis of the byproducts produced. The treatment plant here in St. Cloud uses chloramination as a disinfection technique. This technique produces trihalomethanes (THM's) as the byproducts. These byproducts are carcinogenic and are regulated by the EPA at a level of 80 ppb in tap water. The research that I am doing looks at the THM's in several concentrations within and above the EPA regulated amount in standard solutions. The standards are being tested using a technique called solid-phase microextraction (SPME). SPME is a sampling technique which is used in conjunction with gas chromatography / mass spectrometry (GC/MS). GC/MS is an improvement on the analysis technique widely used today, gas chromatography. SPME uses headspace analysis of the volatile byproducts, which are then identified and quantitated by the GC/MS. The range in concentrations in the standards shows that this analysis method can detect very small levels, 10 ppb, to the larger levels, 100 ppb. Since the regulated amount is below 80 ppb, I am trying to show that this is a viable analysis technique for detection of the THM's in tap water.

Presentation Index: C5

Identification of Equine Emotions by Human Counterparts

Leslie Russell

Sponsor: Kristen Kling
St. Cloud State University, Psychology

This research involves determining a piece of the basis of Equine Assisted Therapy or EAT. EAT has been shown to reduce stress and promote treatment outcomes in people diagnosed with many different disorders or problems. Studies have indicated that people react to Equine therapy, but reasons as to why this treatment works are still unknown. The purpose of this research is to suggest possible reasons why EAT works as well as explain current research that is being conducted. The current research involves the ability of a human to recognize equine emotional states through varied photograph presentation. Methods and results will be discussed.

Presentation Index: D1

Prelinguistic Vocal Characteristics of Children with Cleft Palate

Mae Petrangelo

Sponsor: Monica Devers
St. Cloud State University, Communication Disorders

The babbling patterns of six children with cleft palate who ultimately required secondary surgical management were studied. Babbling patterns were analyzed pre- and post- primary surgery. Place of articulation analyses indicated a majority of front and glottal sounds were produced prelinguistically. Manner of articulation analyses indicated a higher proportion of nasal sounds were produced. The proportion of glottal stops increased after primary palatal repair. Three prelinguistic babbling patterns were observed among the six children. Implications for earlier identification are discussed.

Presentation Index: D2

Experience in Spanish Speaking Cultures: Effect of Interest Level

Naomi Green

Sponsor: Leslie Valdes
St. Cloud State University, Psychology

This research is to determine if people's attitude about a culture affects their ability to learn a second language as an adult. A number of factors can affect learning a second language including similarity in language structure (Mallen, 1991 and Allerton, 1991), teaching technique (Fitch, 1995), age of acquisition (Epstein, Flynn, & Martohardjono, 1996), and motivation (Noels, Pelletier, Clement, & Vallerand, 2000). Gardner, Masgoret, and Tremblay (1999) have shown that people's attitudes affect their motivation to acquire a second language. These attitudes toward another culture are directly correlated with participant's motivation level. If a person has a positive attitude toward Hispanic culture they perhaps will have more motivation when learning Spanish as a second language. It is hypothesized that negative cultural attitudes toward the Hispanic culture will significantly impair a person's ability to learn the Spanish language. Sixty-two undergraduate psychology students who reported little or no knowledge of Spanish were randomly divided into six groups. The participants memorized one randomized list of 20 words (Spanish, English, or pronounceable pseudo-words) at a time but were tested on all three. Each word was shown for one second. The participants were then asked to recall as many words as possible, following the list presented, without attention to order. After all three lists had been shown the participants were asked to fill out a questionnaire about their current attitudes toward the Hispanic culture. The main effect of participants recalling more English words than Spanish words was significant ($p < .05$). Positive participants did recall more Spanish than those with a negative attitude. The reverse was true for English words. This pattern was consistent with the hypothesis but was not significant. Attitudes toward the Spanish speaking culture need to be addressed when teaching a foreign language.

Presentation Index: D3

Japanimation and the World of the Otaku

Jessica Walsh

Sponsor: Thomas Carter
St. Cloud State University, Sociology and Anthropology

Abstract was not available at printing.

Presentation Index: D4

Bringing Them to Us and Us to Them: Student-Produced Theatre Northern Irish Drama "Carthaginians"

Neil Dunn, Bethany Urban and Hanni Baugh

Sponsor: Andrew Vorder Bruegge
St. Cloud State University, Theatre, Film Studies and Dance

The main challenge in the entirely student produced and directed production of *Carthaginians* was to present an Irish subject to an American audience and to create a feeling of connection with that subject. Through the filter of American eyes (often filtered through American media), Northern Ireland, like so many other countries where conflict exists, often becomes an "us and them" situation. It is, however, important to remember that the human capacity for emotion and feeling is the same everywhere, perhaps even heightened in areas that have experienced the political hardships that Northern Ireland has. The events of 30 January 1972 forever shattered the emotional conscious of the people of Derry, Northern Ireland. *Carthaginians* deals with the after-effects of Bloody Sunday on seven Derry characters who were present that day. The play explores the psychology of mourning, remorse, and hope through these seven characters.

Presentation Index: E1

The Irrationality of Belief

Guy Rice

Sponsor: Susanna Nuccetelli
St. Cloud State University, Philosophy

All belief is fundamentally irrational. Epistemologists, those who study knowledge, have struggled for millenia with the problem of finding a satisfactory basis for justifying belief. Actually, what they've done is try to avoid the fact that perfectly clear and valid criteria have been known for millenia, but that no belief can ever satisfy them. They have avoid this because this view leads to skepticism. As an irrational Pyrrhonist, I demonstrate why common sense and rational thinking lead to the inevitable conclusion that given any proposition P, one can never have better founded reasons for believing P than believing not P. This view is also known as irrationalism, anti-rationalism, or rational nihilism, although I object to the latter terms, as I argue that acceptance of this view does not necessarily lead to a rejection of rationality. Rather, it leads to a better understanding of what rationality can and (perhaps more importantly) cannot do, thus what cannot be reasonably expected of it, such as expecting it to provide a foundation for beliefs. Various attempts to provide support for beliefs are discussed and demonstrated to be insufficient. Specifically, foundationalism is shown to be a form of irrationalism, and coherentism is shown to be both a form of irrationalism and relativism. In fact, whether explicitly stated or not, all supposedly rational accounts of belief ultimately advocate that beliefs be accepted on faith, they only differ in what one should have faith in, and can provide no support for why their articles of faith are more valid than any rival set. The validity of any belief can only be judged relative to the context of a belief system which cannot be rationally justified. Thus, I banish the irrational notion of rational belief.

Presentation Index: E2

Testimony, Rationality and the Belief in God

Lawrence Giebenhain

Sponsor: Susanna Nuccetelli
St. Cloud State University, Philosophy

Alston argues that God exists due to several reasons. One of these deals with the fact that there is no way to confirm that a belief that one holds about God due to a supernatural experience is false. This problem occurs because there are no qualified witnesses to confer with, as there would be about some form of empirical evidence. Alston aligns the perception of God and belief of God's existence with the perception of the senses concerning the physical world. Cormen, Leherer, and Pappas argue against Alston's claim by giving examples of how perception of the senses with regard to the physical world differs conclusively to those of the spiritual realm. They also have arguments to counter Alston's other reasons backing the existence of God. I will agree with both sides on some of the key materials brought up, but feel more sympathetic toward the reasoning of Alston.

Presentation Index: E3

Dilemmas of Reflective Equilibrium

Keith Johnson

Sponsor: Susanna Nuccetelli
St. Cloud State University, Philosophy

Questing for justification of deductive inference, Nelson Goodman attempts to justify his theory of reflective equilibrium. He states that if a deduction is valid, it conforms to a valid set of rules. Naturally, one is inclined to question how these rules are determined to be valid. Instead of alluding to his predecessors, Goodman appeals to "accepted deductive practice". This creates a notable circularity in argument form. Goodman maintains that this circle is not vicious, but virtuous. I argue that such circular argumentation is not justification for deductive inference, and terms like "virtuous", hardly apply to Goodman's reflective equilibrium.

Presentation Index: E4

The Rationality and Objectivity of Science
Michael Paggen

Sponsor: Susanna Nuccetelli
St. Cloud State University, Philosophy

Science is commonly taken to be among the most objective and rational pursuits. However, the history of modern science has seen the rise and fall of several different paradigms, all of which, in their own time, were the accepted world view. If the world view of the established scientific community is so apt to change over time, then can we really call science objective? Furthermore, how do we decide which world view it is more rational to accept? In this essay, I will discuss some of the problems of science, specifically the problems of induction and underdetermination. And I will argue that although the process of science may have some claim to objectivity and rationality, the paradigms that we construct based on scientific evidence do not constitute an objective world view.

Presentation Index: E5

Ascribing Rationality
J. Christopher Joiner

Sponsor: Susanna Nuccetelli
St. Cloud State University, Philosophy

Within the topics of translation and interpretation, there has been a much work done by philosophers of language in the late twentieth century regarding the notions of "charity" and "ascription of rationality". Ascription of rationality is seen as integral to the process of good interpretation. When a translator is confronted with an incoherent translation, one assumes that there is something wrong with the translation. This is how rationality gets ascribed, and is more charitable than assuming the translatee is incoherent. This essay analyses several conceptualist's approaches and their varying degrees of rationality. The views of Davidson, Holles and Stitch are the focus of both praise and criticism. Using examples that appeal to intuition, this essay recommends some sort of distinction in the concept of rationality between intellectual understanding and interpretive understanding. Making this distinction has an effect on things like bizarre religious beliefs. An effect that may be more comfortable than the ultimatum between either our translation system being wrong or that we are dealing with nonsense. The critical element of this essay takes this ultimatum as its primary target. There are several different approaches mentioned; such as an analysis of the concept of nonsense and meaninglessness which are portrayed as being overly clumsy. This discussion meanders through issues of rationality, nonsense, meaning and meaninglessness and of course cultural relativism.

Presentation Index: E6

Behaviorism and Rationality
James Newman

Sponsor: Susanna Nuccetelli
St. Cloud State University, Philosophy

Abstract was not available at the time of printing.

Presentation Index: E7

Karl Popper
Justin Cox

Sponsor: Susanna Nuccetelli
St. Cloud State University, Philosophy

This presentation considered for the 2001 Philosophy Colloquium is about Karl Popper's hypothesis, concerning the scientific model for composing theories and his refutation hypothesis. The presentation will include a summary of Popper's hypothesis for model of refutation. Some arguments against Karl Popper will then be addressed, including Kuhn's infamous "Dirty Trick Argument". Finally, in an attempt to save Popper's hypothesis, a few replies against the objections of this hypothesis will be explained, in order to gain a better understanding of the model of refutation and support for the Philosophy of Science.

Presentation Index: E8

Study of Survey Research Data on St. Cloud Students' Drinking and Drug Use
Bridget Keanery, Mina Johnson and Bill Hyers

Sponsors: Steven Frank and Steven Wagner
St. Cloud State University, Political Science

The purpose of the presentation is to analyze and explain the St. Cloud State 2001 student survey research findings on alcohol use at St. Cloud State University. The presentation will include an overview of the methodology used in collecting the data and what the data actually revealed about the drinking habits of St. Cloud State University Students. The analysis of the St. Cloud State drinking habits will be done by comparing the Student Survey conducted in March 2001 results with other similar surveys. The main two other surveys that the results will be compared to will be a 1999 St. Cloud State student survey asking the same questions, and a Harvard study of all college students seeking the same results.

Presentation Index: F1

SCSU: Up In Smoke?
Sonu Kapoor, Stefanie Morseth and Angela Bennett

Sponsor: Steven Wagner and Steven Frank
St. Cloud State University, Political Science

Due to the nation wide legislation on prohibiting smoking in public places, the Saint Cloud State University (SCSU) Survey conducted a study on student smoking and how it effects students views on a similar policy being implemented on the SCSU campus. The SCSU survey team and the students conducted the study using the computer assisted telephone interviewing (CATI) system. Random digit dial (RDD) and systemic sampling were the methods used to obtain the data. Our main goal is to ascertain student views on the smoking policy on the SCSU campus. We will also take a comparative look at how citizens of Minnesota and the United States feel on prohibiting smoking in public places. Revolving around student smoking issues, we will compare the empirical data throughout three studies conducted between 1999-2001. In addition, our study will also provide possible variables influencing student views on implementing smoking policies.

Presentation Index: F2

Land Distribution as a Measure of Democracy
Matthew Heffron

Sponsor: Michelle Kukoleca Hammes
St. Cloud State University, Political Science

Ever since theorists such as James Harrington and John Locke, the Western concept of liberal democracy has been tied to the idea of individual property rights. Harrington argued that the distribution of property in a country determined the form of government that state would have. If all property was considered to be owned by the king, absolute monarchy was assured. A small group, an elite, owning the land resulted in aristocracy. Only where there was broad ownership of land could democracy develop. Later theorists developed these theoretical concepts. A good example of this development is the British Distributionist movement, which argued that the only way to avoid economic and eventually political slavery was by broad distribution of property. Hilare Belloc argued that not owning capital made us economic slaves, and unless property was more distributed, it would not be long until we were slaves in all respects and at all times. Research into regime stability has identified some relationship between land distribution and political violence, but the results have been inconclusive in many respects and do not show the strong direct correlation our theory would expect. The purpose of this paper was to directly measure correlation between Zehra Arat's measure of "democraticness" presented in her 1991 book *Democracy and Human Rights in Developing Countries* and the Gini coefficient of land inequality. This study measures these two variables for 85 countries from data taken around 1970. My hypothesis was that countries with a high score on the measure of democracy would have a low coefficient for land inequality; the more distributed ownership of land in a state, the more democratic it would be. This paper proposes tentative conclusions about the nature of land distribution as a measurement of democracy and proposes many possibilities for further research.

Presentation Index: F3

Building Effective Web Sites for Export Marketing
Ulrik Nielsen and Ming Chee Ming Tan

Sponsor: Wenyu Dou
St. Cloud State University, Marketing

The Internet is becoming increasingly important for exporters to reach out to their customers and to develop new markets. This study investigated how different components of exporters' web sites can help exporters achieve either their communication or transaction objectives.

Presentation Index: F4

Women and Political Participation
Holly Dasinger

Sponsor: Michelle Kukoleca Hammes
St. Cloud State University, Political Science

This research is to determine how men and women participate in political issues differently in Minnesota and how they compare to national political participation trends. I hypothesize that women in Minnesota participate in politics as often as men do and that Minnesota's rate of participation is higher than the national trends. Data were collected from the SCSU Survey research lab by random telephone interviews of 629 Minnesota Adults. A series of 10 questions were asked involving registered voters, past political participation, interest in politics, and ways in which one might participate in politics. The results show that women participate in political matters as frequently as men do in Minnesota, but they participate in different ways. Women in Minnesota also participate in politics more frequently than the national average for women. These findings provide important new insights on women and political participation.

Presentation Index: F5

Born to Rape?

Lisa Becker

Sponsor: Paul Brown
Minnesota State University Mankato, Anthropology

The field of behavioral ecology is concerned with tracing the link between ecological factors and adaptive behavior. Certain theories in behavioral ecology stress the importance of sexual selection through mate choice. An emerging theory in this filed pertains to the male propensity for coercive sexual intercourse. This theory does not imply that this behavior is absolutely biologically determined. It simply states that rape, while socially unacceptable to modern humans, may have been beneficial to some males in some circumstances. Was this behavior advantageous to some of our evolutionary ancestors? Does this biological "hardwiring" mean that males have a license to rape? This paper will attempt to answer these questions through an analysis of current behavioral ecology literature concerning male vs. female reproductive strategies, as well as address the social implications of these data.

Presentation Index: G1

Analysis of the Development of YMCA Programs and Services

Jon Cody and Kim Kokett

Sponsor: Elizabeth Scheel
St. Cloud State University, Sociology and Anthropology

Our research looked at the development of programs offered by the Young Men's Christian Association(YMCA). The research question used was: What are the factors that have influenced the development of programs at the YMCA? By doing content analysis on data provided by the YMCA, including memos, letters and minutes of committee/board meetings and interviewing staff, members and volunteers of the YMCA we developed a timeline and structure for development. Factors influencing the development of programs include safety concerns, funding and budget considerations, moral and ethical issues, member desire and satisfaction, cultural shifts and external competition. One of the results of our research was the development of a survey to effectively gather information from those involved in the YMCA and the formatting of an analysis tool to evaluate programs, both to be used in the future by the YMCA.

Presentation Index: G2

Family Violence and Youth Runaways

Laura Vobelt, Lisa Fredricks and Cheryl Willenbring

Sponsor: Elizabeth Scheel
St. Cloud State University, Sociology and Anthropology

Abstract was not available at the time of printing.

Presentation Index: G3

Evaluating Family Peace
Charlotte Stokes and Jeffrey Williams

Sponsor: Elizabeth Scheel
St. Cloud State University, Sociology and Anthropology

This presentation will address the question of "Was the Family Peace Event successful?" We are focusing on positive feelings, participation and new peace activities learned and through these, that attending the Family Peace Event was beneficial. Through observations and survey we will have learned the amount of family participation in activities and if there are new ones would they be willing to do these outside of the Family Peace Event with their family and/or community organizations. We will have also looked at their desire to attend other Peace events or willingness to recommend to others through surveys. We will be taking it one step further by looking at the positive feeling that this event created; this will be done through observations of laughter and smiling.

Presentation Index: G4

Effects of Regular Voluntary Exercise of Pregnant Spontaneously Hypertensive Rats (SHR) on the Development of Hypertension in the Subsequent Offspring
Jenny Fields and Chris Busse

Sponsor: Penny Knoblich
Minnesota State University Mankato, Biology

Although gestational conditions have been documented which have successfully altered hypertension development in the offspring, no studies have examined the effect of maternal exercise on the degree of hypertension development in the offspring. The spontaneously hypertensive rat (SHR) is a model for the study of hypertension. This study will investigate the effects of regular, voluntary exercise of pregnant SHR on the development of hypertension in the subsequent offspring. All exercise will occur on an exercise wheel connected to a device, which logs distance run. An average distance will be determined per study group for each week of the study. Systolic blood pressure on the offspring will be measured biweekly from 5 to 21 weeks of age. Twenty-four females will be assigned to one of the following groups:

- Group 1 (sedentary): Females will not exercise before or during pregnancy.
- Group 2 (exercised): Exercise wheels will be placed into the females' cages immediately following confirmation of breeding and will be removed after the birth of the pups.
- Group 3 (pretrained): Exercise wheels will be placed into the females' cages at least 3 weeks prior to breeding, and will be removed after the birth of the pups.

Presentation Index: H01

Distribution of Exon 2 Mutant Allele of Human Class-3 Aldehyde Dehydrogenase
Bruce DeGrote and Jacie Swanson

Sponsor: Lakshmaiah Sreerama
St. Cloud State University, Chemistry

Cytosolic class 3-Aldehyde Dehydrogenase (ALDH3A1) is an enzyme that is currently the subject of extensive research. ALDH3A1catalyzes the detoxification of xenobiotic (carcinogenic) aldehydes as well as some widely used anticancer drugs known as oxazaphosphorines, e.g., cyclophosphamide. This process results in the protection of cells from toxic effects of aldehydes and leads to anticancer drug resistance in tumor cells. We have recently cloned the complementary deoxyribonucleic acid (cDNA) coding for ALDH3A1 from two cell types: (1) Human normal stomach mucosa (nALDH3A1 cDNA), and (2) Human breast adenocarcinoma (tALDH3A1 cDNA). The two cDNA's show a six base difference. Two of these transversions, one in exon 2 (base # 35 cytosine--> guanine) and the other in exon 4 (base # 400 thymine--> guanine) leads to an amino acid substitution (proline--> arginine and serine--> alanine respectively) in ALDH3A1 proteins. Further, tALDH3A1 detoxifies cyclophosphamide 10-fold more effectively than does nALDH3A1. How these base transversions effect anticancer drug detoxification is being investigated. The ultimate goal of this research is to define the physiological role of polymorphic ALDH3A1. In this regard, the research presented here in attempts to establish the presence and determine the frequency of distribution of ALDH3A1 alleles in normal human populations.

Presentation Index: H02

Substrate Specificity of Human Class-3 Aldehyde Dehydrogenase

Melissa Link

Sponsor: Lakshmaiah Sreerama
St. Cloud State University, Chemistry

ALDH3A1 catalyzes the detoxification of endegenous and xenobiotic aldehydes including widely used anticaner drugs such as cyclophosphamide, ifosfamide and mafosfamide. The presence of ALDH3A1 in normal cells will protect them from toxic effects of aldehydes. The presence of ALDH3A1 in tumor cells causes a resistence to anticancer drugs. ALDH3A1 is usually not found in the liver, however, it is found substantially in the gastrointestinal tract, saliva, the cornea, certain tumors and tumor cells. ALDH3A1 is inducible by xenobiotics like phenolic antioxidants and polycyclic aromatic hydrocarbons. This may play a role in cancer chemoprevention and in carcinogenesis. ALDH3A1 is polymorphic in nature. There have been two recently polymorphic forms identified: normal cell ALDH3A1 (nALDH3A1) and tumor cell ALDH3A1 (tALDH3A1). tALDH3A1 detoxifies the anticancer drug, cyclophosphamide 10 fold more efficiently. The goal of this study is to gain an understanding of structure function relationship of aldehydes detoxified by tALDH3A1. Methodology used included purification of tALDH3A1 and testing > 50 aldehydes as substrates for this enzyme utilizing a spectrophotometric enzyme assay. Purified tALDH3A1 was obtained by Reactive Blue-2 affinity chromatography procedure. The source of the enzyme was human breast adenocarcinoma MCF-7 cells treated with catechol. Many of the aldehydes tested were substrates for ALDH3A1. The aldehydes of importance are long chained fatty aldehydes and acrolein. Acrolein is an intermediate in the metabolic activation/detoxification of cyclophosphamide. Our results indicate that tALDH3A1 exhibits differential substrate specificities towards endogenous and xenobiotce aldehydes. A comparison of the substrate specificities of nALDH3A1 and tALDH3A1 is expected to reveal differential catalysis of aldehyde oxidation by these enzymes and differential detoxification of aldehyde in the person expressing these polymorphic forms.

Presentation Index: H03

Error Analysis of the ASOS HTB PAS During Cold-Weather Precipitation Events

Jacob Gontesky

Sponsor: Tony Hansen
St. Cloud State University, Earth Sciences

The Automated Surface Observing System (ASOS) is widely regarded as one of the great advancements in meteorological technology in recent decades. It has provided detailed, cost effective surface weather observations from a wide range of sites on a frequent basis. However, with the reliance on this technology, some drawbacks have been discovered. The automated instruments have shown some biases over previous manual observations. One of the instruments showing a systematic error is the heated tipping bucket precipitation accumulation sensor. This instrument consists of a heated funnel which collects and melts frozen precipitation. Once collected, the liquid is funneled into the tipping bucket apparatus. The tipping bucket then records the accumulated precipitation. Observations provide strong evidence that the heated tipping bucket instrument under-reports cold-weather precipitation accumulation. This research consists of measurements taken during precipitation events during the 2000-2001 cold season in St. Cloud, Minnesota. ASOS precipitation accumulation data was recorded during each precipitation event. A standard, 4" Tenite rain gauge was mounted approximately 30 meters from the St. Cloud ASOS station. Manual observations were taken from this instrument following each precipitation event. A regression analysis is performed comparing the data from the two gauges. A statistical model is constructed for correction of the ASOS measurements.

Presentation Index: H04

Short-Term Memory: Effects of Long-Term Activation

Angela Nelson

Sponsor: Leslie Valdes
St. Cloud State University, Psychology

The current study examines the effects of presentation and type of word on recognition performance. Participants were 34 introductory psychology students who reported normal or corrected to normal vision. Participants viewed a word list that consisted of color-related and color-unrelated words and completed a recognition task. Presentation was manipulated in the multi-color (experimental) group. Color-related words were presented in congruent colors (i.e. *red* blood) or incongruent colors (i.e. *blue* blood). The color was further manipulated so the words were either presented in the same or different color at study and test. The monochrome (control) group was tested on the same words but the words were all presented in black. The results of the current study did not support the hypothesis that presentation would affect recognition performance. The results of the current study may be attributed to the nature of the instructions. That is, participants were told of a recognition task possibly cueing them to ignore the color of the word.

Presentation Index: H05

BroadBand 3G Wireless Communications

Nadeem Chaudhry and Fahd Habeeb

Sponsors: Zheng Yi and Aiping Yao
St. Cloud State University, Electrical and Computer Engineering

The revolution in wireless communication is bringing fundamental changes to data networking, telecommunication, and integrated networks. Some of the most common implications of wireless technology are wireless LAN, mobile radio networks, and cellular systems. The wideband wireless communication system, third generation (3G) wireless, provides Internet accessing ability to a portable device. The 3G systems provide up to a bandwidth of 2MHz mobile applications. Considering that it is applied in a moving environment with a small device with an omni antenna, 2MHz is wideband comparing to current small portable devices with a bandwidth at KHz ranges. The 3G technology is still in the research development stage and may be implemented in the next few years. The objective of our Senior Design project is to design and develop a mobile broadband wireless communication system, operating at 2.4GHz, using most advanced wireless communication technologies including Orthogonal Frequency-Division Multiplexing (OFDM), Quadrature Amplitude Modulation (QAM), and Code Division Multiple Access (CDMA). OFDM is a relatively new technology, which transfers band-limited signals to orthogonal signals for multi-channel transmission, with the minimized Inter-Channel Interference (ICI), and Inter-Symbol Interference (ISI). Our system sends data from a PC via USB bus to a digital signal processing board and code the data in T1 format. T1 signal will be sent to a transmitter that codes the data by the QAM and CDMA and transmit the coded as radio frequency (RF) signal at 2.4GHz. Simulation for OFDM code will be done in the PC or the digital signal processing board prior to the transmission. At the receive terminal, the data will be decoded and converted from T1 to binary format and send to a receiving PC through the digital signal processing board and the USB interface. The final goal of the project is to transmit data from PC to PC, through our wireless system at a rate of up to 1.544 Mega bits per second. The project will evaluate the performances of the QAM, CDMA, and OFDM for wideband wireless communication systems and its applications for the 3G technologies.

Presentation Index: H06

Teen Peace Fair

Carla Berg

Sponsor: Elizabeth Scheel

St. Cloud State University, Sociology and Anthropology

This research project deals with teens finding peace in their communities. In order to open up the teen's minds to the idea of peace within the community, we put together a Teen Peace Fair. The peace fair let the teens have an opportunity to listen to live music, play games and participate in fun activities emphasizing the importance of teen peace. Throughout the peace fair I interviewed teens on the most important lesson the fair taught them, how they are going to promote peace in their community and what their goals are for the future. I also handed out surveys that let the teens confidentially express how they feel about teen peace. The most significant finding was that teens have a lot of input that can positively influence the community, they just need to be asked.

Presentation Index: H07

YMCA Donations

Sarah Williamson, Missy Hansen, Krista Jorgensen, Alison Seevers and Nicole Propson

Sponsor: Elizabeth Scheel

St. Cloud State University, Sociology and Anthropology

Abstract was not available at the time of printing.

Presentation Index: H08

The Effects of Gender on Toxicology of 14 Days of Ribose Ingestion

Angela Frelich

Sponsor: John Seifert

St. Cloud State University, Health, Physical Education, Recreation, and Sport Science

Ribose has been used only recently as a supplement. However, there is little toxicological data available on its use. Therefore, the purpose of this study was to investigate the hematological and hepatological differences between males and females following 14 days of ribose ingestion. Nineteen healthy subjects (female = 8, male = 11) volunteered to ingest 20 g/day of ribose. Ribose was divided into 2 feedings of 10 g that were taken with breakfast and dinner. Venous blood samples were collected at the same time of day on days 0, 7, and 14. Females exhibited lower values than males for Hb (13.4.08, 15.2.06 g/L), Hct (39.8.2, 45.0.2 %), RBC (4.5.03, 4.9.02 million), platelets (2333.0, 2412.3 K/uL), uric acid (2907.6, 3575.8 mM/L), ALKP (65.2.9, 70.4.7 U/L), GGT (15.01.2, 25.21.0 U/L), ALT (20.11.4, 28.51.1 U/L), and AST (15.91.3, 23.61.0 U/L). Conclusion. Ingestion of 20 g/day of ribose over a moderate duration (14 consecutive days) did not result in significant interactions of gender x time in hematological or hepatological variables. For most variables, however, females exhibited lower concentrations than males.

Presentation Index: H09

Pressure Measurement During Ambulation Under Two Prosthetic Socket Conditions

Tracy Beil

Sponsor: Glenn Street
St. Cloud State University, Health, Physical Education, Recreation, and Sport Science

Daily residual limb volume loss, which can be up to 10%, can create problems for an amputee with fit of the prosthetic socket. Proprioception is reduced and pressure points on the limb can result in painful sores. TEC Interface Systems of St Cloud, MN has developed a vacuum-assisted socket (VAS) that has been shown to allow below-knee amputees to maintain normal limb volume during activity. Our hypothesis is that the VAS produces different pressures on the residual limb than the traditional total surface bearing socket (TSBS) allowing volume maintenance. In order to test this hypothesis, urethane liners were instrumented with sensors to document pressures on the residual limb during walking. Force sensing resistors were placed on five areas of soft tissue labeled proximal posterior, distal lateral and medial, proximal lateral and medial. One air pressure sensor capable of recording negative pressures was placed at the distal end of the liner. Nine unilateral below-knee amputees participated in the study. Peak negative and positive pressures achieved during each step were averaged for each walking trial. Four trials were averaged to attain one value for each sensor. A Student's t-test was performed to compare pressures at each sensor location. Negative pressures seen during swing phase were found to be significantly lower in the VAS condition by p-value $< .01$. The VAS averaged –33.0 kPa during the swing phase of walking while the TSBS averaged –25.7 kPa. Peak positive pressures seen during the stance phase were not found to be significantly different, although there was a trend for impact pressures with the VAS to be lower than those of the TSBS. It is thought that lower pressures seen during both stance and swing phases using the VAS either reduces the amount of fluid forced out or increases the amount of fluid drawn into the limb, thereby preventing volume loss.

Presentation Index: H10

YMCA Memberships

Heather Gerdin and Tara Hanson

Sponsor: Elizabeth Scheel
St. Cloud State University, Sociology and Anthropology

We have completed a research project on why people become members of the Young Men's Christian Association. Throughout our project, we gathered data through survey and secondary analysis. The data that we gathered included information such as what qualities the YMCA holds that attract members, the types of memberships that the members hold, and who the members are. We then used this information to help the YMCA determine how to attract new members and keep the members that they are currently serving. We found that the current members of the YMCA would like to see improvements in equipment, as well as programs. We feel that we have influenced the YMCA to make appropriate changes in order to keep its' current members as well as attract new ones.

Presentation Index: H11

Sand Prairie Vegetation Analysis

Matthew Nelson

Sponsors: Craig Anderson and Jorge Arriagada
St. Cloud State University, Biological Sciences

The response to stress includes changes in the secretory function of the adrenal cortex and testis, and perturbation in the glucose metabolism. Nitric Oxide (NO) is synthesized by oxidative de-amination of the amino acis L-arginine by isoforms of the regulated enzyme nitric oxide synthase (NOS). Nitric oxide is implicated in the changes induced by stress in some organs. Two isoforms of NOS are known: a calcium dependent form that is synthesized constitutively (cNOS) and a calcium independent type that is inducible (iNOS). In preliminary study we have observed that immobilization stress increases corticostersone, reduces both plasma and testicular testosterone levels, and increases blood glucose concentration. Most of these effects are prevented by inhibiting NO synthesis. This project will show, using semi-quantitative RT-PCR, expression of cNOS and iNOS mRNA in testicular and brain tissue from aged rates that are subjected to immobilization stress.

Presentation Index: H12

Memory Strategies for Mental Health Practitioners

Joy Fitzsimons

Sponsor: Leslie Valdes
St. Cloud State University, Psychology

It has been shown with experimental stimulus, that an individual is more likely to remember events that took place at the beginning or end, rather than events that occurred during the middle (e.g., Crowder, 1976; Greene, Prepscius, & Levy, 2000). Sehulster (1989) found similar results for the memory of opera seasons. This study focuses on the memory of mental health practitioners of their clients. My hypothesis is that practitioners will remember their clients better from early in their career or their last/current clients more than they will remember the clients they saw during the middle of their career. From the 99 surveys distributed only 29 were returned from the mental health practitioners. These participants were asked 18 questions from a mailed survey. Information about their age, gender, type of job location, degree, how long they have been practicing, caseload, and their approach to therapy were collected. To assess their memories for their clients, participants were asked to rate their memory from their first year of practicing, 1998, 1999, and present. The remaining questions were designed to gather more information about memory retrieval cues and strategies they use. The results found a correlation between how practitioners were trained to remember their clients and the strategies that they used to remember them. Lastly, only a recency effect occurred, which means they remembered their current clients the most. It is a benefit to know what memories are more memorable and easily retained. The more information we can learn about what makes events or people easier to remember, the better we are able to advise practitioners about using their memory rather than use notes or other external memory aids. It is to their clients' benefit that practitioners use their memory to reduce the possibility of intrusions of their clients' confidentiality.

Presentation Index: H13

Non-Board Volunteers

Craig Schapira and Amanda Pfalzgraf

Sponsor: Elizabeth Scheel
St. Cloud State University, Sociology and Anthropology

Our research question was "What is the profile of St. Cloud YMCA staff volunteers from 1997 to the present and which activities are these volunteers most likely to be involved in?" Our dependent variable was volunteerism and our independent variables were religious affiliation, age, gender, race, career, marital status, YMCA's appreciation programs and how many hours they volunteered. Much of this information we found from volunteer applications, however, the information not found on the applications was received through a survey we mailed to the volunteers who we had applications for. We reported on if our independent variables did in fact have an influence on those who volunteered at St. Cloud's YMCA. The study has future implication for studies on who volunteers, as well as an influence on how the YMCA recruits their volunteers in the future.

Presentation Index: H14

YMCA Board Members Research

Brandon Maki and James Burkham

Sponsor: Elizabeth Scheel
St. Cloud State University, Sociology and Anthropology

Our poster project has been done for the Young Men's Christian Association (YMCA). Our objective for this project is to take past YMCA board member meetings that have been logged by previous board members and manipulate the information in order to be processed into a new Microsoft Excel computer program provided by the YMCA. The methods that we used to manipulate the recorded data were to individually sort through the past documented issues and code them into specific categories and sub categories. These categories included: Board Development, Agency Development, Staff Development, Finance and Maintenance Issues and Resolutions, and Volunteerism. The purpose of categorizing these topics was to provide the YMCA a clearer understanding of what occurs during the various meetings as well as track reoccurring topics in an efficient manner. In summary, we have found what issues have been discussed regularly, the effectiveness of the resolutions stemming from the issues, how effective the members on the board are, and what measures the board can take to be more efficient in the future.

Presentation Index: H15

Students' Identification of Stuttering

Amy Magnuson

Sponsor: Shelley Brundage
St. Cloud State University, Communication Disorders

Stuttering is a complex speech disorder. The complexity of stuttering has lead to difficulty in defining and measuring it. Current research is exploring new, more reliable ways of measurement. This study is a replication of a previous research study on stuttering identification (Cordes and Ingham, 1995). Students in Communication Disorders and Education served as subjects. Subjects in this study were asked to make yes/no judgments of presence of stuttering within short intervals of speech. We then calculated the subjects' intra- and inter- reliability of stuttering identification. Results of this study will be compared to similar studies in which experts in the field of stuttering and speech-language pathologists were asked to complete the same task..

Presentation Index: H16

The Effects of a Heat-Exchange Mask on Physiological Function in EIA Subjects

Jeremy Frost

Sponsor: John Seifert
St. Cloud State University, Health, Physical Education, Recreation, and Sport Science

Alterations in heat and water exchange in the respiratory tract appear to be important factors in reducing pulmonary function during exercise in the cold. The purpose of the study was to investigate the effects of a heat exchange mask (HE) on physiological function during exercise in the cold. Eight EIA subjects performed two trials, a HE and no intervention (NI) trials. All subjects refrained from inhaler use for 8 hr prior to each trial. Subjects sat for 30 min at –15°C then walked at 5 kph for 40 min. Data are mean (±SD). At rest, NSD were observed for change in SaO2, IC, ERV, FEV1, FEV1%, or FEF25-75. Change in HR, systolic BP and MAP was less for HE than NI, -0.01 (3.2) bpm, 0.25 (3.0) mm Hg, and 0.2 (1.5) mm Hg vs. –15 (3.2) bpm, 17.5 (3.0) mm Hg and 7.5 (1.5) mmHg. Change in ERV was also less for HE (0.2 ±.2 L) than NI (-0.4 ±.2 L). During exercise, NSD between treatments was observed for HR and FEV1. SaO2 was lower at 40 min for NI vs. HE (96.0 vs. 97.5%). FVC was greater (4.51 vs. 4.20 L), IC was greater (3.48 vs. 2.94 L), FEV1% was greater (88.2 vs. 83.4 %), and FEF25-75 was greater (4.17 vs. 3.70) for HE than NI. Conclusions. A HE mask worn during rest in cold temperature maintained cardiovascular function. During exercise, however, HE maintained pulmonary function while the NI trial demonstrated significant reductions in pulmonary function.

This study was funded by PolarWrap, Inc.

Presentation Index: H17

FI Schedules and Web Courses

Emily Rudrud

Sponsor: Eric Rudrud
St. Cloud State University, Community Psychology

Lindsley (1977) and Imel (1998) suggested technologies have changed to become more learner-centered and allow learners more control over their learning environment. However, student procrastination in completing assignments is an issue (Crosbie & Kelly, 1993). Student success (lack of procrastination) has been attributed to personality variables such as "external locus of control" and "high self-regulation". The purpose of this study was to examine student access of course material on an Internet delivered course, Introduction to Behavior Analysis. Results of the study indicated that student access of course material was characteristic of performance on Fixed Interval Reinforcement Schedules rather than "personality" traits. After a unit test, students exhibited low rates of access of materials, followed by an increase in rate of access as the next test approached. Suggestions for increasing student accessing material are discussed.

Presentation Index: H18

Eyewall Examination of a Rapidly Intensifying Tropical Cyclone: Case Study of Hurricane Bret

Amy Weinzierl

Sponsor: Tony Hansen

St. Cloud State University, Earth Sciences

Tropical cyclones can undergo rapid intensification in which the system's central pressure drops a dramatic 42 mb/day or where the pressure falls more than 20 mb in a six-hour period. Rapid intensification of tropical cyclones is believed to occur by dynamical interactions occurring between the system and its environment. These dynamical, interacting processes include: upper-ocean (air-sea) interactions, atmospheric environmental influences, and eyewall dynamics. Eyewall behavior can affect the intensity of a hurricane by convective and physical processes. Hurricane Bret is the only tropical cyclone in which measurements were taken inside of the eyewall while the cyclone underwent a period of rapid intensification. Data acquired from the flight missions into Bret can be used to determine important physical and dynamical processes that were involved with its rapid intensification. Predicting rapid intensification of tropical cyclones is important to operational forecasting because the largest errors currently reported with tropical cyclone intensity changes occur in those particular cyclones which rapidly intensify.

Presentation Index: H19

Quorum Sensing and Pseudomonads

Eric Hjelm

Sponsor: Gordon Schrank

St. Cloud State University, Biological Sciences

Pseudomonads are opportunistic bacterial pathogens that grow in many environments including soil, water and on vegetation. Psuedomonas aeruginosa is a leading cause of nosocomial (hospital-acquired) infections and infects the damaged skin of burn patients and the lungs of about 90% of cystic fibrosis patients. One of its several virulence factors is the production of quorum sensing compounds. Quorum sensing provides the organism with the ability to sense its own cell density, communicate with other cells and to act as a population of cells instead of single unrelated organisms. P. aeruginosa uses acyl-homoserine lactone (AHL) as a signal to control the expression of several virulence genes. In the present study, efforts were directed at isolation procedures for collecting and studying quorum sensing in pseudomonads isolated from the environment. Quorum sensing is a mechanism that enhances survival of bacteria by allowing the organisms to establish biofilms. Study of these factors in environmental isolates allows for testing compounds that may inhibit quorum sensing. Such inhibition might provide treatment strategies in patients with pseudomonad infections. A reliable protocol for isolating and testing these organisms is described along with preliminary studies of inhibition of quorum sensing.

Presentation Index: H20

Error Analysis of the Next Generation Radar Storm Total Precipitation Estimates

Jonathan Conder

Sponsor: Tony Hansen
St. Cloud State University, Earth Sciences

One of the earliest quantitative uses of meteorological radar data was the measurement of rainfall. The radar's ability to scan rain showers and thunderstorms over large areas very quickly makes it a valuable tool for weather and flood forecasting. The Next Generation Radar, NEXRAD, has a great advantage by sampling large areas nearly simultaneously, but it measures the rainfall rate above the earth, not at the surface. Fifteen convective rainfall events occurring across Minnesota and Western Wisconsin have been chosen during the warm season months of May through September for 1999 and 2000. Storm Total Precipitation estimates made by the WSR-88D Doppler Radar located at Chanhassen Minnesota will be compared to the ground truth of the National Weather Service Rain Gauge Network. This study will yield a statistical analysis of the uncertainty and quantify the amount of error of Storm Total Precipitation estimations. It is to be expected that the WSR-88D radar at Chanhassen will over estimate rainfall rates for ranges less than 30 nautical miles do to beam over sampling of the atmosphere. Under estimations at long ranges greater than 60 nautical miles will also be expected due to the overshooting effect of the radar beam of the precipitation induced by the curvature of the earth.

Presentation Index: H21

Predicting Heart Rate and Blood Lactate in a Roller Ski Biathalon Race Using Field Test Data

Steve Vrieze and Megan McNair

Sponsor: David Bacharach
St. Cloud State University, Health, Physical Education, Recreation, and Sport Science

Sponsor: P. Bednarski
MN Community Olympic Development Program, Minneapolis, MN

The purpose of this study was to determine if a series of field tests can be used to accurately predict race pace heart rate (HR) and blood lactate (La) during competition. Five male subjects (19.3 ± 2.9 years) participated in monthly field tests (June-September, 2000) consisting of five 1.5 km loops that progressively increased in intensity from base/recovery training through developmental endurance, threshold, race pace, and finally maximal effort. Values for HR, blood La and time to complete each loop were recorded. The HR, and blood La obtained from the race pace loop was then used to predict HR and blood La during competition. In mid-October, the subjects completed a 12.5 km Biathlon roller ski competition consisting of five 2.5 km loops with shooting stages between each loop. Skiers were stopped near the middle of the loop and blood La was sampled either during the third loop (n = 2, ~ 6 km) or during the fourth loop (n = 3, ~ 9 km). Each skier also wore a Polar HR monitor with HR being averaged and stored using five-second intervals for the entire race. Mean blood La level during competition (8.0mmol ± .8) compared to the predicted race pace La level using the field test (7.6mmol ± .6) was not different ($t = 1.0$, $P < .18$), nor was HR during competition (183 bpm ± 10) as compared to the predicted HR of the field test (185 bpm ± 7) ($t = 0.5$, $P < 32$). These data suggest that a series of field tests could be used in lieu of traditional lab testing to predict competition HR and La levels during a Biathlon roller ski race.

Presentation Index: H22

Can Digitizing be Used to Detect the SSC in Squat Jump that Cannot be Detected with the Force Plate?

Tal Amasay

Sponsor: Glenn Street

St. Cloud State University, Health, Physical Education, Recreation, and Sport Science

The stretch shortening cycle (SSC) is a sequence of muscle contractions common in all human movement. The SSC is an eccentric contraction followed by concentric contraction (Komi, 2000) that increases muscle power output. In the Human Performance Lab at SCSU the amount of countermovement in the SSC that is needed to maximize squat jump height is being studied. The initial results showed that as you eliminate countermovement, the height of the jump as a percent of the max countermovement jump height falls to approximately 70%. A question arose as to the ability of the force plate to detect a small SSC of the muscle. The purpose of this pilot study is to see if there is any evidence of the SSC during squat jumps where there is no detectable unweighting on the ground reaction force tracing. Five subjects will be instructed to perform a squat jump without countermovement. The subjects will be given time to practice the task before data are collected. The subjects will perform the jumps on an AMTI force platform. The trials will be filmed with a 60 Hz video camera. Five locations will be marked side view (head of metatarsal II, lateral malleolus, femoral condyle, greater trochanter and glenohumeral axis)(Winter, 1990) and digitized. The angles of the hip, knee and ankle will be calculated for each field. The two sets of data will be compared to see if any joint motion occurs during trials with no measurable unweighting before the concentric phase.

Presentation Index: H23

The Glycemic Index of Sports Bars

Julia Devonish

Sponsor: David Bacharach

St. Cloud State University, Health, Physical Education, Recreation, and Sport Science

Previous research has reported that foods with a higher glycemic index (GI) improved glycogen resynthesis rates. The purpose of this study was to assess the GI of various sport 'energy' bars. Twelve healthy, nondiabetic subjects volunteered to participate. Subjects ingested either a 50g glucose control beverage (GL), a bar with CHO added to equal 50g CHO (C5), a bar with 39g CHO (CC), and a bar with 44g CHO (AC) on four different days. All testing took place in the morning hours following a 12 hour fast. Blood samples were collected at 10 min intervals from 0 min (pretreatment) through 40 min, at 60 min, 90 min, and 120 min following treatment ingestion. The GI was derived mathematically by calculating the area under the respective curves. Results are reported as mean(SD). The GI of GL, C5, CC, and AC were 100, 83, 64, and 69 respectively. The 20, 30, and 40 min blood glucose concentrations for the three bars were greater than baseline values. However, blood glucose concentrations from 10 to 60 min were all greater than baseline in the GL trial. Average blood glucose concentration for GL, C5, CC, and AC was 5.4(.1) mM/L, 5.0(.1) mM/L, 4.7(.1) mM/L, and 4.8(.1) mM/L, respectively.

Presentation Index: H24

Junior High Students Get a Peace of Fun

Derek Schack and Kate Lawrence

Sponsor: Elizabeth Scheel

St. Cloud State University, Sociology and Anthropology

On March 30, 2001 the second annual peace carnival was held. The purpose of the carnival was to involve youth in fun activities that promoted positive attitudes about peaceful living in a diverse world. Our objectives for this research project was to determined the success of the peace carnival for junior high aged students. We collected qualitative and quantitative data through survey, observation, and interview. The purpose of our research was to evaluate activities that teach peace and to gather information about new ideas to teach peace from junior high students perspective. We believe our research demonstrated that students can learn about peace through interactive activities and provided suggestions for future peace carnivals.

Presentation Index: H25

Determining Extinction Coefficients at St. Cloud State Observatory

Sarah Reed, Kortlan Storm and Peter Crandall

Sponsor: Maria Womack

St. Cloud State University, Physics, Astronomy, and Engineering Science

We determined extinction coefficients specific to the St. Cloud State University Observatory. Extinction coefficients indicate how much of an object's light is attenuated due to scattering or absorption by the atmosphere before reaching the observer. To obtain the coefficients, we observed and imaged various stars as they traveled from zenith to horizon. We used a Meade LX200 sixteen-inch reflecting telescope, along with an Apogee AP7 CCD (charged-coupled device) to make the observations. The images were corrected for pixel variations in the CCD chip via a process known as "flat-fielding" and they were also corrected for thermal noise. Extinction coefficients were determined by fitting a line to data points of observed magnitude vs. zenith angle for a star. The derived extinction coefficient will be used to calibrate the brightness other images that are taken from the observatory.

Presentation Index: H26

A Nuclear Fireball with Flow

Judith Peters

Sponsor: Kevin Haglin

St. Cloud State University, Physics, Astronomy, and Engineering Science

When two nucei collide in an ultra-relativistic collision, the resulting system resembles a hot nuclear fireball comprised of possibly thousands of subatomic particles. Conditions are extreme as temperatures are of the order of a trillion Kelvin and densities reach a thousand trillion grams per cubic centimeter. The system rapidly expands into the near vacuum surrounding the collision site; we refer to this expansion as "flow". We model the fireball with kinetic theory and study the effects of flow on such dynamical details for the light particle species as average separation and wavelength so as to identify a boundary between classical and quantum mechanical behavior. Graphical and numerical results of the model with and without flow will be presented.

Presentation Index: H27

Headspace Solvent Microextraction

Aaron Theis

Sponsor: Michael Jeannot

St. Cloud State University, Chemistry

A hanging microliter drop of 1-octanol is shown to be an excellent preconcentration media for headspace analysis of volatile compounds in an aqueous matrix by gas chromatography – mass spectrometry (GC-MS). Model compounds benzene, toluene, ethylbenzene, and o-xylene (BTEX) are conveniently and rapidly preconcentrated in the microdrop. An internal standard, decane, is present in the organic extracting solvent, and linear calibration curves of relative peak area versus aqueous concentration are obtained for the four model compounds. Stirring of the aqueous phase has little effect on the rate of mass transfer, and equilibrium and kinetic models are proposed to explain the observed extraction behavior. The very low vapor pressure of 1-octanol results in minimal evaporation of the microdrop during the extraction time. This system represents an inexpensive, convenient, and precise sample cleanup and preconcentration method for the determination of volatile organic compounds at trace levels.

Presentation Index: H28

Gender Effects on the Sentencing of Criminals

Michelle St. Clair

Sponsor: Joseph Melcher
St. Cloud State University, Psychology

In our criminal justice system everyone should be treated equally and be given a fair trial without bias or discrimination. Unfortunately there are many factors that lead to discrimination in the criminal justice system. This experiment investigates how the gender of the defendant can effect the sentence they receive. This experiment consists of two scenarios: one of a murder and one of stolen property. The gender of the criminal is given in each scenario and half of the participants receive a male criminal version and the second half receives a female version. After reading each scenario the participant is asked to choose a sentence. They are given the choice of 5 sentences for the murderer and 4 for the thief. The possible sentences for the murderer range from 3-10 years to death. The possible sentences for the thief range from probation to 5-8 years. After sentencing the criminal the participant is asked whether the criminal should be eligible for parole. The main purpose of this experiment is to see whether there is a double standard in the sentencing of men and women when they had committed the same crime, the exact same crime in this case. Only the gender of the criminal was changed between the two versions. The results of the pilot study indicate that there is a double standard and that after a certain point participants will no longer sentence women but they have no problem sentencing men beyond that point.

Presentation Index: H32

Wireless Millennium LED Light Bar with PC Interface

Deq Hussein and Roman Marjamaa

Sponsors: Zheng Yi and Peter George
St. Cloud State University, Electrical and Computer Engineering

The need for power efficiency in Emergency Vehicle lighting has prompted research into alternative sources for Emergency Vehicle lighting. An Emergency Light designer and manufacturer located in St. Cloud, Minnesota has already begun the transition from incandescent bulbs to Light Emitting Diodes (LED) for Emergency vehicle lighting. They have developed the Millennium LED Light Bar, an all LED light bar for law enforcement vehicles. To further promote the flexibility and efficiency of this solid state Light Bar, we have come up with a design for a remote RF controller interface and a touch-screen PC laptop interface for the Millennium LED Light Bar. The RF controller gives the law enforcement officer control of the light bar when the officer is not in the vehicle. The touch screen laptop interface can be installed on the already existing police laptops thus eliminating the need for additional physical controls that take up valuable space on the police vehicle dash. A solid-state interface module that communicates with the Millennium, the PC interface, and the RF interface, eliminates the need for power packs and relay switches needed for analog controllers.

Presentation Index: H33

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Presentation Index: H33

An Investigation of Precipitation During the Winter in St. Cloud, MN

Jeffrey Luxford

Sponsor: Tony Hansen
St. Cloud State University, Earth Sciences

The advent of modern society and its associated technology have resulted in large amounts of anthropogenic pollution being continuously deposited into the environment. One consequence of this has been the contamination of precipitation with various chemical compounds. This happens when pollutants act as condensation nuclei or are scavenged from the air by falling precipitation. Because of this, precipitation is continuously monitored by organizations such as the United States Geological Survey (USGS) to document specific precipitation components such as pH, sulfate ion concentration, and nitrate ion concentration. Sulfate and nitrate ion concentrations are most closely associated with depressed pH values in precipitation (Baez et al. 1997, Pratt et al. 1984). I collected precipitation samples on the campus of St. Cloud State University and measured their pH, filtered them, and measured the pH again. Then, I measured the concentration of sulfate and nitrate ions in each sample. I have found that there are variabilities in the chemical make-up of precipitation in St. Cloud, MN. Other studies have shown that precipitation composition is affected by prevailing wind direction (surface and aloft) before and during precipitation, precipitation type, and time of week (weekday as opposed to weekend). Measurements taken in this study support the theory that prevailing wind direction directly affects precipitation chemistry in St. Cloud, MN.

Presentation Index: H34

Statistical Modeling of the Interarrival Times of Packets in a Computer Network

Sara Felten

Sponsor: David Robinson
St. Cloud State University, Statistics

Frequently networks suffer from poor design. Simulation can be highly effective in planning a network design. In this paper, a model is proposed for a computer network's packet inter-arrival time distribution using a Markov Chain. This methodology was chosen because random events often cause conditions of a system to change with time. In the case of the Markov property, each outcome depends only on the one immediately preceding it. It is of interest to determine the influence an inter-arrival time has on later inter-arrival times. A Markov model can provide an additional level of detail in computer simulation methodology through its transition probability matrix. Certain characteristics of Markov chains are difficult to study theoretically. In these cases, simulation is the only practical method of obtaining information about these characteristics.

Presentation Index: H35

Rights of Human Subjects

Taryn Cochran

Sponsor: Tracy Ore
St. Cloud State University, Sociology and Anthropology

An ethical concern in sociological research is protecting the rights of human subjects. "The process of conducting a sociological research must not expose respondents to substantial risk of personal harm. Informed consent must be obtained when the risks of research are greater than the risk of everyday life" (American Sociological Association, 1989). The purpose of this paper was to determine the protection of rights of human subjects from disadvantaged populations. Specific areas that were looked at were non-consenting individuals who were deemed mentally incompetent, participants who are at a disadvantage based on their given situation (i.e. prison population) and individuals who are studied and observed without knowledge of it. The research method used was Secondary Analysis. Based on existing studies many researchers hold the belief that public benefits outweigh that of individuals. The findings imply there is a justification in researchers exploiting disadvantage population when our larger social world benefits from it.

Presentation Index: H36

Innocent until Proven Guilty: The Practical and Ethical Dilemmas of Wrongful Convictions

Matthew Steinbrink

Sponsor: Tracy Ore

St. Cloud State University, Sociology and Anthropology

In our society, we live by, are governed by, and held accountable to the laws that prevail over us on a daily basis. Furthermore, the ideologies of justness, equality, impartiality, and accuracy within the U.S Justice System have been instilled in the minds of Americans since its inception in order to gain support and acceptance from society. Moreover, we, as a society, have been asked to embrace the laws and decisions made by the courts of this Nation on an unconditional basis. Although noble and dignified in scope, often times the members and laws of this system contribute to the arrest, persecution, prosecution, conviction, and punishment of one who is factually innocent of the crime for which he or she has been accused. The truth of the matter is that justice is not blind; it has a very keen set of eyes and scrutinizes those who lack the financial or physical means to defend themselves or their beliefs. Over the past 20 years, the incidence of exposing a wrongful conviction and subsequently, proving that person's innocence has markedly increased. Thus, the scope of this analysis was to identify the incidence of wrongful convictions, victims of the wrongfully conviction, the ethical dilemma, which faces those involved in the process, and solutions to this problem. I expected to find a correlation between the incidence of those wrongfully convicted and the racial, ethnical, and financial background of the accused. In order to accomplish this study, I utilized a comprehensive search and review of literature, refereed journal publication, and other media sources. The aforementioned search and subsequent review has yielded results, which indicate that race, ethnicity, and financial factors do play a significant role in this injustice. In our society, we live by, are governed by, and held accountable to the laws that prevail over us on a daily basis. Furthermore, the ideologies of justness, equality, impartiality, and accuracy within the U.S Justice System have been instilled in the minds of Americans since its inception in order to gain support and acceptance from society. Moreover, we, as a society, have been asked to embrace the laws and decisions made by the courts of this Nation on an unconditional basis. Although noble and dignified in scope, often times the members and laws of this system contribute to the arrest, persecution, prosecution, conviction, and punishment of one who is factually innocent of the crime for which he or she has been accused. The truth of the matter is that justice is not blind; it has a very keen set of eyes and scrutinizes those who lack the financial or physical means to defend themselves or their beliefs. Over the past 20 years, the incidence of exposing a wrongful conviction and subsequently, proving that person's innocence has markedly increased. Thus, the scope of this analysis was to identify the incidence of wrongful convictions, victims of the wrongfully conviction, the ethical dilemma, which faces those involved in the process, and solutions to this problem. I expected to find a correlation between the incidence of those wrongfully convicted and the racial, ethnical, and financial background of the accused. In order to accomplish this study, I utilized a comprehensive search and review of literature, refereed journal publication, and other media sources. The aforementioned search and subsequent review has yielded results, which indicate that race, ethnicity, and financial factors do play a significant role in this injustice.

Presentation Index: H37

Aviation Emergency Locator Receiver with GPS, Digital Compass, and a PC Graphical User Interface with Geographic Mapping Capability

Bradley Ryan Westphal and James Robert Range

Sponsor: J. Michael Heneghan

St. Cloud State University, Electrical and Computer Engineering

Airplanes in the United States contain Emergency Locator Transmitters, which are utilized in the unfortunate event of a crash. Our Senior Design Project was to develop a Personal Computer to Emergency Locator Receiver Interface, which can be installed in an automobile. Once installed, its purpose is to aid in search and rescue missions by locating crashed airplanes on a digital geographic map. The above system operates in the following manner. The distance and direction of the crashed airplane, relative to the vehicle with this system installed in it, is determined by using Radio Direction Finding Triangulation. The personal computer can be a laptop or an in-car-computer. The personal computer interfaces to a Microcontroller, which in turn interfaces to an Emergency Locator Receiver, Global Positioning System (GPS) Receiver, and a Digital Compass. The Windows Graphical User Interface in the personal computer contains geographic mapping software that plots a dot indicating the automobiles current location, and another dot indicating the location of the wreckage of the airplane.

Presentation Index: H38

Short-term Fasting Effects on Plasma and Central Motilin Release in Cows – A Preliminary Report

Jason Lunden and Burton Afonja

Sponsor: Oladele Gazal
St. Cloud State University, Biological Sciences

Motilin is a 22-amino acid polypeptide that is secreted by cells located in the gastrointestinal tract in mammals. Evidence also supports motilin synthesis by brain cells. Whereas the function of plasma motilin is known, it is not clear what this peptide does in the CNS. Further, there is no information as to the relative levels and pattern of secretion of motilin in systemic blood and the central compartment. The objectives of this study were to determine the relative levels of motilin in plasma and CSF of cows during well-fed and fasting states. Three ovariectomized cows were fitted with both external jugular- and cerebroventricular cannulae to permit simultaneous blood and CSF collection. Animals were maintained on full-feed and sampled for 6 h. Motilin was injected icv at either 0, 100 or 300 μg midway into the sampling. Animals were then fasted for 48 h and then sampled for 4 h. Plasma and CSF motilin were determined by RIA. Plasma motilin was significantly greater ($p < .001$) than CSF motilin at all sampling times. Feed restriction increased plasma but not CSF motilin in 2 of 3 cows. In motilin-injected cows, CSF motilin was elevated and this increase was sustained for 48 h. There was a paradoxical increase in CSF motilin in the saline-injected cow but this increased was not sustained for 48 h. The increase in CSF motilin did not induce a concomitant increase in plasma motilin. These results suggest that motilin secretion into systemic blood far exceeds central motilin secretion. Furthermore, the effect of fasting may be exerted at the level of gastrointestinal and not the level of central motilin secretion.

Presentation Index: H39

Wireless Web Cam

Hoon Yoo, Tony Dehn and Nick DeLisi

Sponsor: Lekhakul Sura
St. Cloud State University, Electrical and Computer Engineering

With modern technology advancing towards wireless products making life easier to communicate with people and machines. Incorporating these high tech devices with the personal computer has become a fixture for every day life. As computer technology advanced, the roles of imaging on the computer have become very important. Many companies sell their products through the Internet showing their product images on the computer as well as individuals. A lot of people put their picture or their own materials on the Internet using a web cam. The wireless web cam will be more convenient to individuals who need to put images on the computer. A Wireless web cam will benefit the user by having a greater range from the computer for more applications. A standard web cam will be connected to a separate board containing a Universal Serial Bus (USB) port for the web cam to connect to. Then on this board a number of applications will take place for gathering and sending the data wirelessly to another board that is connected to the personal computer (PC). The board that is connected to the PC will gather the sent data and send it via USB to the computers USB port to display onto the screen. The standard protocols for USB 1.1 will be used for gathering the information on the two boards. The board that contains the connection for the web cam will be powered by batteries, therefore making it so that the camera can be placed anywhere within a 100 feet of the computer. The directional controller will be added to the web cam to move web cam in all direction. USB board will send signals to motor driver to move web cam.

Presentation Index: H40

Amplification and Expression of Cellular Binding Protein

Bryan Meade

Sponsor: Nathan Winter
St. Cloud State University, Chemistry

The purpose of the project is to alter the protein cellular retinal binding protein II (CRBPII) in order to make it easy to purify. The gene for CRBPII will be amplified using the Polymerase Chain Reaction. After amplification, the CRBPII coding DNA will be digested and ligated into a similarly digested plasmid vector that will code for a poly-Histidine leader sequence. After ligation, a strain of E. coli will be transformed with the newly developed plasmid through the classical calcium chloride and heat shock treatment. The bacteria will then be used to express CRBPII with the poly-Histidine leader sequence attached to it. This will allow for easy purification of the CRBPII through the use of polar side chains of the Histidines. The modified CRBPII can then be isolated and purified by metal chromotography.

Presentation Index: H41

Testicular and Brain Nitric Oxide Synthase (NOS) Gene Expression in Aged Immobilized Rats

Yaiza Diaz-De-Durana

Sponsor: Oladele Gazal

St. Cloud State University, Biological Sciences

The response to stress includes changes in the secretory function of the adrenal cortex and testis, and perturbation in the glucose metabolism. Nitric Oxide (NO) is synthesized by oxidative de-amination of the amino acis L-arginine by isoforms of the regulated enzyme nitric oxide synthase (NOS). Nitric oxide is implicated in the changes induced by stress in some organs. Two isoforms of NOS are known: a calcium dependent form that is synthesized constitutively (cNOS) and a calcium independent type that is inducible (iNOS). In preliminary study we have observed that immobilization stress increases corticostersone, reduces both plasma and testicular testosterone levels, and increases blood glucose concentration. Most of these effects are prevented by inhibiting NO synthesis. This project will show, using semi-quantitative RT-PCR, expression of cNOS and iNOS mRNA in testicular and brain tissue from aged rates that are subjected to immobilization stress.

Presentation Index: GH42

Individual Differences in Attention and Memory: Use of Quantitative Electroencephalographs

Alyssa Braaten

Sponsors: Leslie Valdes and Tim Tinius

St. Cloud State University, Psychology

This study examines the relation among attention, short term memory, and brain activity. Sustained attention is the ability to focus and maintain one's concentration (Sandford & Turner, 1995). These two elements of sustained attention are measured separately with the Intermediate Visual and Auditory Continuous Performance test (IVA). Memory was assessed using a questionnaire about everyday occurrences of memory failure (Broadbent, Cooper, Fitzgerald, & Parkes, 1982) and a behavioral test of memory, the Wechsler Memory Scale Revised (WMS-R). If the mental processes involved in attention and memory are similar to each other, individuals with a greater ability to focus their attention should have fewer memory failures in daily living and perform better on memory tests than those who have a harder time focusing their attention. Quantitative Electroencephalographs (QEEG) should also be able to differentiate individual differences in attention and memory.

Presentation Index: G43

Wireless Vote Tallying

Ahmed Rashed, Karin Fazlul, and Ghias Amer,

Sponsor: Peter George

St. Cloud State University, Electrical and Computer Engineering

Members of Parliament when voting have to leave their chambers to vote to have their 'Aye' and 'No' votes recorded by tellers sitting beside each chamber. According to BBC, each vote takes 12 to 15 minutes to complete and senators are forced to queue. The Wireless Vote Tallying System will record the senator's vote electronically and total the amount of votes on the personal computer. The speaker of the house will be able to look at his personal computer for the total number of votes received and depending on the majority vote, pass a ruling on the motion. The whole election process will save time, will be web linked and the result will be available in real time to the public. The system will be implemented using PIC chip, radio frequency transceiver, serial link and graphic user interface. The master controller will control the keypad on the senator's desk and the radio frequency transceivers will be used to transmit and receive signals back and forth from the senator's keypad and speaker's desk. After the senator votes using his keypad, the radio frequency transceivers will transmit the signal to the speaker's desk. Serial link will be used to communicate with speaker's personal computer. The graphic user interface application will show the names of the senators and provide information to the speaker on the type of vote placed by each senator. Anyone will be able to access the graphic user interface through web link and see the election results in real time. To secure the information on the system, we encrypt the signal information using code division multiple access technology. The wireless keypad can only be used once after the speaker resets the system from his personal computer. The transceiver can be run on batteries.

Presentation Index: H44

Remote Controlled Robotic Arm

Nabin Sharma, Hieu Nguygen and Hanh Vo

Sponsor: Michael Glazos
St. Cloud State University, Electrical and Computer Engineering

This project entails the construction of a Remote controlled robotic arm. A personal computer (PC) provides a graphical user interface (GUI) to the robotic arm. The GUI window includes movement command buttons such as forward, backward, up, and down. The robotic arm has two degrees of rotational freedom and is actuated by two stepper motors. The stepper motors are controlled by a resident microcomputer employing an 8-bit micro controller. The microcomputer receives movement commands from the PC, via infrared serial link, and in turn controls the motion of the robotic arm. The robotic arm employs an electromagnet as and end effector to pick and place metal objects in order to demonstrate dexterity.

Presentation Index: H45

Perceived Mother-Infant and Father-Infant Attachment During Two Feeding Situations

Krista Dillman

Sponsor: Marlene DeVoe
St. Cloud State University, Psychology

Surveys rating the perceived attachment of parents with their infants in four feeding situation pictures were completed by forty-one university students, thirty-two females and nine males. The four situations depicted were (1) the mother breastfeeding her infant, (2) the father in a supportive role of his infant being breastfed, (3) the mother bottle-feeding her infant, and (4) the father bottle-feeding his infant. There were five questions in relation to each feeding situation picture rating the perceived attachment of the parent and infant on a four point scale. Results showed a difference between male and female participants' responses.

Presentation Index: G46

Chinese English Tense

Xie Huimin

Sponsor: Marya Teutsch-Dwyer
St. Cloud State University, English

The study examines 1) The influence of learner's first language on the acquisition of English tense (focus on past tense), aspect; 2) The hypothesis that the English learners tend to mark the foreground information rather than the background in a narrative. The subjects are two groups of speakers of English as a second language, whose mother tongues are Chinese and Japanese, respectively. Data were collected by oral and written production tasks: an oral narrative of personal experiences in English; a written narrative of the same experience in English; a written narrative of the same experience in Chinese and in Japanese. Chinese is a language whose aspect (perfective, progressive) and tense are not marked morphologically. Instead, they are marked through lexicons and narrative principles, unlike English and Japanese, where tense/aspect are marked by both lexicons, narrative principles and morphological inflection of verbs. The finding so far suggests that the distribution of morphological markers of Chinese English speakers varies, depending on the data elicitation task and emotional state.

Presentation Index: G47

The Effects of Declining Temperature Gradations on the Viability of Harmonia Axyridis

Melissa Olson and Brandie McCray

Sponsor: Ralph Gundersen

St. Cloud State University, Biological Sciences

The multicolored Asian Lady Beetle, Harmonia axyridis (Coleoptera:Coccinellidae), has been used by the United States Department of Agriculture for biological control measures in the southern U.S. However, recent congrigations in Minnesota have suggested the possibility for using them as a biological control method in northern latitudes. In order for this to be an effective biocontrol method, the lowest temperature threshold needs to be quantified to determine the sustainability of the population over a wintering period. The results will show the potential effect of severe climate on the success of H. axyridis in Minnesota. It will also determine the extent of the species range and identify whether it can be a stable member of the community.

Presentation Index: G48

P31 NMR Studies of the Reaction Catalyzed by Creatine Kinase

Joe Dunbar

Sponsor: Nathan Winter

St. Cloud State University, Chemistry

Adenosine triphosphate (ATP) is a high-energy phosphate used by the body's muscles to store and release energy. The ATP molecule contains two phosphoric anhydride linkages, which can be broken to release quick energy in the body. ATP with creatine is converted with an enzyme called Creatine kinase to Adenosine diphosphate (ADP) and creatine phosphate. This is an easily reversible reaction that allows the body to regenerate energy from the creatine phosphate and ADP, making ATP/ADP a versatile energy shuttle device. The equilibrium constant for the enzyme-catalyzed reaction is ~1. We attempted to determine the concentrations of ATP and ADP using Nuclear Magnetic Resonance Spectroscopy (NMR), from this we could determine the equilibrium constant. First we had to identify the NMR spectra of ATP and ADP, and then be able to accurately quantitate them together in a buffered solution. Knowing how to do this will allow us to perform the reaction with creatine kinase and then calculate the equilibrium constant.

Presentation Index: G49

Presentation Index

Presenter	Sponsor(s)	University	Time	Presentation Index
Afonja, Burton	Gazal, Oladele	BIOL, SCSU	2:00 PM	H39
Amasay , Tal	Street, Glenn	SS, SCSU	2:00 PM	H23
Amer, Ghias	George, Peter	EE, SCSU	2:00 PM	H44
Baugh, Hanni	Vorder Bruegge, Andrew	THFS, SCSU	10:30 AM	E1
Becker, Lisa	Brown, Paul	ANTH, MSU	10:30 AM	G1
Beil, Tracy	Street, Glenn	SS, SCSU	2:00 PM	H10
Bennett, Angela	Frank, Steven	SCSU Survey, SCSU	10:50 AM	F2
Berg, Carla	Scheel, Elizabeth	SOC, SCSU	2:00 PM	H07
Bethke, Bridget	Hou, Ling	EE, SCSU	10:30 AM	A1
Bisek, Aaron	Yu, Warren	MFGE, SCSU	11:50 AM	A5
Blount, Theron	Haglin, Kevin	PHYS, SCSU	11:50 AM	B5
Braaten, Alyssa	Tinius, Tim & Valdes, Leslie	PSY, SCSU	2:00 PM	H43
Burkham, James	Scheel, Elizabeth	SOC, SCSU	2:00 PM	H15
Busse, Chris	Knoblich, Penny	BIOL, MSU	2:00 PM	H01
Carlson, Todd	Covey, Steven	MFGE, SCSU	11:30 AM	A4
Chaudhry, Nadeem	Yi, Zheng & Yao, Aiping	EE, SCSU	10:50 AM	A2
Chee Ming Tan , Ming	Dou, Wenyu	MBA, SCSU	11:30 AM	F4
Cochran, Taryn	Ore, Tracy	SOC, SCSU	2:00 PM	H36
Cody, Jon	Scheel, Elizabeth	SOC, SCSU	11:10 AM	G3
Conder, Jonathan	Hansen, Tony	ESCI, SCSU	2:00 PM	H21
Cox, Justin	Nuccetelli, Susanna	PHIL, SCSU	12:20 PM	E8
Crandall, Peter	Womack, Maria	ASTR, SCSU	2:00 PM	H26
Dasinger, Holly	Hammes, Michelle Kukoleca	POL, SCSU	11:50 AM	F5
DeGrote, Bruce	Sreerama, Lakshmaiah	CHEM, SCSU	2:00 PM	H02
Dehn, Tony	Sura, Lekhakul	EE, SCSU	2:00 PM	H40
DeLisi, Nick	Sura, Lekhakul	EE, SCSU	2:00 PM	H40
Devonish, Julia	Bacharach, David	SS, SCSU	2:00 PM	H24
Diaz-De-Durana, Yaiza	Gazal, Oladele	BIOL, SCSU	2:00 PM	H42
Dillman, Krista	DeVoe, Marlene	PSY, SCSU	2:00 PM	H46
Dunbar, Joe	Winter, Nathan	CHEM, SCSU	2:00 PM	H49
Dunn, Neil	Vorder Bruegge, Andrew	THFS, SCSU	10:30 AM	E1
Ethen, Matt	Heneghan, J. Michael	EE, SCSU	11:10 AM	A3
Fazlul, Karin	George, Peter	EE, SCSU	2:00 PM	H44

Presenter	Sponsor(s)	University	Time	Presentation Index
Felten, Sara	Robinson, David	STAT, SCSU	2:00 PM	H35
Fields, Jenny	Knoblich, Penny	BIOL, MSU	2:00 PM	H01
Fitzsimons, Joy	Valdes, Leslie	PSY, SCSU	2:00 PM	H13
Fredricks, Lisa	Scheel, Elizabeth	SOC, SCSU	10:50 AM	G2
Frelich, Angela	Seifert, John	SS, SCSU	2:00 PM	H09
Frost, Jeremy	Seifert, John	HPERSS/HPL, SCSU	2:00 PM	H17
Gerdin, Heather	Scheel, Elizabeth	SW, SCSU	2:00 PM	H11
Giebenhain, Lawrence	Nuccetelli, Susanna	PHIL, SCSU	11:05 AM	E3
Goldschen, Marcel	Harlander, John	COSE, SCSU	11:30 AM	C4
Gontesky, Jacob	Hansen, Tony	ESCI, SCSU	10:50 AM	C2
Gontesky, Jacob	Hansen, Tony	ESCI, SCSU	2:00 PM	H04
Green, Naomi	Valdes, Leslie	PSY, SCSU	11:10 AM	D3
Habeeb, Fahd	Yao, Aiping & Yi, Zheng	EE, SCSU	10:50 AM	A2
Hansen, Missy	Scheel, Elizabeth	SOC, SCSU	2:00 PM	H08
Hansen, Susan	Jeannot, Michael	CHEM, SCSU	11:50 AM	C5
Hanson, Tara	Scheel, Elizabeth	SW, SCSU	2:00 PM	H11
Hecker, Beth	Melcher, Joseph	PSY, SCSU	2:00 PM	H30
Heffron, Matthew	Hammes, Michelle Kukoleca	POL, SCSU	11:10 AM	F3
Henning, Brian	Buske, Dale	Math, SCSU	10:30 AM	A1
Hjelm, Eric	Schrank, Gordon	MFGE, SCSU	2:00 PM	H20
Hussein, Deq	George, Peter & Yi, Zheng	EE, SCSU	2:00 PM	H33
Hyers, Bill	Frank, Steven & Wagner, Steven	POL, SCSU	10:30 AM	F1
Johnson, Keith	Nuccetelli, Susanna	PHIL, SCSU	11:20 AM	E4
Johnson, Mina	Frank, Steven & Wagner, Steven	POL, SCSU	10:30 AM	F1
Joiner, J. Chris	Nuccetelli, Susanna	PHIL, SCSU	11:50 AM	E6
Jorgensen, Krista	Scheel, Elizabeth	SOC, SCSU	2:00 PM	H08
Kapoor, Sonu	Frank, Steven & Wagner, Steven	SCSU Survey, SCSU	10:50 AM	F2
Keanery, Bridget	Frank, Steven & Wagner, Steven	POL, SCSU	10:30 AM	F1
Koester, Kurt	Neu, Don	CHEM, SCSU	11:10 AM	B3
Kokett, Kim	Scheel, Elizabeth	SOC, SCSU	11:10 AM	G3
Krueger, Alex	Hou, Ling	EE, SCSU	10:30 AM	A1
Langfield, Jason	Heneghan, J. Michael	EE, SCSU	11:10 AM	A3
Lawrence, Kate	Scheel, Elizabeth	SOC, SCSU	2:00 PM	H25
Link, Carrie	Gregory, Dan	CHEM, SCSU	11:10 AM	C3

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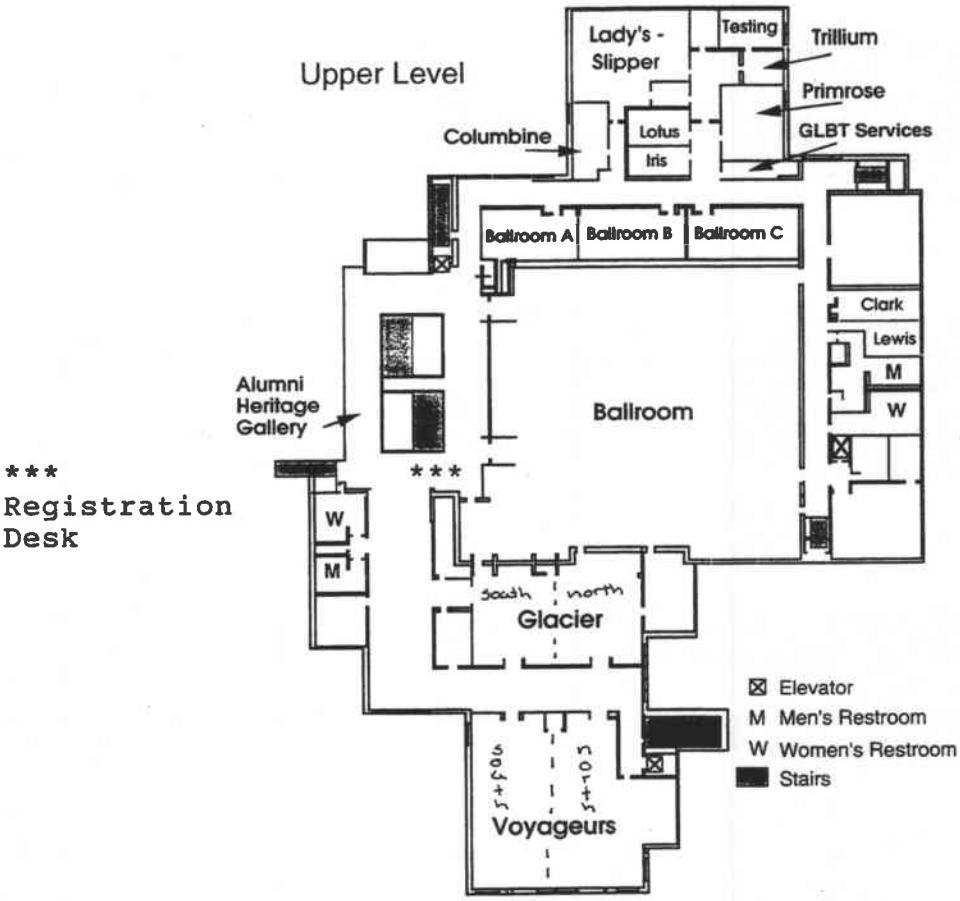
Link, Melissa	Sreerama, Lakshmaiah	CHEM, SCSU	2:00 PM	H03
Lunden, Jason	Gazal, Oladele	BIOL, SCSU	2:00 PM	H39
Luxford, Jeffrey	Hansen, Tony	ESCI, SCSU	2:00 PM	H34
Magnuson, Amy	Brundage, Shelley	CDIS, SCSU	2:00 PM	H16
Maki, Brandon	Scheel, Elizabeth	SOC, SCSU	2:00 PM	H15
Marjamaa, Roman	George, Peter & Yi, Zheng	EE, SCSU	2:00 PM	H33
McCray, Brandie	Gundersen, Ralph	BIOL, SCSU	2:00 PM	H48
McNair, Megan	Bacharach, David & Bednarski, P	SS, SCSU	2:00 PM	H22
Meade, Bryan	Winter, Nathan	CHEM, SCSU	2:00 PM	H41
Melberg, Ray	Hou, Ling	EE, SCSU	10:30 AM	A1
Morseth, Stefanie	Frank, Steven	SCSU Survey, SCSU	10:50 AM	F2
Mrozek, Randy	Neu, Don	CHEM, SCSU	11:10 AM	B3
Munt, Benjamin	Covey, Steven	MFGE, SCSU	10:30 AM	B1
Nelson, Matthew	Arriagada, Jorge & Anderson, Craig	BIOL, SCSU	2:00 PM	H12
Newman, James	Nuccetelli, Susanna	PHIL, SCSU	12:30:0	E7
Nguygen, Hieu	Glazos, Michael	EE, SCSU	2:00 PM	H45
Nielsen, Ulrik	Dou, Wenyu	MBA, SCSU	11:30 AM	F4
Olson, Melissa	Gundersen, Ralph	BIOL, SCSU	2:00 PM	H48
Paggen, Michael	Nuccetelli, Susanna	PHIL, SCSU	11:35 AM	E5
Peters, Judith	Haglin, Kevin	PHYS, SCSU	2:00 PM	H27
Petrangelo, Mae	Devers, Monica	CDIS, SCSU	10:50 AM	D2
Pfalzgraf, Amanda	Scheel, Elizabeth	SOC, SCSU	2:00 PM	H14
Propson, Nicole	Scheel, Elizabeth	SOC, SCSU	2:00 PM	H08
Range, James Robert	Heneghan, J. Michael	EE, SCSU	2:00 PM	H38
Rashed, Ahmed	George, Peter	EE, SCSU	2:00 PM	H44
Reed, Sarah	Womack, Maria	ASTR, SCSU	2:00 PM	H26
Rice, Guy	Nuccetelli, Susanna	PHIL, SCSU	10:50 AM	E2
Roering, Shawn	Huang, Danrun	MATH, SCSU	10:50 AM	B2
Rudrud, Emily	Rudrud, Eric	LDR, SCSU	2:00 PM	H18
Russell, Leslie	Kling, Kristen	PSY, SCSU	10:30 AM	D1
Schack, Derek	Scheel, Elizabeth	SOC, SCSU	2:00 PM	H25
Schapira, Craig	Scheel, Elizabeth	SOC, SCSU	2:00 PM	H14
Schock, Mike	Heneghan, J. Michael	EE, SCSU	11:10 AM	A3
Seevers, Alison	Scheel, Elizabeth	SOC, SCSU	2:00 PM	H08

Presenter	Sponsor(s)	University	Time	Presentation Index
Sharma, Nabin	Glazos, Michael	EE, SCSU	2:00 PM	H45
Spinar, Michael	Hansen, Tony	ESCI, SCSU	10:30 AM	C1
Spychala, Alicia	Gregory, Dan	CHEM, SCSU	11:30 AM	B4
St. Clair , Michelle	Melcher, Joseph	PSY, SCSU	2:00 PM	H32
Steinbrink, Matthew	Ore, Tracy	SOC, SCSU	2:00 PM	H37
Stock, Jacob	Covey, Steven	MFGE, SCSU	11:30 AM	B1
Stokes, Charlotte	Scheel, Elizabeth	SOC, SCSU	11:30 AM	G4
Strom, Kortlan	Womack, Maria	ASTR, SCSU	2:00 PM	H26
Swanson, Jacie	Sreerama, Lakshmaiah	CHEM, SCSU	2:00 PM	H02
Tax, David	Yu, Warren	MFGE, SCSU	11:50 AM	A5
Theis, Aaron	Jeannot, Michael	CHEM, SCSU	2:00 PM	H28
Tourand, Philip	Jeannot, Michael	CHEM, SCSU	2:00 PM	H29
Urban, Bethany	Vorder Bruegge, Andrew	THFS, SCSU	10:30 AM	E1
Vo, Hanh	Glazos, Michael	EE, SCSU	2:00 PM	H45
Vobelt, Laura	Scheel, Elizabeth	SOC, SCSU	10:50 AM	G2
Vrieze, Steve	Bacharach, David & Bednarski, P	SS, SCSU	2:00 PM	H22
Walsh, Jessica	Carter, Thomas	ANTH, SCSU	11:30 AM	D4
Walsh, Jessica	Carter, Thomas	ANTH, SCSU	12:10 PM	D6
Weinzierl, Amy	Hansen, Tony	ESCU, SCSU	2:00 PM	H19
Westphal, Bradley Ryan	Heneghan, J. Michael	EE, SCSU	2:00 PM	H38
Willenbring, Cheryl	Scheel, Elizabeth	SOC, SCSU	10:50 AM	G2
Williams, Brent	Harlander, John	COSE, SCSU	11:30 AM	C4
Williams, Jeffrey	Scheel, Elizabeth	SOC, SCSU	11:30 AM	G4
Williamson, Sarah	Scheel, Elizabeth	SOC, SCSU	2:00 PM	H08
Wojchouski, Dylan	Heil-Chapdelaine, Richard	BIOL, SCSU	2:00 PM	H31
Xie, Huimin	Teutsch-Dwyer, Marya	ENGL, SCSU	2:00 PM	H47
Yoo, Hoon	Sura, Lekhakul	EE, SCSU	2:00 PM	H40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Primrose
GLBT Services
Columbine
Lotus
Iris
Ballroom A
Ballroom B
Ballroom C
Clark
Lewis
M
W
Alumni Heritage Gallery
Ballroom
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Registration Desk
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M
south
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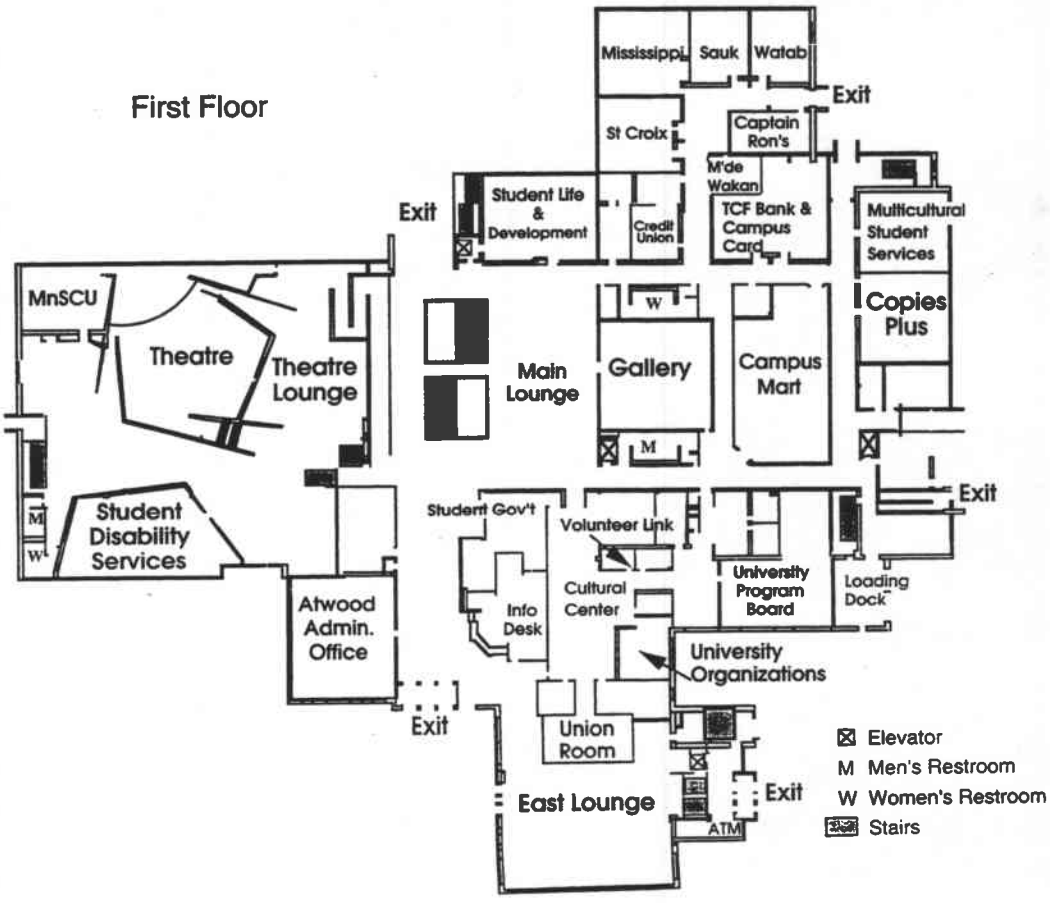
Glacier
Elevator
M Men's Restroom
W Women's Restroom
Stairs
Voyageurs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St Croix
Captain Ron's
M'de Wakan
Exit
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TCF Bank & Campus Card
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MnSCU
Theatre
Theatre Lounge
Main Lounge
W
Gallery
Campus Mart
Copies Plus
M
Exit
Student Disability Services
M
W
Student Gov't
Volunteer Link
Info Desk
Cultural Center
University Program Board
Loading Dock
Atwood Admin. Office
University Organizations
Exit
Union Room
East Lounge
Exit
ATM
Elevator
M Men's Restroom
W Women's Restroom
Stairs