

# MSUM Student Academic Conference



## PRESENTATION LISTINGS

Times and locations may have changed since the publication of this document. Please go to the Student Academic Conference website for the most up-to-date information. Here you may also view the listing database to sort the listings by time, location, department, keyword and presenter's name. <http://web.mnstate.edu/acadconf/>

### ACCOUNTING

#### Cloud Computing in Today's World

Lohana Gautam, Prasanna

Shrestha, Roshani Lama

Advisor: Lori Johnson

9:30 AM - 10:10 AM • CMU Hallways

Cloud computing is clearly one of today's most enticing technology areas due, at least in part, to its cost-efficiency and flexibility. Moreover, these network access are done quick and with the use of very minimum amount of efforts and time. Similarly, we can make some cost savings through the use of significant pooling of the resources available. Likewise, if the system of cloud computing is successfully implemented then different cost of operations and maintenance of the infrastructures of Information Technology can be reduced. Hence, it is definitely economic in terms of money and time. Cloud computing allow computer users access to powerful computers and software applications hosted by remote groups of servers, but security concerns related to data privacy are limiting public confidence and slowing adoption of the new technology.

### ACCOUNTING

#### How to Detect a Criminal Mind

Nathan Funk, Tharaka Muthukumarana

Advisor: James Hansen

10:10 AM - 10:50 AM • CMU Hallways

Fraud is an intentional deception made for personal gain or damage to another individual. A typical organization loses up to five percent of its annual revenue to fraud, with a median loss of \$160,000. Fraud is rapidly spreading through businesses, banks, manufacturing, and the government. Types of fraud include: Embezzlement, tax fraud, identity fraud, vendor schemes, and Ponzi schemes. According to recent research identity fraud is rising through the use of income tax returns and refunds. The fraud triangle is a valuable tool in determining how fraud occurs and how it can be detected. If all three elements of the fraud triangle are present, there is a good chance fraud is occurring. Fraud, which costs U.S. companies billions of dollars each year, is rapidly growing.

### ANTHROPOLOGY

#### An Analysis of Archaeological Excavations at Poverty Point State Historic Site, Louisiana

Sara Kram, Katie Jacobson, Blake Clerico

Advisor: Rinita Dalan

1:00 PM - 1:40 PM • CMU Hallways

Minnesota State University Moorhead students conducted archaeological studies at the Poverty Point State Historic Site in northwest Louisiana in June of 2011. This complex site with large earthen mounds and ridges is listed as a National Historic Landmark by the U.S. Department of the Interior. Fieldwork, supervised by MSUM professor Rinita Dalan, Poverty Point Station Archaeologist Diana Greenlee, and Assistant Station Archaeologist and Interim Regional Archaeologist Fran Hamilton, included the continuation of excavations initiated in 2009, geophysical measurements across excavation floors and walls, water screening of excavated sediments, flotation for seeds, charcoal, bone fragments, beads, and other small artifacts, and lab work. Excavations took place in the plaza of site in the area of a large (approximately 20 m in diameter) circular feature that had been discovered by a magnetometer survey. Though the function of this unusual circular feature is not known, excavations revealed that it was constructed of large, closely-spaced posts. The material in the post-holes was highly magnetic, comprised of Poverty Point objects (fired silt balls) and charcoal in an organically rich matrix. Ongoing analysis of these findings is helping to broaden our knowledge of activities of the prehistoric Poverty Point culture.

### ANTHROPOLOGY

#### Maple River Survey - Ceramic Analysis

Beatriz Castro

Advisor: George Holley

1:40 PM - 2:20 PM • CMU Hallways

The Maple River Survey was conducted by Dr. Michael Michlovic, along with students from MSUM, in 1992, prior to the construction of an earthen dam to assist in flood protection for the Red River. A number of prehistoric sites

with ceramic remains were identified during the survey within the middle section of the Maple River, Cass County, North Dakota. These ceramics appear to date largely from the Late Prehistoric period (1200-1600 AD). I have conducted an analysis of these ceramic remains as a means of reevaluating the occupation time spans assigned to the sites. Since the time of the survey there have been refinements in the prehistoric sequence. I am interested in placing the sites identified into this new sequence to determine if this new data changes our understanding of the occupation of the valley.

### ANTHROPOLOGY

#### Analysis of Ceramic Materials from the Wichman Site

Lynsee Langsdon

Advisor: George Holley

2:30 PM - 3:10 PM • CMU Hallways

The Red River Valley was a prime area for Native American settlement for thousands of years before the colonization of America. As such the region has a rich archaeological record. One example of this resource base is an archaeological site from Cass County, ND called the Wichman site (32CS30). The Wichman site was excavated by the MSUM field school under the direction of Dr. Michael Michlovic in 1987 and yielded cultural materials dating from the Late Prehistoric period (AD1200-1700). My goal is to provide an understanding of the temporal and cultural position of the occupations at this site on the Maple River. This is accomplished by a detailed ceramic analysis of the collection and a comparison with other sites in the region.

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## ANTHROPOLOGY

### Survey of Symbolism in Rural Cemeteries (South of US Highway #10 in Clay County, MN with an Outlier in Wilkin County, MN)

Larissa Harris

Advisor: Michael Michlovic

2:50 PM - 3:10 PM • CMU 208

This project was carried out beginning the summer of 2011 through a grant from the CSNS in an attempt to determine local trends in cemetery symbolism, which had not been researched in the area before. The study area consists of 14 townships with 17 cemeteries meeting the criteria for the survey. Digital photography was used to capture images of the gravestones (a total of 1,410). Gravestone shape also factored into the final analysis, with the most popular combination of gravestone shape and symbol being block and floral. Rural cemeteries, however, provide a distinct look at the local people and their heritage because they contain people from varying backgrounds, economic standings, social statuses, and occupations; therefore, the remainder of the findings (children excluded) did not reflect significant patterns. Children's stones were separated in the conclusions because they followed a more significantly apparent pattern overall.

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## ANTHROPOLOGY

### Data collection in the 21st century: a new archeological app

Paul Carlson

Advisor: Michael Michlovic

3:10 PM - 3:50 PM • CMU Hallways

This project is a design for an application that can be used by archaeologists in the field for data collection and organization. Such an "app" will fill a gap in technology for archaeologists. While there are applications that deal with mapping and others that deal with databases, they had not been combined. Here, I use existing applications with the special needs of the field archaeologist in mind to offer a program for use on archaeological survey and excavation. This application was designed for simplicity and power. This is first and foremost a data collection application, to better catalog artifacts from sites, units and levels can be entered into the database. These can then later be easily reviewed for on-site decisions. The application is also a time saver in post field work lab analysis. Field data entry saves both money and time will not have to be spent for another person to re-enter the data. This expedites both analysis and report writing by collapsing what would have been two separate operations.

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## ART AND DESIGN

### Intent of Writing for Children's Books

Kira Westberg

Advisor: Anna Arnar

9:30 AM - 9:50 AM • CMU 214

My presentation will examine the expressed intent and motivation behind various authors' works for the purpose of differentiating the intrinsic value between those works derived solely for the purpose of expression from those motivated by other means (deadlines, marketability, etc.). In making this distinction, I assert that works of higher quality and greater value are those that are motivated by the sheer desire of expression over those subject to other external premises. For example, both Theodor Geisel and Maurice Sendak had a certain dislike for children, yet they produced books for children so magnificent some consider them art. Likewise, in a recent interview with Maurice Sendak, he said that he didn't write children's books but rather wrote and someone else decided it was for children. Despite their relative ambivalence for their audience these authors have been lauded as exceptional and influential. In contrast, Stephanie Meyers produced a series of books predicated on marketability and the end product suffered from a lack of substance, quality, and intrinsic value - a consequence of her motivations - and yet marketed equally well. From this, one could assert that the process of developing works of higher quality is best served when the creative process is centered around the author's individual and expressionistic desires rather than orbiting around some other compensatory factor; that writing for the audience creates a lesser form of expression and should be viewed thusly. This perceived ambivalence towards one's audience is what I will be exploring in order to ascertain the validity of my claims that a distinction must be made between process and end product when ascribing value to varying works of art. In doing so I hope to explore relevant questions pertaining to the same: Is a story less a work of art if it is produced merely with sales in mind? Even if the story is considered beautiful? If the author has a story to tell, and exhausts himself expressing his story, is that to be considered art instead?

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## ART AND DESIGN

### Eroticism and the Book

Emily Kemper

Advisor: Anna Arnar

9:50 AM - 10:10 AM • CMU 214

Buzz Spector describes the book as an erotic object in the sense that it parallels the shape of human anatomy. Anatomical terms are also associated with the book, such as the spine, head, foot, and joint, giving them a larger connection to the body and, in effect, a more sensual connotation. I would like to investigate the various sensual associations the book can have with the reader. Some topics involved would be the form of the book itself, as

discussed by Buzz Spector, the sensual interaction of page-turning, reading, touching, etc., and artists' books that focus on the human body and the associated sexual metaphors. Some of the visual and textual information in the artists' books are graphic, which raises the question of how they can be released to the public with the current practices of censorship and political correctness. This project would also be a minute investigation into sociology as well as a book's potential to be an erotic object. Other authors and artists to be researched are Marcel Duchamp and Keith Smith.

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## ART AND DESIGN

### The Zine: from Creation to Contemporary

Elise Forer

Advisor: Anna Arnar

10:10 AM - 10:30 AM • CMU 214

The purpose of my presentation is to highlight the zine as a form of artist's book, detailing its history and contemporary usages. A focus will be placed on the zine in context with current events of the time period, respectfully, and why the zine was influential at that time.

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## ART AND DESIGN

### Carbon Printing: A Modern Take

Courtney Johnson

Advisor: Donald Clark

1:00 PM - 1:20 PM • CMU 214

This presentation will address the modern limitations of carbon printing, a historical photographic process. Carbon printing was introduced to the public in 1856 and was one of the only permanent processes at that time. This process involves the use of pigmented gelatin sensitized with potassium dichromate, left to harden in the sun. Because carbon prints have a large tonal scale, the type and amount of ink used to pigment the gelatin is important to achieve the contrast needed for a technically sound print; modern inks react differently with the gelatin, and our goal was to find an ink that would closely mirror historical carbon prints. Throughout the span of our research, we used four different kinds of ink. This is important - especially to the art world - because as new photographic processes are developed the older processes tend to die out, along with the components needed for that process. Keeping up to date replacing older, historical elements with modern ones allows for historical processes to continue being used to their highest potential.

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## ATHLETIC TRAINING

### Sickle Cell Anemia

Jennifer Kelley

Advisor: Christopher Huot

9:30 AM - 10:10 AM • CMU Hallways

Sickle cell anemia is a genetic disorder that was first discovered in 1910. It is a condition in which the structure and shape of the hemoglobin and red blood cells are affected. A normal red blood cell is disc shaped, soft, and flexible, whereas with SCA the red blood cell is deformed and presents as an abnormal crescent or sickle shape. Sick cells have a significantly shortened lifespan, consisting of about 10 to 20 days, while a normal red blood cell has a lifespan of around 120 days. SCA is most commonly found among the African-American, Native American, and Mediterranean populations. Some doctors believe that SCA developed over the years because the gene offers protection from malaria, since the disease was first noted among the malaria belt. The signs and symptoms of SCA can vary widely from patient to patient as well as the severity. The nature of these signs and symptoms, which can be acute or chronic, is one of the main reasons this disease can be so hard to treat.

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## ATHLETIC TRAINING

### Fluid Replacement

Kayla Mohs

Advisor: Dawn Hammerschmidt

9:30 AM - 10:10 AM • CMU Hallways

Fluid replacement is a common problem found in athletic training. Being dehydrated can lead to more serious problems such as heat illnesses. To gather information, I reviewed 12 peer reviewed journals and two websites. Through my research I found that athletes do not have proper knowledge on fluid replacement. I also found information on how much, when, and what an athlete should drink to stay hydrated. Educating not just athletes but coaches too, will help decrease the amount of athletes that suffer from dehydration and its negative affects.

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## ATHLETIC TRAINING

### Athlete's Heart

Jeffrey Baum

Advisor: Christopher Huot

10:10 AM - 10:50 AM • CMU Hallways

Athlete's Heart is a common phenomena that occurs in individuals that are extremely physically active. This physical adaptation can pose some difficulties when trying to differentiate from heart diseases such as hypertrophic cardiomyopathy. This presentation is a literature review discussing the relation Athlete's heart has to sudden cardiac death due to hypertrophic cardiomyopathies.

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## ATHLETIC TRAINING

### Kinesio Taping: Effective or Not?

Tara Hendrickson

Advisor: Christopher Huot

10:10 AM - 10:50 AM • CMU Hallways

Kinesio tape, also known as kinesio tape, is a modern therapeutic tool that has become increasingly popular within the sports and medical field. It is being used on many different types of injuries from patellar dislocations, to lymphatic tissue disorders, to helping reduce muscle fatigue and proprioception. This tape is elastic in nature and unlike the nonelastic white tape that is most commonly seen in Athletic training, Kinesio tape allows the body to move in a normal way through biomechanical processes. There has been research done on Kinesio tape and little is known for sure if it is truly effective in helping with proprioception, muscle strength, motor neuron conduction velocity, and help with pain from injuries. However, some of the research is promising in the future of Kinesio tape especially with helping the lymphatic flow to help facilitate an optimal healing environment. This is a new tool being used and there must be more research done to truly define if this innovative technique is beneficial in the sports and medical field.

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## ATHLETIC TRAINING

### Redcord Training—New Method of Training & Rehabilitation

Advisor: Christopher Huot

10:30 AM - 10:50 AM • CMU 208

30 min presentation. Redcord is a set of sling exercise equipment that can be used for rehabilitation and fitness training. In other countries such as Norway, it is used by various populations, including athletes, physically active individuals, and patients with various injuries. However, the equipment is not commonly used in the United States. I reviewed research articles to provide scientific rationales for use of Redcord. Some of those articles indicated effectiveness of the sling exercises based on existing theories and clinical findings. Other articles showed advantages of the equipment in improving physical performance. Although further researches are required, it would be beneficial to incorporate Redcord training into rehabilitation and fitness training programs.

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## ATHLETIC TRAINING

### The Benefits of Yoga for Athletes

Ashley Peterson

Advisor: Christopher Huot

1:00 PM - 1:40 PM • CMU Hallways

Yoga focuses on the physical body and breathing to achieve self-awareness, concentration, endurance, flexibility, and balance. All of these factors play an important role in athletes' lives and can be especially

valuable for preventing injuries in explosive sports such as sprinting, basketball, baseball, and tennis. Yoga promotes relaxation and simultaneously uses the movement of major and minor muscle groups to increase core stability, flexibility, and range of motion. This study interprets nine peer-reviewed research articles that analyze the various benefits of yoga for athletes as well as the general population. For an athlete, yoga builds core stability allowing the strength for whole-body movements and an increased sense of balance. Yoga poses can be used to prevent injury by increasing muscle strength and flexibility, minimizing muscle fatigue and low back pain, eliminating stress, and increasing a person's musculoskeletal and cardiopulmonary function. Considering the benefits, yoga could be incorporated into a preseason workout schedule or rehabilitation program for an athlete or an entire team, or could be used as a supplemental activity for regular exercise.

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## ATHLETIC TRAINING

### Heat Illnesses

Michael Halvorsen

Advisor: Christopher Huot

1:40 PM - 2:20 PM • CMU Hallways

1) My presentation is going to be about Heat illnesses. The reason why this topic was chosen was because there are many unknown feature about heat illnesses among Athletic Training Students/Certified Athletic Trainers. So to let people know what heat illnesses are and what is the cause of it is critical to our profession. Also, it is important to educate not only the athletes but the community because it could happen to any one of us. 2) To justify my findings I analyzed 8 to 10 journals and gathered the information to put together as a presentation. Also, I asked my clinical instructors for help. 3) I believe I learned a lot from these findings, what common heat illnesses are, how to prevent it, best ways to treat the illnesses, and proper care. Also, it is important to teach the students, athletes, and whomever the danger behind those illnesses. 4) As a conclusion the findings were critical and essential to our program as well as to the community and we now have a better understandings of what heat illnesses are and the ways to treat them.

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## ATHLETIC TRAINING

### The Diabetic Athlete

Zachary Herrmann

Advisor: Christopher Huot

2:30 PM - 3:10 PM • CMU Hallways

There have been many studies and journals written on type 1 diabetes mellitus focusing on management, monitoring, and exercise. Whether or not the research focused on the general diabetic community or towards athletes with diabetes, one recommendation was constant, that exercise is one of the most important therapeutic tools. Hornsby and Chetlin (2005) stated that The American

College of Sports Medicine (ACSM) recommends aerobic exercise at 50-80% of the maximal volume of oxygen that can be consumed. The problem with exercise is that with type 1 diabetes the athlete can go into an exercise induced hypoglycemia due to the high insulin levels lowering the blood glucose levels. In order to fully understand the risks and care that is needed for the athletic community with type 1 diabetes the following must be taken into consideration: development of diabetes, physiological roles of insulin, treatment and management options, signs and symptoms, and acute and long term complications.

## ATHLETIC TRAINING

### Tommy John Surgery

Alexandra Nistler

Advisor: Christopher Huot

3:10 PM - 3:50 PM • CMU Hallways

Tommy John Surgery is a procedure done to reconstruct the ulnar collateral ligament in the elbow. This procedure was brought about in 1974 when Tommy John tore this ligament. There have been many modifications of this surgery since then. This is good to learn about in the sports medical field because these injuries are seen in many athletes. Managing and treating athletic injuries is part of an Athletic Trainer's job description. To find the results in this project, I looked at multiple research and case studies, along with other information found about Tommy John Surgery. From this research study, I learned that there is a lot to consider related to this procedure. Along with any surgery, there is a need for rehabilitation and treatment. I learned much about the rehabilitation protocols for getting the athlete back to pre-injury status.

## ATHLETIC TRAINING

### Redcord Training 'New Method of Training & Rehabilitation'

Yuichiro Yoshida

Advisor: Christopher Huot

12:00 AM - 12:00 AM • NO LOCATION YET

30 min presentation. Redcord is a set of sling exercise equipment that can be used for rehabilitation and fitness training. In other countries such as Norway, it is used by various populations, including athletes, physically active individuals, and patients with various injuries. However, the equipment is not commonly used in the United States. I reviewed research articles to provide scientific rationales for use of Redcord. Some of those articles indicated effectiveness of the sling exercises based on existing theories and clinical findings. Other articles showed advantages of the equipment in improving physical performance. Although further research is required, it would be beneficial to incorporate Redcord training into rehabilitation and fitness training programs.

## BIOLOGY

### A 5-E Model Lesson in Genetics for Secondary Science Students

Rachel Loomis

Advisor: Alison Wallace

9:30 AM - 9:50 AM • CMU 216

40 min presentation. I will present a lesson in genetics suitable for a tenth grade biology class. After the lesson, I will reflect on the 5-E model, which is an effective science teaching method, and the Minnesota Science Frameworks. I will also ask for discussion from the audience.

## BIOLOGY

### Anaerobic Infections and Infertility

Rachel Loomis

Advisor: Kathryn Wise

9:30 AM - 10:10 AM • CMU Hallways

Anaerobic bacteria, or bacteria that can grow where oxygen is not present, are abundant in various areas of the human body. Anaerobic bacteria comprise part of the normal flora of the human body, but some species can cause infection and disease. Specifically, some anaerobic bacteria, such as *Trichomonas vaginalis* and *Gardnerella vaginalis*, have the ability to penetrate the reproductive tract and cause infections which may lead to infertility in women. Based upon a review of the literature, this presentation focuses on providing data related to the risk of such infections developing and how they might be avoided or detected early to minimize the likelihood of infertility.

## BIOLOGY

### Forget Bedbugs, What Inhabits Your Lake?

Sarah Weber

Advisor: Kathryn Wise

9:30 AM - 10:10 AM • CMU Hallways

Each year several beaches in Minnesota are closed due to high levels of *E. coli* in the water. In nearly every case a human infection occurs before the beach is closed. Authorities close the beach only after sampling has shown 1,000 fecal coliform bacteria cells per 100 mL of water. These beach bugs do not solely affect those sickened, rather, the entire city. If beaches were closed before any human illness occurred, these cities would avoid great financial loss and the stigma of a "Dirty Beach." I reviewed seven *E. coli* outbreaks between 2008 and 2009 in lakes throughout Minnesota, searching for any similarities in, but not limited to, lake size, temperature patterns, and the type of lake (i.e. swimming/recreational). Any similarities will be useful in predicting when *E. coli* levels will rise; leading to enhanced monitoring of Minnesota beaches and preventing human illness.

## BIOLOGY

### Should you "get active" when trying to reduce the risk of viral infections?

Ronak Habib

Advisor: Kathryn Wise

9:30 AM - 10:10 AM • CMU Hallways

When it comes to viral vaccines your doctor might make a choice between giving you a live attenuated or dead virus vaccine. A live attenuated virus vaccine has a weakened form of the virus that is still capable of replication when introduced, sometimes resulting in mild symptoms. An inactivated or dead vaccine contains virus incapable of replication when introduced. Some viral vaccines are available in both forms. When the recipient has a strong immune system the live attenuated form is preferred. Vaccination guidelines have been established by government agencies including the Centers for Disease Control and Prevention (CDC). This presentation will help students understand the rationale behind the government health agencies recommendations.

## BIOLOGY

### Heat treatment of moss spores (*Drepanocladus aduncus* and *Leptodictyum riparium*) impacts later life history traits

Scott Kleindl

Advisor: Linda Fuselier

9:30 AM - 10:10 AM • CMU Hallways

Prairie mosses are exposed to fires that are set as a regular management strategy. Heat from fires are concerns for spore production and germination of prairie mosses. Mosses *Drepanocladus aduncus* and *Leptodictyum riparium* are tested to see how the spores respond to heat treatments and the effects it has on the plant growth. Spore solutions of each species are placed in 20 mL sterilized petri plates containing 1% Bacto Agar with 1:10 Hoagland's solution. 30 plates of each species contain heat-treated, experimental spores and 30 plates of each contain control spores. Experimental spore plates are heat-treated using a hot water bath and plates with the control spores are incubated under a 14 hour light cycle at 25°C. A T-test is used to calculate average percent germination. Spores from these heat treatments will be observed to see if there is delayed germination or no germination compared to the controlled spores, and if later-life growth effects and traits are shared within families and sibling spores.

## BIOLOGY

### Development of Validated Proliferation Assays for Translational Therapeutics

Advisor: Mark Wallert

9:30 AM - 10:10 AM • CMU Hallways

For a new drug to enter clinical trials a company must receive approval of an Investigational New Drug application from the Food and Drug Administration. This requires a range of supporting preclinical data, a major portion of which comes from validated cell-based assay. Validation is the process of demonstrating the ability to provide consistent, reproducible results from assays by assessing the impact of key variables on assay results. In our project we are validating cell proliferation assays for the NCI-H1299 line of non-small cell lung cancer cells. In this assay we will assess cell population using an XTT assay. Our experimental plan includes: 1) determination of population doubling time to calculate a baseline rate of cell proliferation; 2) assessment of linear correlation, which will allow us to determine the range of cell population where there is a linear relationship between cell number and assay readout; 3) determination of initial cell density, to assess optimal seeding density for experiments; and 4) evaluation of edge effects to ensure that well location does not impact assay outcome. In our initial experiments we have determined the doubling time for the H1299 cells to be 21.24 +/- 1.43 hours. Full data from the validated assays will be presented. This work supported by MSUM Biopharmaceutical Industry Apprentice Scholarships sponsored by the Greater Fargo Moorhead Economic Development Corporation and awarded to Alex Novak and Harrison Pantera.

## BIOLOGY

### Innate Predator Recognition of Costa Rican Convict cichlids

Andrew Nelson, Heather North

Advisor: Shireen Alemadi

9:30 AM - 10:10 AM • CMU Hallways

Being able to distinguish a predator from non-predator is important for the survival of prey. The earlier prey can make this distinction the better chance they will have. Aquatic organisms learn predator recognition by pairing injured conspecific cues with the scent of a predator. The Wood Frog (*Rana sylvatica*) has shown the capacity to recognize a specific predator as a tadpole, after being exposed to alarm cues while still developing within the egg. We questioned whether or not this example of innate predator recognition would also be represented by fish. To test this, we will use Costa Rican Convict cichlids (*Amatitlania nigrofasciata*). In nature, Convicts prefer to spawn in a cave where the eggs are laid on the surface of the walls or ceiling. For this experiment we will use cichlids eggs and expose half of them to a pairing of predator scent

mixed with injured conspecific cue and the other half to a control. Following hatching the young will be tested to see if they respond to the predator conspecific cue with anti-predatory behavior. We predict that the young exposed to the paired cue during development will have a greater response than the young exposed to the control.

## BIOLOGY

### The effects of pollution on reproductive behavior of fish.

Samundra Bhattarai

Advisor: Shireen Alemadi

9:30 AM - 10:10 AM • CMU Hallways

I did my literature review on the effect of pollutants on fish reproductive behavior. Scientists have continually linked pollutants and chemicals to changing reproductive behavior of fish. Much research is ongoing around the world to better understand and mitigate the problem. I have compiled useful resources and future possible solutions so that we can better understand the problem at hand and take quick action for the betterment of our ecosystem. Water resources around us are more polluted than ever. The toxic waste from various direct and indirect sources eventually end up in the lakes and rivers that support fish populations. Environmental pollutants such as metal, pesticides and other toxins disrupt the aquatic ecosystem around the world on a regular basis. The toxicity of these pollutants impacts complex fish reproductive behavior. Fish in particular possess many specific features that make them vulnerable to pollutants with endocrine disrupting potential, and as a result it impacts fish reproduction.

## BIOLOGY

### A 5-E model lesson plan in cellular biology for middle school science students

Kaleb Kosak

Advisor: Alison Wallace

10:10 AM - 10:30 AM • CMU 216

40 min presentation. This is a lesson plan for cellular biology that follows the "5-E Lesson Plan Model." This lesson plan is written to be used in a 7th or 8th grade life science classroom. It will follow the Minnesota Department of Education Science Standards. I will be using the Minnesota math and science frameworks as aids in developing this lesson plan and for ideas on creative activities.

## BIOLOGY

### Gut Instincts: Predator-Prey Arms Race in Masking Detection of Chemical Cues of a Predator's Diet

Phillip Schotte

Advisor: Brian Wisenden

10:10 AM - 10:50 AM • CMU Hallways

Chemical cues released when a minnow is injured by a predator indicate danger to other minnows. Minnows can even detect these chemicals from inside the digestive tract of a pike. Minnows use these cues to avoid predators. Therefore, there should be selection on predators to mask these cues. Here, we compare behavioral responses of fathead minnows to dietary cues released by two types of fish: Protacanthopterygii (old) and Acanthopterygii (new). Old type fish have pelvic fins down low in between anal and pectoral fins and a gas bladder still connected to their esophagus. New type fish have pelvic fins more forward closer to pectoral fins and a gas bladder that has lost its connection to the esophagus. Previous studies show that northern pike (old) cannot disguise their odors from minnows, which allow nearby prey to detect them. In this experiment we investigate whether evolutionarily derived fish, such as sunfish, have evolved metabolic processes mask any trace of their diet from future prey. We are using central mudminnows (old) and bluegill sunfish (new) as our test predators and fathead minnow as our prey. We hypothesize that the old type fish will not be able to mask the odor of their diet but the new type of fish can.

## BIOLOGY

### Treating Autoimmune Diseases with Tumor Necrosis Factor Inhibitors

Erin Larson

Advisor: Kathryn Wise

10:10 AM - 10:50 AM • CMU Hallways

Tumor necrosis factor (TNF) proteins are cell communication molecules, cytokines, which induce some tumor cell death as well as cause inflammation. TNF proteins can influence lipid metabolism, insulin resistance, coagulation and status of blood vessel endothelial cells sometimes contributing to excessive inflammation that leads to significant tissue pathology in autoimmune diseases. Disorders involving autoimmune diseases cause the body to become unable to distinguish the difference between healthy tissues and antigens resulting in an immune response that attacks normal tissue. By blocking the action of TNF, inflammation can be reduced. A review of medical and scientific literature suggests therapy using anti-TNF agents has revolutionized the treatment of inflammatory diseases such as rheumatoid arthritis but there are significant risks as well.

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## BIOLOGY

### **Tuberculosis: How your immune system both defends and destroys**

**Sonam Dekyi**

*Advisor: Kathryn Wise*

**10:10 AM - 10:50 AM • CMU Hallways**

Despite the ability to diagnose, treat, and vaccinate, Tuberculosis (TB) still remains a major global health problem. Nine million people are infected with TB each year, killing about 2 million of them. TB is an infectious disease caused by the *Mycobacterium tuberculosis* bacterium. It is spread from person to person through air when an infected person coughs or sneezes. Not everyone who gets infected with the bacteria will develop the disease. Most people who are chronically infected with the bacteria are able to control the infection and settle it into a dormant state while others develop the active disease. In active TB cases, the individual's immune system, not the bacterium, damages the lungs. TB was known to be the disease of the poor in under-developed and developing countries but since 1985, the number of TB cases has been increasing in developed countries as well. This poster will focus on how the immune system can be "encouraged" to successfully eliminate or control the infection and achieve the likelihood of a better outcome.

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## BIOLOGY

### **Where in the World is Diphtheria?**

**Heather Sorenson**

*Advisor: Kathryn Wise*

**10:10 AM - 10:50 AM • CMU Hallways**

Classic diphtheria is an acute respiratory disease caused by the bacteria *Corynebacterium diphtheriae*. The disease can also be presented as a skin infection, but this is generally exhibited in the tropics. Diphtheria is passed from person to person through respiratory droplets or skin contact. It can be treated with the early administration of the diphtheria antitoxin or antibiotics. The disease killed many people around the world until the development of the DPT vaccine. Because of widespread vaccination, diphtheria is no longer common in the United States, but it is still prevalent in many other parts of the world. A review of the literature will focus on how immunizations have influenced the prevalence of diphtheria in the U.S. as well as in other countries. It will also examine possible reasons why diphtheria occurs in the form of a skin infection in tropical parts of the world.

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## BIOLOGY

### **Feminist Perspective on American Women in Bryology**

**Chelsea Norman, Katheryn Haskins**

*Advisor: Linda Fuselier*

**10:10 AM - 10:50 AM • CMU Hallways**

Although the history of women in botany has been a topic of numerous historical treatments, the history of women in bryology has not been as equally considered. In the early years of the Botanical Society of America (BSA), a significant portion of the membership consisted of women "amateur" botanists. By 1920, membership was restricted to "serious professionals" with university degrees, excluding women from the society. The primary bryophyte professional society always valued the participation of "amateurs". We aim to examine the participation of women in bryology. We will quantify women's participation using publications and herbarium contributions during the 19th, 20th, and 21st centuries. The results of this quantitative research could be applied to many areas of academia. Furthermore, by using this research we can then explore possible relationships between women and bryology and various other social trends throughout American history.

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## BIOLOGY

### **Heat treatment of moss spores (*Drepanocladus aduncus* and *Leptodictyum riparium*) impacts later life history traits**

*Advisor: Linda Fuselier*

**10:10 AM - 10:50 AM • CMU Hallways**

Prairie mosses are exposed to fires that are set as a regular management strategy. Heat from fires are concerns for spore production and germination of prairie mosses. Mosses *Drepanocladus aduncus* and *Leptodictyum riparium* are tested to see how the spores respond to heat treatments and the effects it has on the plant growth. Spore solutions of each species are placed in 20 mL sterilized petri plates containing 1% Bacto Agar with 1:10 Hoagland's solution. 30 plates of each species contain heat-treated, experimental spores and 30 plates of each contain control spores. Experimental spore plates are heat-treated using a hot water bath and plates with the control spores are incubated under a 14 hour light cycle at 25°C. A T-test is used to calculate average percent germination. Spores from these heat treatments will be observed to see if there is delayed germination or no germination compared to the controlled spores, and if later-life growth effects and traits are shared within families and sibling spores.

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## BIOLOGY

### **Sexual Selection in Guppies**

**Brittney Rother, Amy**

**Moorhouse, Heather North**

*Advisor: Shireen Alemadi*

**10:10 AM - 10:50 AM • CMU Hallways**

Female guppies use sexual selection for acquiring the best choice for a mate among multiple contenders. Males will court a female using the "sigmoid" display by forming an S-shape during his display. If a female is attracted to the male, she will move toward him in a slow, non-aggressive manner. It has been shown that the color and size of a male contributes to the female's choice of mates. Our hypothesis is that the female will choose the males and will select for the larger, more carotenoid-colored males. We will place a small male and a large male in a 10 gallon tank and introduce a female into the same aquarium, then observe mate choice. We will repeat this set up with the same males and multiple independent female trials to see if the same male is consistently chosen. We will use the same design for the color choice experiment but with one blue male and one carotenoid colored male. Studies of guppies in their natural habitat show that males present a courtship display and are smaller and more colorful than females. Thus, we expect the female to choose the males and will select for the larger, more carotenoid-colored males.

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## BIOLOGY

### **The Effect of Limiting Resources on Ecological Niches**

**Jared Ronningen**

*Advisor: Alison Wallace*

**1:00 PM - 1:20 PM • CMU 216**

40 min presentation. Using a 5-E model, populations are discussed with regards to the ecological niches they inhabit, and the role that limited nutrients and resources may play in niche determination, along with other factors. This is presented to an intended audience at the high school level. The presentation can be used in a classroom to build on the understanding of the ecosystems benchmark (9.4.2.1) of the Minnesota Academic Standards.

## BIOLOGY

### **A study of altered activity of the galactinol synthase gene and modifications to the primary plant cell wall structure following the abiotic induction of systemic acquired resistance in *Cucumis sativum* seedlings.**

**Ashish Shrestha, Manasvi Kulshrestha**

*Advisor: Andrew Marry*

**1:00 PM - 1:40 PM • CMU Hallways**

Hunger, starvation, and malnutrition are endemic in many parts of the world today, and on top of that, the rapidly increasing world population has intensified these problems. One should remember that all of the food we eat comes either directly or indirectly from plants. Each year up to a staggering 30% of crops are lost to insects and other crop pests.

Plant cell walls have a dynamic function in response to the environment, plant defense and cellular communication. Pathogen invasion wounding or chemical treatment activates systemic acquired resistance (SAR). Initially, an oxidative burst induces the expression of defense related genes. A signaling cascade is triggered that increases phenylalanine ammonia lyase (PAL) activity. Salicylic acid (SA) then accumulates, marking the onset of SAR.

SA accumulation causes permanent alterations to the cell wall. These alterations resist cell wall degrading enzymes (CWDE) produced by the invading pathogen. Increase in intracellular calcium has also been noted that forms cross-linkages resulting in higher cell wall strength. Pectins are highly complex polysaccharides with many physiological functions, including intercellular adhesion, modulation of cell wall porosity and pH, extracellular recognition and signal transduction. We will use FPLC, FTIR, and various sugar assays to analyze the structural changes in the carbohydrate components of the cucumber cell wall. Also, we will isolate and quantify the galactinol synthase gene. This gene causes an increase in the sugar content of the cell wall, in *Arabidopsis*, in response to SAR. We will investigate the effects SAR has on it in *Cucumis sativum*. “

## BIOLOGY

### **An investigation into potential alterations of polyphenol oxidase activity in *Cucumis sativus* seedlings following the abiotic induction of systemic acquired resistance.**

**Cassandra Anderson**

*Advisor: Andrew Marry*

**1:00 PM - 1:40 PM • CMU Hallways**

Polyphenol oxidase is an enzyme found in plant tissues and catalyzes the reaction of a phenol to a diphenol, and can also catalyze the reaction of diphenols to quinones. The role of this enzyme in a plant's defense mechanism known as systemic acquired resistance (SAR) hasn't been determined. SAR is shown by an altered plant cell wall when the plant is treated with salicylic acid. The activity of polyphenol oxidase will be measured by measuring the amount of active enzyme at different times after SAR is induced. *Cucumis sativus* plants will be treated with three 20  $\mu$ L drops of 100 mM salicylic acid on each cotyledon, and left to react for a specific amount of time. The first leaves will then be collected and frozen using LN<sub>2</sub>, and then be ground up using a mortar and pestle combined with 20 mL of 50 mM Tris-HCl, pH 7.2, .4 M Sorbitol and 10 mM NaCl buffer. The mixture will be centrifuged at 20,000g for 10 minutes, and the supernatant will be saved, as that contains the enzyme. In a cuvette, 2.5 mL 0.1 M phosphate buffer at pH 6.5 and 0.3 mL 0.01 M catechol. 0.2 mL of the enzyme-containing supernatant will be added, and the absorbance of the mixture will be read at 495 nm, recording it every minute. Once it is determined if polyphenol oxidase plays a role in SAR, it will be further determined what role it plays, and what part of the cell it affects.

## BIOLOGY

### **Use of Salivary ELISA Kits to Measure Cortisol in Zebrafish**

**Justin Scheierl**

*Advisor: Brian Wisenden*

**1:00 PM - 1:40 PM • CMU Hallways**

Cortisol is a hormone secreted in response to stress. This stress hormone may play an important role in zebrafish behavior, particularly in the shy-bold continuum of behavioral phenotypes. The challenge then is to develop a technique for measuring cortisol levels in such a small fish. Enzyme-linked immunosorbent assays (ELISA) kits designed to detect cortisol in samples of human saliva will be used to isolate and measure the levels of cortisol in zebrafish. Because cortisol levels are known to inhibit the immune system, and therefore lower the white blood cell count, we can explore for a correlation between cortisol (ELISA) and white blood cells effects. If a direct

correlation between the two tests is found, the white blood cell smears will be used as a reliable and inexpensive alternative to the more expensive ELISA test.

## BIOLOGY

### **Limited Exposure of Monarch Butterfly Populations to Bt-toxin Due to Impotent Dispersal of Corn Pollen**

**Kayla Sluka, Jenae Olson, Kaleb Kosak**

*Advisor: Daniel McEwen*

**1:00 PM - 1:40 PM • CMU Hallways**

Bt corn is a genetically modified organism that expresses the bacterial Bt toxin. The toxin is poisonous to most insects, working as a pesticide for corn agriculture. Although the toxin is not intended for monarchs, it is lethal if ingested. The pollen gets transferred by wind onto milkweed plants near agricultural Bt fields. We explore the possibility of an increased mortality rate in monarch larvae near Bt corn fields. If the monarchs die as larvae they never reach reproductive maturity, in turn this decreases the overall monarch population. Milkweed only accumulated enough Bt corn pollen to kill larvae when located within 0-3.5 meters of the field.

## BIOLOGY

### **Nest Monitoring and Control of Urban Canada Geese in Moorhead, Minnesota**

*Advisor: Donna Stockrahm*

**1:00 PM - 1:40 PM • CMU Hallways**

Increasing populations of urban Canada geese (*Branta Canadensis*) throughout the United States pose health and safety concerns for residential areas. Geese flock to the Fargo/Moorhead area because it is located on the Mississippi Flyway and many geese nest and raise their offspring within city limits. Our study was conducted on land owned by American Crystal Sugar. Year-round open water in holding ponds and minimal predators have provided optimal breeding habitat for a number of years. In the spring of 2010 and 2011, we quantified goose numbers and monitored nests to gather baseline data as part of a long-term management plan to curb burgeoning populations. In 2010, geese were counted 5 times between 29 March and 9 April; numbers approached 440. Nest monitoring began 14 April 2010 and 123 nests were located. Clutch size averaged 5.9 eggs/nest (range = 1-12, median 6). All but 2 eggs per nest were oiled to limit number of hatchlings. On 20 June 2010, remaining geese were rounded up and removed. In 2011, geese were counted 7 times between 11-19 April and numbers approached 250. Nest numbers were reduced to 64, although the number of eggs per nest was similar to that of 2010 (5.8 eggs/nest, range = 3-14, median =

6). Spring flooding, the introduction of a predator(s), and the 2010 removals probably all contributed to reduced goose numbers in 2011. Nest monitoring and egg oiling are expected to continue in 2012 to help reduce the geese population in the Fargo/Moorhead area.

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## BIOLOGY

### Plague: A Contagious Weapon

Jessica Sigurdson

Advisor: Kathryn Wise

1:00 PM - 1:40 PM • CMU Hallways

One of the oldest diseases known, plague, still remains a global concern. *Yersinia pestis*, a gram-negative bacillus, had its first major appearance in Europe around 1348 killing roughly 25% of the population. Bubonic, septicemic, and pneumonic are the main forms of plague. They differ significantly in transmission, severity, and communicability. In particular the pneumonic form poses a major threat because it can be spread through the inhalation of fine air droplets that can pass easily from human to human. Fortunately, there are preventive measures, symptoms, and treatments stopping further transmission that can help identify and limit the spread. One of the biggest preventive measures is of course preparing for a response in countries that are epidemic-prone. The plague is classified as a CBRNE (Chemical, Biological, Radiological, Nuclear, and Enhanced Conventional Weapons). After reviewing the literature provided by government agencies, this presentation will focus on the pneumonic form of plague and its major threat as a biological weapon.

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## BIOLOGY

### Heat treatment of moss spores (*Drepanocladus aduncus* and *Leptodictyum riparium*) impacts later life history traits

Advisor: Linda Fuselier

1:00 PM - 1:40 PM • CMU Hallways

Prairie mosses are exposed to fires that are set as a regular management strategy. Heat from fires are concerns for spore production and germination of prairie mosses. Mosses *Drepanocladus aduncus* and *Leptodictyum riparium* are tested to see how spores respond to heat treatments. Spore solutions of each species are placed in 20 mL sterilized petri plates containing 1% Bacto Agar with 1:10 Hoagland's solution. 30 plates of each species contain heat-treated, experimental spores and 30 plates of each contain control spores. Experimental spore plates are heat-treated using a hot water bath and plates with control spores are incubated under a 14 hour light cycle at 25°C. A T-test is used to calculate average percent germination. Spores from these heat treatments will be observed to see if there is delayed germination or

no germination compared to the controlled spores, and if later-life growth effects and traits are shared within families and sibling spores.

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## BIOLOGY

### Effects of chemical cues on Nicaraguan Cichlid embryos

Julie Piche, Calvin Flander, Olivia Hansen

Advisor: Shireen Alemadi

1:00 PM - 1:40 PM • CMU Hallways

Chemical cues are one way in which fish detect when there is danger nearby. A scent is given off when a predator has attacked prey from the same species. This is a great way of communication for each species of fish when it comes to their safety in terms of protection. A similar experiment was done with embryos of ringed salamanders (*Ambystoma annulatum*). Embryos that were exposed to chemical cues from predators had significantly less activity compared to the blank treated embryos. Low activity in this species is an antipredator response. To test this communication in fish, the Nicaraguan Convict cichlid (*Amatitlania siquia*) injury released chemical cues were used. These cues acted as a test to determine if fish kept in captivity can sense and react to these cues. In this experiment, we exposed cichlid eggs to predator cues to test their behavior. Eggs were separated into two sibling groups. One half of the eggs were treated with the predator cues and the other half with only water. Once hatched, the fish were tested. This data will indicate if cichlids given cues as eggs grow up to recognize the cues faster in adulthood when compared to those only given water.

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## BIOLOGY

### Are Colonizers Plastic?

Ashley Remmick

Advisor: Alison Wallace

1:40 PM - 2:20 PM • CMU Hallways

Plasticity is the ability of individuals to change phenotype due to a change in environment. Colonizers might be expected to be more plastic than non-plastic due to their response time to the environment. This research will show whether this is true by evaluating individual plasticity in the liverwort *Marchantia polymorpha* and observing plastic responses to light. All individuals will be placed in novel light environments such as those potentially experienced by colonizers. I hypothesize that more plastic individuals will grow and inhabit a larger area in a novel environment compared to less plastic individuals. The significance of this research will be able to show that plasticity is directly related to colonization abilities and this may also be applied to other bryophyte populations in their ability to disperse and colonize.

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## BIOLOGY

### The Effects of Atmospheric Carbon Dioxide Levels on Plant-Herbivore Interactions

Brittany Beers, Amy Moorhouse

Advisor: Alison Wallace

1:40 PM - 2:20 PM • CMU Hallways

Carbon dioxide levels in the atmosphere are changing and in response, plant-insect interactions are changing too. Plants and insects interact and benefit each other, as well as the ecosystem they live in. As CO<sub>2</sub> concentrations increase, plants may be able to photosynthesize more, which would allow them to grow and develop more carbon-rich tissues. The quality of these plant tissues, based on available nutrients can affect herbivory rates, which can then affect interactions throughout the food chain. Our hypothesis is that the Carbon-to-Nitrogen ratios will increase in the elevated CO<sub>2</sub> levels, thus resulting in higher herbivore consumption and slower larval growth due to a decrease in plant tissue quality. In our experiment, *Brassica rapa*, Wisconsin Fast Plants, were grown alone in different carbon dioxide levels, and with *Pieris brassicae*, Cabbage White Butterfly, larvae. The carbon dioxide levels represent current and predicted atmospheric levels. The consumption rates and biomass growth rates of the larvae and the surface areas of the plant foliage were measured. Data concerning the Carbon-to-Nitrogen ratios in the plant foliage are still to be collected and all of the results will be shared at the Student Academic Conference.

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## BIOLOGY

### Ontogeny of Antipredator Behavior in Nicaraguan Convict Cichlids

Justin Scheierl, Kurtis McIntire

Advisor: Brian Wisenden

1:40 PM - 2:20 PM • CMU Hallways

Convict cichlids have biparental care of their young for six weeks. The rate at which the young develop and gain ability to avoid predators is crucial in determining when they are ready to live on their own. The two cichlid populations in our lab are from Rio Cabuyo, Costa Rica and Laguna de Xiloo, Nicaragua. The Costa Rica cichlids are from an area of low predator density, while the Nicaraguan cichlids are from an area of high predatory density. In the experiment the fish videotaped doing a startle response at 1-mm intervals of growth to test for development of an antipredatory response. Data from the Nicaraguan population will then be compared to swimming performances of cichlids from Costa Rica. Swimming performance will also be compared to existing data on the rate of skeletal ossification in each population.



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## BIOLOGY

### Analyzing the Importance of Pyruvate Phosphate Dikinase Regulatory Protein (PD-RP) in C4 Photosynthesis Using RNA Interference on Zea mays

Sandip Karki, Omar Adow, Patrick Zimmerman

Advisor: Chris Chastain

1:40 PM - 2:20 PM • CMU Hallways

Plants that are major food sources for humans—such as rice and wheat—employ the C3 photosynthetic pathway. Plants possessing C3 photosynthesis are less efficient at the capture and assimilation of carbon than plants with C4 photosynthesis. Because of the inherently high productivity, interests in C4 photosynthesis have surged. By studying the underlying regulation of corn, any C4 pathway knowledge generated from such research can be applied to genetically engineer C3 plants—like rice—into C4 in order to increase yield. However, to engineer C3 into C4 plants, a detailed investigation of the C4 pathway is required. The goal of this project is to understand the effect of the knockdown of an enzyme known as Pyruvate Phosphate Dikinase Regulatory Protein using RNA interference in maize plants. The effect of this knockdown in plants will be analyzed both at the physical and molecular level. Later, plants will be compared to the control (wild type). If PDRP is critical for C4 photosynthesis, plants with a low amount will show a slowed or reduced photosynthetic rate compared to the control. When complete, scientists should know whether or not they must account for PDRP when attempting any research involving the photosynthetic conversion of C3 plants to C4 plants.

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## BIOLOGY

### Urban Turkeys: Survey of Wild Turkey Distribution and Numbers, Human Interactions, and Public Opinion in the Red River Valley in Cass (North Dakota) and Clay (Minnesota) Counties (2003-2011)

Ashley Remmick, Chelsea Schmalz, Kara Nygaard, Amanda Leigh Peterson, Scott Kleindl, Jennifer Ringgold

Advisor: Donna Stockrahm

1:40 PM - 2:20 PM • CMU Hallways

This study started in 2003 with the objective of using mail surveys to estimate the minimum wild turkey (*Meleagris gallopavo*) population in the Red River Valley (RRV) in the Fargo/Moorhead area. The RRV offers suitable turkey habitat in a relatively narrow corridor surrounded by a dense human population. In 2004, urban-turkey interactions were monitored as well, adding a new survey in 2005 to assess public opinion on wild

turkey management options in the event abatement measures became necessary due to problematic urban turkeys. Turkey observations reported from 2003 through 2010 show a strong population thriving in the RRV with an overall increase in numbers and sightings. Turkey observations reported from 2010 through 2011 show a slight decrease in the RRV turkey population. Negative interactions included turkeys blocking traffic routes, eating from bird feeders/gardens, interacting near agricultural areas, and interacting with domestic animals. This year's (2011) return rate amounted to 37.4% (89 out of 238) of surveys sent out to area observers. The opinion and observation surveys are planned to continue throughout the upcoming years.

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## BIOLOGY

### Developing Cell Proliferation and Migration Assays using Electric Cell-Substrate Impedance Sensing

Clarice Wallert

Advisor: Mark Wallert

1:40 PM - 2:20 PM • CMU Hallways

Cell-based assays are commonly used tools in the pharmaceutical industry. To assess the impact of potential therapeutic agents on cancer progression both proliferation assays and migration assays are employed. The common methods for these assays are end point determinations, which means the cells are destroyed or permanently altered during the measurement. In an effort to continuously assess the impact of potential therapeutic agents on proliferation and migration in H1299 non-small cell lung cancer cells, I will be developing proliferation and migration assays using electric cell-substrate impedance sensing (ECIS). Developing the ECIS assay will allow for continuous measurement of changes in cell population and a decreased screening time. Ultimately this should allow us to screen an increased number of therapeutic agents in less time. In the ECIS method, cells growing on the surface of an electrode change impedance levels. Thus as cell numbers increase during proliferation or when cells crawl onto electrodes during migration, the impedance measurements increase. The focus of my project will be to develop the impedance measurements, compare them to more traditional measurements of proliferation and migration and finally do preliminary determinations of inhibition using known pharmacological agents that block these two functions.

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## BIOLOGY

### Molecular Applications to Sexual Selection in Guppies

Nancy Stenger, Moriah Hovde, Kylie Zenner

Advisor: Sara Anderson

1:40 PM - 2:20 PM • CMU Hallways

Guppies are live-bearing fish, meaning they reproduce by internal fertilization and give birth to live young. To attract the attention of females, males of different colors and size will engage in elaborate courtship behaviors. As part of a larger experiment of sexual selection, we will be collaborating with another research project testing female sexual selection choices by looking at size and color of male guppies. Females can store sperm and fertilize their eggs several times; therefore, visual observation of mating alone is not enough to confirm paternity. To assign paternity we will be extracting DNA from both male and female guppies and their offspring using molecular biology techniques. Using an automated DNA sequencer we will generate genotypes for all individuals using five different microsatellite loci. Relative reproductive success will be determined after paternity is established for all offspring. Studies have shown that females perceive larger carotenoid males to have better survival skills and thus a more desired genome. For these reasons, we believe that larger and more carotenoid males will father more offspring than smaller or less carotenoid males.

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## BIOLOGY

### Studies of Genetic Diversity within *Halictus Confusus* Collected from Prairie Habitats

Ashley Hoeck, Prastuti Ghimire, Dana Dugger, Courtney Constantini

Advisor: Sara Anderson

1:40 PM - 2:20 PM • CMU Hallways

Native bees serve a vital function in the landscape through pollination of native and agricultural plants. Recent studies have shown that bee populations are declining and the services provided by these bees may be decreasing. Prairie bees, of the genus *Halictus* (*confusus*), are generalists that pollinate a variety of plants in many different habitats. Genetic data, in the form of microsatellites, was gathered in hopes to elucidate genetic diversity of these bee populations and identify the genotype of the bees down to the individual. The data will be used to study genetic flow, allele frequencies, and identify and differentiate between individuals. Currently, data describing three specific loci has been gathered, and this data will be used to calculate the minimum number of genetic markers necessary to differentiate between individuals in the bee population. This data is important in studying the genetic variation present within populations of bees inhabiting prairie lands. Isolating mechanisms may impact populations by

increasing inbreeding and reducing genetic variation in the population, which may lead to negative long-term effects on population viability.

## BIOLOGY

### Odor tracking by young cichlid fish

Noah Berglund, Carissa Storseth

Advisor: Brian Wisenden

2:30 PM - 3:10 PM • CMU Hallways

Convict cichlids defend their offspring for up to 6 weeks. They also incorporate unrelated young into their brood. Because the swimming ability of young convict cichlids improves as they develop, the relative size between related and unrelated young in a mixed brood determines the relative rate of survival of each. Do young convict cichlids use size information when deciding to join a new family? We used a dichotomous Y maze to test if convict cichlid young displaced from their own family orient towards a family other than their own; and to test if they can detect the size of unrelated young using chemical cues alone. First, we showed that young preferentially orient toward water taken from another family's tank versus blank water taken from a tank that contained no fish. Second, we anticipate that young placed in the Y maze will orient towards young that are larger than themselves because they are more likely to be accepted by the receiving family. Third, we anticipate that young placed in the Y maze will orient towards parental cichlids instead of non-parental cichlids because then they will not become a meal.

## BIOLOGY

### Is expression of C4 PDK and its regulator, the PPDK regulatory protein, co-regulated by light intensity in maize leaves?

Christina Poudyal

Advisor: Chris Chastain

2:30 PM - 3:10 PM • CMU Hallways

Pyruvate phosphate dikinase (PPDK) is a cardinal enzyme of the C4 photosynthetic pathway that catalyzes the regeneration of the primary CO<sub>2</sub> acceptor, PEP. In C4 leaves, PPDK activity is regulated to match the level of light incident on the leaf. The bi-functional PPDK regulatory protein (PDRP) catalyzes this up/down regulation by reversible phosphorylation of a PPDK active site, Thr, with the enzyme inactive in the phosphorylated state. PDRP also functions as the light level sensory component of the regulation cycle. To uncover how these two proteins may be co-regulated at the molecular level in maize leaves, we are assessing changes in the transcript and polypeptide abundance during high to low light dynamic (non developmental) acclimation. Initial results indicate that PDRP is a very low abundance mRNA being some eight orders of magnitude lower than the transcript level of its target enzyme. More focused experiments on high

light to low light effects on PPDK and PDRP gene transcript level and polypeptide level are currently in progress. The results will be summarized with respect to how molecular expression of the two interrelated C4 pathway genes are coordinated for optimizing photosynthetic response to short-term changes in light intensity.

## BIOLOGY

### Eleven Years of Painted Turtle Ecology in Clay County, Minnesota: Where Have the Turtles Gone?

Ashley Remmick, Kiana Ochsendorf, Amanda Leigh Peterson, Scott Kleindl, Kara Nygaard, Chelsea Schmaltz, Jennifer Ringgold, Jessica Keesling

Advisor: Donna Stockrahm

2:30 PM - 3:10 PM • CMU Hallways

Live-trapping of painted turtles (*Chrysemys picta bellii*) near Rollag, MN has been executed from 2001-2011 to study growth rates, survival, movements and population characteristics. Traps were placed in 2 sloughs, 2.7 ha and 6.2 ha in size and approximately 1 km apart. Turtles were weighed, sexed, measured, marked (by scute notches and/or PIT tags; PIT tags started in 2006), and released on the shoreline of the slough of capture. In 2009 and 2010, we noted a drastic decrease in turtle captures in our smaller slough. The area around the 2.7-ha slough was previously Conservation Reserve Program (CRP) land, but it had been converted into grazing cattle grounds in 2009. In 2011, traps were introduced into a third slough approximately halfway between the 2 original sloughs and 0.5 ha in size. This middle slough was excluded from cattle grazing and shoreline vegetation was intact. We wanted to determine if the marked turtles from the original sloughs were moving into the undisturbed middle slough. Turtle dispersal between the larger (6.2-ha) slough and the middle slough was nearly 3 times more than dispersal between the grazed slough and the middle slough. The lack of vegetative cover from the cattle grazing between the grazed slough and the middle slough may have been a deterrent for turtle dispersal. Many captured turtles from the middle slough were juvenile, indicating a possible "nursery" habitat. The continuation of trapping and tagging in all 3 sloughs will continue to further investigate changing habitat use.

## BIOLOGY

### Measuring NHE activation and transport rates with ratiometric fluorescence microscopy.

Nicholas Berthelsen

Advisor: Joseph Provost

2:30 PM - 3:10 PM • CMU Hallways

The sodium-hydrogen exchanger (NHE) regulates intracellular pH (pHi) by exchanging an intracellular proton for an extracellular sodium ion. NHE also serves as an anchoring site for actin during cytoskeletal formation. Both of these roles are critical in metastasis. The first phase of this research monitored NHE transport levels in cells with wild type NHE and NHE knock down cells. NHE transport levels were measured using ratiometric fluorescence microscopy loading with 2', 7'-Biscarboxyethyl 5 (and -6) carboxy fluorescein (BCECF), a dye that fluoresces independent of pH at 440nm and dependent on pH at 495nm. These cells were treated with urokinase plasminogen activator (uPA), an agonist, and with ethylisopropylamiloride (EIPA), an inhibitor. The wild type cells showed negligible transport when stimulated with uPA, but transport was lowered to the same level as the knockdown cells in the presence of EIPA. This indicates that NHE is maximally activated in cancer cells, but can be chemically suppressed. The next phase of the research will be to observe the transport rate of NHE with mutations at the ribosomal S6 kinase (RSK) and RhoA associated kinase (ROCK) phosphorylation sites. Mutations at these sites prevent NHE phosphorylation by the signaling pathways associated with these kinases.

## BIOLOGY

### Addressing the Actions of Anti-Inflammatory Agents

Ali Dhanani

Advisor: Kathryn Wise

2:30 PM - 3:10 PM • CMU Hallways

Inflammation is part of the complex biological response of vascular tissues to harmful stimuli, such as pathogens, damaged cells, and irritants. The cardinal signs of inflammation are: heat, pain, redness, swelling, and loss of function. Most of the time inflammation is beneficial and necessary to defeat these enemies of the body; however, this is not always the case. Unwanted or unnecessary inflammation can be detrimental to one's health. Inflammatory abnormalities are a large group of disorders which underlie a vast variety of human diseases. Inflammation can be relieved by the use of nonsteroidal anti-inflammatory drugs (NSAIDs), immune selective anti-inflammatory derivatives (ImSAIDs), corticosteroids, and herbs. Using information acquired through the review and analysis of scientific literature, this presentation focuses on the body's physiological response to anti-inflammatory treatments.

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## BIOLOGY

### Why You Will Be Drooling In The Doctor's Office

Andrea Berge

Advisor: Kathryn Wise

2:30 PM - 3:10 PM • CMU Hallways

Saliva is now being used as a specimen to detect diseases, antibodies, hormones and much more. Collecting saliva is less invasive and stress-inducing than blood collection. The measurement of steroid hormone levels by salivary testing is preferable because the presence of specific and non-specific binding proteins in serum complicates the detection of the level of hormone activity. The UCLA Human Salivary Proteome Project identified more than 1,000 proteins in the saliva of healthy individuals. By studying individuals with various diseases and comparing them to healthy individuals, screenings can be made to detect disease earlier. Biomarkers have been found in saliva associated with cardiovascular disease and pancreatic cancer. There are commercial kits available that are easy to use that analyze cortisol levels in saliva that identify patients with Cushing's Syndrome and Addison's Disease. This presentation provides insight into the current and future value of saliva as a diagnostic specimen as revealed by a review of the literature.

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## BIOLOGY

### Bryophyte assemblages in restored wetlands in the Red River Valley.

Donovan Donarski

Advisor: Linda Fuselier

2:30 PM - 3:10 PM • CMU Hallways

The prairie pothole region is an economically and ecologically important swath of over 300,000 miles of glacially-created wetlands dotted across a nutrient rich landscape. Wetlands in and near the Red River Valley (RRV) in Minnesota are a part of this landscape that has suffered severe habitat loss since recorded history. Understanding wetland plant assemblages is crucial for the conservation of these important habitats. We characterized the bryophyte assemblages of wetlands in the RRV and compared assemblages among wetlands of different ages to examine colonization rates and establishment sequences. Our results indicate a succession of species and higher diversity in older wetlands.

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## BIOLOGY

### The Affect of Landscape on Bee Populations in Tallgrass Prairies

Nancy Stenger

Advisor: Rebecca Andres

2:30 PM - 3:10 PM • CMU Hallways

Native bees serve a vital function in the landscape through pollination of native and agricultural plants. Recent studies have shown that bee populations are declining and the services provided by these bees may be decreasing. Felton and Bluestem Prairies are tallgrass grassland prairies. Felton's landscape is fragmented while Bluestem has a more connected landscape with Nature Conservancy land neighboring land held by MSUM science center and a MN state park. This project will compare both the biodiversity of bee species as a whole and the genetic diversity within the specific species, *Halictus confusus*, between a fragmented and connected landscape. Through analysis of the distribution and composition of species within each prairie, the richness of each prairie can be determined. Using three variable microsatellite loci, I can measure genetic diversity between individuals along with allelic richness between prairie populations. These methods will help me to answer the question of how landscape characteristics affect biodiversity.

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## BIOLOGY

### Is phenotypic plasticity in *Leptodictyum riparium* correlated with wetland age in the Prairie Pothole Region of the Red River Valley?

Noah Berglund

Advisor: Alison Wallace

3:10 PM - 3:30 PM • CMU 214

Phenotypic plasticity in plants may be a large determinant in a plant's ability to compete and colonize. The purpose of this experiment is to examine plasticity in relation to wetland age with the hypothesis that plasticity of *Leptodictyum riparium* will decrease as wetland age increases. This will be accomplished by quantifying a plasticity degree to the plants from each sampled wetland. The wetlands sampled range from newly constructed to native. A regression analysis will determine whether wetland age influences plasticity. The logic behind this is that the longer a species remains in a habitat, the more adapted it will become to a smaller range of conditions. This is important because it will add to the understanding of plasticity's role in plant colonization and competition.

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## BIOLOGY

### Freeze-fanning as a Form of Cryptic Chemical Sampling

Phillip Schotte

Advisor: Brian Wisenden

3:10 PM - 3:50 PM • CMU Hallways

Many animals perform anti-predator behaviors as a response to alarm cues received through their environment. For some fish, this behavior can be described as freeze-fanning, or becoming stationary in the water column by thrusting the caudal fin forward while fanning the pectoral fins backwards to remain stationary. Becoming stationary allows the fish to be less conspicuous to nearby predators. However, a stationary fish receives less chemical information from its environment due to decreased water flow passed the nares (nostrils). In this experiment, we will attempt to capture freeze-fanning on film to show water flow across the nares. We hypothesize the fanning of the pectoral fins as not only a means of remaining stationary, but also as a means of creating water flow past the nares to increase the rate of chemical sampling.

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## BIOLOGY

### Inefficacy of plant incubators coupled with water baths to study temperature effects on the population dynamics of aquatic invertebrates.

Ashlyn Kuklock, Jaclyn

Kuklock, Danielle Kuperus

Advisor: Daniel McEwen

3:10 PM - 3:50 PM • CMU Hallways

Temperature, through its influence on biochemical reactions involved in metabolism, influences overall biological rates including population dynamics (i.e., birth and death rates). At high temperatures, metabolic biochemical reactions speed up, and subsequently organisms have a metabolic rate that increases in concert. The increased metabolic rate comes with an increase in per capita energy cost, which must be met with higher rates of per capita food consumption. We should expect that, at a constant resource supply rate, population densities decrease as environmental temperatures increase because the constant resource supply gets divided up among fewer individuals who are feeding at a higher rate. We tested this hypothesis on laboratory-reared populations of vinegar eels (*Turbatrix aceti*) over a range of five different temperatures from 19 - 35 °C. We were unable to reject our null hypothesis that temperature has no influence on population densities possibly due to a poor experimental design. Specifically, we used a plant incubator along with water baths to regulate temperature, and failed to take into account the confounding variable of the warm lights

in the incubators on our experiment. We are in the process of correcting our design, using a dedicated aquarium chiller with cool lights for our treatments.

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## BIOLOGY

### **Nest Monitoring and Control of Urban Canada Geese in Moorhead, Minnesota**

**Jaclyn Fuller, Chelsea Schmaltz, Amanda Leigh Peterson, Ashley Remmick, Scott Kleindl, Nicole Brokmeier**

*Advisor: Donna Stockrahm*

**3:10 PM - 3:50 PM • CMU Hallways**

Increasing populations of urban Canada geese (*Branta canadensis*) throughout the United States pose health and safety concerns for residential areas. Geese flock to the Fargo/Moorhead area because it is located on the Mississippi Flyway and many geese nest and raise their offspring within city limits. Our study was conducted on land owned by American Crystal Sugar. Year-round open water in holding ponds and minimal predators have provided optimal breeding habitat for a number of years. In the spring of 2010 and 2011, we quantified goose numbers and monitored nests to gather baseline data as part of a long-term management plan to curb burgeoning populations. In 2010, geese were counted 5 times between 29 March and 9 April; numbers approached 440. Nest monitoring began 14 April 2010 and 123 nests were located. Clutch size averaged 5.9 eggs/nest (range = 1-12, median = 6). All but 2 eggs per nest were oiled to limit number of hatchlings. On 20 June 2010, remaining geese were rounded up and removed. In 2011, geese were counted 7 times between 11-19 April and numbers approached 250. Nest numbers were reduced to 64, although the number of eggs per nest was similar to that of 2010 (5.8 eggs/nest, range = 3-14, median = 6). Spring flooding, the introduction of (a) predator(s) and the 2010 removals contributed to reduced goose numbers in 2011. Nest monitoring and egg oiling are expected to continue in 2012 to help reduce the geese population in the Fargo/Moorhead area.

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## BIOLOGY

### **Reproductive Development of *Oryzias latipes* upon Exposure to Red River Water Collected Downstream of a Wastewater Treatment Plant**

**Brittany Bisnett**

*Advisor: Ellen Brisch*

**3:10 PM - 3:50 PM • CMU Hallways**

Recently it was reported that water sampled downstream of a wastewater treatment plant in the Fargo/Moorhead area contained a significant amount of environmental

estrogens. Estrogens usually enter the environment in the form of man-made chemicals and animal waste, and have been shown to interfere with gonad development of many aquatic species. This study will investigate whether the concentration of estrogens in the Red River is high enough to effect sexual differentiation in Medaka (*Oryzias latipes*). Sixty embryos will grow and develop in four different water samples (river water collected downstream of the wastewater treatment plant, distilled water, DMSO, and 17 $\beta$ -estradiol in DMSO). They will later be examined for secondary sex characteristics to determine their phenotypic sex. If the estrogen concentration in the river water is high enough to effect sexual differentiation, the expected outcome would yield a higher ratio of females to males. An ELISA assay will also be performed to determine the exact estrogen concentration. Although some estrogens are naturally occurring, excess estrogen has been reported to cause feminization of males and to disrupt reproductive function in numerous species, including humans. This study may help the understanding of how environmental estrogens effect the reproductive success of many different species.

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## BIOLOGY

### **Should you Äüget active, Äü when trying to reduce the risk of viral infections?**

**Ronak Habib**

*Advisor: Kathryn Wise*

**3:10 PM - 3:50 PM • CMU Hallways**

When it comes to viral vaccines your doctor might make a choice between giving you a live attenuated or dead virus vaccine. A live attenuated virus vaccine has a weakened form of the virus that is still capable of replication when introduced, sometimes resulting in mild symptoms. An inactivated or dead vaccine contains virus incapable of replication when introduced. Some viral vaccines are available in both forms. When the recipient has a strong immune system the live attenuated form is preferred. Vaccination guidelines have been established by government agencies including the Centers for Disease Control and Prevention (CDC). This presentation will help students understand the rationale behind the government health agencies recommendations.

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## BIOLOGY

### **The Role of Human Dendritic Cells in the Development of an HIV Vaccine**

**Ashley Hoeck**

*Advisor: Kathryn Wise*

**3:10 PM - 3:50 PM • CMU Hallways**

Human immunodeficiency virus (HIV) is a retrovirus that causes acquired immunodeficiency syndrome (AIDS), a deadly infection that has taken the lives of nearly 30 million individuals since the virus's outbreak. As of 2010,

it is estimated that over 34 million individuals around the world live with HIV/AIDS, of which 3.4 million are children. Ideally vaccination could play a crucial role in limiting this devastating epidemic. Promising research has been conducted focusing on engaging dendritic cells (DCs) to achieve a stronger immune response. Normally DCs act as cellular messengers within the body. They capture the virus and process it into peptides, which are then carried to the lymph nodes and presented to helper T cells. Unfortunately, HIV interferes with this processing and presentation. Previous research done with modified DCs and cancer cells has shown that by regulating antigen presentation by DCs, modified DCs are able to enhance responses against tumor-associated antigens. This presentation will focus on vaccine development underway that is specifically designed to engage the DC cells in stimulating protective responses against HIV as reported in the current medical and scientific literature.

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## BIOLOGY

### **Development of Validated Proliferation Assays for Translational Therapeutics**

**Harrison Pantera, Alexander Novak**

*Advisor: Mark Wallert*

**3:10 PM - 3:50 PM • CMU Hallways**

For a new drug to enter clinical trials a company must receive an Investigational New Drug approval from the Food and Drug Administration. This requires a range of supporting data, a major portion of which comes from validated cell-based assay. Validation is demonstrating the ability to provide consistent, reproducible results from assays by assessing the impact of key variables on results. In our project we are validating cell proliferation assays for the lung cancer cell line NCI-H1299. We will assess cell population using a XTT assay. Our experimental plan includes: 1) determination of population doubling time to calculate a baseline rate of cell proliferation; 2) assessment of linear correlation, to determine the range of cell population where there is a linear relationship between cell number and readout; 3) determination of initial cell density, to assess optimal seeding density; and 4) evaluation of edge effects to ensure that well location does not impact assay outcome. In our initial experiments we have determined the doubling time for the H1299 cells to be 21.24 +/- 1.43 hours. Full data from the validated assays will be presented. This work supported by MSUM Biopharmaceutical Industry Apprentice Scholarships sponsored by the GFMEDC to AN and HP.

## BIOLOGY

### The Effects of Diet on Exploratory-Boldness Behavioral Syndrome in Zebra Fish (*Danio rerio*)

Alane Korf, Kristin Wittman, Evangeline Holley, Chelsea Norman

Advisor: Shireen Alemadi

3:10 PM - 3:50 PM • CMU Hallways

Zebra fish (*Danio rerio*) are a great model organism especially in behavior and molecular genetic studies because they can survive and breed in laboratory settings. They have a high reproduction rate and reach sexual maturity early. Zebra fish are known to exhibit exploratory-boldness behavioral syndrome; which could be considered suitable for survival in the context of foraging or courtship, but may be maladaptive in terms of predation. These behavioral traits appear to be genetically linked, yet the causes of these predispositions are unknown. These exploratory behaviors may be tied to diet. An initial run will determine proportion of bold vs. shy on regular diet. We then established two feeding groups: good diet (two doses of bloodworms per day) and poor diet (one dose of bloodworms per day). After two weeks, fish were tested again using a serial maze designed to examine exploratory behavior. We expected good diet fish to be bolder because of lower stress levels and the ability to spend energy on exploration.

## BIOLOGY

### Physiological relationship between Choline and Alzheimer Disease

Nathaniel Arneson

Advisor: Ellen Brisch

3:30 PM - 3:50 PM • CMU 214

Alzheimer disease is an "incurable" disease that still to this day perplexes even the most intellectual scientists as to where it begins and how it can be treated. It has not only torn apart families but also the minds of those affected by this devastating degenerative disease. During this three month study I will attempt to explain relationships between the newly designated nutrient "Choline," and Alzheimer Disease using historical archives of past patients, and present day literary sources. I suggest that having a choline deficiency in the body may lead to mild case of fatty liver disease which, over prolonged periods of time, will lead to a specific pattern of neurofibrillary "tangles" in neurons (AKA Alzheimer Disease). This current study will be useful in the future for better treatment and prevention of Alzheimer disease.

## CHEMISTRY

### The Impact of RhoA Kinase and Ribosomal S-6 Phosphorylation of Ezrin/Radixin/Moesin Binding to NHE1

Gabriel Sauvageau, Rubi Gutierrez

Advisor: Joseph Provost

9:30 AM - 10:10 AM • CMU Hallways

The Na<sup>+</sup>/H<sup>+</sup> exchanger isoform 1 (NHE1) is a ubiquitously expressed membrane protein that structurally anchors actin filaments at the leading edge of the cell by binding Ezrin/Radixin/Moesin (ERM) family of proteins. ERM proteins link actin filaments to the membrane, a step necessary for directing cell migration. The RSK and ROCK phosphorylation sites on the COOH-terminus of NHE1 are believed to regulate the binding of ERM to NHE1. To test whether the phosphorylation of these sites is required for ERM binding, we will work with five cell lines 1) PS120 - NHE1 null cells; 2) PSN - PS120 cells expressing human NHE1; 3) PSN S703A cells - PSN with a mutated RSK phosphorylation site (S703A); 4) PSN T653A - PSN with a mutated ROCK phosphorylation site (Thr653A); and 5) PSN TSA cells - PSN expressing both mutations. To determine whether ERM and NHE1 co-immunoprecipitate we will transfect cells with GFP-Ezrin and immunoprecipitate using a GFP antibody and assess proteins via Western blotting. We hypothesize that the control cell line PSN will blot both Ezrin and NHE1. If a Western blot of a mutant cell line does not identify both NHE1 and Ezrin, that site is not required for binding.

## BIOLOGY

### The role of NHE1 on directed cellular migration events in Chinese hamster lung fibroblasts

Andrew Dornbusch

Advisor: Joseph Provost

10:10 AM - 10:50 AM • CMU Hallways

The Sodium-Hydrogen Exchanger isoform-1 (NHE1) is a transmembrane protein that regulates intracellular pH and cell volume. NHE1 also provides an attachment point between the cytoskeleton and the plasma membrane, and activates extracellular proteases leading to the digestion of the extracellular matrix; both of these functions coordinate directed cellular migration. To investigate the regulation of cellular migration we have mutated specific amino acid residues on the carboxyl tail of NHE1 to determine the role of these residues in regulating cellular migration. Ribosomal S6 kinase (RSK) phosphorylates NHE1 and promotes an increased Na<sup>+</sup>/H<sup>+</sup> exchange. Rho-associated kinase (ROCK) is believed to phosphorylate NHE1 to mediate the formation of actin filaments. We have created stable cell lines that express human wild-type NHE1, NHE1-S703A, NHE1-T653A, and NHE1-ST653, 701A. We then assessed the ability of the mutant cell lines to support cellular migration in the presence and absence of

Lysophosphatidic Acid (LPA), and determined what effects these mutations have on stress fiber formation and the Na<sup>+</sup>/H<sup>+</sup> exchange of NHE1. This work was supported with funds from NSF-MCB-081778 and NSF-RUI-MCB 0930432.

## BIOLOGY

### Estimating the Molecular Volumes of Small Molecules Using IR Spectroscopy

Etsehiwot Gebreselassie, Samantha Stewart-James

Advisor: P Asoka Marasinghe

1:00 PM - 1:40 PM • CMU Hallways

Infrared spectroscopic absorbance peaks of moderate to strongly absorbing frequencies of the solvents appear as negative peaks at such positions when solutes are added to it. Such negative peaks are used in this investigation to estimate the molecular volumes of the dissolved solutes. The magnitude of the negative peaks of toluene as the solvent was correlated to the theoretical molecular volumes of the solutes. Using such correlation plots molecular volumes of some small molecules were estimated and compared to their theoretically calculated molecular volumes. As of now the estimated molecular volumes from the proposed method were within 10-20% of the calculated values.

## BIOLOGY

### A 5-E Model Lesson in Chemistry for Secondary Science Students

Abbi Wittner

Advisor: Alison Wallace

1:40 PM - 2:00 PM • CMU 216

40 min presentation. I will present a lesson in chemistry that is suitable for a 11th/12th grade chemistry class. After teaching the lesson, I will explain how and why this lesson meets the 5-E model. I will also explain how this lesson meets the Minnesota Science Standard Frameworks.

## BIOLOGY

### Impact of NHE1 Interactions with ROCK and ERM on Cellular Migration Events in H1299 Lung Cancer Cells

Andrew Dornbusch, Nicholas Kohles, Ismael Banla

Advisor: Joseph Provost

1:40 PM - 2:20 PM • CMU Hallways

The sodium-hydrogen exchanger isoform-1 (NHE1) is a 12-pass transmembrane protein that regulates intracellular pH, cell volume, and cell motility. Directed cell migration is dependent on the ion transport and cytoskeletal anchoring of NHE1. NHE1 is regulated through interactions on its carboxyl tail. Rho-associated kinase (ROCK) phosphorylates

NHE1 promoting NHE1 interactions with the cytoskeleton. ROCK also directly phosphorylates and activates ezrin-radixin-moesin (ERM). ERM binding to NHE1 promotes cytoskeletal anchoring and regulates cell motility. The goal of this study is to elucidate the function of the ERM binding and ROCK phosphorylation sites in the regulation of cellular migration, invasion and the formation of stress fibers in non-small cell lung cancer cells (H1299). This will be achieved by comparing the migration, invasion, and stress fiber formation of H1299 cells. Our laboratory has generated NHE1 null cells via shRNA and a set of full length, epitope tagged human NHE1 engineered to express in the presence of shRNA used in the NHE1 null cells. Mutant NHE1 is reinserted into the NHE1 knockdown cells and verified using western blotting techniques. The effect of the mutations on cellular migration events are then determined using electric cell-substrate impedance sensing. This work will be supported with funds from NHI-1R15-CA135616-01.

## BIOLOGY

### Substitution reactions of borohydride and cyanoborohydride ions with hexafluorophosphate ions

Arjun Kafle

Advisor: Gary Edverson

2:30 PM - 3:10 PM • CMU Hallways

We are interested in studying the reactions of hexafluorophosphate ions with NaBH<sub>4</sub> and NaBH<sub>3</sub>CN. When the ionic liquid trihexyl(tetradecyl)phosphonium hexafluorophosphate is reacted with NaBH<sub>4</sub> at high temperatures, <sup>11</sup>B NMR shows that the only boron containing product is BF<sub>4</sub><sup>-</sup>. The same ionic liquid with NaBH<sub>3</sub>CN gives a mixture of BF<sub>4</sub><sup>-</sup> and a borate anion that has had one hydrogen atom substituted. The reaction of a concentrated THF solution of tetrabutylammonium hexafluorophosphate with NaBH<sub>3</sub>CN at high temperatures produced the same mixture of substituted borates as the ionic liquid. However, a concentrated THF solution of Bu<sub>4</sub>NPF<sub>6</sub> with NaBH<sub>4</sub> at high temperatures produced a disubstituted borate ion. A proposed mechanism for these substitution reactions will be discussed.

## BIOLOGY

### Cycloadditions of Amino Acid Derived Imino Esters to Pyrazolidinone Substrate

Kiesha Bullock

Advisor: Craig Jasperse

3:10 PM - 3:50 PM • CMU Hallways

Research in this program is designed to develop synthetic organic chemistry methods. Possible uses might be made by medicinal chemists and pharmaceutical researchers to form new medications and drug therapies. The first part

of this study focused on optimizing the preparation of pyrazolidinone substrates. A procedure that is fully detailed and that produces consistent, reproducibly pure product was developed. Once that goal was accomplished, the second part of the study involved using the pure products of part one. Cycloadditions were investigated using amino acid-derived imino esters to produce stereochemically complex pyrrolidine targets. These nitrogen-containing heterocyclic targets have promise as being useful products, in part because of opportunities for stereoselectivity with the cycloaddition. Also since they are made from amino acid derivatives, they could have biological significance as they may be more easily accepted by our body's immune system if they can be optimized for pharmaceutical purposes.

## COMMUNICATION STUDIES

### Muted Group Theory Applied to "Mobile Suit Gundam Victory"

Justin Johnson

Advisor: Jason Anderson

9:30 AM - 9:50 AM • CMU 207

I am using Muted Group Theory to analyze the main character "Usō Evin" from the animated series "Mobile Suit Gundam Victory" and see how I can apply the theory to Usō's interactions with other characters in the series. While the main character is male, it is because of his age that makes him a muted group.

I conducted my data collection on January 18-25 2012 by simply going through and watching each of the 51 episodes of "Mobile Suit Gundam Victory." I used the Pages application on my Ipad to take note of the start and end times. With the start and end times of each scene noted, so I could simply go back and refer to the appropriate scene while I was writing on that scene in the paper. At the start of the series, Usō is weak willed and often muted by other characters, but as the series progresses, Usō is able to un-mute himself to a certain extent. This growth is evident to the extent that other characters actually begin to listen to his appeals."

## COMMUNICATION STUDIES

### Suicide Awareness Week

William Krumwiede, Ashley Harrington, Megan Nitschke

Advisor: Jason Anderson

9:30 AM - 10:10 AM • CMU Hallways

We are addressing the problem of the lack of awareness relating to depression issues among college students that lead to suicide and the impact it has on the tri-college community. According to the American Foundation for Suicide Prevention, suicide is the second leading cause of death among college students and the third leading cause of death among all youth 15-24 years old. Depression is a common mental illness associated with suicide. Depression is an illness which causes a teen to feel sad, lonely,

withdrawn and unable to accomplish simple tasks. The pressures college students face, such as parents, grades, involvements, jobs, graduation, etc., make it more likely for this age group to experience depression. One out of every four college students suffer from a mental illness, and over two-thirds of college students do not seek help to talk about their mental problem, such as depression.

April 8-13 we will be hosting Suicide Awareness Week that will focus on the issues stated above. The week of events will include various speakers, a panel and educational/fun events to promote awareness towards issues related to suicide."

## COMMUNICATION STUDIES

### Student Senate Research Campaign

Danielle Saul, Kylie Potter, Nallely Urbano Villagomez

Advisor: Jason Anderson

9:50 AM - 10:10 AM • CMU 207

We are partnering with the MSUM Student Senate to do a research based campaign promoting awareness of the organization and its function within the University. As of right now not many students know what Student Senate is, or what it does. Through the data collected in our survey, we will learn the exact beliefs and opinions of MSUM students in order to launch a campaign that is tailored to our audience. With the lack of knowledge and input from the student body, Student Senate cannot be utilized to its fullest extent, because they cannot accurately represent their constituency. As a result, many students have become angry with the University and feel like they are not valued by MSUM. This can be problematic for prospective students, because their first impression of our school will be the lack of enthusiasm of the current students. If current students got involved in the student government and helped make the decisions in our school, we could increase school spirit again and promote campus involvement. Through a research based campaign, we will figure out exactly how to market our event to students and find the most effective means of communicating with the student body at large.

## COMMUNITY HEALTH

### Oral Health Issues of Aging Americans

Advisor: Susan Humphers-Ginther

10:10 AM - 10:50 AM • CMU Hallways

There is little attention and limited access to affordable, adequate, oral health care for the elderly. It is often not provided within assisted living communities and long-term care facilities. The elderly who live independently often do not have the financial ability to obtain costly routine oral care and it is not included in Medicare plans. Dental insurance is too expensive for many, causing them

to ignore their oral health rather than attempting to pay out-of-pocket. It has been identified, and stressed recently, that oral health and systemic health are closely related. So if an attempt is made to improve oral health and access to care, we could possibly improve their over-all health status and even reduce, or prolong the initial need, for medications to treat certain systemic conditions. An analysis of data from The Nation Health Interview Survey (NHIS) reflects the correlation of a steady decline in health status related to aging. More research is needed to validate the relationship of oral health, systemic health, and aging. The correlation between the benefit of improved routine oral care and how it may affect the incidence of chronic disease and health status related to aging may be significant.

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## COMMUNITY HEALTH

### Oral Health Issues of Aging Americans

**JoAnn Jennen**

*Advisor: Susan Humphers-Ginther*

**1:00 PM - 1:40 PM • CMU Hallways**

There is little attention and limited access to affordable, adequate, oral health care for the elderly. It is often not provided within assisted living communities and long-term care facilities. The elderly who live independently often do not have the financial ability to obtain costly routine oral care or dental insurance which is not included in Medicare plans. As a result they ignore their oral health rather than attempting to pay out-of-pocket. It has been identified and stressed recently that oral health and systemic health are closely related. So if an attempt is made to improve oral health and access to care, we could possibly improve their over-all health status and even reduce, or prolong the initial need, for medications to treat certain systemic conditions. An analysis of data from The National Health Interview Survey reflects the correlation of a steady decline in health related to aging. More research is needed to validate the relationship of oral health, systemic health, and aging. The correlation between the benefit of improved routine oral care and how it may affect the incidence of chronic disease and decline in health status related to aging may be significant.

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## COMPUTER SCIENCE AND INFORMATION SYSTEMS

### Basics of Building an Android App

**Safal Rana Magar**

*Advisor: Daniel Brekke*

**10:10 AM - 10:30 AM • CMU 207**

30 min presentation. Android is one of the most versatile and flourishing Linux based operating systems for mobile devices out in the market today. After its establishment in 2003, it was soon acquired by Google in 2005 and has been operating under its wing ever since. With the rise of use in mobile devices and applications, it will be useful

for developers to have a skill set in app development and integration. Android's system User Interface (UI) provides a framework on top of which we will be able to build our apps. The presentation will feature an overview of the requirement to build a simple app for an Android device running Android 2.3.3 (Gingerbread) with the use of Android SDK Tools and Android Virtual Device for working emulation.

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## COMPUTER SCIENCE AND INFORMATION SYSTEMS

### The Growing Importance of Mobile Applications in Computer Programming

**Gerard Beaubrun**

*Advisor: Yurii Boreisha*

**10:30 AM - 10:50 AM • CMU 207**

With the internet boom, programming couldn't limit itself to business and social application created with the desktop and eventually laptop user in mind. The internet more than simply extended an entity's presence, it offered programmers the abilities to create applications. With the rise of smartphones and the synchronization of internet contents to a phone, programming is unavoidably present in the field of mobile application and mobile internet. As a business rule, you reach people not only where they are most active or most present, but there is potential for them to be active and present. This presentation chronicles the rise of mobile programming while exploring the different platforms of today's mobile programming. This presentation will also present the difficulties encountered by mobile programming and the solutions that have been brought forth. The importance of mobile programming as a medium of the future and also as a business tool will come not as a conclusion but as a forecast of the future.

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## CONSTRUCTION MANAGEMENT

### Construction Management Capstone Project

**Cory Peterson, Richard Dablow, Nicholas Barth**

*Advisor: Norma Andersen*

**9:30 AM - 9:50 AM • CMU 208**

Proposed rehabilitation of the old Moorhead power plant into an art gallery and community art center, creating a neighborhood cohesion within all age groups.

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## CONSTRUCTION MANAGEMENT

### Pearson Crown Plaza Hotel

**Jacob Knutson, Dayton Thorpe, Alexander Pearson, Darren Dell**

*Advisor: Norma Andersen*

**9:30 AM - 10:10 AM • CMU Hallways**

We have provided no abstract. One of us will have to get in here and fix it by the 15th of Feb or this is EXACTLY how it will appear in program.

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## CONSTRUCTION MANAGEMENT

### Capstone Presentation - Water Park

**Daniel Watkins, Dominic**

**Rademacher, Thomas Alverson**

*Advisor: Norma Andersen*

**1:00 PM - 1:20 PM • CMU 207**

Our presentation will consist of our company business plan, site selection, project feasibility, project description and plans, estimate, schedule, contract process, job hazard, risk analysis, storm water control, change orders, request for payment and green building/sustainability.

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## CONSTRUCTION MANAGEMENT

### Capstone Moorhead Power Plant Renovation

**Craig Koenen**

*Advisor: Norma Andersen*

**1:40 PM - 2:20 PM • CMU Hallways**

Our project consists of renovating the old Moorhead Power Plant. We will be turning the old plant into a fitness center.

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## CONSTRUCTION MANAGEMENT

### Big Dog Builders

**Timothy Bement, Christopher Brorby, Justin Doom**

*Advisor: Norma Andersen*

**2:30 PM - 3:10 PM • CMU Hallways**

At the academic conference this spring 2012 our group consisting of Justin Doom, Tim Bement, and Chris Brorby will be presenting our final project for our capstone class. This is a project that we work on throughout the entire semester. Our project for the semester was to come up with an idea on how to renovate an old building into a useable facility. We chose to do a community event center. We had to do an exact estimate of time, labor, and materials. We had to schedule the project to see how long it would take. We did a feasibility study to see if this project was worth putting up in the area we had to build. In our event center we will have a basketball and volleyball court, and rock climbing, there will be kayak, and bike rentals.

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## CONSTRUCTION MANAGEMENT

### Construction Management Capstone project presentation

Ryan Hill, Bova Kiboko  
Ngase, Dillon Theusch

Advisor: Norma Andersen

3:10 PM - 3:50 PM • CMU Hallways

In the city of Moorhead there is old power plant that is vacant and not being used. What should be done with it? With the research that was found, we as a group by looking at the demographics, economy, and socials trends of the area came up with solution for the building. We propose that the building is turned into a Dave and Busters restaurant. We have provided details of all aspects of the project from start to finish. We plan to show the reason why this business should be built, what it would cost to have it built, and what it would look like.

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## COUNSELING & STUDENT AFFAIRS

### The Feasibility Study of Establishing Diversity Requirements in MSU Moorhead

Yi Chu

Advisor: Donna Brown

2:00 PM - 2:20 PM • CMU 208

30 min presentation. Studies have shown that by having a significant understanding of diversity and culture, students appreciate cultural pluralism and increase awareness towards social inequalities. Possessing this knowledge benefits individuals, communities and has the potential to make positive changes to society. By researching examples from universities in the U.S., analyzing current organizational structure and programs of the institution, and conducting qualitative and/or quantitative surveys, this study examines the feasibility of implementing an optional "proficiency in diversity understanding" endorsement at MSU Moorhead.

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## CRIMINAL JUSTICE

### A Summer with the Fargo Police Department

Crystal Smith

Advisor: Geraldine Hendrix-Sloan

10:10 AM - 10:50 AM • CMU Hallways

When people think of police work, the first images that come to mind are often TV shows such as COPS, Law & Order, or CSI. There are many preconceived notions about cops, such as that they are constantly on the move, chasing dangerous criminals, or spend their down time eating donuts at the local Holiday station. However, the experiences from my internship with the Fargo Police Department contradict these stereotypes. My presentation

will offer insight and information about the actual roles and duties delegated to the employees of the Fargo Police Department.

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## ECONOMICS

### Off Campus Living Might Cost You More Than You Think

Godwin Kessy

Advisor: Oscar Flores-Ibarra

9:30 AM - 9:50 AM • CMU 200A

Previous research has identified that living on campus has a positive impact on students' Grade Point Average (GPA). Given that students frequently disregard this finding and choose to move off campus, this paper analyses whether and to what extent proximity to campus impacts students' GPA. In this study I surveyed MSUM students and used regression analysis to show the relationship between proximity to campus and students' GPA.

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## ECONOMICS

### Uganda: Striving to Move Forward

Laura Troisdahl

Advisor: Oscar Flores-Ibarra

9:30 AM - 9:50 AM • CMU 200D

Uganda, a nation tucked away in east-central Africa, has faced its fair share of political and economic problems. However, the country's outlook is looking bright. The purpose of my analysis is to examine how Uganda has grown economically and determine how the country should proceed in order to continue growing. After assessing how Uganda has improved, I will look into the country's current economic conditions, population demographics, and international relations in order to make my suggestions. My main sources of information will be government databases, news articles, and economic outlooks previously compiled by other researchers. I expect that Uganda's economy will continue to grow and improve, both domestically and internationally, particularly due to its high level of agriculture and consumer goods production.

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## ECONOMICS

### Undergraduate Retention across Regional Public Universities

Marissa Peterson

Advisor: Oscar Flores-Ibarra

9:50 AM - 10:10 AM • CMU 200D

A regression analysis of retention rates at public universities; specifically analyzing the impact local unemployment rates have on student retention.

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## ECONOMICS

### A Review of Investments in Renewable Energy in the United States

Diamond Stokes

Advisor: Tonya Hansen

9:50 AM - 10:10 AM • CMU 200A

Increasing usage rates and the investment of billions of dollars in renewable energy reveal that sustainability is a growing priority among countries throughout the world. However, many critics of investments in renewable energy argue that taxpayers bear a disproportionate share of the costs of adoption and that renewable energy sources actually harm the environment. This study will review the renewable energy literature with regards to three themes: funding allocations by energy source, environmental criticisms, and economic performance. Results of this research will offer insights to individuals, firms, and governments deciding what share of their budgets to allocate to traditional versus renewable energy sources.

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## ECONOMICS

### Banksy Artwork: The New Stable Asset

Brock Gauer

Advisor: Tonya Hansen

10:10 AM - 10:30 AM • CMU 200A

Individuals are most familiar with assets such as the value of a stock traded on the Standard and Poor's 500 or the gold price. In contrast, artwork is a challenging asset to value because it is not easily exchanged due to limited markets and with artwork, beauty is always in the eye of the beholder. Banksy is a British street graffiti artist whose works are displayed in prestigious museums and sold at respected auction houses. The goal of this paper is to develop a model for pricing Banksy artwork using sales from eBay and respected auction houses. Hedonic regression analysis is used in this research to determine the impact of asset characteristics (year released, medium, area squared, edition size, etc.) on trading price. Results of this research will enable individuals to better understand the value of Banksy artwork and its potential as an alternative investment to financial assets.

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## ECONOMICS

### Pet Surplus: It is Raining Cats and Dogs

Kelli Landis

Advisor: Tonya Hansen

10:10 AM - 10:30 AM • CMU 200D

Within the growing pet industry, there are an estimated 75 million dogs being cared for in the United States. However, many people do not realize that revenue from the sale of dogs supports commercial breeders (puppy



mills) and backyard breeders who may treat their dogs very inhumanely. The purpose of this research is to consider whether and to what extent puppy mills and pet owner negligence (backyard breeders) are contributing to pet overpopulation. Results of this analysis will guide regulatory reform related to commercial and backyard breeders.

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## ECONOMICS

### Are the Declining Rates of Union Membership a Result of the Economic Downturn?

**Katie Nicklay**

*Advisor: Tonya Hansen*

**10:30 AM - 10:50 AM • CMU 200D**

Labor unions began forming in the United States following the Civil War. Their development was in response to the modern industrialized economy. Labor unions gained in popularity until membership peaked in the 1950s, and has declined ever since. This research determines if there is a negative relationship between union effectiveness and a downturn in the economy. A regression analysis will be completed using state-level data from the Bureau of Labor Statistics and the Current Population Survey. The regression uses union membership as a proxy for effectiveness. A binary variable reflecting whether the state is a right-to-work state and demographic characteristics of union and nonunion members serve as explanatory variables. Results of this research will reveal if union membership provides protection to laborers during an economic downturn.

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## ECONOMICS

### Cost Benefit Analysis of Nuclear Power

**Fariha Rahman**

*Advisor: Tonya Hansen*

**10:30 AM - 10:50 AM • CMU 200A**

The first nuclear reactor in the world to produce electricity was the small Experimental Breeder Reactor (EBR-1) in Idaho, which started up in December 1951. There are now over 440 commercial nuclear power reactors, operating in 30 countries and providing 14% of the world's electricity. However, after a 9.0-magnitude earthquake and 30-foot tsunami in 2011 damaged the Fukushima nuclear reactor in Japan, questions have been raised regarding reliance upon nuclear energy. This paper compares the costs and benefits associated with future investment in nuclear power generation. Results of this analysis will guide allocation of energy resources between nuclear and other energy sources.

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## ECONOMICS

### Crime and Unemployment in North Dakota

**Swarnima Rimal**

*Advisor: Tonya Hansen*

**1:00 PM - 1:20 PM • CMU 200A**

Official crime statistics reveal that communities with high unemployment rates often experience high crime rates. In contrast, North Dakota counties exhibit low unemployment rates, but increasing crime rates. While most existing research incorporates the unemployment rate as an independent variable in regression analyses focused on this topic, the impact of other variables (crime detection rates, weather deviations, population densities and alcohol consumption levels) is often overlooked. This paper improves upon existing research by including these factors and the unemployment rate as independent variables in the same regression equation. This research uses data from 43 counties in North Dakota to examine whether and to what extent these independent variables impact property and violent crime rates in North Dakota. Results of this research will direct policies for reducing crime rates in North Dakota.

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## ECONOMICS

### Economic Analysis of Electricity Prices Across States

**Tanner McCarty**

*Advisor: Tonya Hansen*

**1:00 PM - 1:20 PM • CMU 200D**

There is a large variance in the prices that households pay for electricity across different states. It is as low as six cents per kilowatt hour in some states and as high as twenty four cents per kilowatt hour in others. The literature reveals several variables (tons of discovered coal, number of nuclear power plants, square feet of natural gas deposits, regulations, number of retail electrical sellers, and yearly GDP in manufacturing) that are correlated with the average price per kilowatt hour charged to households. In addition, this research also includes taxes on electricity and yearly temperatures as additional variables that may impact electricity prices. This research will determine whether and to what extent these impact states average prices per kilowatt hour charged to households.

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## ECONOMICS

### Do the cigarette consumption patterns of youths and adults differ?

**Aastha Khatiwada**

*Advisor: Tonya Hansen*

**1:20 PM - 1:40 PM • CMU 200A**

The quantity demanded of cigarettes is expected to respond to changes in cigarette prices. Also, variables like cigarette taxes, real income, gender and other demographic and socioeconomic factors have been shown to alter the demand for cigarettes among different consumers. This research uses state-level data and regression analysis to extend previous research related to cigarette consumption patterns. Specifically, this research considers the interaction of consumer age with location and offers insights related to cigarette consumption of youths and adults during expansionary and contractionary economic periods.

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## ECONOMICS

### Red Clover in the Red River Valley

**Amber Wolbeck**

*Advisor: Tonya Hansen*

**1:20 PM - 1:40 PM • CMU 200D**

Competing interests related to agricultural profitability and environmental management have resulted in a growing body of literature on the use of cover crops. In particular, red clover has been the focus of a number of those studies. The primary reason for concentrating on red clover is due to its ability to fix nitrogen into the soil. Despite recent studies, the literature has failed to address the long and short run economic impacts to the farming operations of planting cover crops. Further, while crop budgets of a conventional nature are prevalent, budgets recognizing cover crops are limited. Budgets recognizing cover crops will be constructed based on North Dakota State University crop budgets with adaptations made for the use of cover crops and common rotations used in the Red River valley area. A sensitivity analysis based on these budgets will determine the profitability of incorporating red clover into the rotation as a cover crop with wheat.

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## ECONOMICS

### Do youth participation rates really reduce crime rates?

**Neil Lindner**

*Advisor: Tonya Hansen*

**1:40 PM - 2:00 PM • CMU 200A**

The long-standing reasons to involve youth in sports are to keep them busy, focused and out of trouble. It is unclear whether this is the reality in the United States today. Previous research shows that increased enrollment in competitive sports has resulted in increased crime rates for some locations. This research will use regression analysis to

examine the impact of youth activity participation rates on crime (property, violent, and juvenile) rates. Results of this research will influence how youth activities are organized and conducted in the future.

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## ECONOMICS

### The Economic Components of Stock Prices

**Nicholas Enger**

*Advisor: Vernon Dobis*

**1:40 PM - 2:00 PM • CMU 200D**

Considerable research has been conducted surrounding stock prices and values. Previous studies have often emphasized “true” stock valuation or shown that changes in various economic variables (earnings, dividends, new information, etc.) affect stock prices in a predictable manner; in contrast, this study examines the myriad of economic impacts on stock prices (GDP, earnings, CPI, dividends, etc.). Using regression analysis, the impact of microeconomic and macroeconomic variables hypothesized to determine stock prices are examined with five randomly selected companies listed on the Dow Jones Index.

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## ECONOMICS

### Effects on Attendance in Major League Soccer

**Jesse Larson**

*Advisor: Tonya Hansen*

**2:00 PM - 2:20 PM • CMU 200A**

Major League Soccer (MLS) has grown in recent years and has remarkably surpassed the National Basketball Association and the National Hockey League in average attendance, making it the first time that MLS has reached the top three leagues for attendance in North America. The literature reveals that attendance for other professional sports is affected by the building of a new stadium, the team’s performance, and demographics of the team’s city. Variables that are expected to influence MLS attendance include: soccer-specific stadiums and the addition of David Beckham and other superstar soccer players. This paper uses regression analysis to examine whether and to what extent both types of variables affect MLS attendance.

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## ECONOMICS

### How does altering consequences to display moral implications affect the criteria individuals use in determining daily consumptive activities?

**David Geeslin**

*Advisor: Tonya Hansen*

**2:30 PM - 2:50 PM • CMU 200A**

Individuals are faced with multiple decisions every day. As they make these decisions, individuals may be driven by economic (self-interest) or moral (social-interest) factors. This research involves Minnesota State University Moorhead students in an economic experiment to test how decision-making behavior changes when individuals are made aware of short-term and long-term negative consequences of their decisions. Results from this research will reveal whether individuals make decisions using criteria in addition to self-interest.

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## ECONOMICS

### Investing in Human Capital for Economic Growth

**Michael Kasper**

*Advisor: Tonya Hansen*

**2:50 PM - 3:10 PM • CMU 200A**

Economic growth is the increasing capacity of an economy to satisfy its societal members’ demands for goods and services. In Bangladesh, it is estimated that 40 percent of the population lives in poverty and approximately 20 percent are living in extreme poverty. The high number of people living in poverty means that the health and vitality of the country’s population is weak. Economic development literature has revealed that investments in human capital can improve economic growth outcomes in developing countries. Factors that impact the biological and intellectual human capital of a country are the health and nutrition of its population, natural disasters, and education. Using publicly available data and existing literature, this research examines how public and private investments in human capital can increase productivity and create growth in an economy such as Bangladesh.

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## ECONOMICS

### Is Human Capital the Answer to the Development of the “Bottom Billion”?

**Ka-wai Lau**

*Advisor: Tonya Hansen*

**3:10 PM - 3:30 PM • CMU 200A**

Economic development research has offered a thorough explanation of why the growth paths of developed and developing countries have differed. In contrast, the dissimilar development paths among developing nations

have received less attention. Paul Collier, Professor of Economics at Oxford University, refocused the academic discussion when he introduced the term “bottom billion” to describe the bottom billion of the five billion people living in developing world nations who have experienced the slowest economic growth and least improvements in quality of life. In a review of the literature and public data sources for Uganda, this study considers the economic development outlook for this nation by examining the quantity and quality of its factors of production (natural resources, labor, capital, and entrepreneurship). This research addresses two questions: What has delayed the economic development of Uganda and other “bottom billion” countries? And what can be done to change the growing disparity that exists among developing countries?

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## ECONOMICS

### Outsourcing: Why is it occurring and how does it impact new labor market entrants?

**Kelsey Grondahl**

*Advisor: Tonya Hansen*

**3:30 PM - 3:50 PM • CMU 200A**

Outsourcing is a rapidly growing occurrence in the U.S. labor market. Literature reveals many unanswered questions regarding whether firms are outsourcing in response to increasing wage costs or increasing benefits costs. In response to this gap in the literature, this paper uses a regression analysis to analyze the decision of outsourcing.

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## EDUCATION

### A 5-E model lesson in Ecology for secondary science students.

**Donovan Donarski**

*Advisor: Alison Wallace*

**9:30 AM - 9:50 AM • CMU 218**

40 min presentation. I will be performing an instructional workshop focused on Ecological Systems intended for a 10th grade secondary science level. I will utilize the 5-E Model and Minnesota Frameworks throughout this 30 minute lesson/activity. I then plan on leaving 5 to 10 minutes for questions and a slight review of the topics discussed.

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## EDUCATION

### **A 5-E Model Lesson in Evolutionary Biology for Secondary Science Students**

**Peter Atterberg**

*Advisor: Alison Wallace*

**10:10 AM - 10:30 AM • CMU 218**

40 min presentation. The lesson will be presented as if it was to be given to secondary science students. After the lesson, there will be a reflection on how the 5-E model was followed and effective scientific teaching was used. Minnesota science teaching standards frameworks will also be reviewed. Time for questions and comments will be given at the end and during the reflection.

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## EDUCATION

### **Teacher Candidates' Perceptions of Appropriate Social Network Use**

**William Scott**

*Advisor: David Tack*

**1:00 PM - 1:40 PM • CMU Hallways**

The purpose of this action research study was to examine entry-level teacher candidates' perceptions of appropriate social network use. Having seen that educators are held to a higher set of standards and expectations both by the general public and the schools for which they work, we wanted to see if these candidates understood the importance of what information they chose to make public to these entities. Dr. Tack's courses were studied, which consisted of 36 students. We analyzed both existing data from classroom assignments (a poll on perceptions of social network use) and data gathered from the students' publicly displayed information on Facebook. The data was coded based upon the appropriate use guidelines for students and educators used by a local school district to determine whether or not the teacher candidates were using appropriate judgment in regards to the information they chose to make public on their Facebook pages. Results showed most of the students' content to be appropriate; however, those who violated appropriate use guidelines did so egregiously. Based upon the results, further education is needed within the School of Teaching and Learning regarding appropriate use of Facebook and social media.

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## EDUCATION

### **A 5-E Model Lesson on Plant Biology and Defenses for Secondary Science Students**

**Eric Hauge**

*Advisor: Alison Wallace*

**1:20 PM - 1:40 PM • CMU 207**

40 min presentation. I will be presenting a lesson on plant biology and defenses against foreign stimuli designed for secondary science students. My lesson will be based off of the 5 E model, which is a model for effective science teaching methods. My presentation will conclude with a discussion of how the 5 E model was used to develop the lesson.

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## ELEMENTARY AND EARLY CHILDHOOD EDUCATION

### **Insights into Literacy Skills: Teaching Toddlers**

**Carole Braschayko**

*Advisor: Camille Brandt*

**1:40 PM - 2:20 PM • CMU Hallways**

In current literature and practice, literacy as an educational focus tends to address the needs and skills of preschoolers and children entering kindergarten and/or first grade. While this focus makes sense from the perspective of those who develop curriculum and instructional materials, lessons, and assessments in literacy, there is a population of learners often overlooked. The research tells us that preschoolers who receive exposure and reinforcement demonstrate emerging skills including one to one letter/sound correspondence, concepts about print, and orthographic awareness but there is little information available regarding emerging skills of 2 and 3 year olds. Our intention is to share insights into the pre-literacy and emerging literacy skills of this population.

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## ENGLISH

### **MSUM and Volunteersim: Providing Opportunities for Service Learning**

**April Knutson**

*Advisor: Hazel Retzlaff*

**9:30 AM - 9:50 AM • CMU 227**

Early research illustrates the need for volunteerism on college campuses. Volunteering develops communication, leadership, critical thinking and problem-solving skills. It promotes teamwork while educating others on social problems and issues. This study examines the feasibility of MSUM providing a course for students where they could practice Service Learning through Volunteerism. This class would provide opportunities for volunteering and allow students to have scheduled time to provide service to the

Fargo/Moorhead community. In service learning students would be able to practice skills obtained in their chosen field in real life situations. This study will analyze the benefits of Service Learning to the students, the university and the community. The study will determine the demand for service learning opportunities while estimating the cost of the class to the university and its students. Using the report, the Dean of Academic affairs would have the information needed to decide if implementing a service-learning course is feasible to the university.

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## ENGLISH

### **What Can I Do With An English Major?**

**Hayley Burdett, KatieJo**

**Sonneman, Jamee Larson**

*Advisor: Michael Tomanek*

**9:30 AM - 9:50 AM • CMU 203**

Facing the workforce post-graduation can be daunting, especially if you choose to pursue a degree in a field that you love. As English majors, we're faced with the ubiquitous question "What in the world are you going to do with that?" The members of Sigma Tau Delta propose a panel discussion on the many things an MSUM English alumnus can do to put his or her degree to work. We will look at how you can use your English degree in various settings - from the academic pursuit to the savvy business world. We aim to clear up misconceptions about what an English major is really worth.

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## ENGLISH

### **As Above, So Below: Religious and Secular Hierarchies in Eco-critical Literature**

**Brandon Baker**

*Advisor: Katherine Meiners*

**9:50 AM - 10:10 AM • CMU 227**

Religion figures strongly into both historical and contemporary literary perspectives upon human interaction with broader non-human ecological entities. Widely accepted Christian tenets, for example, place humanity in a position of dominion over the earth, necessarily establishing a hierarchy of ecological worth wherein plant and animal life exists primarily to serve humanity, whether as chattel, as food, or as a means of production. At the same time, atheistic or secular-humanist belief systems, while usually devoid of overt dominion-oriented stances toward the relationships between humanity and the rest of nature, nonetheless frequently propagate hierarchical conceptions of nature wherein humanity also takes pride of place over non-human nature, in essence imbuing humanity with quasi-divine qualities that stem from the inherently subjective prioritization of high-functioning human consciousness over the perceived lower-functioning consciousness ascribed to non-human biological entities. Overtly

ecological literature, as well as literature only tangentially examining ecological interactions and humanity's place within broader ecosystems, provide us with opportunities to not only explore relationships between humanity and the wider world, but to reestablish ourselves as both stewards of the earth and as fellow-creatures in significant need of the stewardship that the earth-ambivalent though it may be-provides for us.

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## ENGLISH

### **Eternalization of Gain, Externalization of Cost: An Examination of Corporate Greed.**

**Seamus MacDonald**

*Advisor: Katherine Meiners*

**10:10 AM - 10:30 AM • CMU 227**

My presentation will focus on superfund sites and their effects on the ecosystems and communities in which they reside. More specifically, the presentation will focus on the effects the Brekeley Pit, an open pit copper mine, has had on the community of Butte, MT. Once referred to as the richest hill on earth, the open pit now home to the nation's largest superfund site has nothing but a massive environmental catastrophe to show for the riches in mineral ore taken from beneath its surface. The robbery and subsequent disaster that occurred in Butte stand as proof of the flawed nature of a system by which the few are allowed to amass huge profits at the expense of the many. In addition to the damage to the community of Butte and robbery of the state of MT, my paper will examine the link between patriotism, capitalism, and the exploitation of people and the environment--all in the name of profit. This link was intentionally created by advertising executives at the Arco. company and aimed at profiting off of the fear the U.S. middle class had of communism. The Arco company has a history of exploitation and disaster as it is now.

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## ENGLISH

### **Shall We Torch The Earth; Reflections on Ecology, Humanity and Morality** **Chitrasen Parbhunath**

*Advisor: Katherine Meiners*

**10:30 AM - 10:50 AM • CMU 227**

This paper will focus on human population crisis and how it is impeding ecological sustainability through the residual belief of human supremacy over nature, mindless consumerism, selective moral disengagement, and other ecologically destructive attitudes and practices. Why is it worth asking these questions? Why is morality important in this issue? Why is it even worth considering? This paper will attempt to explore, with a more traditional philosophical bent, the function of morality and the role of ethics in the ways that humans interact with the environment.

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## ENGLISH

### **Milton's Eve and the Petrarchan Conceit**

**Maureen Kraft**

*Advisor: Stephen Hamrick*

**10:30 AM - 10:50 AM • CMU 203**

30 min presentation. I will be discussing how John Milton uses Eve in Paradise Lost to show how this conceit holds Eve back. This Petrarchan Conceit also simplifies the fall of humanity through Eve's interactions with herself, Adam, God and Satan.

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## ENGLISH

### **Smoking Guns and Compound Bows: Image and Ethics of Hunting Constructed in Literature**

**Matthew Pullen**

*Advisor: Katherine Meiners*

**1:00 PM - 1:20 PM • CMU 227**

Whether viewing hunting as a leisure activity to be enjoyed by the elite, a rite of passage into adulthood, a heroic adventure to prove individual or group worth, or a means to provide sustenance to sustain human life, the cultural reception of the hunt varies significantly between changing time periods, geographies, social classes, and ethical foundation of each unique society. The image, spectacle, and reception of hunting created by authors such as Alexander Pope, John Gay, Joseph Conrad, Aldo Leopold, Joy Williams, and Terry Tempest Williams reveals a quickly evolving ethic and tradition over the history of humanity; as technology and society progresses, the acceptability of hunting regresses. As the population and ecological awareness has exploded, the long-standing romantic status hunting once held has all but vanished. In its representation in contemporary society and literature, hunting has lost any middle ground-one is either absolutely in favor of it or absolutely against it. Comparative analysis of contemporary literature, both for or against hunting, however, suggests a foundational similarity between conservationists and hunters. Literature from each sect promotes the same ethic, but the semiotic understanding and language of each prohibit a consolidated effort to conserve and preserve the landscape, wilderness, and wildlife.

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## ENGLISH

### **Parallels Between Clarissa and Septimus in Virginia Woolf's "Mrs. Dalloway"**

**Christina Welgraven**

*Advisor: Sandra Pearce*

**1:20 PM - 1:40 PM • CMU 227**

In my presentation, I will discuss the parallels between the characters of Clarissa Dalloway and Septimus Smith in Virginia Woolf's novel, Mrs. Dalloway. Specifically, I will argue that Woolf skillfully draws the connection between these two characters personalities and their search for social, psychological, and sexual identity.

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## ENGLISH

### **"Perowne vs. Perowne: Ian McEwan's complex characterization of Henry Perowne within Saturday."**

**Vanessa Perkins**

*Advisor: Sandra Pearce*

**1:40 PM - 2:00 PM • CMU 227**

What do George Lucas and Ian McEwan have in common? They both include threads of classical heroic discourse in their creative work. Ian McEwan's novel Saturday does more than just entertain people on the subway. McEwan's novel captures just one Saturday. One day in the life Henry Perowne. Within one day though, we find the heart of McEwan's novel: Henry's mother Lillian. Throughout my presentation I will illustrate the complexities of McEwan's novel and the torment of facing that which we fear the most. This presentation will also link McEwan's narrative structure with other heroic stories, such as: classical heroic mythos and George Lucas's The Empire Strikes Back."

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## ENGLISH

### **The Indifferent Universe of A Passage to India**

**Tyler Sorensen**

*Advisor: Sandra Pearce*

**2:00 PM - 2:20 PM • CMU 227**

This research project explores the image of the sky and its ulterior meaning within E. M. Forster's A Passage to India. By examining Forster's detailed and occasionally oblique descriptions, I specify how the author denounces British-Indian relations as a largely trivial dispute in the face of a universe characterized as omnipotent, indifferent, and infinite. In his dismissal of world conflict from an omniscient perspective, Forster effectively stresses a need to connect simply as human beings. In line with the New Criticism approach, this research project rejects vague historical and biographical information in favor of primary textual evidence, i.e. the novel itself.

## The Role of the Doctor in Mrs. Dalloway and Saturday

Rachael Johnson

Advisor: Stephen Hamrick

2:30 PM - 2:50 PM • CMU 227

This paper will discuss the role of the doctor in Virginia Woolf's "Mrs. Dalloway" (published in 1925) and the contemporary novel "Saturday" written by Ian McEwan. Analyzing these two novels as well as reading additional information on the public recognition of the medical field during the time will explore how public reception of the doctor has changed in society. The language each author uses creates metaphors in which to interpret each doctor's characterization. These findings/conclusions give insight on how the public received medical professionals, how that has changed from the early 1900s, and how it has not changed.

### FILM STUDIES

## Chinese Cinema of the Fifth Generation of Film

Travis Buschette

Advisor: Anthony Adah

9:50 AM - 10:10 AM • CMU 203

The Cultural Revolution in China during the 1960s and 1970s saw a lapse in the nation's filmmaking. But in the early 1980s, a stream of young directors started to flow out of the Beijing Film Academy, such as Zhang Yimou, Chen Kaige, Tian Zhuangzhuang, and many more. Most notable films of this fifth generation of filmmaking (1980s-1990s) had a rejection of the socialist-communist ways that had gotten several films banned during the Cultural Revolution. But these films focused on either present-day issues or became period pieces set in ancient China. Films of this time usually did not address the problem of communism directly, and thus the fifth generation filmmakers were able to put more attention toward character and their use of symbolism (through colors, actions, etc.). With most of these directors still alive and active, I'd use this essay as an opportunity to explore what made this era of Chinese cinema so great and see if the directors can still create deep meanings within recent works, such as Zhang Yimou's *The Flowers of War* (2011). By analyzing several films of this period by directors from all over China, I believe I can accomplish just that.

### FILM STUDIES

## Cinema Go Bragh: Irish Nationalism in Celtic Tiger Cinema

Conor Holt

Advisor: Anthony Adah

10:10 AM - 10:30 AM • CMU 203

From 1994 to 2007, Ireland experienced a great economic boom, known as the era of the 'Celtic Tiger'. During this time, Ireland went from being one of Europe's poorest countries to one of its wealthiest, due to low corporate taxes and an influx of high-profile international companies. Irish Cinema also experienced uplift during this time, with multiple major films produced that went on to achieve critical and commercial success worldwide. These Irish films focused on major events in the history of Ireland; films like *Michael Collins* and *In the Name of the Father* addressed the War for Independence and the continuing troubles in Northern Ireland from the Irish perspective. While these topics had been covered before in previous films, often with non-Irish directors and actors, the films of the Celtic Tiger Ireland featured major Irish directors like Jim Sheridan and Neil Jordan, and world-famous Irish actors like Liam Neeson. I will connect the economic success of the Celtic Tiger era to the Irish Cinema of that same time, and explore how those films expressed the mood and climate of the country, and how those films shaped perceptions of Irish history.

### FILM STUDIES

## The Eyes of the Lady: Perspectives and Cinematic Representations of Women in New Danish Cinema

Simone LeClaire

Advisor: Anthony Adah

1:00 PM - 1:20 PM • CMU 203

Since the emergence of New Danish Cinema in the 1990's, the Danish government has instigated a state commitment to the idea of play as a legitimate means of "sustaining and further enhancing the New Danish Cinema's global visibility". State-sponsored initiatives like the Greenhouse Initiative work to foster Denmark's developing film scene into a "playground that induces commitment, where interesting mistakes are accepted as legitimate forms of progress" (Hjort 16). These initiatives conduce to what Steve Gravestocks identifies as a commercially viable, yet artistically challenging cinema that is both avant-garde and traditional. It is here in this context that we can explore the place of the woman as her role emerges in an increasingly relevant and significant way. Thus, the films of the Danish-born director Susanne Bier illustrate how New Danish Cinema has facilitated the advance of cinematic representations of women, by women-a practice that inherently promotes the cultivation of an autonomous and powerful female self as she carves out her place within the patriarchy.

### FILM STUDIES

## Strategies of Reflexive Cinema in How the Solar System was Won

Colin Sloan

Advisor: Raymond Rea

1:20 PM - 1:40 PM • CMU 203

My senior seminar film, *How the Solar System was Won*, is an exercise in mise-en-abime: a film within a film. The protagonist (Lucas Godard - a film student) believes that his life is actually a movie and, through use of his knowledge of genre, is able to deduce and alter his filmic reality. Lucas realizes that he is in a disaster film and that he will most likely not survive through the third reel. In order to alter his narrative arc, he changes the genre to a romantic comedy, as his only means for survival. In short, I believe that by subverting the codex of cinematic structure through the stylistic systems, we are able to create a reflexive film that draws attention to the (de)construction of film itself. Within this paper, I explore the theoretical framework of reflexive cinema, and the practical application of theory to cinematic strategies of the stylistic systems we plan to use for this film. In addition, I will invoke postmodern theoretical perspectives in an attempt to further expose the ironies behind filmmaking. I also adapt the Brechtian aesthetics of alienation effect to produce a disjuncture between the author and the spectator. This film breaks away from the political didactic mode of the Brechtian aesthetic to follow a more humorous and 'purely' postmodern mode of self-reflexivity. By using these ends to meet our means, this film will deconstruct the apparatus of filmmaking, while laying bare the stylistic systems of cinema and narrative structure.

### FILM STUDIES

## Verbatim: A Stop-Motion Animation on Language Comprehension

Ashley Odegard

Advisor: Raymond Rea

1:40 PM - 2:00 PM • CMU 203

Verbatim is a senior seminar capstone project for Film Studies. The film is a short animation dealing with the literal comprehension of cliches and misused words. The presentation will focus on the creative and technical processes of stop motion animation.

## FILM STUDIES

### **Nimble: Urban Fantasy, Cancerous Culture, and the Low-budget Cinema of Mother Goose**

Tara Kramer, Benjamin Pimlott, David Kolar

Advisor: Thomas Brandau  
2:00 PM - 2:20 PM • CMU 203

Nimble is the title of a genre-blending web-series currently in production, the pilot episode of which we are submitting as our senior thesis project. The film follows the character Jack as he discovers a conspiracy hidden in the words of Mother Goose nursery rhymes, a fantastical mystery that may help him understand his very real cancer diagnosis. In this presentation, the writer/director/editor, sound designer, and producer will expound the research that was utilized in the conceptualization and writing of the project and the methods by which they are adapting the script to the screen.

## FILM STUDIES

### **Script to Screen: Final Projects from Techniques of Directing**

Tara Kramer, Charles Miller, Chance Cole, Joseph Lepp, Benjamin Pimlott, Conor Holt, Alyssa Yule, Shane Mackinnon, Jared Myers

Advisor: Thomas Brandau  
2:30 PM - 2:50 PM • CMU 203

60 min presentation. Techniques of Directing class is required for all Film majors and minors. Students are given scenes from existing plays and films and have to cast and direct them. For their final project, students are able to choose their own 5 to 10 minute scene to direct. These scenes are some of the best work of the past two years. The scenes range from comedies to dramas to horror. The director of each scene will introduce their work and talk about how they interpreted the script and brought it to the screen.

## FINANCE

### **Research on trading risk, being cautious and gambling**

Enkhjargal Tumenbayar  
Advisor: Olgun Sahin  
NO LOCATION YET

Basics of trading and trading some tools and basic money management. Trading ideas. But be cautious there is 10% of chance you are going to find money even you did it all right. Researches about people who found money from trading. Researches about people who lost money from trading"

## GEOSCIENCE

### **Verifying the Identities of Potential Meteorites through Chemical Analysis**

Advisor: Russell Colson  
9:30 AM - 10:10 AM • CMU Hallways

Have you ever wondered how a meteorite is distinguished from a tektite or some less exotic rock native to Earth? Identifying the chemical components and physical characteristics of meteorites is essential to verifying their identity. We received three samples, from Dennis Jacobs, Jessie Rock and Gene King, that were all called meteorites. Our project will attempt to determine if the samples are meteorites or something else. Petrographic thin sections were made, which will be studied using a petrographic microscope before being carbon coated and analyzed using an electron microprobe. The electron microprobe analysis will enable us to determine the chemical composition of each sample. If a sample is indeed a meteorite, we will expect it to contain graphite and metallic iron. Both are rare on Earth, but common in rocks that originated outside our atmosphere. Currently, the only sample we believe may be a meteorite is the one given to us by Jessie Rock. If it is, it has been severely altered and weathered during its time on Earth. The other two are more likely tektites. Tektites are pieces of the Earth which exited the atmosphere during an asteroid impact, then re-entered the atmosphere severely altered.

## GEOSCIENCE

### **Stratigraphic Significance of a Fossiliferous Shale in the Lower Part of the Raytown Limestone Member of the Iola Limestone (Upper Pennsylvanian) in Eastern Kansas**

Scott Flores  
Advisor: Karl Leonard  
2:30 PM - 3:10 PM • CMU Hallways

There is a growing body of evidence that suggests that many of the Carboniferous cyclothem in the mid-continent region of the United States are not simply one transgressive-regressive cycle, but are composed of two or more smaller cycles. The Iola Limestone is a major cycle or cyclothem that occurs along an outcrop belt that extends from Iowa to Oklahoma. In the central part of the Iola outcrop belt the core-shale thins dramatically (from over 1 m. to around 10 cm), and the core-shale lithologies and part of the overlying regressive-limestone lithologies pinch out or lap out onto a surface that lies on top of the transgressive limestone. A statistical analysis of macrofossils in the Lower Raytown and Muncy Creek calcareous shales will help us determine cyclicity. In the northern part of the study area the core shale is thick and

organic and overlies the transgressive limestone by a sharp contact. In the south it is very thin fossiliferous shale that overlies an erosional contact with a phosphatic lag at the base. In the south the core shale is very similar to shale in the lower part of the regressive limestone in the north, and if it is the same stratigraphic layer, then it is very likely that the Iola is two cycles. This would imply that facies, rather than just changing laterally, are lapping out onto this surface making it disconformable and a cycle boundary.

## GEOSCIENCE

### **Verifying the Identities of Meteorites Through Chemical Analysis**

Jordana Anderson, Meridith Ramsey, Elliot Young, Lindsey Anderson, Samantha Buhr  
Advisor: Russell Colson  
3:10 PM - 3:50 PM • CMU Hallways

Have you ever wondered how a meteorite is distinguished from a tektite or some less exotic rock native to Earth? Identifying the chemical components and physical characteristics of meteorites is essential to verifying their identity. We received three samples, from Dennis Jacobs, Jessie Rock and Gene King, that were all called meteorites. Our project will attempt to determine if the samples are meteorites or something else. Petrographic thin sections were made, which will be studied using a petrographic microscope before being carbon coated and analyzed using an electron microprobe. The electron microprobe analysis will enable us to determine the chemical composition of each sample. If a sample is indeed a meteorite, we will expect it to contain graphite and metallic iron. Both are rare on Earth, but common in rocks that originated outside our atmosphere. Currently, the only sample we believe may be a meteorite is the one given to us by Jessie Rock. If it is, it has been severely altered and weathered during its time on Earth. The other two are more likely tektites. Tektites are pieces of the Earth which exited the atmosphere during an asteroid impact, then re-entered the atmosphere severely altered.

## HEALTH

### **Importance of Activities for Alzheimer's Patients**

Lhemi Lama, Sagun Shahi  
Advisor: Susan Humphers-Ginther  
10:10 AM - 10:50 AM • CMU Hallways

Alzheimer's patients benefit a lot when their brain gets stimulated by getting engaged in activities. If these activities are not very stressful and confusing, then they can face the constant degradation of their health with more self-esteem. According to the Alzheimer's Association, there are many ways to keep an Alzheimer's patient's brain active. Research also suggests that by engaging in activities like listening to music, Alzheimer's

disease patients become more vigilant and can sustain better recollection of their skills. Other activities that are said to be really helpful are arts and crafts, painting, playing games, etc. Arts and crafts are said to increase their motor skills, whereas painting is said to encourage the Alzheimer's disease patients express their freedom. Likewise, playing games increases excitement in the patients.

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## HISTORY

### **Queen Himiko & the Yamatai State**

**Jacob Walker**

*Advisor: Henry Chan*

**9:30 AM - 9:50 AM • CMU 101**

With reference to available Chinese and Japanese sources in English translations, this paper discusses the debates on Queen Himiko and the Yamatai state. She ruled during the late Yayoi Period, around 300 C.E., serving as political leader and high priestess of the state. Missions were to the Chinese court to promote the trade between her state and the continent. Among the topics for discussion are the controversies surrounding the location of the state, the political organization, social structure and economy of Japan in her reign.

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## HISTORY

### **Coal: The Birth of Industry and the Death of Human Morality**

*Advisor: Nathan Clarke*

**9:50 AM - 10:10 AM • CMU 101**

Prior to the Industrial Revolution, coal mining was not performed by civilians. It was considered dangerous work that was fit for only slaves and prisoners. When the coal boom erupted in the United States, poor immigrants were used to mine the Appalachian Mountains. Driven by money, coal mining systems lacked regulation. Deadly gasses, cave-ins, explosions, and black lung were an everyday threat to the immigrant miners. Not only did the mining of the Appalachian Mountains affect the workers, but the surrounding forests and wildlife was also in danger. These dangers include the clearing of surrounding vegetation, displacement or destruction of wildlife, and degradation of the air quality. In this presentation I will discuss the negative effect the coal industry has on the people of the region and the environmental devastation that it imposed on the Appalachian Mountains.

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## HISTORY

### **Deforestation in the Democratic Republic of the Congo**

**Meghan McCarthy**

*Advisor: Nathan Clarke*

**10:10 AM - 10:30 AM • CMU 101**

The economic effects of the natural resource exploitation have and always will be an issue of moderation for the future. The destruction of natural resources in the Democratic Republic of Congo has gone widely unregulated. For the DRC, without regulation, the over-consumption of natural resources is not limited to deforestation. The destruction of the Democratic Republic of the Congo has been due to years of civil unrest which aided in the over consumption of natural resources. It has led to the destruction of endangered animal habitats by hunting them for food. It has also affected national parks throughout the region because of the lack of regulation. Deforestation for the use of shelter and heat aids in pollution, which in return, has an impact on the entire world. Commercial logging, clearing for subsistence agriculture and widespread civil conflict has devastated forests and resulted in the expansion of the bushmeat trade. The deforestation of the DRC cannot be fixed over night, it has taken many years to destroy a global necessity, but without any repercussions deforestation will continue. People, animals and habitats cannot sustain the destruction of these natural resources.

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## HISTORY

### **Fahrenheit 58: How U.S. Consumers and The Octopus Conspired to Alter the Environment in Central America**

**James Powell**

*Advisor: Nathan Clarke*

**10:30 AM - 10:50 AM • CMU 101**

The corporate leviathans underlying today's globalization are following a precedent, which grew out of Central America and one that resulted in the formation of "banana republics." The traditional banana republic narrative spotlights the coup in Guatemala in 1954; the leading, if not the only roles, are assigned to the CIA and the United Fruit Co. This oral presentation downplays the 1954 story in order to acknowledge a more important role, the role of consumerism. The role played by consumers is more relevant because, unlike the other two roles mentioned above, the role of consumerism continues to feed the monster.

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## HISTORY

### **Political Earthquake: Mexico City, 1985**

**Brian Kiedrowski**

*Advisor: Nathan Clarke*

**1:00 PM - 1:20 PM • CMU 101**

Throughout history, natural hazards have created many problems for governments. Knowing just how to respond to such events is a difficult and convoluted task. For Mexico City in 1985, multiple earthquakes struck, creating havoc throughout the area. Mexico City's government failed in the preparation as well as the response of the massive earthquakes and failed to cooperate fully with its citizens. This essay sheds light on an instance when being prepared for a natural disaster can ultimately reduce the disaster factor. The essay also aims to explain why governments and civilians must coordinate together in the wake of such rare occurrences.

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## HISTORY

### **The coal coalition and its contribution to the disaster at Buffalo Creek**

*Advisor: Nathan Clarke*

**1:00 PM - 1:40 PM • CMU Hallways**

On February 26th 1972, the lives of the people of Buffalo Creek were changed forever. The disaster at Buffalo Creek was a result of the Pittston Coal company dams that were built to the lowest standard, became saturated after continuous rainfall and then failed. Millions of gallons of water and coal refuse raced down the valley and engulfed whole villages while their citizens were asleep. In all, one hundred and twenty five people were confirmed dead, with over one thousand declared missing and over four thousand homes destroyed. In this essay I argue the relationship between our government and the coal industry ultimately led to the tragedy at Buffalo Creek, West Virginia in 1972.

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## HISTORY

### **The Coal Coalition and its Contribution to the Disaster at Buffalo Creek**

**Dustin Wenzel**

*Advisor: Nathan Clarke*

**1:20 PM - 1:40 PM • CMU 101**

On February 26th 1972, the lives of the people of Buffalo Creek were changed forever, a result of the Pittston Coal company's dams that were built to the lowest standards becoming saturated after continuous rainfall and failing. Millions of gallons of water and coal refuse raced down the valley and engulfed whole villages while their citizens were asleep. In all, one hundred and twenty five people

were confirmed dead, with over one thousand declared missing and over four thousand homes destroyed. In this essay I argue the relationship between our government and the coal industry ultimately led to the tragedy at Buffalo Creek, West Virginia in 1972.

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## HISTORY

### **The Columbian Exchange: Social and Environmental Impact from New and Old World Exchange.**

**Jose Ledezma**

*Advisor: Nathan Clarke*

**1:40 PM - 2:00 PM • CMU 101**

In 1492 Christopher Columbus's (1451-1506) first voyage changed the history and course of the environment as he connected the Old World to the New World. The Columbian Exchange introduced new vegetation, disease, and animals into foreign environments. It played a vital role in the colonization of the New World. The following presentation will analyze the Columbian Exchange and how it has impacted the Old and New World populations both environmentally and in cultural social events. I argue with supportive evidence that understanding the aspects of the Columbian Exchange will allow for a clear insight into the following questions. What are the social and environmental effects of the Columbian Exchange? How did society respond to the rapid changes that were occurring? How was the New World impacted by colonization?

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## HISTORY

### **The History of Yellowstone National Park**

**Mark Bussey**

*Advisor: Nathan Clarke*

**1:40 PM - 2:20 PM • CMU Hallways**

Yellowstone National Park is recognized as the world's first national park. It is seen by many as our nation's crowning achievement in conservation. My presentation will attempt to show what steps were taken by the United States government to create Yellowstone National Park.

My research revolved around primary sources and second hand accounts of this process. I will describe what efforts were made to discover the park. What was done to create the park and ultimately what was done to preserve the park.

What I found was that cultural attitudes of the country played a large role in the creation of Yellowstone National Park. My presentation will highlight these attitudes and hopefully give the audience a greater understanding of their effect on the country as a whole.

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## HISTORY

### **An Interpretation of the Underground Kingdom of the Eternal Emperor of Qin**

**Derek Ebersviller**

*Advisor: Henry Chan*

**2:00 PM - 2:20 PM • CMU 200D**

Though it has become one of the most infamous archaeological finds since its 1974 discovery, the grave of China's first emperor still remains an enigma to the modern world. To this day the extensive tomb and the massive terracotta army stored within are an object of intrigue to researchers. Together, they provide unprecedented insight into Shi Huangdi, the founder of the Qin dynasty, and the characteristics with which he reigned during the third century B.C.E. An investigation of several sources, which include focuses on both the history of the emperor and the construction of the tomb and army, has allowed this study a look into the timelessness, strength, and shrewdness that the first emperor emphasized in order to unite and rule China.

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## HISTORY

### **The Environmental and Ecological Impact of the Irish Potato Famine 1845**

**Sarah Kaml**

*Advisor: Nathan Clarke*

**2:00 PM - 2:20 PM • CMU 101**

The Great Potato Famine of 1845 had an enormous impact on the people of Ireland. Thousands of crops failed, along with disease and weather conditions, killed approximately one million people and caused another million to immigrate to North America. I explore what was happening before, during, and after the blight as well as the environmental, ecological, and economic impact it has caused on the land and to its people.

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## HISTORY

### **The History of Yellowstone National Park**

**Mark Bussey**

*Advisor: Nathan Clarke*

**2:30 PM - 2:50 PM • CMU 101**

Yellowstone National Park is recognized as the world's first national park and arguably America's greatest achievement in conservation. The process involved in creating this park sheds light on the values of American culture in the 19th and 20th century. After exploring a multitude of primary sources I was able to piece together the story of Yellowstone National Park. Sources used include first hand accounts from fur trappers, prospectors, explorers, soldiers and politicians. What I found was that the creation

of Yellowstone National Park was more than just a quest for the conservation of land. It became a reflection of America, in both its creation and its existence.

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## HISTORY

### **The Environmental Impact of Global E-waste: Dumping on Guiyu, China**

**Safal Rana Magar**

*Advisor: Henry Chan*

**2:30 PM - 3:10 PM • CMU Hallways**

Disposal of electronic waste or e-waste is an emerging global environmental issue, as these wastes have become the most rapidly growing segment of the municipal waste stream in the world. Guiyu, a village located in the Guangdong province of southern China, is an example of one of the world's largest e-waste processing centers since 1995. The environmental impairment instigated by the waste mismanagement is a global issue that the world should turn their attention to. Numerous unofficial reports and investigations conducted in Guiyu have proved that the toxicity derived from the wastes is actually causing major soil depletion and water resources poisoning. The consequential product of this human activity is not only a threat to the local population but to the entire eco-system. To avoid a near-future ecological disaster, we can start by self-awareness of electronic consumption limitations, its irreversible adverse effects on the environment and what we can personally do to pressure the government and the manufacturing industries to invest, implement and produce greener electronic products.

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## HISTORY

### **The Green Revolution in India**

**Emily Risch**

*Advisor: Nathan Clarke*

**2:30 PM - 2:50 PM • CMU 200D**

The Green Revolution was the introduction of genetically modified seeds (GMO) into third world countries. Punjab, India was largely affected by these "miracle seeds" that were thought to produce a higher yield than organic unmodified seeds. Third world countries were used to test these GMOs and proved to produce a higher yield but nothing substantial. Instead of eliminating famine, the seeds proved to be unsustainable, producing political, social and ecological problems. The GMOs needed more water, which caused other problems like waterlogging and salinization. This intense farming is harsh on the soil, especially when cash crops like wheat are planted without being replenished. Pesticides were used to kill insects, which would harm the crops. These harsh chemicals destroyed many other insects and created a bigger problem. The pesticides used on GMO crops have drifted into the water supply and posed a danger to ecosystems and people in India.



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## HISTORY

### Case of Three Mile Island: The Effects it had on the Environment

Sara Erickson

Advisor: Nathan Clarke

2:50 PM - 3:10 PM • CMU 200D

A nuclear meltdown is the melting of a significant portion of a reactor core due to inadequate cooling of fuel. The results of a meltdown can be quite harmful, the biggest result being the leakage of radiation. Radiation is what makes nuclear meltdowns so dangerous and is what made incidents like 1986's Chernobyl and 2011's Fukushima Daini two of the biggest nuclear disasters in the world. Like Chernobyl and Fukushima, Three Mile Island is also known for having a nuclear meltdown in 1979. While the nuclear disasters in the Ukraine and Japan are remembered for their enormous radiation leakages, Three Mile Island is known for being one of the first meltdowns in history. The incident began on March 28, 1979 when a malfunction transpired in the cooling system, which caused a partial meltdown of the reactor. The meltdown didn't become a disaster like the two previously mentioned nuclear accidents. It did, however, end up having adverse consequences on the environment.

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## HISTORY

### The Politics of Global Warming Denial

Christopher Larson

Advisor: Nathan Clarke

2:50 PM - 3:10 PM • CMU 101

Global warming used to be a very hot news topic yet it has all but dried up. This is simply due to some very smart politicking by the Bush administration and lobbying done by oil companies. Due to the efforts of these interest groups global warming is no longer an issue that is discussed. Almost all scientists agree that we are affecting our environment and need to do something to slow the impact we are having. This is something that will damage our day to day lives in the near future. This paper explains why global warming has lost the spotlight.

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## HISTORY

### Impacts of the Exxon Valdez

Clayton Foster

Advisor: Nathan Clarke

3:10 PM - 3:30 PM • CMU 200D

My presentation will be covering the Exxon Valdez oil spill of 1989, including the areas affected by the spill, such as wildlife, ecosystems and the community. Likewise, I will detail the aftermath and recovery of the Exxon Valdez oil spill.

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## HISTORY

### The Reel Good Neighbor: Creating a Hegemonic Western Hemisphere through Disney's Animated Psychological Propaganda

Matthew Baker

Advisor: Nathan Clarke

3:10 PM - 3:30 PM • CMU 101

On the surface Walt Disney Studios and US-Latin American relations have little in common. To the layman, Disney's innocent animated films South of the Border with Disney (1942), Saludos Amigos (1943), and Three Caballeros (1944) are nothing more than harmless entertainment with a Latin American twist. In reality, Disney was part of a government sponsored propaganda program and its Latin American films were designed to improve relations between the US and Latin America to create hemispheric solidarity aligned against the Axis powers during WWII. Disney's Latin American films provide strong evidence that the underlying imperialistic ideology in Disney films helped create a patriarchal Western hemisphere, in which the dominant United States secured its economic and political interests while subordinating its Latin American counterparts and continuing to create a number of dependent economies in the American Republics.

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## HISTORY

### American Religions

Katelyn Fisher

Advisor: Paul Harris

3:30 PM - 3:50 PM • CMU 200D

Something to do with American Religion

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## HISTORY

### Dorothy Day: Journalist, Activist, and Servant of God

Corinne Edgerton

Advisor: Paul Harris

3:30 PM - 3:50 PM • CMU 101

During a time of class struggle, war, and depression, America in the 20th century was a place of turmoil. Those who struggled daily just to get by turned to the state for aid while others turned to the cry of communism: Workers of the World, Unite. You have nothing to lose but your chains!" However, a new organization called the Catholic Worker movement assumed the role of caring for all those in need. At this time, anti-Catholic feelings still existed and many resented the inadequate relief efforts of the Catholic Church. This study will look at Dorothy Day who co-founded the Catholic Worker movement which radically challenged the white hegemonic culture of the 20th century. Analysis of Day's various autobiographies and selected writings as well as books on The Catholic Worker illustrated the rise of Catholic social justice in America and

its reaction from the white, Protestant majority. From my research, I found that Dorothy Day never left her Leftist background, but combined it with her new faith, and used her talent as a journalist to publish a paper that showed people the Catholic Church does have a social program to aid them spiritually, mentally, and physically. She co-founded the Catholic Worker movement which reached out to the community through its gospel of hospitality and nonviolence. This study is part of a growing interest of research focusing on challenges of hegemonic culture as well as the rise of Catholic radicalism.

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## HISTORY

### Coal: The Birth of Industry and the Death of Human Morality

Krista Eckholm

Advisor: Nathan Clarke

12:00 AM - 12:00 AM • NO LOCATION YET

Prior to the industrial revolution, coal mining was not performed by civilians. It was considered dangerous work that was fit for only slaves and prisoners. When the coal boom erupted in the United States (Starting in the nineteenth-century), poor immigrants were used to mine the Appalachian Mountains. Driven by greed, most coal mining systems lacked regulation. Deadly gasses, cave-ins, explosions, and black lung were an everyday threat to the immigrant miners. Not only did the mining of the Appalachian Mountains affected the workers, but the surrounding forests and wildlife was also in danger. These dangers include the clearing of surrounding vegetation, displacement or destruction of wildlife, and degradation of the air quality. In this presentation I will discuss the negative effects the coal industry has on the people of the region and the environmental devastation that it imposed on the Appalachian Mountains.

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## HISTORY

### The Columbian Exchange: Social and Environmental Impact from Old and New World Exchange.

Advisor: Nathan Clarke

12:00 AM - 12:00 AM • NO LOCATION YET

In 1492 Christopher Columbus's (1451-1506) first voyage changed the history and course of the environment as he connected the Old World to the New World. The Columbian Exchange introduced new vegetation, disease, and animals into foreign environments. The Exchange helped drive the colonization of the New World. The following presentation will analyze the Columbian Exchange and how it has impacted the Old and New World populations both environmentally and in cultural social events. I argue with supportive evidence that understanding the aspects of the Columbian Exchange will allow a clear insight into the following questions: What are the social and environmental effects of the Columbian Exchange?

How did society respond to the rapid changes that were occurring? How was the New World impacted by colonization?

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## HISTORY

### Amish in America

**Chelsey Hendrickx**

*Advisor: Paul Harris*

**12:00 AM - 12:00 AM • NO LOCATION YET**

This presentation will discuss the reasons why the Amish came to America while focusing on main points like their background, articles of faith they use in their religion, traditions they follow like their style of dress and how their religion affects the Amish youth.

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## HONORS

### Not Your Average Summer Job: Reflecting on Professional Experiences from Summer Internships

**David Kolar, Conor Holt, Chayane Haley**

*Advisor: Denise Gorsline*

**9:50 AM - 10:10 AM • CMU 208**

As part of the MSUM honors program, students have the option of replacing one of the three required honors seminars with a professional internship. Dave Kolar, Conor Holt and Charly Haley chose that option as a result of being hired as interns for summer 2011. Kolar, a music major, worked with sound recording at Interlochen Arts Camp in Michigan. Holt, a film major, worked with editing at CTV North Suburbs, a TV station in the Twin Cities. A journalism major, Haley worked as a general reporting intern at the St. Cloud Times in St. Cloud, MN. The presenters feel that their professional experiences from these summer internships have enhanced and applied what they've learned in their classes, supplementing their education as honors students and film, music and journalism students.

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## INTERNATIONAL STUDIES

### Human Rights Education: Promoting Peace through Life-Long Understanding

**Jessica Delaney**

*Advisor: Andrew Conteh*

**10:10 AM - 10:30 AM • CMU 208**

In light of the past decade of seemingly continuous conflict and revolt, two crucial questions emerge: Why in this century does there remain a lack of respect for the dignity of humanity in political and economic affairs worldwide? and: Is there an effective way to address the problem at its source? Human Rights Education (HRE) was officially recognized by the international community in the monumental December 2011 passage of the United Nations Declaration of Human Rights Education and

Training as a key to success for promoting peace, security and human development. The integration of HRE into primary and secondary education programs has great potential to reshape the dynamics of local, domestic and international relations by instilling an understanding, value and respect for human rights in generations of children who will grow to become citizens, business leaders and decision-makers in a globalized society. In the following paper and presentation, I begin with a brief summary of the development and history of HRE, then move to discuss the substance and relevance of the Declaration, its reception among various nations with particular attention to the United States, and its implications for human rights in both the developed and developing world.

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## INTERNATIONAL STUDIES

### Renewable Energy- A Booster for Increasing Human Development Index in Developing Country: A Case Study of Nepal

**Pragya Devkota**

*Advisor: Bruce Roberts*

**3:30 PM - 3:50 PM • CMU 208**

30 min presentation. Renewable energy is a natural form of energy which is generated from naturally occurring components. Biogas technology is one of the most important renewable energy sources. Biogas energy is especially generated from the household waste materials that include kitchen waste and animal waste. This kind of energy could be most beneficial in developing agricultural countries like Nepal. This project explores the revolution of biogas energy in rural Nepal. The objective of this research is to focus on the influence Biogas has had on the health of the community by eliminating the use of traditional firewood and coal. The result of this shift from traditional wood burning to biogas has resulted in many advantages in rural Nepalese community by reducing deforestation, proliferation of environmental sanitation, fertilizer value of the slurry, drudgery reduction, and socio-economic upliftment of the community. Hence, implementing biogas has improved the human development index of the community in Nepal. This project includes the summary of the field visit and survey carried out during my summer internship with United Nation-affiliated RERL, on the improved livelihood in rural Nepal, after adopting biogas technology over a traditional system.

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## MARKETING

### The World of New Media Communication

**Billy McDonald**

*Advisor: Jonathan Wepking*

**1:00 PM - 1:20 PM • CMU 208**

Welcome the social era; no longer does the marketer own the conversation. Instead, they must join the conversation, vulnerably. I've done just that. Since January of 2011, I have acted as the social media ambassador for MSUM. Working out of the Dragon Athletics dept., I have successfully integrated a social plan, and campaign designed to harbor a community of stakeholders that are invested in the world of Dragon Athletics.

In my methods, I used severely dashboards that allowed me to monitor keywords, manage multiple web accounts, comb the Internet for relevant data, sentiment, and most importantly the ability to measure special formatted clicks that effect the fluctuations in web traffic to MSUMDragons.com. In addition, tools like Google Analytics provided other social traffic source information. Over the course of 18 months, research proves that social media marketing drives upward to 25% of all daily traffic to MSUMDragons.com.

Social media meets the hype, and it is where my career will be steered after I graduate in May.

The larger implications of my findings is that social media is always evolving, so there is no way to forecast its growth in our culture perfectly, but surely it not going away.

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## MARKETING

### Strategic Marketing Research Through Use of a Simulation

**Monica Nelson, Emma Holo**

*Advisor: Ruth Lumb*

**1:20 PM - 1:40 PM • CMU 208**

Through the use of a simulation, this presentation shows how marketing research is conducted in a firm. The simulation is based on a large international electronics firm entering the microcomputer business. It has formed a new PC Marketing Division to pursue this business opportunity. In order to succeed in a fast-paced market where customers are demanding and the competition is attempting to take away business, marketing research must be undertaken. We will show how research enables marketers to analyze a situation, plan a strategy to improve it, and then execute that strategy into the future while facing uncertainty from the outside environment. The interplay among marketing, manufacturing, logistics, human resources, finance, accounting, and team management is stressed. The simulation provides a 'real-world' example of trade-offs and potential outcomes of various decisions. Through this simulation we learned how to make decisions in ways that would be most

profitable for the firm. The requirements included market opportunity analysis, brand development, advertising, pricing, sales force management, and profitability analysis.

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## MASS COMMUNICATIONS

### 7 Wonders of Wellness: Battling Childhood Obesity

Sarah Cooper, Trevor Hopkins,  
Megan Clemenson, Brittany  
Moorhouse, Kelli Heath

Advisor: Colan Hanson

3:10 PM - 3:50 PM • CMU Hallways

The Bateman Case study, for the Public Relations Student Society of America, is focusing on battling childhood obesity this year. Our group has partnered with a local client, the STEM Center of West Fargo, to help create a campaign to help battle this issue. Our campaign focuses on the idea of the 7 Wonders of Wellness.

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## MATHEMATICS

### Preventing an asteroid from colliding with Earth

Sain Mahato, Ishan Subedi,  
Murshid Saqlain

Advisor: Damiano Fulghesu

1:20 PM - 1:40 PM • CMU 214

If an asteroid were on a collision course with Earth, one possible way to prevent the collision would be to send a huge shuttle in space to gravitationally attract the asteroid and divert its course. This project develops a simple mathematical model to predict how massive the shuttle has to be and how soon it has to be launched depending on the mass and velocity of the asteroid. The two-body problem will be incorporated into the mathematical model. By using differential equations and concepts of classical mechanics, how the orbit of the asteroid may be altered will be determined.

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## MATHEMATICS

### Methane, climatic game- changer or just a bunch of gas?

Pragalv Karki, Holly Beimdiek

Advisor: Damiano Fulghesu

1:40 PM - 2:00 PM • CMU 214

A number of climatologists warn that the current trend of global warming threatens to release massive amounts of methane, a greenhouse gas many times more efficient at trapping solar energy than carbon dioxide, which lies frozen within the Earth's oceans and polar regions. Substantial discharges from these gas deposits would then significantly increase the rate of climate change. A mathematical model will be developed specifically focused on how the rapidly receding glaciers and extensive diminishing of the world's polar ice caps -- along with the

resultant impact on oceanic temperature, salinity and sea level -- may lead to the dissociation and disintegration of these methane clathrates and the subsequent ejection of the gas into the planet's atmosphere.

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## MATHEMATICS

### Statistical Distributions and q-Analogues of k-Fibonacci Numbers

Advisor: Adam Goyt

2:00 PM - 2:20 PM • CMU 214

In their book [1] Benjamin and Quinn use tilings of an  $n \times 1$  board with tiles of lengths one and two to give combinatorial interpretations for many classic Fibonacci identities. We define a natural extension of their results by defining the  $n$ th  $k$ -Fibonacci numbers to be the number of tilings of an  $n \times 1$  board with tiles of lengths  $1, 2, \dots, k$ . We will show that these tilings lead to natural generalizations of Fibonacci identities. These tilings are in bijection with certain sets of pattern avoiding permutations and set partitions. As was done in [2, 3], we study distributions of statistics over these pattern restricted sets. By assigning a weight to each tile correspondant to the contribution of each layer to the statistical distribution, we bijectively produce identities involving  $q$ -analogues of the  $k$ -Fibonacci numbers. References [1] A. T. Benjamin, J. J. Quinn, Proofs that really count, vol. 27 of The Dolciani Mathematical Expositions, Mathematical Association of America, Washington, DC, 2003, the art of combinatorial proof. [2] A. M. Goyt, D. Mathisen, Permutation statistics and  $q$ -Fibonacci numbers, Electron. J. Combin. 16 (1) (2009) Research Paper 101, 15. URL [http://www.combinatorics.org/Volume\\_16/Abstracts/v16i1r101.html](http://www.combinatorics.org/Volume_16/Abstracts/v16i1r101.html) [3] A. M. Goyt, B. E. Sagan, Set partition statistics and  $q$ -Fibonacci numbers, European J. Combin. 30 (1) (2009) 230-245. URL <http://dx.doi.org/10.1016/j.ejc.2008.01.015>

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## MATHEMATICS

### Algorithms of Sudoku

Christina Szarkowski, Steven Ruckdashedl

Advisor: Damiano Fulghesu

2:30 PM - 2:50 PM • CMU 214

This presentation will cover many of the algorithmic aspects of Sudoku puzzles. In particular, the algorithms for different moves will be considered. The algorithms identified will be used to solve existing Sudoku puzzles as well as to develop puzzles of at least four different difficulty levels. The algorithms described will ensure a unique solution for each puzzle developed, and the complexity of the algorithm to create puzzles will be analyzed and minimized.

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## MATHEMATICS

### Mathematical Model of Throwing a Baseball

Zachary Morseth, Shouvik

Bhattacharya, Nicole Anderson

Advisor: Damiano Fulghesu

2:50 PM - 3:10 PM • CMU 214

In this talk a mathematical model of throwing a baseball will be presented. There are three different cases that will be addressed in this presentation. They are: First, finding the range of values for the optimum release angle at which the ball will result in a strike. Second, assuming the pitcher throws a strike, then how a batter hits a home run. Third, if the batter hits the ball to left field, but it does not result in a home run, then how the left fielder catches the ball. A simulation model will be used to explain these three cases.

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## MATHEMATICS

### Statistical Distributions and q-Analogues of k-Fibonacci Numbers

Brady Keller

Advisor: Adam Goyt

12:00 AM - 12:00 AM • NO LOCATION YET

In their book [1] Benjamin and Quinn use tilings of an  $n \times 1$  board with tiles of lengths one and two to give combinatorial interpretations for many classic Fibonacci identities. We define a natural extension of their results by defining the  $n$ th  $k$ -Fibonacci numbers to be the number of tilings of an  $n \times 1$  board with tiles of lengths  $1, 2, \dots, k$ . We will show that these tilings lead to natural generalizations of Fibonacci identities. These tilings are in bijection with certain sets of pattern avoiding permutations and set partitions. As was done in [2, 3], we study distributions of statistics over these pattern restricted sets. By assigning a weight to each tile correspondant to the contribution of each layer to the statistical distribution, we bijectively produce identities involving  $q$ -analogues of the  $k$ -Fibonacci numbers. References [1] A. T. Benjamin, J. J. Quinn, Proofs that really count, vol. 27 of The Dolciani Mathematical Expositions, Mathematical Association of America, Washington, DC, 2003, the art of combinatorial proof. [2] A. M. Goyt, D. Mathisen, Permutation statistics and  $q$ -Fibonacci numbers, Electron. J. Combin. 16 (1) (2009) Research Paper 101, 15. URL [http://www.combinatorics.org/Volume\\_16/Abstracts/v16i1r101.html](http://www.combinatorics.org/Volume_16/Abstracts/v16i1r101.html) [3] A. M. Goyt, B. E. Sagan, Set partition statistics and  $q$ -Fibonacci numbers, European J. Combin. 30 (1) (2009) 230-245. URL <http://dx.doi.org/10.1016/j.ejc.2008.01.015>

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## MUSIC

### Escaping the Grid: My Search for Humanity Within the Medium of Electronic Music

Harry Shaffer

Advisor: Annett Richter

2:30 PM - 2:50 PM • CMU 216

With the proliferation of inexpensive electronic tools available to the modern composer, it has become trivial to accomplish virtually anything that can be imagined. However, these same tools can affect the methods and even dictate the style of music in which a composer writes. One of my primary challenges as a composer has been to escape the “grid” of computer-based music. Using microtonality as well as asymmetric meter and timbres unique to the electronic medium, I have been creating meaningful music that reflects a natural human expression and that is able to transcend the bounds of conventional compositional thinking. By reflecting upon my own perceptions and inspirations, I will demonstrate my progress as an artist through examples of my own music, the art and music which has affected me, as well as the successes and failures I have encountered in exploring my own creative process. In examining the journey I have undertaken over the past four years, I will present insights into what I attempt to express as an artist, my methods and techniques, and what it means to live as a composer in the 21st century.

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## MUSIC

### Multidimensionalism as it Pertains to the Musician Today

Dustin Ellingson

Advisor: Annett Richter

2:50 PM - 3:10 PM • CMU 216

In today's constantly evolving technological landscape, musicians find themselves immersed in a world of unprecedented opportunity. In a time where people want music and entertainment for free, how are those responsible for creating said entertainment supposed to earn a living? This paper explores what it takes to be an entrepreneur in the midst of the Information Age. It uses the term “multidimensionalism” to describe our current times and the different sides of what a musician is expected to be. Multidimensionalism refers to the world of “What else? We have seen your work, now, what else have you got? What else are you?”. If there is nothing else to offer, one can simply click on to the next website and possibly never consider your work again. This Internet culture we humans are growing in, in itself, another dimension, not tangible to the touch, and accessible only by means of specialized technological devices. Based, in part, on the writings of Paul D. Miller, Jerry Burger, and David Cutler, as well as on the lives of jazz musician Miles Davis, jazz bassist Charles Mingus, and contemporary

comedian Louis C.K., this paper shows that there is indeed a methodology for today's musician to carve their unique and successful path into the future.

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## MUSIC

### Pop & Circumstance: The How and Why of the Impact of Popular Music on Our Brains

Matthew Monson

Advisor: Annett Richter

3:10 PM - 3:30 PM • CMU 216

This paper focuses on the effect of popular music on its American audience. More specifically, I will illustrate the concept of the inherent accessibility of popular music. I will analyze four American contemporary popular songs in their use of rhythm, harmony, and melody in order to demonstrate the inherent simplicity of such music, and to uncover why these songs have the impact they do. Additionally, I draw upon several scientific studies concerning the effect of music on our brains and culture, including early human development of speech and how it relates to music - all in order to explore the why, when, and how our lives are enriched by the listening experience. I will contextualize this study with referencing pertinent historical events and movements in American popular culture to further illustrate popular music's indelible effect on the hearts and minds of our youth culture, and American culture at large.

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## MUSIC

### The Jug Band: Traditional Preservation and Modern Innovation

Amanda Nygard

Advisor: Annett Richter

3:30 PM - 3:50 PM • CMU 216

The jug bands of the early 1920s lined Beale Street in Memphis, Tennessee, playing rhythmic dance music on homemade instruments. A one-string bass made out of a washtub, a washboard, a comb and wax paper, bones, spoons, and tin whistles are just a few of the instruments we have seen. The music these bands played was heavily rhythmic and influenced by the blues, as the blues were influenced by them. Although many jug bands began to lose popularity in their own time, the folk revival of the 1960s brought a renewed interest in them, thus passing the tradition on. Through many performances, festivals, and competitions today, the jug band continues to entertain audiences of the 21st century. In this paper I will relay my research on the history, instrumentation, and repertoire of the jug band, drawing on pertinent scholarly literature by Samuel Charters and Francis David, among others. I will also share my experience being in and viewing modern-day jug bands to demonstrate how tradition and innovation are continuously being redefined and appear in flux in jug bands today.

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## NURSING

### Acute Ischemic Stroke: Treatment in the Emergency Department

Matthew Lutjens

Advisor: Alicia Swanson

9:30 AM - 10:10 AM • CMU Hallways

Acute ischemic stroke is a serious medical emergency that has a high incidence of occurrence. It can be caused by a thrombosis or an embolism, which causes obstruction in a vessel of the brain. This event can lead to long-term disability, or death. It is vital to understand proper treatment during the early stages of this event, in order to prevent further complications from occurring (Morton & Fontaine, 2009). Exploring and analyzing written material took place, in order to learn more about acute ischemic stroke and the pathophysiology behind it. Evidence-based practices were also examined to gain an understanding of the treatment that is performed in the emergency department, as (Melynk & Fineout-Overholt, 2005; Sackett & others, 2000) describe evidence-based practice as a guide for timely and appropriate clinical decision making (as cited in Perry & Potter, 2010). Focus is given to emergency nursing care and treatment primarily, or care the nurse is involved with. Early and appropriate treatment plays a large role in producing more successful outcomes of the patient who has experienced an acute ischemic stroke (Morton & Fontaine, 2009).

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## NURSING

### Coronary Artery Disease: Can Your Lifestyle Prevent It?

Amanda Hennen, Jordana Cook

Advisor: Alicia Swanson

9:30 AM - 10:10 AM • CMU Hallways

Coronary artery disease, also referred to as coronary heart disease, is a disease in which the coronary arteries are narrowed or blocked causing a disruption in the flow of blood to the myocardium (Mayo Clinic Staff, 2008). The coronary arteries supply the heart with blood, nutrients, and oxygen. It's no secret that the majority of the United States citizens are victims of that “busy,” “on the go” lifestyle. With this type of lifestyle may follow time restraints, stress, and poor diets. Have you ever stopped to think that these factors alone could influence your risk for developing coronary artery disease? As student nurses, our goal is to educate others on coronary artery disease to decrease risk factors that lead to coronary artery disease.

## NURSING

### Hysterectomies: A Nursing Overview

Alli Decker, Whitney Conzemius

Advisor: Alicia Swanson

9:30 AM - 10:10 AM • CMU Hallways

Every ten minutes twelve hysterectomies are performed in the United States. For every 10,000 hysterectomies performed 11 women die. Given the high amount of the procedures performed every year and the complications and deaths that can accommodate this procedure it serves as an important reason to conduct research regarding evidence based practice. The results that are obtained and have yet to be obtained will be collected utilizing the Livingston Lord Library databases including CINAHL and PubMed, as well as interviewing nursing educators. The findings that will be presented will include different procedures utilized, the complications that can emerge, and the nursing care involved to promote an optimal patient outcome. With the 600,000 hysterectomies performed each year in the United States this proves to be a fairly common procedure that warrants attention of evidence based practice and the advancement of nursing research.

## NURSING

### Transcultural Nursing

Lindsey Duffield, Ashley Jones,

Genevieve Wingerter

Advisor: Alicia Swanson

9:30 AM - 10:10 AM • CMU Hallways

It is essential for practicing nurses to be culturally competent in order to provide a high level of care. When providing nursing care for a different culture multiple barriers can affect the quality of care a patient receives. After researching and reviewing evidence based practice on transcultural nursing it was found that there are numerous ways to improve a nurse's practice in this area. A lack of knowledge of patient's language abilities, cultural beliefs, and values can result in serious threats to health and quality of care. By achieving culturally competent care, barriers such as communication, cultural beliefs, religious values, and personal health care beliefs can be overcome.

## NURSING

### Diabetes Mellitus Epidemic

Gabrielle Welin, Cortney Dettwiler

Advisor: Alicia Swanson

10:10 AM - 10:50 AM • CMU Hallways

Diabetes Mellitus is becoming a prominent epidemic in the United States today with 25.8 million people of all ages being affected. Currently, approximately 18.8 million people are diagnosed with the disease while 7 million go undiagnosed. In addition, 79 million American adults suffer from pre-diabetes, which can eventually lead to

diabetes mellitus type II. Throughout our presentation these statistics will be further explored in order to show the necessity of lifestyle modifications and appropriate medical interventions. Preventative measures, diet modifications, the need for exercise, and medication therapy will be discussed as well because interventions such as these have the ability to reduce diabetes complications, such as heart disease, stroke, lower-limb amputations, and death (National Diabetes Information Clearinghouse, 2011).

## NURSING

### Early Detection and Treatment of ARDS is Critical!

Sara Schafer, Melinda Thompson

Advisor: Alicia Swanson

10:10 AM - 10:50 AM • CMU Hallways

Acute Respiratory Distress Syndrome or ARDS is a complex clinical syndrome that carries a high risk of mortality. Approximately 190,600 cases occur in the United States each year with 74,500 resulting in death. In Intensive Care Units/Critical Care Units, approximately 20% of mechanically ventilated patients meet the criteria for ARDS. These high statistics make it imperative that healthcare professionals recognize ARDS in the early stages. Early recognition and treatment increase the survival rate dramatically. Our research of several evidence based practice articles shows the most effective forms of treatment for ARDS are combinations of antibiotics, protective ventilation strategies, supportive nutrition and prevention of complications. With this research, we can better understand the stages of ARDS and treat each stage more effectively.

## NURSING

### Coronary Artery Bypass Grafting: An Evidence-Based Review

Evan Dyce

Advisor: Pamela Kirk

10:10 AM - 10:50 AM • CMU Hallways

Coronary artery bypass grafting (CABG), more traditionally known as open heart surgery, is a common surgery in the United States with more than 400,000 surgeries done in 2007 alone. This presentation provides a brief overview of coronary artery bypass grafting as well as the nursing implications for the care of individuals who have undergone this procedure. This presentation describes nursing care prior to surgery, during surgery, post-surgery, and after discharge. The process of patient care is described from a nursing standpoint with an emphasis on evidence based practice. One objective of this presentation is to give the general public a brief overview of CABG and how nurses care for individuals who undergo this procedure. A second objective is to provide current or prospective nurses an evidence based review of the current e practices surrounding CABG.

## NURSING

### Competent Postoperative Nursing Care for Patients Recovering from Coronary Artery Bypass Graft Surgery

Amy Reinhart

Advisor: Terry Dobmeier

10:10 AM - 10:50 AM • CMU Hallways

Heart disease is the number one cause of death in the United States, affecting 11.8% of the population (Center for Disease Control, 2010). For these people, the narrowing and blockage of coronary arteries can be life-threatening. One surgical intervention to overcome this problem is coronary artery bypass graft (CABG) surgery. CABG patients rely on nurses to provide competent postoperative care and to prevent potentially fatal complications, so nurses must stay up-to-date with the latest research. A review of literature was conducted regarding postoperative care of CABG patients. Research sources included textbooks, medical references, hospital protocols, interviews with nurses, and peer-reviewed journal articles. Using the nursing process, an evidence-based nursing care plan was developed for the generic postoperative CABG patient summarizing best practice guidelines on nursing topics including pain management, nutrition, activity, medication administration, and complication prevention. Nursing care is crucial to CABG patients' postoperative recovery. Exemplary care can improve a patient's quality of life while substandard care, based on outdated practices, could be fatal. By routinely engaging in research and applying it in clinical practice, nurses can ensure the best care for their patients.

## NURSING

### Anaphylaxis: Pathophysiology and Prevention

Brooke Harris

Advisor: Pamela Kirk

1:00 PM - 1:40 PM • CMU Hallways

Anaphylaxis is a life-threatening type 1 hypersensitivity reaction that can be triggered by many common agents in a susceptible person. It has a rapid onset, ranging from seconds to minutes, and can be fatal, even with immediate medical care. Thus, prevention is key and begins with educating and preparing a susceptible person for a reaction. To obtain information on anaphylaxis the researcher used a variety of sources including textbooks and online sources. The results of the research found that although anaphylaxis can be deadly, early intervention is critical and can delay the onset of the reaction. The anaphylaxis-prone person should be educated to avoid known allergens, wear a medical alert band, and carry an emergency anaphylaxis kit at all times.

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## NURSING

### Quality Assurance in Long Term Care Facilities

Lindsey Elless

Advisor: Pamela Kirk

1:00 PM - 1:40 PM • CMU Hallways

I decided to do this project because I care a lot about the quality of care long term care residents are receiving at LTC facilities. I believe there is always room for improvement and will have completed over 120 hours in a long term care facility following the Director of Nursing at that facility. Through these hours I have learned an abundance about the quality of care program that the LTC facility works on continually. As a result of this experience I have learned that problems will always occur in LTC facilities. But even though these problems arise it is essential to work through them and find improvements as they arise.

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## NURSING

### Effects of Magnesium Sulfate on Preeclampsia

Advisor: Terry Dobmeier

1:40 PM - 2:20 PM • CMU Hallways

Preeclampsia, which is high blood pressure associated with pregnancy, is a dangerous condition for both mother and child. Magnesium sulfate is a medication that is used in the hospital setting for women who have experienced pregnancy induced hypertension, or are at risk of developing preeclampsia. Magnesium therapy is usually initiated at the beginning of labor and continues for approximately 24-48 hours after the baby is born. After researching and personally caring for patients on magnesium therapy, medical and nursing interventions have been found to promote the best outcome for the patient. By incorporating magnesium therapy into medical interventions, women can experience a healthy pregnancy and prevent the complications associated with preeclampsia.

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## NURSING

### Nursing Care related to patients experiencing Septic Shock

David Sanderson

Advisor: Terry Dobmeier

1:40 PM - 2:20 PM • CMU Hallways

Septic shock is a very serious condition that can be life-threatening if not treated immediately and appropriately. Along with physicians, nurses also need to be able to recognize and help treat septic shock before it is too late for the patient experiencing it. In order to be able to recognize septic shock, it is important for the nurse to know the clinical manifestations of this condition. Once the clinical manifestations are known, it is easier to treat. This poster will include what septic shock is, the clinical

manifestations of this condition, and what can be done to treat it. By knowing these things, more people can be saved from this life-threatening condition.

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## NURSING

### Acute Ischemic Stroke

Megan Tykwinski, Courtney Knudson

Advisor: Alicia Swanson

2:30 PM - 3:10 PM • CMU Hallways

Stroke is a neurological deficit with a sudden onset that occurs when there is disruption of blood flow to a region in the brain. Approximately 700,000 people have a new or recurrent stroke each year (Morton & Fontaine, 2009). Stroke is the third leading cause of death in the United States and the leading cause of disability. The outcome of stroke patients is strongly correlated to the time between the onsets of symptoms to treatment (Shulkin et al., 2011). Emergency department staff is critical in recognizing and treating stroke symptoms. Evidenced based practice shows that using the National Institute of Health Stroke Scale, obtaining a CT scan, and using tPA if the patient is eligible is the most effective treatment in the rural emergency setting. Utilizing evidenced based practice increases patient survival rate. References: Morton, P. G., Fontaine, D. K. (2009). Critical care nursing: A holistic approach (9th ed.). Philadelphia, PA: Lippincott Williams & Wilkins. Shulkin, D. J., Jewell, K. E., Alexandrov, A. W., Bernard, D. B., Brophy, G. M., Hess, D. C., & Lyles, A. (2011). Impact of systems of care and blood pressure management on stroke outcomes. Population Health Management, 14(6), 267-275. doi: 10.1089/pop.2010.0068

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## NURSING

### Central Line-Associated Bacteremia

Amanda Johnson, Roberta Stigen

Advisor: Alicia Swanson

2:30 PM - 3:10 PM • CMU Hallways

This presentation will provide information on central line associated bacteremia and the associated patient care. Central lines are catheters that go directly into the blood stream for purposes of medications, total parenteral nutrition (TPN), chemotherapy, blood draws etc., and are not without complications. All catheters have the ability to introduce bacteria directly into the bloodstream and can cause patient death if infection is serious. This is why special care must be taken for all patients with central lines from newborns to the elderly. Measures such as sterile technique upon insertion and meticulous cleaning must be performed when accessing the device (Wikipedia, 2012).

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## NURSING

### Influence of Magnesium Therapy on Preeclampsia

Ashley Sorensen

Advisor: Terry Dobmeier

2:30 PM - 3:10 PM • CMU Hallways

Preeclampsia, which is high blood pressure associated with pregnancy, is a dangerous condition for both mother and child. Magnesium sulfate is a medication that is used in the hospital setting for women who have experienced pregnancy induced hypertension, or are at risk for developing preeclampsia. Magnesium therapy is usually initiated at the beginning of labor and continues for approximately 24-48 hours after delivery. After researching and personally caring for individuals receiving magnesium therapy, medical interventions have been found to promote the best outcome for the patient. By incorporating magnesium therapy into medical interventions, women can experience a healthy pregnancy and prevent the complications associated with preeclampsia.

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## NURSING

### Long Term Care: Implementation of Lean

Kirsten Nies, Lindsey Elless

Advisor: Helen Harris

3:10 PM - 3:50 PM • CMU Hallways

Long term care is a growing continuum in nursing. Improving the care given in Long Term facilities is a constant push forward. Lean is a tool which is used to maximize customer value and to reduce waste. The ultimate goal of Lean is to provide perfect value to the customer through a perfect value creation process that has zero waste. Lean is focused on five main objectives: Identifying the value, mapping the value stream, creating flow, establishing pull, and seeking perfection. The core idea of Lean provides evidence based outcomes, concluding that the implementation of Lean into nursing home facilities will increase patient and staff satisfactory ratings, improving quality assurance.

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## NURSING

### Alcohol-Induced Dementia

Erica Avery

Advisor: Pamela Kirk

3:10 PM - 3:50 PM • CMU Hallways

Dementia is often associated with Alzheimer's disease. However, dementia caused by Alzheimer's disease is different from other types of dementia such as vascular, frontotemporal, or Lewy body dementia. One type of dementia that is particularly interesting is alcohol-induced dementia. Alcohol is a neurotoxin that can affect the grey matter, or nerve cell bodies, and white matter, or nerve fibers, in the brain. The purpose of this research study and presentation is to explore how and at what amount of

alcohol can cause dementia and whether or not refraining from alcohol can reverse it. Research studies show that while low to moderate alcohol intake may actually prevent dementia, chronically ingesting large amounts of alcohol can increase the risk for alcohol-induced dementia. Research also shows that it is possible to halt and even reverse some of the symptoms by abstaining from alcohol intake. This research study and presentation will help to increase knowledge and provide education about alcohol-induced dementia.

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## NURSING

### Transcultural Nursing in Huehuetenango, Guatemala

Amy Lavalla

Advisor: Sarah Pangarakis

3:10 PM - 3:30 PM • CMU 208

Nurses are an integral part of volunteer medical outreach programs collaborating to serve health needs nationally and internationally. This spring over 100 volunteer Minnesotans from Helps International, a non-profit organization that strives to provide a variety of programs for individuals, traveled to Huehuetenango Guatemala to provide necessary health services. A temporary clinic and hospital were set up where local residents could travel to receive free medical services. Together with the health care teams, nurses saw over 1404 patients in the clinic and recovered over 183 post-operative surgical patients. Nurses worked closely with Mayan family members, Spanish translators, and Helps staff, to comfort and care for patients who may not have been able to receive care if not for international outreach hospitals. Medical outreach trips such as these acts to serve individuals who have a great need and are unable to satisfy those needs through traditional means. This presentation will discuss some of the nursing aspects related to the health issues treated and resolved during that trip, and nursing's impact on the individuals. By nurses becoming involved in healthcare outreach programs, global health can be improved and strides can be made towards meeting the United Nations Millennium Development Goals.

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## PHILOSOPHY

### Charity and Moral Obligation

Jessica Hillesheim

Advisor: Marilea Bramer

2:00 PM - 2:20 PM • CMU 207

The purpose of this presentation is to express the concern of charity as a moral obligation to citizens at large, both geographically distant and on a local scale. With the world economy in crisis this modern issue is at the forefront of world concerns, morally, we must pay special attention to the welfare of those geographically distant and in dire need of assistance. I will be contrasting Kantian and utilitarian ideas on the subject, in order to conclude that both will favor a form of developmental aid above

traditional charity methods. This conclusion is required by the Kantian idea of justice, and Mill's Greatest Happiness Principle.

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## PHILOSOPHY

### The Partnership of Respect and Pleasure: Kantian and Utilitarian Ethics

Jacob Hedlund

Advisor: Marilea Bramer

2:30 PM - 2:50 PM • CMU 207

I began this examination was to find the most effective way to live morally. Many great thinkers have written extensively on the matter of ethics. I chose two very different philosophers that I felt were heading in the right direction and could benefit from a synthesis. This paper will compare the ethics of John Stuart Mill (1806-1873) and those of Immanuel Kant (1724-1804). I argue that a moral agent should use Kant's theory to construct rules for common situations, when the agent is faced with a peculiar moral dilemma, they should use Mill's theory to produce the best consequences feasible. I flesh out the distinction between "common" and "peculiar" situations as well as investigate and appropriate each philosopher's theory. By the end we should see a more effective and comprehensive way to live morally by knowing what holds the most moral weight, during specified situations.

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## PHILOSOPHY

### Concerning the Christian Nation: Balancing Church and State

John Goerke

Advisor: Stephen Hamrick

2:50 PM - 3:10 PM • CMU 207

60 min presentation. My work defends two contentions. First, the United States was not founded as nor could function as a politically Christian nation and it is in the interest of Christianity to avoid becoming simply a political party. Second, it is in the interest of government to avoid controlling religious practice. It is with these two conclusions that I answer the common question: "Is America a Christian Nation?" There are two contemporary threats to the delicately balance relationship between church and state. The first threat arises from the fundamentalist camps of Christianity, who seek to make the United States an explicitly Christian nation. To accomplish this, they have trampled the facts of history and distorted the theological prescriptions of the Bible. It is in my interest as a fellow Christian to criticize and correct such dangerous thinking. Yet, there is another threat to the relationship of church and state arising from the government itself. The state has begun to see religion as merely a set of strongly held beliefs, without corresponding actions. Thus legislation is now being

passed to coerce religions persons into perform actions that are morally unacceptable. These two threats must be addressed and remedied.

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## PHYSICS

### Gamma-Ray

Scott Froehle, Leann Washenberger

Advisor: Linda Winkler

9:30 AM - 10:10 AM • CMU Hallways

We are going to do an experiment on Gamma-rays. We are doing this for our Experimental Physics 306 course.

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## PHYSICS

### Design and construction of a BEAM walker robot

Murshid Saqlain

Advisor: Stephen Lindaas

9:30 AM - 10:10 AM • CMU Hallways

The purpose of this project is to design and construct a simple BEAM walker robot. BEAM stands for Biology Electronics Aesthetics Mechanics. BEAM bots can be made mostly with parts we can find in broken electrical components like a speaker or a microwave oven. BEAM bots in general are cheap to build and require no microprocessor or software to carry out its functions. They can be modified with more precise electrical components in a complex circuitry to achieve more meaningful and specific results. A walker robot typically consists of hex inverters to alternate the direction of motion of motors. With BEAM circuitry, it is possible to create an alternating pattern of the motors to simulate walking motions.

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## PHYSICS

### X-ray Experiment for PHYS 306

Meredith McLinn, Aaron Peterson

Advisor: Linda Winkler

10:10 AM - 10:50 AM • CMU Hallways

Molybdenum emits radiation in the form of x-rays. We will be attempting to use the crystal lattice structure of table salt to observe the wavelengths of this radiation, using a technique related to Bragg reflection. We expect to be able to measure the spectrum emitted by Molybdenum, and will discuss the implications it, namely with regards to the atomic structure of the element.

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## PHYSICS

### Observations Using an Atomic Force Microscope

Garrett Marcus, Tyler Lane

Advisor: Ananda Shastri

1:00 PM - 1:40 PM • CMU Hallways

We will be presenting our results on the properties of nano-structures using the Atomic Force Microscope (AFM). This is for Experimental Physics II. We will explain our results obtained from the in-class experiment.

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## PHYSICS

### Electric Aircraft Conversion Research Project

Advisor: Dennis Jacobs

1:00 PM - 1:20 PM • CMU 218

Presentation of Research to Design an Electric Aircraft

The research was conducted in order to convert a kit airplane, a 1930's design Pietyenpol, into an electric powered aircraft. Primary research was to see if state of the art batteries and state of the art motors would supply enough power and stay within the weight limits needed to power the aircraft. The Pietyenpol was chosen because it was originally designed to use the Ford Model-T engine, which is a very heavy, low power engine.

The research is being conducted by three students and a professor. The construction of the airplane should be completed by the end of may and we hope to have the engine and batteries installed and the aircraft flying by the end of the summer. The findings are being presented to local experimental aircraft chapters and at the Student Academic Conference.

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## PHYSICS

### Astronomical Observations of RR Lyrae stars

Shouvik Bhattacharya

Advisor: Linda Winkler

1:20 PM - 1:40 PM • CMU 218

Minnesota State University Moorhead has a working observatory, named Paul P Feder Observatory at the Regional Science Center of Buffalo River State Park. The observatory facility is equipped with a DFM engineered 16" Cassegrain research graded telescope, an Alta U-series CCD camera and two working computers. Students started their research work from Spring 2011. In the current academic year, a special type of variable stars that are known as RR Lyrae, were observed. RR Lyrae stars change their brightness regularly in a short period of time. In this talk students' progress in photometric observations of RR Lyrae stars will be highlighted. Astronomical data analyses that were done in Fall 2011 and Spring 2012 will also

be discussed. In the latter half of the presentation "Fine and Coarse Calibration of SBIG SGS Spectrograph" will be lectured.

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## PHYSICS

### Constructing a pulsed field gradient nuclear magnetic resonance (PFG-NMR) apparatus

Pragalv Karki, Wesley Teo

Advisor: Ananda Shastri

1:40 PM - 2:20 PM • CMU Hallways

The measurement of hydrogen diffusion constants through proton conductors is important in the study of fuel cells. The diffusion constant is the proportionality factor between the diffusion flux and concentration gradient. A PFG-NMR apparatus creates a magnetic field gradient which causes the hydrogen nuclei to precess at different frequencies. The change in the spin echo amplitude is then used to determine the hydrogen diffusion constant through the material of interest. A PFG-NMR apparatus will be constructed and the calibration of the measurements discussed.

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## PHYSICS

### Using standard smart phones to experimentally determine the motion of a high altitude balloon

Christopher Moore

Advisor: Matthew Craig

1:40 PM - 2:00 PM • CMU 218

As technology has advanced it has become cheaper and easier to conduct experiments that would not previously have been possible in an undergraduate setting. The goal of this experiment is to collect data about the motion of a high altitude balloon using GPS and accelerometer technology commonly available on smart phones and compare it to a mathematical model created using known forces acting on the balloon. Following multiple low-level launches a standard Android powered smart phone will be attached to a high altitude balloon with the goal of 100,000ft. The built-in GPS technology will be used to follow and find the phone through the flight and afterwards, GPS and accelerometer data will be analyzed and compared to our theoretical models. The phone will take photographs at the peak of the balloon's flight to observe the curvature of the earth. This experiment will provide a framework for future high altitude projects.

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## PHYSICS

### Assessing Spatial & Dosimetric Accuracy with Lucy-3D QA Phantom

Victoria Honetschlager

Advisor: Stephen Lindaas

2:00 PM - 2:20 PM • CMU 218

I plan to assess the spatial and dosimetric accuracy of the newly installed Novalis Tx&trade; radiosurgery platform at the Roger Maris Caner Center in Fargo, ND. This will be achieved by seeing phantom through from diagnosis to treatment. I will be using Standard Imaging's Lucy-3D QA phantom, a cranial phantom. The phantom will be imaged using Computed Tomography (CT); then the images will be transferred to a planning system where several treatment methods will be planned in the same manner as a real patient. Treatments are then exported to a computer interfaced with the radiosurgery platform; the phantom is positioned on the couch in the exact location as the imaging was taken, and then treated with radiation therapy. Data will be gathered from sensors inside the phantom as well as from the machine, and then compared in order to ensure the machine's precision. Quality assurance checks such as this maintain confidence in the machines and allow for treatments on human patients to continue as regularly planned.

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## PHYSICS

### Harnessing solar energy using eutectic salts

Alycia Bergeson

Advisor: Ananda Shastri

2:30 PM - 3:10 PM • CMU Hallways

The study simulates a method of harnessing solar energy in a cost-effective and readily available manner. This utilizes the latent heat of fusion in a phase change material to harness thermal energy. Specifically, as sodium decahydrate reaches its eutectic point in temperature an amount of thermal energy is released.

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## PHYSICS

### NMR experiment physics 306

Deep Kafley, Beza Mulugeta

Advisor: Ananda Shastri

3:10 PM - 3:50 PM • CMU Hallways

We are going to present the result of nuclear magnetic resonance. This is done for Physics 306 class.



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## PHYSICS

### Photometric Observations Conducted at Paul P Feder Observatory

Hollee Johnson, Gregory Larson, Tyler Lane, Shouvik Bhattacharya

Advisor: Linda Winkler

3:10 PM - 3:50 PM • CMU Hallways

We were involved in research at Paul P Feder Observatory in Fall 2011 and Spring 2012. Data were taken from stellar light curves obtained via the telescope and analyzed collectively. The results can be used in determining the motion and other properties of the stellar objects.

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## PHYSICS

### Electric Aircraft Conversion Research Project

Wade Holen, Megan Sanford, Alexandra Matthews

Advisor: Dennis Jacobs

12:00 AM - 12:00 AM • NO LOCATION YET

Presentation of Research to Design an Electric Aircraft: The research was conducted in order to convert a kit airplane, a 1930's design Pietenpol, into an electric powered aircraft. Primary research was to see if state of the art batteries and state of the art motors would supply enough power and stay within the weight limits needed to power the aircraft. The Pietenpol was chosen because it was originally designed to use the Ford Model-T engine, which is a very heavy, low power engine. The research is being conducted by three students and a professor. The construction of the airplane should be completed by the end of May and we hope to have the engine and batteries installed and the aircraft flying by the end of the summer. The findings are being presented to local experimental aircraft chapters and at the Student Academic Conference.

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## POLITICAL SCIENCE

### Judicial Independence

Jeffrey Albright

Advisor: Andrew Conteh

2:00 PM - 2:20 PM • CMU 208

Judges are no different than you and me; they have moral beliefs and ideologies that shape the way they do things. The problem with this is that judges are supposed to be independent; they are not supposed to be influenced in our democracy by any other factors besides the law and the application of the judicial process. The purpose of any legal system is to achieve justice. I believe that the judges all over the United States have factors that influence their decisions that is not directly related to the legal system that they swore an oath to uphold. The purpose of this paper is to demonstrate that judges are indeed influenced by many factors such as what they had for breakfast in

addition to their political and religious affiliations. Each of these factors plays a part in a judge's decision-making process that cannot be quantitatively measured but it is apparent that they are there. I propose an idea that a judge is running a dual life that sometimes intertwines with their professional decisions. The conclusion of this paper helps to show that judges are indeed influenced and provides recommendations to combat those influences.

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## POLITICAL SCIENCE

### The Experience of the Witness in the Rwandan Gacaca Courts

Dylan O'Brien

Advisor: Andrew Conteh

2:30 PM - 2:50 PM • CMU 208

25 min presentation. The Rwandan Genocide of the Tutsi people by the Hutu majority in 1994 was one of the most devastating and shocking events of the late 20th century. It left more than one million dead, and many more mourning lost loved ones. The numerous perpetrators of the crimes involved with the Rwandan Genocide have been brought to justice both through the use of western jurisprudence (International Criminal Tribunal for Rwanda in Arusha, Tanzania) and through the use of traditional justice (the Gacaca courts). The Gacaca courts, which are considered to be "grassroots" (traditional) justice and are relatively informal, emphasize the power of community over that of authority. The importance of the Gacaca courts is that they provide the community with a means of trying a large number of the accused fairly inexpensively and quickly. Research on the Gacaca courts has been minimal, and to a large degree, political, rather than focusing upon the qualities of the experiences of its participants. One exception to this is the research done by Dr. Karen Brouneus, a Clinical Psychologist, namely in her articles titled "Truth Telling as a Talking Cure?" Insecurity and Retraumatization in the Rwandan Gacaca Courts (published in 2008), and The Trauma of Truth Telling: Effects of Witnessing in the Rwandan Gacaca Courts (published in 2010).

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## PSYCHOLOGY

### Adult Attachment Behavior on Facial Detection of Emotion

Megan Nere

Advisor: Elizabeth Nawrot

9:30 AM - 9:50 AM • CMU UG

The ability to correctly identify emotions is essential to everyday life. Attachment style is related to one's ability to correctly identify authentic and inauthentic emotion. A number of studies have investigated the relationship between adult attachment styles and the ability to detect emotion on faces (Niedenthal, Brauer, Robin, & Innes-Ker, 2002; Fraley, Niedenthal, Marks, Brumbaugh, & Vicary, 2006; Dewitte, & De Houwer, 2008). The present study aims to further these results by not only examining the

relationship between adult attachment style and ability to identify emotions, but also investigating where people look when they make their decisions. Using an Adult Attachment Questionnaire, pictures depicting authentic and inauthentic happy, sad, and angry emotions, and eye-tracking software, we expect to find a relationship between attachment orientation, detection of emotion, and pattern of looking. The hypothesis is that people with adult attachment styles of preoccupied and dismissive will correctly identify authentic and inauthentic emotions significantly better than people with secure or fearful styles. Furthermore, using eye tracking, the study could help determine how attachment styles affect experience with emotion processing and possibly social development.

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## PSYCHOLOGY

### Eliciting Evidence for False Memories on Explicit and Implicit Memory Tests

Emily Lyons, Bria Itzen, Farryn Helm, Nathan Nowak

Advisor: Christine Malone

10:10 AM - 10:50 AM • CMU Hallways

How does sound and spelling information interact in the early stages of spoken word recognition to affect memory on explicit and implicit memory tests? If sound and spelling information determine the pool of candidates as the spoken stimulus unfolds, study words with shared sound and spelling (parasite) should activate their corresponding target (paragraph) to a great extent during study and seem very familiar at test. Participants taking a recognition memory test (an explicit test) should then make a high rate of false recognition errors to their target (i.e., report having heard paragraph on the study list, when, in fact, it was parasite). Further, if this automatic activation process during study is indeed taking place without the listener's conscious awareness, participants taking a word fragment completion test (an implicit test) that taps into weaker memories beyond the listener's awareness should be even more sensitive to these activation effects. Evidence for activation will appear in the word fragment test as facilitated completion of the target word fragment (P\_RA\_RA\_H) after a shared information study word (parasite or paragraph) compared to an unrelated study word (minimum).

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## PSYCHOLOGY

### “Collared” Differences: Power, Commitment, and Sexual Satisfaction within Virtual BDSM relationships

Rachel Thompson

Advisor: Richard Kolotkin

1:00 PM - 1:40 PM • CMU Hallways

Previous research has investigated power, commitment, and sexual satisfaction within relationships in a mutually exclusive manner. The goal of this study is to investigate these three variables to test hypotheses relating to the specific bondage/discipline, domination/submission, and sadism/masochism (BDSM) types of relationships using the virtual role-playing game known as Second Life (SL) as a research vehicle. Based on previous research it is hypothesized that (1) higher power will be found with the following groups: Dominant males over Dominant females, Submissive females over Submissive males, and Dominants over Submissives (regardless of gender). It is also hypothesized that (2) higher levels of commitment will be found in Dominant females over Dominant males, Dominants over Submissives regardless of gender, and Submissive females over Submissive males. Submissive males will show the lowest amount of commitment throughout comparison of all groups. Lastly, it is predicted that (3) higher levels of sexual satisfaction will be found in Dominant males compared to Dominant females, Submissive males over Dominant females and Submissive females, but less than Dominant males. Submissive females will show the lowest levels of sexual satisfactions when compared across all groups. Participants will complete surveys regarding power, commitment, and sexual satisfaction in relation to their SL gender and role within their BDSM relationship on SL as well as a demographic survey. If the above hypotheses are supported, these results will potentially expand the limited academic research regarding relationship variables and dynamics within BDSM relationships on SL. Keywords: BDSM, Second Life

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## PSYCHOLOGY

### The Effects of Facial Expression and Body Posture on Emotion Recognition

Jennifer Wenner

Advisor: Gary Nickell

1:40 PM - 2:20 PM • CMU Hallways

Emotions are recognized quickly and accurately through facial expressions and body postures. Emotions are strongest and most accurately detected when matching body posture and facial expression are displayed. However, simple shifts in head position have been shown to change the perception of some emotions. The purpose of the present study was to look at whether or not a shift in the entire body position would change the recognition of an

emotional display as positive or negative. Thirty three participants viewed four images of models depicting facial expressions and body postures indicative of either positive or negative emotions and answered questions about how intense the emotional display was. These pairings depicted completely positive and completely negative expressions and postures, and then combined the positive facial expression with the negative body posture and vice versa. As expected, it was found that images depicting the same emotional expression and posture were rated most positively or negatively and that the combination of positive facial expression and negative body posture was rated more positively than the negative facial expression and positive body posture combination. Eye tracking data will also be analyzed to identify any further significance in the eye movement data.

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## PSYCHOLOGY

### Children’s Detection of Inauthentic Emotion: An Eye Tracking Study

Jennifer Wenner, Kelsey

Ihringer, Megan Nere

Advisor: Elizabeth Nawrot

2:30 PM - 3:10 PM • CMU Hallways

Detection of fake or “inauthentic” emotion impacts the way social situations are interpreted and can even be helpful in avoiding and dealing with threatening environments. Previous research on this subject has demonstrated that infants as young as 18 months are able to distinguish between authentic and inauthentic displays of emotion (Walle & Campos, 2010) and children as young as seven are able to display inauthentic emotions. We believe that children are more likely to reference and detect inauthentic emotion in other children around their same age rather than adults when presented with a situation involving inauthentic emotion. In the present study, we showed a video depicting an adult and child in a novel food tasting scenario to children ages 5-6 and 9-10 and recorded their pattern of looking using a Tobii X120 infrared eye tracker. We are finding that children view the face in the adult video longer than in the child video suggesting a reference of authority rather than age. We are also finding that children spend more time looking at the face of the authentic conditions than the inauthentic one, a trend also found in the adult participants from a previous study.

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## SOCIOLOGY

### How Incarceration Effects Juveniles

Rebecca Swenson

Advisor: Deborah White

9:30 AM - 9:50 AM • CMU 205

The research involves American juveniles who have been influenced by Prisons. Many of our young children today are being pushed through to the adult prisons, but to what cost to them? I will look further into the lives of juvenile offenders who have spent time in prisons and what the outside world has to offer to them once they are released. My data will be collected by the complete use of content analysis.

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## SOCIOLOGY

### Choline deficiency in relation to longevity of alzheimer patients in nursing homes

Advisor: Susan Humphers-Ginther

9:30 AM - 10:10 AM • CMU Hallways

Alzheimer’s disease has affected everyone at one point in time and is a growing “incurable” disease amongst the elderly. Due to this disease, we find greater numbers of people unable to take care for their family members, leading to relocations of the elderly into nursing homes. Although this is a prospective solution for family members, one wonders if the Alzheimer’s patients are getting all the nutrients they should be in a nursing home. Recent studies show that Choline, a newly founded nutrient in the FDA, may help treat Alzheimer disease by prolonging the disintegration period of parts of the mind. I propose a study of nutrition in nursing home cafeterias to see whether there is a deficiency of Choline in the food prepared for these patients. By comparing this research with the difference between mortality rate and enrollment of deceased Alzheimer patients in different nursing homes, we may be able to show relation between the above variables. This current study will be useful in the future for better treatment of Alzheimer disease.

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## SOCIOLOGY

### Domestic Violence and Its Impact on Children

Kadar Hassan

Advisor: Susan Humphers-Ginther

9:30 AM - 10:10 AM • CMU Hallways

Domestic violence is a big problem in many households which can have a tremendous impact on any family. When we think of domestic violence, we assume it’s between two adults, but many studies have shown that children who witness their mother or father beaten up are affected the same way. This topic is directly related to health given the

fact that many children who live in abusive homes develop symptoms of post-traumatic stress disorder. Also, these children are more likely to suffer from bed-wetting and nightmares. They sometimes develop stress that can affect their performance in school and play. The purpose of this research is to find and explain the implications of domestic violence on children. More research is needed for this topic to convey the importance of the effects on children in emotional, mental, and physical aspects. Children who have grown up in abusive homes are more likely to cause problems in their schools and neighborhoods and my end up in the legal system or foster care, thereby incurring societal costs.

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## SOCIOLOGY

### Health Disparities Among Americans

**Najib Hirsi**

*Advisor: Susan Humphers-Ginther*

**9:30 AM - 10:10 AM • CMU Hallways**

There are health disparities between Americans. Some races in America have better health care access while some others suffer from poor health care. According to research, white Americans have better health care than black Americans and others. The majority of white Americans have excellent health care while black Americans and the other minorities have the poorest care. Poverty and low socioeconomic status are factors that cause these health disparities between these groups. The lack of good health contributes to low life expectancy. The purpose of this research is to learn more about health care disparities among Americans. More research is needed on this issue because it can assist health workers and policy makers to improve health care and eliminate health disparities among Americans.

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## SOCIOLOGY

### Obesity and Society

**Cole Brunner**

*Advisor: Susan Humphers-Ginther*

**9:30 AM - 10:10 AM • CMU Hallways**

In the United States, unhealthy and inadequate behaviors continue to contribute to the rise of obesity. Many of these behaviors are closely related and also prove how society affects what we do. My research on the sociological perspective of obesity will examine the external factors that are causing this epidemic increase and how society perceives obese individuals. One external factor includes their family environment. Families play a large role on how an individual interprets food and healthy behaviors. For instance, an individual may have grown up in an environment where daily fast food meals were practiced. The reason why this topic interests me is because I have battled obesity and know firsthand the sociological perspective on obesity. The way society plays a role in the increasing rate of obesity is another reason why the

topic of obesity interests me. This increase in obesity has also caused an increase in other health related conditions such as hypertension and diabetes. I believe that more research on this epidemic would be beneficial because it will link the topics of obesity and sociology together. This will provide a better understanding of how obesity and sociology closely affect one another. In conclusion, obesity is a major health concern and is a large factor in the contraction of obesity-related diseases, such as hypertension, heart disease, and diabetes. My research will address external factors causing obesity, how society perceives obesity, and other obesity related conditions. The gap in research on the sociological perspective of obesity will be filled by the research that I have done on the topic. Readers will be able to gain a better understanding on how society can be directly related to and a cause of obesity.

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## SOCIOLOGY

### Trouble Sleeping Causes Bad Health?

**Jared Brooks**

*Advisor: Susan Humphers-Ginther*

**9:30 AM - 10:10 AM • CMU Hallways**

Issues of sleep and health status interest me because health status is dependent on the amount of sleep people get. You need sleep to be able to go into the REM cycle which is needed for your body to be able to work on itself and to recycle your white blood cells and battle off diseases. If you don't get enough sleep, the body is not able to do the required checkups on itself and becomes more susceptible to becoming infected by a disease or an ordinary cold. I believe that people should be aware of the sleep they should get and not to take it lightly. On occasion, it is okay to not get that much sleep, but regularly getting insufficient sleep makes the body more susceptible to disease. One can actually die from not getting enough sleep. I will look at people having trouble sleeping and the health problems, if any, that show up because of their sleep patterns.

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## SOCIOLOGY

### A Closer Look at the Residential Foster Care System

**Crystal Smith**

*Advisor: Deborah White*

**9:50 AM - 10:10 AM • CMU 205**

People with mental and behavioral disabilities are sometimes unable to care for themselves, and may be placed in care facilities, such as a mental hospital or a residential foster care system. The goals of deinstitutionalization (i.e. placement in residential foster care systems) are to provide optimum care for the clients, and to prepare them for independent living. This presentation will focus on the quality of care for clients within the residential foster care system, the effects on

their well-being and progress, and whether it is overall detrimental or supportive for a future in independent living.

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## SOCIOLOGY

### A Sociological Study on the Levels of Cultural Immersion Expatriates Have While Living Abroad for a Longer Period of Time

**Sky Purdin**

*Advisor: Deborah White*

**10:10 AM - 10:30 AM • CMU 205**

Prior research shows that cultural immersion and interaction with local people is an important motivator for traveling to a foreign country to volunteer. As our world becomes more globalized more people will be traveling and living abroad. I will be exploring the levels of cultural immersion into a foreign culture that expatriates that have lived in a foreign country for extended periods of time. I will use qualitative research through in-depth interviews to find out how people get culturally immersed and analyze the existing different levels of cultural immersion among my interviewees. Are people intentionally becoming more or less immersed into a culture?

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## SOCIOLOGY

### Choline deficiency in relation to longevity of alzheimer patients in nursing homes

*Advisor: Susan Humphers-Ginther*

**10:10 AM - 10:50 AM • CMU Hallways**

Alzheimer's disease has affected everyone at one point in time and is a growing "incurable" disease amongst the elderly. Due to this disease, we find greater numbers of people unable to take care for their family members, leading to relocations of the elderly into nursing homes. Although this is a prospective solution for family members, one wonders if the Alzheimer's patients are getting all the nutrients they should be in a nursing home. Recent studies show that Choline, a newly founded nutrient in the FDA, may help treat Alzheimer disease by prolonging the disintegration period of parts of the mind. I propose a study of nutrition in nursing home cafeterias to see whether there is a deficiency of Choline in the food prepared for these patients. By comparing this research with the difference between mortality rate and enrollment of Alzheimer patients in the nursing home, we may be able to show relation between the above variables. This current study will be useful in the future for better treatment of Alzheimer disease.

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## SOCIOLOGY

### Condition of Health and How Regularly a Person Drinks Over the Last 12 Months

**Amber DeVries**

*Advisor: Susan Humphers-Ginther*

**10:10 AM - 10:50 AM • CMU Hallways**

A high consumption of alcohol over a long period of time can have some negative effects on a individual physical, mental, and even social health. At the present time, we do not know if age or sex makes a difference in health when dealing with a high consumption of alcohol. The purpose of the research is to look up more information and see if there really is a difference with a person's drinking habits and how they feel as far as them being healthy. Hopefully, by the end of this research there will be an answer as to whether drinking is really a risk to a person's health with how they feel emotionally and physically. The research will be useful to people and they can then analyze for themselves if they believe they are in excellent, good, fair, or poor health when consuming alcohol.

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## SOCIOLOGY

### Finding the Beat in Rehabilitation: The Role of Music Therapy in Neurologic Rehabilitation

**Mackenzie Schorn**

*Advisor: Susan Humphers-Ginther*

**10:10 AM - 10:50 AM • CMU Hallways**

Many people are afflicted with neurologic conditions such as dementia, Parkinson's disease, stroke and acquired brain injuries, and there are countless areas of rehabilitation for them to benefit from. Many strategies include pharmaceutical treatment, along with speech and physical therapies. However, there are other forms of therapy that can aid in a patient's rehabilitation. Music therapy is one form of alternative therapy that has gained some ground and recognition in the past years, and I believe there has to be further research into the viability and use of such therapy. Research that has been done suggests that music therapy is beneficial in improving speech prosody and phonation in those suffering from neuro-communication disorders, and there was an improvement in the mental flexibility aspect of executive functioning among those suffering from brain injuries. Also, those who experienced physical limitations due to a stroke, showed improvement in their fine and gross motor skills after music-supported therapy. Data from the Integrated Health Interview Series will be used to analyze the relationship between those who consider themselves as having a functional limitation due to a stroke, and their perceived health status. I will be looking further into the various forms of music therapy, its effects on the previously mentioned neurologic issues, and how it may impact future rehabilitation procedures.

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## SOCIOLOGY

### Individual Health and Well-Being in Lower Social Classes

**Benjamin Smith**

*Advisor: Susan Humphers-Ginther*

**10:10 AM - 10:50 AM • CMU Hallways**

A major problem in the relation of social class and health is people in lower social classes are more at risk of getting diseases or becoming ill. The relationship between health and class will be analyzed with data obtained from the General Social Survey. In addition the relationship between health and homelessness will be examined. Further analysis will be done on education, jobs, race and ethnicity on its impact on health in lower social class individuals. The biggest impact on health is income because individuals who have higher incomes are able to afford health and have a longer life expectancy, whereas individuals who have very low incomes are more likely to die due to poor health and disease. Additionally, people who are homeless are at the greatest risk of becoming ill or getting diseases because of where they live and from a simple lack of nutrition due to their lack of income. Further research is needed on the relationship of health and social class because the gap between social classes and income has greatly increased in recent years. The research will show that greater steps are needed if the gap between social classes and income is to decrease.

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## SOCIOLOGY

### Socioeconomic Status and Health

**Radha Maharjan**

*Advisor: Susan Humphers-Ginther*

**10:10 AM - 10:50 AM • CMU Hallways**

Socioeconomic status is one of the most important determinants of health. People's opportunities to live without illness and diseases are distributed unequally because of the difference in their social status. Socioeconomic class is linked with access to health care, income, educational level and employment. The objective of the study is to examine the health status of the individuals, their different approach to health with regard to their lifestyles, behavioral choices and socioeconomic class. Data collected to measure the health condition of the people is based on different variables. In the study, education was associated with the employment opportunities and employment was associated with income. The higher the income, the better was the health of the people. Disease is more prevalent and life expectancy is shorter for people who have lower socioeconomic status. The insights on the social class difference in health have very important implications for the development of effective approaches to improve the health condition of the people and reduce the health disparities. To address the different aspects of socioeconomic status, interventions and specific strategies need to be incorporated.

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## SOCIOLOGY

### Adolescent Use of Alcohol, Tobacco and Other Drugs: What Factors May Contribute?

**Karissa Walker**

*Advisor: Deborah White*

**10:30 AM - 10:50 AM • CMU 205**

Adolescent use of alcohol, tobacco and other drugs: What factors may contribute? Author: Karissa Walker In today's world it seems that adolescents are using alcohol, tobacco and other drugs more frequently than they used to, but why? What are some factors that could be influential when it comes to an adolescent participating in this type of deviant behavior? The goal of this study is to see whether or not adolescents may be at risk depending on the family structure, peer group relationships, and much more that will be discovered. If factors that may contribute to adolescent alcohol, tobacco, and other drug, use are identified support can be given or tools can be taught to more at-risk adolescents.

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## SOCIOLOGY

### Hate Crimes

**Mason Ware**

*Advisor: Deborah White*

**1:00 PM - 1:20 PM • CMU 205**

Crimes motivated by hate have always existed, but laws did not recognize such crimes until the 1968. Hate crime differs from other crime because hate crime is a crime motivated by a bias of race, color, religion, disability, sexual orientation, or national origin. This study looks at different victims of hate crime vandalism to determine any links to prior research. Researchers' such as, Christopher Lyons, Arthur Miller, and more, have looked at many aspects of hate crime motive, which helped build the hypotheses. The main focus is on victims' gender, age, race, and marital status. The data use comes from National Crime Victim Survey (NCVS) with a sample size of 6,938 of individuals ages 12 and older from the United States.

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## SOCIOLOGY

### What Factors Put Adolescents at Greater Risk to Use Alcohol, Tobacco, and Other Drugs?

**Karissa Walker**

*Advisor: Deborah White*

**1:00 PM - 1:40 PM • CMU Hallways**

Adolescent today see using alcohol, tobacco and other drugs as a social norm, but why? Which adolescents are more at risk? This research will look at adolescents and if family structure matters when it comes to the adolescent's risk of participation in alcohol, tobacco, and other drugs. It will also look at, when it comes to adolescents if a certain race is more predisposed compared to other races in the

use of alcohol, tobacco, and other drugs. This research is important because society needs to help adolescents get on the right track for the future and give them the proper tools that they need to help fight off the demands of their social group.

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## SOCIOLOGY

### **Choline Deficiency in Relation to Longevity of Alzheimer Patients in Nursing Homes**

**Nathaniel Arneson**

*Advisor: Susan Humphers-Ginther*

**1:00 PM - 1:40 PM • CMU Hallways**

Alzheimer's disease has affected everyone at one point in time and is a growing "incurable" disease amongst the elderly. Due to this disease, we find greater numbers of people unable to take care for their family members, leading to relocations of the elderly into nursing homes. Although this is a prospective solution for family members, one wonders if the Alzheimer's patients are getting all the nutrients they should be in a nursing home. Recent studies show that Choline, a newly founded nutrient in the FDA, may help treat Alzheimer disease by prolonging the disintegration period of parts of the mind. I propose a study of nutrition in nursing home cafeterias to see whether there is a deficiency of Choline in the food prepared for these patients. By comparing this research with the difference between mortality rate and enrollment of Alzheimer patients in the nursing home, we may be able to show relation between the above variables. This current study will be useful in the future for better treatment of Alzheimer disease.

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## SOCIOLOGY

### **Detecting Emotional and/or Mental Instability in Individuals According to Their Degree of Social Competence**

**Misty Schwab**

*Advisor: Susan Humphers-Ginther*

**1:00 PM - 1:40 PM • CMU Hallways**

As someone who silently fought depression off and on for several years, I often wondered why no one took my social distance as a cry for help. It only recently occurred to me that few people link social insecurity with a deeper internal battle. The purpose of my research is to discover a connection between emotional and mental stability with one's ability to confidently socialize, and to determine which variable serves as the instigator. Data from the General Social Survey will be used to examine the relationship between people who consider themselves sociable and those who have a mental or emotional disorder. I hypothesize that individuals who view themselves as being unsociable are more likely to exhibit symptoms of mental and/or emotional disabilities

than people who demonstrate more advanced social skills. I intend to help people realize the importance of detecting instability early on by examining one's social patterns. This research will benefit the family members and friends of individuals who experience internal discomfort that often goes unnoticed.

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## SOCIOLOGY

### **Sociological Influences of Differences in Obesity Rates Among Food-Industrialized Nations**

**Jake Hutchison**

*Advisor: Susan Humphers-Ginther*

**1:00 PM - 1:40 PM • CMU Hallways**

In the past 40 years, food production has shifted from small local production with regional trade to large scale mass production with international trade. Following the same business model of mass production textile goods, mass production of food has radically changed what is available to eat and how much it costs. The change in the food supply system now seeks to produce as much profit as possible, with little regard to the needs of the population which has led to an abundance of cheap to produce, widely available food products that companies must convince people to buy. The combination of our biological nutritional needs, socially acceptable eating practices, and availability of less nutritious food has led to increasing proportion sizes and waist sizes. However, among other comparable food-industrialized nations, the United States has a much greater rate of obesity per capita. Therefore, even though the same kinds of foods are available, Americans are more likely to gain excessive weight. In order to discover the differences in eating and exercising habits among different nations, data will need to be collected and reviewed regarding general social trends in nutrition and health. A social influence of obesity may be the types of foods that are available, consumed, and demanded, as well as the average daily calorie intake. The interpretation of this data should give some insight to the factors that are influencing obesity differences across nations.

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## SOCIOLOGY

### **The History of Influenza Epidemics and Prevention Today**

**Arielle Hoff**

*Advisor: Susan Humphers-Ginther*

**1:00 PM - 1:40 PM • CMU Hallways**

Though there have been some influenza epidemics in recent history, they have been nowhere near as catastrophic as flu epidemics before proper preventative methods were known. This project analyzes the consequences of past influenza epidemics and compares them to the prevalence and effects of influenza today. This examination looks at issues regarding flu vaccinations and

other private or public preventative procedures used to avoid major influenza epidemics today. This assessment will explore why we do not experience calamitous flu epidemics as we have before preventative measures were put into place. Also explored is the relationship between age and likeliness to get vaccinated for influenza using information from the National Health Interview Survey. In addition to the vaccination survey, reasons why people choose to get vaccinated or why they do not will be explored. The analysis will outline how the spread of influenza affects people differently in regard to age and how their bodies respond.

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## SOCIOLOGY

### **Homeschooling Fathers: A Theoretical Review**

**Tyler Anderson**

*Advisor: Deborah White*

**1:20 PM - 1:40 PM • CMU 205**

Although there is a relatively wide breadth of research centered on the homeschooling household, much of this research revolves around the perceptions and attitudes of homeschooling mothers and children, leaving a major lacuna in the area of homeschooling fathers. In this presentation I analyze interviews conducted with twenty-one Christian homeschooling fathers in the upper-Midwest. Specifically, I will evaluate the perceptions of homeschooling fathers in terms of their contributions to mitigating the role-strain and emotion work expressed by teacher-mothers. Additionally, I will examine the motivations of homeschooling fathers in both the desire to filter the impact of social forces on their children as well as the perceived loss of legitimacy of public schools. Included in this analysis is a review of classical and contemporary social science research that will provide a comprehensive summary of the current homeschooling climate.

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## SOCIOLOGY

### **Imagining Control: The Jehovah's Witnesses from a Sociological Perspective**

**Elise Wieck**

*Advisor: Deborah White*

**1:40 PM - 2:00 PM • CMU 205**

This paper looks at Jehovah's Witnesses through a sociological perspective and examines how they are structured and function as a group with an emphasis on examining how social control is maintained. A history of the foundations, the evolution to present day, and its modern day form is included. I am interested in this subject because I want to look into why the Witnesses choose to live in a highly structured, regimented lifestyle. I will be conducting research through material written about Jehovah's Witnesses and include both research and sociological academic papers.

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## SOCIOLOGY

### Choline Deficiency in Relation to the Longevity of Alzheimer Patients in Nursing Homes

*Advisor: Susan Humphers-Ginther*  
1:40 PM - 2:20 PM • CMU Hallways

Alzheimer's disease has affected everyone at one point in time and is a growing "incurable" disease amongst the elderly. Due to this disease, we find greater numbers of people unable to take care for their family members, leading to relocations of the elderly into nursing homes. Although this is a prospective solution for family members, one wonders if the Alzheimer's patients are getting all the nutrients they should be in a nursing home. Recent studies show that Choline, a newly founded nutrient in the FDA, may help treat Alzheimer disease by prolonging the disintegration period of parts of the mind. I propose a study of nutrition in nursing home cafeterias to see whether there is a deficiency of Choline in the food prepared for these patients. By comparing this research with the difference between mortality rate and enrollment of Alzheimer patients in the nursing home, we may be able to show relation between the above variables. This current study will be useful in the future for better treatment of Alzheimer disease.

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## SOCIOLOGY

### Marital Status and Health

**Katherine O'Sullivan**

*Advisor: Susan Humphers-Ginther*  
1:40 PM - 2:20 PM • CMU Hallways

It seems like everywhere I turn people are getting divorced. It happens to family, friends, famous people and sometimes the couple next door. All of these people contribute to the ever increasing divorce rate in our country. Because our health status can be made up of physical, mental, and emotional health, the marital status of a couple is a health issue. Whether a divorce is mutual or not, it is without a doubt going to affect the emotional health of both parties. I think more research is needed in this area because it seems like now more than ever, there are higher divorce rates; but not only that, people seem to be getting married too quickly and these immediate weddings often times end in divorce. Analyses of data from the General Social Survey found that while generally married people are happier, isn't by an overwhelming percentage. By understanding how both a successful and unsuccessful marriage can affect your mental health, we can more effectively understand this common trend.

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## SOCIOLOGY

### Race, Mental Health, and the road to Homelessness

*Advisor: Susan Humphers-Ginther*  
1:40 PM - 2:20 PM • CMU Hallways

Mental Health problems are a significant factor in contribution the size of the homeless population in America. This is a highly documented occurrence. There is also a known social stigma attached to mental health in certain races. I wish to tie the three factors together, Race, Homelessness, and Mental Health, to determine just how large a role race plays (if it plays any role at all). I believe I will find that different races and the taboo surrounding seeking treatment or care for mental health will be a large factor in the likelihood of becoming homeless. There is little research out there aimed at answering this question. I will try and find an answer using previously published surveys and analyzing the data to come to a conclusion. Hopefully whatever conclusions I come to can illuminate the need for appropriate treatment and the necessity of avoiding stigmatizing the mentally ill.

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## SOCIOLOGY

### Social Aspects of Health and Physical Exercise

**Nicole Broadway**

*Advisor: Susan Humphers-Ginther*  
1:40 PM - 2:20 PM • CMU Hallways

Physical activity in relation to health is one of the most important factors in living a healthy lifestyle. Exercising keeps your body moving and making it more resistant to harmful things that can make you sick. It also will make you live longer and have a better life in all aspects related to health. I believe more emphasis on exercise is very much needed in our society. Overall, with the health issues that exist, exercise can be a great regimen to make people much healthier and act as a preventative health practice. I will further explore how exercise relates to age and the knowledge of exercise. By providing more basic information on the importance and benefits of developing and maintaining a regular exercise routine, the results in the success of preventative care would dramatically increase as well as the overall health status of society.

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## SOCIOLOGY

### The Causes and Effects of Mental and Physical Abuse

**Jeannie Sackman**

*Advisor: Susan Humphers-Ginther*  
1:40 PM - 2:20 PM • CMU Hallways

Millions of children each year are victims of abuse. Some need medical attention for broken bones, head trauma which may result in brain damage or death. Data from the General Social Survey allows one to compare whether

children or adults suffer more from mental abuse. The survey showed that adults have less trust in people than children. We spend millions for mental health and health care annually for injuries, hospital stays, and loss of time from school or work. Many children never receive the help even after asking for it from their school counselors. Children who suffer from abuse in the home are commonly ignored and people assume they tell stories and are just "bad kids". We are being told by the media that "It's our business if someone we know is being abused" but when the abuse is reported they are told that it's not their business and the parents have the right to raise their kids the way they want. The purpose of my research is to assist in changing the way abuse and neglect are investigated.

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## SOCIOLOGY

### Injuries Kelly Ritter

*Advisor: Deborah White*  
2:00 PM - 2:20 PM • CMU 205

This study is important because it examines the relationship between age, demographics, and injuries. Not many researchers have researched this topic, which is a limitation when trying to find research for the analysis. By looking into this study, information can be analyzed to see what age is most prone to which injury, what were the causes of each injury, and sometimes even the intent of injuries. Unintentional injuries can cover a wide variety of injuries. Injuries from recreational sports, non-recreational sports, injuries from motorized vehicle accidents, stings from insects, and bites, excluding canine bites, are to name a few. All the information in this study was gathered through research articles.

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## SOCIOLOGY

### America: An Over-Medicated Society

*Advisor: Susan Humphers-Ginther*  
2:30 PM - 3:10 PM • CMU Hallways

Prescription and over the counter drugs have played a very central role in the American society over the past several decades and have provided us with a fix to the majority of our health issues. However, in recent years, over prescribing and medicating has lead to an increase in harmful drug side effect reactions and deaths due to those. We are slowly becoming too dependent on prescription and over the counter drugs as the only way to help us feel better. Most of America does not realize the damage that is being caused to our society. The purpose of this research is to inform our society on the effects that over medicating has on us. The lack of knowledge and awareness that the drugs that are supposed to be helping us are in fact slowing killing needs to be recognized. The findings from this will provide doctors and pharmacists with more options than telling their clients to depend on popping

pills and give patients and everyday consumers of over the counter drugs a better understanding of when medication is truly needed.

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## SOCIOLOGY

### Organ Donation

Courtney Swanson

Advisor: Susan Humphers-Ginther

2:30 PM - 3:10 PM • CMU Hallways

I am interested in the area of organ donation. I have experienced the loss of someone close to me because of organ failure. I am going to specifically look at liver transplants because this can be done from a living or a deceased donor and how it affects people from a sociological point of view. Besides have gone through this experience with my own family, I will look at research on organ transplant waiting lists, mortality rates, and survival rates associated with transplants. I will also include the steps it takes to become a living donor. I think more lives can be saved if more people were more informed about the process and the outcomes of organ donation.

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## SOCIOLOGY

### Race, Mental Health, and the Road to Homelessness

Ryan Hardtke

Advisor: Susan Humphers-Ginther

2:30 PM - 3:10 PM • CMU Hallways

Mental health problems are a significant factor contributing to the size of the homeless population in America. This is a highly documented occurrence. There is also a known social stigma attached to mental health in certain races. I wish to tie the three factors together: race, homelessness, and mental health in order to determine just how large a role race plays (if it plays any role at all). I believe I will find that different races and the taboo surrounding seeking treatment or care for mental health will be a large factor in the likelihood of becoming homeless. There is little research out there aimed at answering this question. I will try and find an answer using previously published surveys and analyzing the data to come to a conclusion. Hopefully, whatever conclusions I come to can illuminate the need for appropriate treatment and the necessity of avoiding stigmatizing the mentally ill.

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## SOCIOLOGY

### Smoking and Health

Badal Omar

Advisor: Susan Humphers-Ginther

2:30 PM - 2:50 PM • CMU 205

Smoking can cause many diseases and minimize the healthy life expectancy of smokers. According to the U.S. Department of Health, the adverse effects from smoking account for an estimated 443,000 deaths or approximately one of every five deaths each year. More deaths are caused

each year in United States due to smoking than any other deaths from HIV, motor vehicle accidents, suicides and other illegal drugs combined. However, smoking causes an estimated 90% of all lung cancer deaths in men and 80% of all lung cancer deaths in women. A majority of the people who die with chronic pulmonary diseases or heart attack are caused by smoking. Data from the General Social Survey will be used to explore the relationship between smoking and health status in greater depth.

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## SOCIOLOGY

### Social Support Systems

Heather Forbord

Advisor: Susan Humphers-Ginther

2:30 PM - 3:10 PM • CMU Hallways

The topic of social support systems interests me the most and is the focus my research. I chose this particular topic because when I first started my college career I wanted to major in Social Work. After taking a few of the classes, I learned that I would not be able to handle it emotionally. However, it is still something that fascinates me and I know I will enjoy conducting research on social support systems. This topic would be classified as a health issue because depending on your status and location in society, it may be a challenge obtaining the help you need when struggling with a difficult life situation. I believe that more research would be beneficial in this specific area for a few reasons. Depending on your individual crisis/crises and where you reside are factors in the matter. Also, it is possible that the type of support center you need is not available in your area. Individuals may not know where to go and/or lack the funds to receive the care they need. Another road block that people may encounter is the fear that there are certain stigmas associated with reaching out and asking for help. People may be afraid of asking for help because they think it makes them weak or less of a person.

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## SOCIOLOGY

### Who Are You Going to Call?

Kelsey Bauer

Advisor: Susan Humphers-Ginther

2:30 PM - 3:10 PM • CMU Hallways

How sexual assaults are handled on campus can cause some health issues that could be solved by meeting a few accommodations. The reason this topic interests me is because campus doesn't handle it efficiently or effectively. I've interviewed multiple authoritative figures on campus about the issue, and came to the conclusion that the system that is currently set up can cause health issues, along with many mental health issues. The things that make it a health issue are easy to identify: Hendrix isn't open 24/7, so students that may be hurt will have to go at least 8 blocks to get to the nearest hospital, which can give time for the condition to get worse. There's also a mental health issue with knowing that Public Safety admits that they don't have the training to handle such situations and

they're liable for calling the cops, so the victim will have to repeat their story multiple times. I'm looking into this more deeply than before to figure out why. Why isn't Hendrix open 24/7? Is it staffing or funding? And why doesn't Public Safety have adequate training? Is it funding or just lack of resources to achieve better training?

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## SOCIOLOGY

### Societal Influences on Health and Aging

Rebecca Scott

Advisor: Deborah White

2:50 PM - 3:10 PM • CMU 227

With medical advances life expectancy is starting to rise.

Meaning people are living longer and new diseases are surfacing. In addition to the rise in life expectancy, the baby boomers retirement is nearing. That means that older adults make up a lot of the population. That is why it is important to research what affects their health. I am focusing on the social aspects of aging and how society impacts the health of the elder population. I used a dataset collected by Neal Kruse, to find some variables that affected older individual's health. The variables I tested were alcohol consumption, socioeconomic status, and religion. Additionally, I conducted a content analysis to gather the information on how the media portrays older individuals and their process of aging. The media has a big influence on society's perspective of aging, which often creates stereotypes. The purpose of my study is to figure out what factors are affecting older individuals' life and how society is influencing these factors.

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## SOCIOLOGY

### Income and Mental Illness

Shekhar Pandey

Advisor: Susan Humphers-Ginther

2:50 PM - 3:10 PM • CMU 205

The paper discusses and contrasts overall good or bad health status mentally and physically due to rise or fall of household income. It is based on data from the General Social Survey on household income and its effects on the mental health or illness of the family members. The survey reveals that the mental health status of the family members with the rise and fall of income. It relates and analyses the various mental health issues created within the family members especially with lower incomes. The effects of the lower incomes were mental issues such as depression, trauma, frustration and anger. Other rising health issues such as malnutrition, high blood pressure, and heart diseases followed by mental illnesses are also regarded as effects of lower household incomes. This research has implications for all communities since lower income can cause deteriorating mental health.

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## SOCIOLOGY

### Residivism of Juvenile Delinquency

Ashley Cornwell

Advisor: Deborah White

3:10 PM - 3:30 PM • CMU 227

Context analysis on the Dakota Boys and Girls Ranch, and how often do the juveniles go back to supervised, residential living. I will collect data on race, gender, and education.

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## SOCIOLOGY

### America: An Over-Medicated Society

Erin Erickson

Advisor: Susan Humphers-Ginther

3:10 PM - 3:50 PM • CMU Hallways

Prescription and over the counter drugs have played a very central role in the American society over the past several decades and have provided us with a fix to the majority of our health issues. However, in recent years, over prescribing and medicating has lead to an increase in harmful drug side effect reactions and deaths. We are slowly becoming too dependent on prescription and over the counter drugs as the only way to help us feel better. Most of America does not realize the damage that is being caused to our society. The purpose of this research is to inform our society on the effects that over medicating has on us. The lack of knowledge and awareness that the drugs that are supposed to be helping us are in fact slowing killing needs to be recognized. The findings from this research will provide doctors and pharmacists with more options than telling their clients to depend on popping pills and give patients and everyday consumers of over the counter drugs a better understanding of when medication is truly needed.

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## SOCIOLOGY

### Effects of Smoking and Gender on Health

Courtney Campbell

Advisor: Susan Humphers-Ginther

3:10 PM - 3:50 PM • CMU Hallways

Smoking has been a prevailing hazard to the public for many years, especially to the health of the person smoking. This research fills the gap of determining how health and gender influences peoples' attitudes towards smoking. The procedure to get the data was done using the "General Social Survey Cumulative Data file 1972-2006" from the University of California at Berkeley's Survey Documentation and Analysis Archive website. The results showed a particular relationship between both males and females: the higher the health status, the less likely the

person was a smoker. The data also showed that males were more likely to smoke than females in all of the health status categories.

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## SOCIOLOGY

### Medical Field Employees' Health Compared to the General U.S. Population

Christina Paquin

Advisor: Susan Humphers-Ginther

3:10 PM - 3:50 PM • CMU Hallways

More often than not, having a high paying job gives individuals adequate health insurance, allowing them to get regularly check ups for whatever they deem necessary. To get the majority of these high end jobs, one must have a college education. This research is designed to figure out if the more education an individual has, regardless of health insurance status, the healthier those individuals are. Data from the National Health Interview Survey will be used to explore education and health status while controlling for health insurance status.

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## SOCIOLOGY

### Outcast by Class, Economic Status, and Interaction with the Mentally Ill

Zachary Toliver

Advisor: Susan Humphers-Ginther

3:10 PM - 3:30 PM • CMU 205

Many people, rich or poor, suffer from mental illness in the United States. However, when it comes to perception of the mentally ill, recognizing "odd" behavior, or knowing those with the illness, how much is tied to socioeconomic status? In essence, social class status can potentially influence who "sees" the mentally ill. Much research has shown our class status influences our social experience and heavily constructs the social environments we live within. These environments come with expectations of normative behavior, common characters, and certain situations all of which can shed light on the frequency of interaction or observation of the mentally ill. Through quantitative survey research, we can start to recognize certain trends. More interaction and more positive reactions with the mentally ill are done in lower class environments. Yet higher economic classes know more people who have received treatment for mental illness perhaps due to their elevated possibility of healthcare coverage. It is medically significant to understand which class interacts with the mentally ill more for it will help society with outreaching to those most in need of medical assistance. Furthermore, it is dire to understand social classes' perceptions of the mentally ill to fuel positive interactions and influence healthier assistance to those suffering from mental illness.

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## SOCIOLOGY

### The Influence of Rock and Roll on Children based upon Age, Sex, and Social Class

Erik Dodds

Advisor: Susan Humphers-Ginther

3:10 PM - 3:50 PM • CMU Hallways

Our children's lives are influenced today by numerous stimuli. As of today, not much is known about the effect of music and other media on our children. Some speculate it leads to violence and aggression; others say it has no affect at all. I have decided to look at how respondents think about the influence of rock and roll on their children based upon their, sex, age and social class. I hope to find out some substantial evidence on how this particular type of music affects our youth. It will help with censorship laws and free music publication. Data from the General Social Survey will be used to analyze the relationship between the influence of rock and roll on our children and age, sex, and social class.

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## SOCIOLOGY

### Why Do Older People Have a Higher Risk of Getting Alzheimer's Disease?

Abby Grussing

Advisor: Susan Humphers-Ginther

3:10 PM - 3:50 PM • CMU Hallways

Alzheimer's disease is gaining attention in our aging society. There are new drugs that can help Alzheimer's disease slow down but nobody has lived from this disease yet. The purpose of this presentation is to figure out why Alzheimer's disease affects people who are at an older age and what influences this disease to happen. This presentation will show the stages of Alzheimer's and why older people have a higher risk of getting the disease. The research will go on to see what triggers Alzheimer's to affect older adults and see if there's any association with gender, environmental issues, or lifestyle. Alzheimer's disease affects more adults than ever as baby boomers are at the age that the risk factor greatly increases. It is starting to be an epidemic in today's society which is why I'm researching why Alzheimer's disease affects older adults rather than younger people.

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## SOCIOLOGY

### Mental Illnesses and the Sociological Perspective

Debra Frank

Advisor: Magdalene Chalikia

3:30 PM - 3:50 PM • CMU 227

Mental Illness, as a sociological issue, has become a major concern for people in society. The topic of interest for the research topic and oral presentation will be "Mental



Illnesses” and “The Sociological Perspective.” Specific areas of interest will be the mental disorders of Depression and Schizophrenia. The etiology and characteristics of these mental conditions will be reported from “The Diagnostic and Statistical Manual of Mental Disorders-IV., (or DSM-IV.). Personality disorders and the effects on the development of these conditions will be included in the literature review. The effects of anger, anxiety, and stress and the possible development and causes for later delinquency will be reviewed and discussed in relation to “An Empirical Test of General Strain Theory.” The effects of role-loss and normlessness and “Durkheim’s Theory of Anomie” will be addressed as well as the “Concept of Suicide.” Other areas of discussion will also focus on the costs of “Mental Illnesses to Society” and helpful ways to provide psychiatric care and therapy. Various prevention and intervention techniques and strategies will be reviewed and discussed from “The Sociological Perspective” on how to best meet the physical, psychological, social, financial, and occupational needs of those individuals experiencing “Mental Illnesses Within Society!”

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## SOCIOLOGY

### Domestic Violence

Emma Onyancha

Advisor: Susan Humphers-Ginther

3:30 PM - 3:50 PM • CMU 205

Domestic violence occurs and takes place across all racial and ethnic groups, and primarily women are the ones most frequently affected and victimized. With this said, I would say that this is got my interest because it a very sensitive and wide topic that people need to be aware of and that those who are experiencing this should not be afraid to come forward and report it. As a result, at some level, this is also considered a health issue because the victims are affected in different ways. It could either be physically, where all the bruises and other physical injuries are visible. Or, it can be mental and psychological such as a result of verbal and emotional abuse, one may end up suffering from post traumatic stress disorder or even depression. Therefore, more research needs to be done on this topic because people need to be made aware and need to know that it is all right to intervene whenever they see something of this sort happen and that one should not be afraid to report, be it the victim or a bystander.

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## SOCIOLOGY

### Adolescent use of alcohol, tobacco and other drugs: What factors may contribute?

Karissa Walker

Advisor: Deborah White

NO LOCATION YET

In today’s world it seems that adolescents are using alcohol, tobacco and other drugs more frequently than they used to, but why? What are some factors that could

be influential when it comes to an adolescent participating in this type of deviant behavior? The goal of this study is to see whether or not adolescents may be at risk depending on the family structure, peer group relationships, and much more that will be discovered. If factors that may contribute to adolescent alcohol, tobacco, and other drug, use are identified support can be given or tools can be taught to more at-risk adolescents.

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## SPEECH AND LANGUAGE PATHOLOGY

### Comparison of static and dynamic assessments in speech sound disorders

Sarah Hoepfner

Advisor: Kris Vossler

9:30 AM - 10:10 AM • CMU Hallways

The graduated prompting method of dynamic assessment (DA) examines how an individual responds to a sequence of more supportive cues (Laing & Kamhi, 2003). This study investigated the use of static assessment (SA) and the graduated prompting method of DA for the purpose of measuring change in the speech sound system of a preschool child with a mild speech sound disorder. A single-word picture naming task and the Scaffolding Scale of Stimulability (SSS, Glaspey & MacLeod, 2010; Glaspey & Stoel-Gammon, 2005; 2007) were the assessment tools used in this research project. Results of dependent t-test comparisons of SA and DA scores revealed a statistically significant difference between the dynamic assessment scores after five and ten weeks of treatment. The results of this study suggest several clinical implications for the importance of using dynamic assessment during assessment of individuals who have speech sound disorders.

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## SPEECH AND LANGUAGE PATHOLOGY

### Implementing a decision-tree for dysphagia screenings in a university clinic

Jennifer Leadbetter

Advisor: Nancy Paul

9:30 AM - 9:50 AM • CMU 204

A swallowing disorder, or dysphagia, is commonly defined as “difficulty moving food from the mouth to the stomach” (Logemann, 1998, p.1). Past student research found that dysphagia screening tools are primarily designed for medical settings; and are therefore, not as applicable to a university clinic setting. The importance and necessity of such a tool is needed as both neurogenic and non-neurogenic patients at the onset of the disorder as well as in chronic stages of treatment are present within the university clinic setting. An in-depth review of the literature was completed. A decision tree for carrying out dysphagia screenings in a university clinic setting was developed for determining if further screening for dysphagia was necessary. Clinical implications related

to the importance of educating SLPs on the dysphagia decision tree and its correlating screenings within the university clinic setting were discussed.

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## SPEECH AND LANGUAGE PATHOLOGY

### Factors That Influence Speech-Language Pathologists’ Education and Experiences Regarding Treatment for Children Who are Deaf or Hard of Hearing

Kasey Greff

Advisor: Kris Vossler

10:10 AM - 10:50 AM • CMU Hallways

Speech-language pathologists (SLPs) are responsible for providing effective treatment to a variety of populations, including children who are deaf or hard of hearing. For most SLPs preprofessional experiences specific to this population may not be available. This qualitative study investigated the types of preprofessional training and professional experiences school-based SLPs encounter regarding treatment for children who are deaf or hard of hearing. The information collected during the interview process answered the research question, “What factors influence speech-language pathologists’ education and experiences regarding treatment for children who are deaf or hard of hearing?” The data analysis revealed ten categories, three themes, and a final assertion. Identifying and discussing the factors, increase the understanding of whether SLPs’ education and experiences provide the knowledge and competence to efficiently provide treatment to children who are deaf or hard of hearing.

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## SPEECH AND LANGUAGE PATHOLOGY

### Memory Wallet Intervention for an Individual with Dementia

Justine Fee

Advisor: Nancy Paul

1:00 PM - 1:40 PM • CMU Hallways

Memory wallets are made of relevant photos of an individual’s life, with corresponding typed statements. This type of research was first investigated by Michelle Bourgeois in 1990. Bourgeois has examined the usefulness of this intervention for individuals with mild to severe dementia with a variety of conversational partners including: spouses, adult children, nursing staff, friends and volunteers (Bourgeois, 1990, 1992, 1993; Bourgeois & Mason, 1996). This research examined the effects of memory wallet intervention on the quality of conversation for an individual with moderate dementia. It evaluated the effectiveness of an intervention approach that was first conducted by the researcher, followed by a short training session for the caregiver at the conclusion of the study. Data was collected on the individual’s novel utterances during conversation with the researcher before the introduction of the memory wallet. The

researcher then implemented the memory wallet in conversation with the participant. Dependent measures were the number of novel and wallet statements of fact, ambiguous, unintelligible, perseverative, error and other statements. Pre-post treatment conversational utterances were descriptively analyzed. The participant increased her number of on-topic utterances after implementation of the memory wallet. Future research should explore moving from direct to indirect intervention approaches.

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## SPEECH AND LANGUAGE PATHOLOGY

### Factors involved in the successful design and implementation of telepractice programs in university clinics

Jenna Tews

Advisor: Kris Vossler

3:10 PM - 3:50 PM • CMU Hallways

The purpose of this study was to determine the factors involved in the successful design and implementation of a telepractice program at a university clinic. A qualitative modified phenomenological research design that utilized interviews with Speech-Language Pathologists (SLPs) with previous or current experience with telepractice programs was conducted to meet this purpose. Three SLPs who had previous experience in this area were selected using theoretical, or purposeful, sampling. Through analysis and coding of the transcribed interviews of the three participants in this study, the central phenomenon that emerged from the data was as follows: Successful telepractice programs need to have the proper equipment, proper funding, and support from everyone involved in the program. Additionally, three major patterns emerged from the data and included factors related to the SLP, factors related to other individuals involved in the telepractice program, and factors related to the telepractice program. The findings from this study suggest that although each university program should be designed to meet the specific needs of the university and not all programs will be alike, the similarities identified in the data may help a university clinic establish and maintain a successful telepractice program.

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## SPEECH, LANGUAGE & HEARING SCIENCE

### Implementing Literacy for Beginning Communicators

Kelsey Longwell, Aubrey Vesledahl

Advisor: Kris Vossler

1:40 PM - 2:20 PM • CMU Hallways

In the Speech-Language-Hearing Sciences clinic, students serve a population of cognitively and linguistically diverse clients across the lifespan. Literacy is becoming a major component in speech therapy. Not all of the literacy materials available for clinicians to use in therapy are age appropriate for the clients. Our solution to this problem was to develop twelve packets including therapy materials

such as games, writing worksheets, crafts and age appropriate books for student clinicians in the Speech-Language-Hearing Sciences clinic to check out and use in therapy. These packets will provide an outline for student clinicians to use during sessions that can be incorporated into their lesson plans. Each packet contains a story written by the presenters and was compiled to include a master lesson plan and activities related to the book. Student clinicians would then be able to check out the packet as needed and be able to accommodate the contents to their clients. In conclusion, integrating these packets into the Speech-Language-Hearing Sciences clinic will benefit student clinicians and current or future clients. Students will receive the benefits of incorporating literacy and other related activities into their therapy sessions, while clients will receive the assistance of having a meaningful and functional therapy session.

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## SPEECH AND LANGUAGE PATHOLOGY

### Now Hear This

Maria Lendobeja

Advisor: Mary Drake

2:30 PM - 3:10 PM • CMU Hallways

Few studies chart the noise exposure a musician experiences in a typical week of music rehearsals and private instrumental practice within the university setting. It is known, however, that over a prolonged period, exposure to high-intensity sound can place the musician at risk for developing hearing loss. (Chesky, 2006). Many music majors are not aware of the risks placed on their hearing due to high decibel exposure and the overall potential long-term effects. This project involves looking at the potential exposure for a student musician through direct measurement and literature review. In addition, a hearing conservation program specific to student musicians will be addressed.

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## THEATRE ARTS

### THREE SISTERS by Anton Chekhov

Jacob Hundley, Nicole Neuha, Kelly Nelson, Carl Rottman, Chandler Cline, Kieran Kane, Matthew Englund, Katie Kendrick, Michael Meraz, Anne Brown, Katie Kendrick, Caroline Stommes, Nicholas Kaspari, Laura Sorenson, Nikko Raymo, Jayme Godding, Lucas Vonasek, Parker Shook, Megan Yahna

Advisor: Jennifer Tuttle

12:00 AM - 12:00 AM • CA Hansen Theater

The Theatre Arts Department would like to present our production of THREE SISTERS by Anton Chekhov as part of the Students Academic Conference, which will be open to all participants and attendees of the SAC for free. We are holding a special performance on Tuesday, 4/17 at 7:30pm in the Gaede Theatre in the Center for the Arts.

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## WOMEN'S STUDIES

### Against the Odds

Robin Aanstad

Advisor: Claudia Murphy

9:30 AM - 10:10 AM • CMU Hallways

Elizabeth Blackwell (1821-1910) was the first woman to graduate from medical school. She took an active role in educating women in medicine and encouraging them to pursue a career. One can only imagine the amount of opposition that met Elizabeth, yet she persevered and had a very busy and successful career. She is an intriguing woman. Through research of biographies, articles from that time, and other sources, I plan to find out more about this remarkable woman, what drove her, and from where she got her strength. Women such as Elizabeth Blackwell are important role models for today's women of science.

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## WOMEN'S STUDIES

### Water is a Natural Resource not a Commodity

Emily Risch

Advisor: Claudia Murphy

10:10 AM - 10:50 AM • CMU Hallways

Water is an irreplaceable natural resource and is needed by all of us. This resource is becoming threatened as deforestation, the industrial revolution, water pollution, agriculture using genetically modified seeds and privatization of water have become more of a commonality. After reading science-based journals, articles and books, I have come to the conclusion; that water is necessary to protect and should be by the communities that surround it. Many communities started by major rivers and waterways. Everyone needs water and it shouldn't be owned and sold like as a commodity. Conservation of water is important more than ever due to the lack of clean water in the United States and around the world. Privatization of water destroys livelihoods, threatens cultures and increases dehydration. This is a research paper based on the disheartening scarcity of water and its effect on the world.

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## WOMEN'S STUDIES

### The Many Dimensions of Gender Identity

Maite Rodriguez Berrios

Advisor: Claudia Murphy

1:00 PM - 1:40 PM • CMU Hallways

In today's society, particularly in our region, there is a lack of understanding about gender identity. When talking about gender and filling out common forms, gender is typically limited to male and female. It is important to understand the many definitions of gender to create consciousness. I plan to complete extensive reading of current articles and books on gender identity. Furthermore, I will examine the case studies of Andrej

Pejic and Caster Semenya. Andrej Pejic is a male who does androgenic modeling. Semenya's participation in sports drew controversy due to questions about her gender. My research will also identify the correct use of the words gender and sex, and their biological, psychological, and sociological definitions. I will clarify what it means to be feminine and masculine. Sexual orientation and gender identification will be defined and compared. This study will pay special attention to androgyny, another term for ambigender.

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## WOMEN'S STUDIES

### Woman And Science

Wendy Jojola

Advisor: Claudia Murphy

1:40 PM - 2:20 PM • CMU Hallways

Mae C. Jemison was a phenomenal woman known for her scientific accomplishments and her intelligence. She became the first African American woman ever admitted into the astronaut training program. She actually flew into space with six other astronauts aboard the "Endeavour" on mission STS47. The sciences that held the greatest fascination for Mae were anthropology, archaeology, and astronomy. Anthropology would teach her about the similarities and differences around the people across the world. Archaeology would allow her to peep into the changes earthlings and their environment have gone through over thousands and thousands of years. Astronomy taught her about our sun, our moon, and our neighboring planets. Her company's early projects included a satellite based telecommunication system to improve health care in West Africa and international science camp for teens named the White Earth.

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## WOMEN'S STUDIES

### Overweight is Unhealthy?: A critique of current standards of height vs weight which affect healthy body perception

Kathryn Kottenbrock

Advisor: Claudia Murphy

2:30 PM - 2:50 PM • CMU 218

The purpose of this research is to examine the current medical charts which set the standard for the ideal weight for a person of a certain height. Jumping off the idea depicted in the novel, *The Obsession: Reflections on the Tyranny of Slenderness*, I will research medical journals and magazines to find studies that prove or disprove the theory that medical charts do not necessarily depict healthy weight. I will research common medical conditions linked to obesity such as diabetes to find data on the causes of these diseases and if they are truly caused by obesity. Once all the data is collected, I will compare "idea medical weights" with average weights of American women to see if there is a large gap. These results will lead to a discussion of dieting and body image in America. I will tie together

information presented from eating disorder centers, feminist literature, medical journals, advertisements, entertainment, and diet/health magazines to display the underlying challenges of the idea weight chart and how it affects women's daily lives.

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## WOMEN'S STUDIES

### The Prevalence of Gendered Metaphor in the Sciences

Samantha Kunderer

Advisor: Claudia Murphy

2:50 PM - 3:10 PM • CMU 218

This research considers the usage of language within the field of science. The goal is to explain the presence of gender specific language used to label and describe objects and theories. There is a tendency for descriptive language to possess a gender specific overtone that is stereotypical of gender attributes. Gender stereotypical terms interfere with the accuracy and neutrality of science and its outcomes. Research will be compiled from academic journals and published research. This information will be presented to point out the presence of such subtle language, its implications, and changes that must be made to maintain a neutral, inclusive field of science. The use of language must be responsible and intentional if science is to be an impartial, professional field.

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## WOMEN'S STUDIES

### Analysis of Student Preconceptions of Scientist Names

Amanda Phillips, Staci Dreyer

Advisor: Linda Fuselier

3:10 PM - 3:50 PM • CMU Hallways

Historically, Western Science has been male-dominated but recently, the contributions of women are becoming better recognized. This study aims to determine if students have preconceptions of gender when given the last names of scientists in various fields. We predicted that gender bias would be evident among students despite representation of women in current science textbooks and that science students will be more likely to recognize names of female scientists and have more confidence in their gender designations. Survey results will be analyzed in terms of major, number of years in college, and gender.

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## WOMEN'S STUDIES

### Of Poison, Pens and Peer Review: How Crisis Fuels a Pressure Cooker

Deepa Trivedi

Advisor: Linda Fuselier

3:10 PM - 3:30 PM • CMU 218

In *Reflections on Gender and Science* Evelyn Fox Keller notes that any scientist who is not a man walks a path bounded by inauthenticity on one side and subversion on

the other. I examine the subversive identity by examining the work of an "outlaw" scientist; a scientist that produced work considered anomalous with respect to the current scientific paradigms. Dr. Felisa Wolfe-Simon discovered a bacterium adapted to a very unique environment and able to incorporate arsenic into its DNA structure. Wolfe-Simon is an "outlaw" with her scientific ideas, and has encountered severe criticism from scientists. I use Wolfe-Simon's experience as a case study of a scientific "outlaw" challenging how scientific discoveries are executed, acknowledged, and accepted.

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## WOMEN'S STUDIES

### The Myth of PMS

Tiffany Zilka

Advisor: Claudia Murphy

3:30 PM - 3:50 PM • CMU 218

25 min presentation. Faintness, irritability, loss of appetite for food and sex and being highly emotional are all symptoms of Hysteria, a psychological disorder found in women that is no longer recognized. However, the symptoms they look remarkably like a well-recognized and accepted illness in women called Premenstrual Syndrome (PMS). The Diagnostic and Statistical Manual of Mental Disorders, or DSM, calls the disorder premenstrual dysphoric disorder, PMDD. With the new version of the DSM coming into print there is much debate to whether or not PMDD is an actual diagnosis. This is because there is little proof that the effects of PMDD are biological. There is no clear cause of PMDD. Many psychologists believe the roots of the disorder are in societal and interpersonal factors, instead of biology. First, I will draw connections between PMS and past psychological disorders found only in women. Then, I will prove there is no biological reason for PMS or PMDD. Finally, I will explore the possible causes for the symptoms of PMS and PMDD.