



UNDERGRADUATE RESEARCH SYMPOSIUM

Lane Center

May 1st, 2015
10 AM - 1 PM

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ABSTRACT BOOKLET CREDITS

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THE ABSTRACTS

This Symposium includes 90 presentations featuring the work of 136 students, mentored by 45 Faculty across 15 Departments and the Honor's Program. The projects presented at this Symposium took place in 2014 and 2015 and include coursework and independent study activities. Abstracts are organized alphabetically by department and by project title. The presentation number in parentheses following the title refers to the locations of the Poster and/or Physical Displays in the ARMAH. Oral presentations are scheduled in Lane Center 108, 110, 111 and 113. A map of the ARMAH and a schedule for the oral presentations will be available at the Registration Table. Each presentation also includes the following information:

Project Title (Poster, Physical Display, Oral Presentation, Display #)

Name(s) of presenting student(s)

Name(s) of contributing student(s) (if applicable)

Name(s) of faculty mentor(s)

DEPARTMENT OF BIOLOGY

Advanced Microscopy Portfolio (Poster 2)

Presenting Student: Seth Stine

Faculty Mentor: Rebekah Taylor

This semester is the first time in several years that Frostburg State University has offered a class that was solely focused on providing students with experience using advanced microscopy techniques. Currently there are many different forms of microscopy, each of which allows individuals to take advantage of specific properties the specimen possesses in order to generate a clear and unique image. From these images, examiners can identify the presence, or the lack thereof, of specific features that can be used to draw interpretations about the specimen. This poster shows images that were obtained from specimens using several advanced microscopy techniques.

Advanced Techniques and Imaging in Microscopy (Poster 3)

Presenting Student: Samuel Blum

Faculty Mentor: Rebekah Taylor

Microscopy is the technical field of using microscopes to view objects and areas of objects that cannot be seen with the naked eye. Thanks to generous funding from the DeI Signore Foundation, high quality images of organisms using techniques such as brightfield illumination, darkfield illumination, Rheinberg illumination, fluorescence, and scanning electron microscopy (SEM) are able to be produced at Frostburg State University. The following images of biological specimens were created using these techniques.

Analyzing the Density of Cryptopatches in Mouse Small Intestine (Poster 4)

Presenting Student: Picard Johnson

Faculty Mentor: Rebekah Taylor

Cryptopatches are microscopic aggregates of lymphoid cells in the crypt areas of mammalian small intestines. They have a unique developmental program in that they form in adulthood (rather than in utero) and can mature into antibody-producing tissues called isolated lymphoid follicles. While the structure and overall number of cryptopatches in strains of laboratory mice (*Mus musculus*) are well understood, these features have not been studied in wild field mice (*Peromyscus*). The purpose of this project was to examine a plethora of pre-made slides of wild mouse intestine to determine the amount of cryptopatches per square centimeter of each mouse subject. To do this, a light microscope with an attached camera was used to take multiple digital photos of areas that displayed either cryptopatches or immense crypt area and tile them into one large-format image. From these images, area measurements could be taken and cryptopatch density determined.

Confirmations of a SNP in the Anthocyaninless Gene of Wisconsin Fast Plants (Poster 5)

Presenting Student: Mitchell Mills

Faculty Mentor: David Puthoff

A single nucleotide polymorphism (SNP) is suspected within the DFR region of the Wisconsin Fast Plant (WFP). This SNP is suspected to be the cause of the two different phenotypes: purple and non-purple (green). DNA was isolated from 10 purple candidate and 10 green candidate WFP. The DNA was then subjected to PCR using two primers, which we determined to provide the best amplification pattern. PCR amplification yielded a favorable banding pattern so samples were purified, and subjected to enzymatic digestion with a restriction enzyme that cleaved at the potential SNP. The resulting product was run through the agarose gel electrophoresis. The initial results suggest that the DFR region of the purple phenotype does contain the SNP resulting in the color variation. This was shown in the multiple banding patterns observed in the purple WFP as opposed to single band observed in the green WFP. We are proceeding with analysis of the purified and enzymatically cut DNA to determine if the banding pattern as seen on the gel does represent the DFP region of the DNA.

Development of a Portfolio of High-Quality Images of Biological Specimens Using Advanced Microscopy Techniques (Poster 6)

Presenting Student: Amy Weakland

Faculty Mentor: Rebekah Taylor

Advanced Microscopy (Biology 490) is a pilot course offered during the Spring 2015 semester. During this course, various microscopy techniques were taught, such as brightfield, darkfield, Rheinberg, fluorescence, deconvolution (2D and 3D), and scanning electron microscopy (SEM). The poster presented displays at least one of the highest quality images from each of the techniques taught in the course. The overall goal of the poster is to show that with training, the generation of high quality microscopy images can be achieved here at Frostburg State University.

Exploring Advanced Microscopy Techniques to Generate a Portfolio of High-Quality Images of Biological Specimens (Poster 7)

Presenting Student: Devin Francillon

Faculty Mentor: Rebekah Taylor

Advanced Microscopy (Biology 490) offers students an opportunity to gain hands-on experience as they learn about the science behind microscopy. The objective of the course is to provide students with the necessary microscopy skills they will need to be successful in a scientific workplace. Throughout the semester the students are exposed to: brightfield, darkfield, phase-contrast, fluorescence, and scanning electron microscopy. Students undergo several critiques to improve their pictures as they finish each type of microscopy. The best photos from each technique are showcased on this poster along with a brief description of the specimen, preparation process, techniques used, and magnification.

***Ex Situ* Conservation of Endangered Native Ecosystems (Oral Presentation)**

Presenting Student: Megan Carr

Faculty Mentor: Sunshine Brosi

For decades, conservation efforts were devoted to the preservation of individual species. In recent years, however, more work has been devoted to a broader scope of preserving functional ecosystems and plant communities. A proposed project at Frostburg State University would apply this wider view to a local native ecosystem type by installing replicated shale barrens in both the campus arboretum and as a component of the green roof on the school's newest building. Implementation of this project could potentially serve multiple functions in allowing for research, outreach, and education, while reducing visitation pressure on actual shale barrens.

Gender Assignment in Birds Using Molecular Techniques (Poster 8)

Presenting Student: Seth Stine

Faculty Mentor: Frank Ammer

Correct gender assignment in avian species is difficult especially for species that display no sexually dimorphic or behavioral traits. Genetic testing provides an opportunity for a simple, cost-efficient solution to this problem. The Z and W sex chromosomes of avian species have conserved intron sequences of differing lengths that can be amplified using polymerase chain reaction (PCR). There are multiple PCR primer sets that amplify different intron sequences on the Z and W chromosomes. Claims have been made that these primer sets are universally effective for gender determination in all avian species. Through extensive trial, these claims have been disputed and the avian species that they are able to sex are not all known. The goal of this experiment is to determine which PCR primers (2550/2718 CHD primers and P2/P8 CHD primers) work best for individual species. Multiple experiments have been conducted on both the 2550/2718 primers and the P2/P8 CHD primers. Tests suggest that P2/P8 CHD primers generate more distinguishable bands than the 2550/2718 primers and are more effective for accurate gender determination in nearly all tested species. Thus far, the P2/P8 CHD primers have been able to successfully identify gender in 37 species.

Histological and Immunohistochemical Staining and Analysis of Serotonin Receptors in Rat Liver and Rat Brain (Poster 11)

Presenting Students: Gina Stuck, Courtney Strubin

Faculty Mentor: Karen Keller

The purpose of this experiment was to learn sectioning techniques and to determine if serotonin receptors were present in the liver and brain of the rat, *Rattus norvegicus*. Rat cerebrum and liver were sectioned, treated with anti-serotonin receptor antibody, and counter-stained with hematoxylin and eosin (H&E). Several cell types, including neurons and glial cells in the brain sections and hepatocytes in the liver, were easily identified; however, only the liver stained positive for serotonin receptors. Further studies using different dilutions of the anti-serotonin receptor primary antibody should be conducted to determine if the rat cerebrum does contain serotonin receptors that were not detected using the dilution in this study.

Identification of Cryptopatches in the Small Intestines of Wild Mice (*Peromyscus* sp.) (Poster 12)

Presenting Student: Nicholas Bowers

Faculty Mentor: Rebekah Taylor

The immune system located in the mammalian gut plays a slightly different role than the immune system located elsewhere in the organism. Elements of the immune system located elsewhere in the organism are programmed to recognize and attack “non-self.” In the gut, however, usually everything that passes through is “non-self.” Thus, the intestine possesses unique lymphoid structures that can address the specific protective needs of the gut. Peyer’s patches are the most commonly studied and understood. Recent evidence points to other factors that aid the Peyer’s patch in intestinal immune responses, like isolated lymphoid follicles and cryptopatches. These tissues are fairly well understood in laboratory mice (*Mus musculus*), but relatively unstudied in wild-caught mice (*Peromyscus*). We sectioned field mouse intestine to look for cryptopatches. In every field mouse intestine sectioned, cryptopatches were observed.

Imaging Biological Samples Using Fluorescence Microscopy (Poster 13)

Presenting Student: Aiesha Hooper

Faculty Mentor: Rebekah Taylor

In Advanced Microscopy (Biology 490), we have been granted the opportunity to experiment with various high quality microscopes while implementing a variety of techniques for quality imaging, such as fluorescence microscopy. Fluorescence microscopy is helpful for identifying specific target molecules and the level of expression in each cell. This technique also has great contrast and resolution. Deconvolution can also be used to eliminate any background fluorescence to yield a quality image. For this presentation, I have dedicated my research to the analysis of fluorescence in biological specimens using an epifluorescent microscope.

Reevaluating Appalachian Cottontail Status Using Fecal Pellet mtDNA Analysis (Poster 14)

Presenting Student: Alicia Matthews

Faculty Mentor: Frank Ammer

The Appalachian Cottontail (*Sylvilagus obscurus*) is dispersed across patchy, mountainous ranges and is suspected to be in decline due to habitat fragmentation caused by development, habitat conversion, hunting, and competition from the more common Eastern Cottontail (*Sylvilagus floridanus*). The Appalachian Cottontail and the Eastern Cottontail are similar in appearance, though cranial structures and chromosome number can be used to separate the two species. Analysis of the mtDNA genome via fecal samples allows the reevaluation of the Appalachian Cottontail status, relative abundance, and its habitat associations in Western Maryland. Habitat assessment and pellet surveys will be conducted at historic sites in Western Maryland. Fecal pellet mtDNA analysis is a non-invasive method that can be used to census the Appalachian Cottontail without disturbance or stress on the population. Data obtained from this study will facilitate the conservation, management and recovery of the species in this region.

Study of Cryptopatches in the Small Intestine of Wild Mice (Poster 15)

Presenting Student: Nyam Quirke

Faculty Mentor: Rebekah Taylor

Cryptopatches are microscopic clusters of uncommitted lymphocytes that develop during adulthood. In response to a stress, cryptopatches can develop into larger antibody-producing structures called isolated lymphoid follicles. While the structure and prevalence of cryptopatches have been studied in detail in laboratory mouse strains (*Mus musculus*), little is known about them in wild populations (*Peromyscus*). Using histology and microscopy, small intestines from wild-caught mice were analyzed for the presence of cryptopatches. These structures were found in all 4 of the mice studied.

The Effect of Riparian Disturbance on Summer Diets and Condition of Age-0 Brook Trout (*Salvelinus fontinalis*) (Poster 16)

Presenting Students: Brooke Baier, Jake Blakely, Nick Jennings

Faculty Mentor: Jered Studinski

Human activities have caused brook trout populations to decrease across most of their range. Brook trout, the only native salmonid in central Appalachia, are an integral part of stream ecology and an important source of tourism revenue. Understanding how disturbance affects brook trout is important; however, data are lacking, especially regarding age-0 (young-of-year) brook trout. This study examined how severe riparian disturbance affected the diet and condition of age-0 brook trout. Age-0 brook trout were repeatedly sampled from three forested streams in eastern West Virginia during June, July, August, and September 2010. Within each stream, samples were collected from both an undisturbed reference section and a heavily disturbed logged section. Stomach contents were evacuated and collected using a novel and non-lethal gastric lavage method. Prey items were measured and identified to family from January 2014-April 2015. Similar to other studies regarding brook trout diets, terrestrial invertebrates were an important component in the diets of age-0 brook trout. When compared to reference sections, diet composition in some of the disturbed sections shifted towards aquatic taxa. In the stream sections where a diet shift was observed, brook trout tended to have fuller stomachs and be in significantly better condition, possibly benefitting from increased stream productivity following near-clearcut conditions. This study provides novel insights into the response of age-0 brook trout to riparian disturbance.

The Incidence of Lyme Disease in Humans in Maryland and Surrounding Areas (Poster 17)

Presenting Student: Drew Brown

Faculty Mentor: Rebekah Taylor

Lyme disease is a vector-borne disease caused by the bacterium *Borrelia burgdorferi*, which is transmitted through the bite of blacklegged ticks (*Ixodes scapularis*). The disease causes a characteristic rash called erythema migrans as well as fever, headache and fatigue. If left untreated, the disease can spread to other parts of the body such as the heart and nervous system and can become much more severe. The purpose of this study was to collect human incidence data over a period of 10 years (2003-2013) and interpret trends related to the disease. We also collected blood samples from wild mice to study the incidence in the Frostburg area. The human incidence data collected from MD, PA and VA indicate that Lyme disease has become more prevalent in that 10 year period and has shown a westward migration, possibly due to commercial development of previously undeveloped land.

The Prevalence of Lyme Disease in Maryland's Pets (Poster 18)

Presenting Student: Bethany Granger

Faculty Mentor: Rebekah Taylor

Lyme disease is a bacterial disease that is transmitted through a bite from the tick species, *Ixodes scapularis*. *Borrelia burgdorferi*, the bacterium which causes this disease, can cause lameness, fever, joint pain, fatigue, lack of appetite, and swollen glands for humans and animals. Research was conducted to gain knowledge on the prevalence of Lyme disease in animals in Maryland. In order to do this, data pertaining to diagnosed cases of Lyme disease in cats and dogs was collected from veterinarians from across the state of Maryland.

What Do Traditional Appalachian Plant-Based Dyes Reveal About Changes in Gender Roles? (Poster 27)

Presenting Student: Karen Johnson

Contributing Students: Sabrina Wasfi, Selena Burke, Jaime Tarnai

Faculty Mentor: Sunshine Brosi

One of the effects of post-industrialization on Southern Appalachia was the near demise of hand-woven and naturally dyed textiles, until the growing economic and social opportunities provided for women by the Settlement Schools of the early 20th century revived these practices. The purpose of this study was to connect the changes in traditional weaving and plant-based dyeing techniques of Southern Appalachia and the changing gender roles and opportunities for the women of the area through the documentation of dye plants native to Southern Appalachia, evidence of changing gender roles, and natural dye usage in textile production. Today's high prevalence of natural dyes in Appalachian woven handicraft is a result of the changing opportunities for women and gender roles.

Yeast Expression Vector Creation for Cellular Compartment Fluorescent Tagging (Poster 28)

Presenting Student: Gillian Hasslinger

Faculty Mentor: David Puthoff

The purpose of the research experiment was to create an expression vector using a primer-dimer multiple cloning site for use in *Saccharomyces cerevisiae* that can be used for future experiments and research. To begin this procedure, a DNA primer was created using several restriction enzyme sites, which contains an overhanging 3' deoxyadenosine (A) nucleotide to allow ligation to occur between the plasmid and primer via T/A cloning. Once this was created, the cloning reaction between the new product and pYES.1/V5-His-TOPO took place using Topoisomerase followed by transforming the plasmid into chemically competent TOP10F' *E.coli* cells. This produced colonies that could grow and be selected from a culture plate. From the plate, 10 colonies were taken and cultured overnight with broth containing ampicillin. To check integrity, a reaction with the plasmids and the restriction enzymes XhoI and SacII was completed, followed by gel electrophoresis. No plasmids with the correct insert were identified, however, after several weeks of trouble-shooting it was discovered that the Ampicillin that was being used for selecting the correct bacterial colony was not functioning correctly. This leads to incorrect selection, which resulted in not identifying a bacterium with the correct plasmid.

DEPARTMENT OF CHEMISTRY

Compound L as a Viable Sensor for Mercury (Poster 23)

Presenting Students: Steven Lowery, Connor Riahin, Christopher Shore

Faculty Mentor: Benjamin Norris

Mercury (Hg) is a dangerous element that can be lethal if handled improperly. If Hg comes into contact with a person, he or she may suffer from Hg poisoning. If Hg poisoning is caught early, a proper treatment of chelation therapy can be administered. This can help prevent damage to the body. Hg is commonly found in volcanic emissions, fish, coal burning, gold mining, and solid incineration. 2,2'-[(1E,2E)-hydrazine-1,2-diylidenedi(E)methylidene]diquinoline (Compound L) has been reported as an in vivo selective mercury sensor. However, Compound L has also been reported as a selective copper (Cu) sensor. We seek to clear any discrepancy. The initial step was synthesizing the compound. The synthesis of the compound was validated using a UV-vis spectrophotometer, melting point, and infrared spectrophotometer. There are three experiments involved in testing the chelation of Compound L in the presence of heavy metals. The first experiment is to simply test if Compound L fluoresces in the presence of Hg or Cu. The next experiment is to test if Compound L fluoresces in the presence of other common metals, like calcium or magnesium, because these elements may cause interference in vivo. Lastly, an experiment will be done to test the detection limit of the sensor.

Determination of Quaternium-15 in Cosmetic Products (Poster 24)

Presenting Student: Gabrielle Bronson

Faculty Mentor: Benjamin Norris

Quaternium-15 is a formaldehyde releasing preservative used in many cosmetic products, including makeup powders, creams, lotions, and several others. The compound is a known irritant and can cause burning of the eyes or throat, allergies, nausea, or dermatitis. Legally, products are allowed to contain quaternium-15 if the amount present does not exceed 0.2%. CoverGirl cosmetics is known for using this compound in almost all of their powdered makeup products. The purpose of this experiment was to analyze the quaternium-15 present in samples of CoverGirl's powdered foundation, blush, and eyeshadow in order to determine if the amount present exceeds the legal limit of 0.2%. Quaternium-15 was extracted from each sample by using small amounts of ethyl acetate. The samples were centrifuged at 5000 rpm in order to remove color. The supernatant was then analyzed using thin line chromatography to determine the presence of quaternium-15. All samples showed presence. The samples have been analyzed using UV-visible spectrometry to determine the absorbance. Known standards of quaternium-15 will be analyzed using UV-vis and the concentration will be determined. The samples will be compared to the known standards in order to determine concentration. These concentrations will be compared to the 0.2% legal limit in order to determine if the amount exceeds that percentage.

Developing a Safer, Optimized Method for Determining Pb in Paint (Poster 25)

Presenting Student: Steven Lowery

Faculty Mentor: Matthew Crawford

Lead was used in paint to give color and durability to it. Lead (Pb) is a heavy metal that is toxic to the body, especially when the metal reaches the bloodstream. Since Pb was found to be toxic, the Consumer Product Safety Commission has placed a restriction of 100 ppm Pb in the paint. Home testing kits are available but these kits only test for the presence of Pb in paint and do not quantify it. Previous quantitative methods involve drying the paint and digesting it with concentrated nitric acid. The full digestion had to be boiled for about 4 hours. There are safety issues with boiling nitric acid because concentrated nitric acid is an oxidizer and a strong irritant. A safer method of digestion has been developed. Using a microwave to digest the paint, the samples were then diluted and measured using atomic absorbance spectrophotometer (AA). A calibration curve was constructed and the concentrations of the samples were interpolated. Three experiments were completed. The first was to test if the paint would digest under the parameters; what was found was that the samples did digest, but they left an orange gas (NO₂). This gas is very dangerous to be around, so an amended microwave method was sought. The addition of hydrogen peroxide was found to diminish the formation NO₂. The second experiment was to test how much the paint solutions had to be diluted in order to be measureable on the AA. This is important because the detector of the AA can only resolve up to 10 ppm Pb. The last experiment was to run the samples in an inductively coupled plasma-atomic absorbance spectrophotometer (ICP-AES). This last experiment was done in order to validate the measurements done with the AA.

Development and Design of a High Yield Raman Spectrometer at Frostburg State University (Poster 26)

Presenting Student: Samuel Blum

Faculty Mentors: Benjamin Norris, Jerald Simon

Raman spectroscopy is a spectroscopic technique used to observe vibrational, rotational, and other low-frequency modes in a system. Raman spectroscopy is commonly used in chemistry to provide a fingerprint by which molecules can be identified. Prior to 2015, Frostburg did not have a fully functional Raman spectrometer. At present, we can obtain Raman spectra at the one-molar scale. We will present the results of our efforts to use multi-pass Raman spectroscopy to obtain millimolar Raman spectra.

Do I Sense Heavy Metals? Synthesis of Fluorescent Biimidazoles for Heavy Metal Sensing (Poster 33)

Presenting Student: Sara Ansteatt

Faculty Mentor: Benjamin Norris

A series of aryl-substituted 4,4'-biimidazoles are being investigated as sensors for heavy metal ions. Out of the series, 2-(4-methoxyphenyl)-2'-(4-nitrophenyl)-5,5'-diphenyl-4,4'-biimidazole is being synthesized in four steps from phenylacetylene and benzoylnitromethane. However, the initial two steps have proven challenging. Initially, the first step provided inconsistent yields and colored product. After improving the first step, more consistent yields were obtained. Also, the second step has proven difficulties in the purification process and percent conversion to the final product. Improving the second step the conversion rate has increased and purification is still in progress. Upon completion of the synthesis, the metal-specific fluorescence response to various heavy metal ions will be investigated.

Investigation of Fly Ash Mineral and Carbon Dioxide Mineralization (Poster 34)

Presenting Students: Grace Candler, Margaret Edmiston, Sara Zachritz

Faculty Mentor: Robert Larivee

Fly ash is a residual component that is produced during the combustion of coal. The primary goal of the investigation is to determine the most cost-efficient way to effectively remove carbon dioxide using a mineralization process. The chemical composition and the physical properties of the fly ash will also be analyzed. Toxic metals capable of leaching from the fly ash will be quantified. Figure 1 describes the apparatus by which carbon dioxide and nitrogen gas will be combined. The combined gases are passed through a humidifier to add water vapor to the gases. The concentration of the water and the

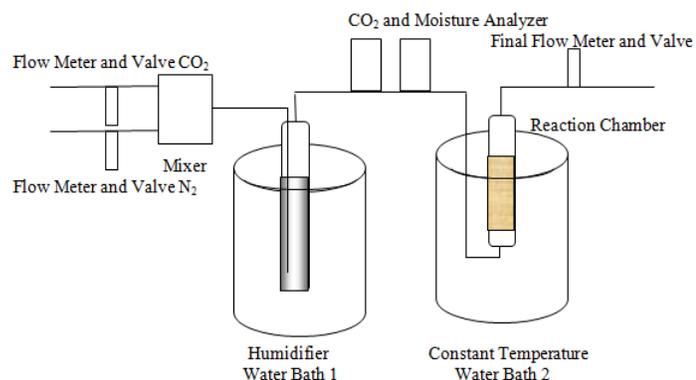


Figure 1: Apparatus used to analyze the fly ash in the investigation.

The concentration of the water and the carbon dioxide will be measured using analyzers, which have the flow going through an infrared detection sensor. The gases will continue to another water bath to reach their final reaction temperature. The gases will then pass through copper tubing that has been placed inside the water bath (not shown). A diffuser will be used to ensure that the gases are evenly spread out as they pass through the reaction chamber. The gases will proceed through the metal oxides (MgCO_3 and CaCO_3). To quantify the leachability of heavy metals from the fly ash, samples of fly ash were soaked in acetic acid and nitric acid for 24hrs. The solution was filtered and then analyzed using the inductive coupled plasma-atomic emission spectrometer. The concentrations of the various heavy metals found in the fly ash samples will be determined.

Molecular Weight Determination of Bovine Heart Lactate Dehydrogenase (Poster 35)

Presenting Students: Grace Candler, Celia Lichtman, Robert Mfuh, Thomas Richardson, Harrison Shore

Faculty Mentor: Peggy Biser

The purpose of the project was to use a variety of methods to determine the molecular weight of lactate dehydrogenase (LDH), which was purified from beef heart. Purification was achieved using a combination of ammonium persulfate precipitation and column chromatography, which included ion exchange, affinity, and gel filtration. Gel filtration and SDS-PAGE were used to determine the molecular weight of the native and denatured protein, respectively. The results are in agreement with known values of the molecular weight of Bovine LDH.

Oxidation of Fatty Acids in Protein Supplements (Poster 36)

Presenting Student: Amy Weakland

Faculty Mentor: Peggy Biser

Many people find themselves with a desire to both look and feel good, which encompasses things like gym memberships, new diets, and, in some cases, supplements. Supplements can range anywhere from a simple whey protein to aid in muscle recovery and repair to a pre-workout supplement to give a mental edge during workouts. Some well-known supplement stores have a large span of products, meaning not every product will leave the shelves. Stores will reduce the price of supplements that are close to expiring, making them more attractive to customers. The question arises as to whether it is safe or not. While the protein in the supplements is not of great concern, the fats are of interest to see if any oxidation will occur as the supplement extends past its expiration date, possibly becoming rancid. The original goals of the project included: refining the extraction procedure, identification, quantification, and observation of any level of change in the GC-MS peaks of palmitic, oleic, linoleic, and steric fatty acids. Then, once the extraction was deemed reliable, the thiobarbituric acid reactive substances (TBARS) assay was planned to measure total lipid oxidation of the sample. Throughout the project, the extraction procedure was modified in order to be performed in a more consistent manner. The GC-MS became an integral aspect of this project. By creating, modifying, and troubleshooting the GC-MS program, a great amount of knowledge and practical real-world research skills were gained.

Quantitative Analysis of Honey Samples (Poster 37)

Presenting Student: Russia Tatum

Faculty Mentor: Benjamin Norris

Honey is a food made by bees using nectar from various flowers. This sweet, sticky substance has various properties that are commonly used in health remedies. The purpose of this experiment was to determine how the properties of honey can be affected by factors such as pH and moisture content. Methods such as pH titrations and vacuum filtrations were used to attain the measure pH and moisture content of the honey samples. According to the National Institute of Health, testing the acidity and moisture content of honey is vital because “honey is potent in vitro in bactericidal activity against antibiotic resistant bacteria causing several life threatening infections to humans.” When honey is placed in foreign environments, the properties are altered, causing defects in its function. Results from experimental analysis indicate successful method development for pH and moisture content determination of honey. Further analysis will be conducted to validate the findings.

Synthesis of 2,6-Dibromocarbazole (Poster 38)

Presenting Students: Daniel Blais, Anthony Russo

Faculty Mentor: Benjamin Norris

It has been demonstrated in previous research that π -conjugated polymers able to be synthesized from dibromocarbazoles have utility in modern polymer chemistry. The electronic and photonic properties of these polymers can be engineered by manipulating the interconnectivity of the monomers in the polymer. However, the dibromocarbazoles that can currently be synthesized in appreciable amounts possess an inherent symmetry that limits the types of interconnectivity that can be observed in dibromocarbazole polymers. An efficient and practical synthesis of an asymmetric dibromocarbazole, such as 2,6-dibromocarbazole, would exponentially increase the types of interconnectivity achievable in a dibromocarbazole polymer and as a result would dramatically increase the specificity with which dibromocarbazole polymers' electronic, photonic, and physical properties could be engineered to the needs of the polymer manufacturer. The purpose of the experiment is to propose and validate a synthesis for the asymmetric dibromocarbazole, 2,6-dibromocarbazole. The proposed synthesis is the bromination at the 4 position of commercially available 2-nitrobiphenyl (2NBP) into 4-bromo-nitrobiphenyl with N-bromosuccinimide (NBS) with $AlCl_3$ in a chloroform reflux. Afterward, the 4-bromo-2NBP is to be converted into 2-bromocarbazole through a reductive cyclization reaction using PPh_3 in refluxing ortho-dichlorobenzene. Finally, 2-bromocarbazole is to be brominated with NBS and SiO_2 in the absence of light. Progress towards the completion of this synthesis will be presented.

What Metals Did You Eat Today? The Evaluation of Essential Metals in Multivitamins Using ICP-AES (Oral Presentation)

Presenting Students: Joseph Pecoraro, Lauren Rosch

Contributing Student: Thomas Richardson

Faculty Mentor: Matthew Crawford

The concentrations of five essential metals (calcium, copper, magnesium, manganese, and zinc) in three commercially available multivitamins (men's, women's, and children's) were analyzed using inductively coupled plasma atomic emission spectroscopy. An external standard calibration method was performed using a least squares regression, and standard addition was employed in order to diagnose and correct for matrix interference. Experimental results for each multivitamin were compared to the manufacturer's label values, and expired and unexpired multivitamin samples were compared to determine whether there was a significant change in metal concentration after expiration. While statistical tests do indicate significant differences between some of the experimentally determined concentrations and the manufacturer's specifications, the results from the analysis were generally very close to the published label values. Moreover, concentrations of a number of metals in expired multivitamins differed significantly from those in unexpired samples. However, given the extremely limited sample size used in this analysis, further testing is warranted on additional samples to determine the true relationship between the obtained results and the published concentration values.

DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGIES

From Speech to Text: The Conversion System (Poster with Display 81)

Presenting Students: Megan Balukoff, Lianna Mack, Jenna Meeks, Christiana Tucker
Faculty Mentor: Xunyu Pan

In this project, we explore the relationship between sound and text. We create a java program where spoken words are converted into text. Java has a great API that defines the interfaces used for speech called Java Speech API (JSAPI). We employ this API and another tool called Sphinx to help implement the proposed program. In the future, we hope to be able to manually edit conversion errors and measure the error rate.

Group Voice Chat (Poster with Display 82)

Presenting Students: Seyed Raoofi, Russell Gilmore
Faculty Mentor: Xunyu Pan

We created a low latency multiuser voice chat program that implements modern media codecs such as Opus. Opus is a commercial codec that has been used in other media streaming applications such as Skype. Binding to libopus gives us access to a very efficient encoder and decoder, which yields us clear, low latency media streams. In addition to having high quality media streams, the client friendly server architecture is implemented to ensure a reliable quality of communication amongst clients. The server can handle client abnormalities with minimal disturbance to the other connected clients.

Infrared Communication (Poster with Display 83)

Presenting Students: Seyed Raoofi, Russell Gilmore, Dakota Fearon

Faculty Mentor: Steven Kennedy

We will be implementing network communication over infrared light between two Raspberry Pi microcontrollers. This will be done using the Python programming language to create an application that will send information between the two units. We will also incorporate a library called Linux Infrared Remote Control (LIRC) that will allow us to recognize our infrared sensors. The units will communicate by flashing an infrared LED that the other unit will receive through its sensor and then interpret. The receiving unit will then translate and display the data on the screen.

Raspberry Media Center (Poster with Display 84)

Presenting Student: Bradley Nedved

Faculty Mentor: Xunyu Pan

The goal of this project is to create a media center from a Raspberry Pi. A Raspberry Pi is a computer that fits into the palm of your hand and has a vast amount of uses. The media center will allow for the streaming of videos stored locally or from other computers on the network. The media center can be hooked up to a TV with an HDMI cord and stream video to the TV.

Touchscreen Interaction Program for Cotton-Top Tamarins (Poster with Display 85)

Presenting Students: Johnathan Tripp, Seyed Raoofi

Faculty Mentor: Steven Kennedy

This project consisted of making a computer program to facilitate behavioral research and training of Cotton-top tamarins. Student researchers in Frostburg State University's Psychology Department will use this program in order to study the behavior of tamarins when using a touchscreen computer. The program uses a sequence of trials to record tamarin interaction with procedurally generated circular buttons with the capability to configure various conditions of the trial, such as auditory feedback and button generation schemes.

Tower Defense in Unity 3D (Poster with Display 86)

Presenting Students: Seth Thomas, Saul Pena Gamero, Kris Misey, Cody Beck

Faculty Mentor: Steven Kennedy

This research involves experimentation and implementation of learned knowledge towards a tower defense-based video game. The project will be put together using the Unity game engine, and the models and animations will be done in 3D modeling programs such as Blender. It will give us experience with Unity, how game objects interact, and the C# programming language. Our goals for this research project are to learn how a tower defense game operates, to gain experience in game development, and to have fun.

DEPARTMENT OF ENGLISH

Bird-Window Collisions: Hazardous Optical Properties of Large Windows of the CSC and the CCIT (Poster 43 and Oral Presentation)

Presenting Students: Olivia Elisio, Madeline Hose

Contributing Students: Paul Rooke, Robert Mfuh

Faculty Mentor: Dawn Armfield

Human activity can have direct and often immediate consequences on wildlife species. Fatalities among migrating bird species are attributed to critical collisions by birds on large, reflective windows in many buildings. The optical properties of such windows in a few of the buildings on the Frostburg State University campus are considered, and interior aesthetic features of the buildings are surveyed. In an effort to reduce any possible bird-window collisions on campus, the “bird’s-eye view” of the window must be obscured. Solutions of this nature and future studies are discussed.

Soil Salinity on Frostburg State University Campus (Poster 44)

Presenting Students: Jessica Warren, Caleb Friend, Allen Benton

Faculty Mentor: Dawn Armfield

The Frostburg State University (FSU) campus has areas of barren soil that lie along the majority of the sidewalks and roads. This team noticed these and hypothesized that salt spread to clear the walkways of snow and ice is the cause to the barren soil. To test this conjecture, soil samples were selected at varying distances from several of the sidewalks and analyzed to determine the salt concentration in the soil. The results led to a significant conclusion: the soil in the vicinity of the sidewalks contains levels of salt well over what is considered highly saline. This not only presents a significant problem for the FSU campus, but has the potential to spread to the campus stream where it could affect an even larger area. This research indicates that less salt should be distributed on the FSU campus, and a better form of clean-up should occur.

Stuck in Foot Traffic (Poster 45)

Presenting Students: Picard Johnson, Ruth Fabre, Ryan Diehl

Faculty Mentor: Dawn Armfield

The concept of foot traffic or “traffic” as a whole generally has a negative connotation to it. People dread the idea of having their movements restricted in one place for too long. The purpose of this paper is to shed light on the other aspect of traffic and show how traffic can actually be beneficial in certain places. One of these places is a college campus. The way this was accomplished was through a series of observations over the course of a week. During that week, individuals were counted at various locations on the campus during different times of the day to determine the places with the highest frequency of foot traffic. The results showed that the Compton Science Center, the CCIT building and the Lane Center were the places with the most traffic. This revealed that the Compton Science Center, CCIT building and the Lane Center are the three most important locations on campus and to the progression of a typical school day.

The Effect of Animal Presence on Humans’ Decision to Donate to an Animal Cause (Poster 53)

Presenting Students: Amanda Carney, Nathan Korvah, Allison Carney, Kayla Kelly, Aimee Lewis, Yoseph Kinfu, Michelle Harris

Faculty Mentor: Dawn Armfield

The purpose of this experiment is to determine if the presence of an animal will increase the amount of donations made to the Tri-State Zoological Park. A poster (used as the control), bearded dragon, cat, and dog were allotted an hour and twenty minute’s time to be exposed to the public outside of Tractor Supply in La Vale. The amount of men and women, money, and the monetary value of items from the list of necessities given to each passerby were tallied after each hour and twenty minutes before the next animal was presented. About 55.1% of the donators were men and 44.9% were women in which both were the highest when the cat was displayed. The monetary donations made up 50.9% of the donations and the donated items’ monetary value made up 49.1%. The monetary value of the donated items were greater than the money for both the poster and bearded dragon, while the amount of money donated were greater for both the dog and cat. It can be concluded from this experiment that there is a strong positive correlation between the presence of a familiar animal and the amount of donations.

The Effects of Weather on Class Attendance (Poster 54)

Presenting Students: Charles Robinson, Crystal Tippett, Shannon Hartfield

Faculty Mentor: Dawn Armfield

The hypothesis for the experiment is that if the temperature falls, the classes of Frostburg State University will have lower attendance levels. Twelve random professors were asked to send in their class attendance records via email in the form of a percentage indicating students in attendance/total number of students registered. In the second part of the experiment, 20 random students in buildings on the Frostburg State University campus were given a survey to take. The class data indicated no difference in class attendance. The survey data indicated a slight correlation between the weather and willingness to go to class with higher class attendance. However, this data may be skewed by survey bias due to survey construction. Data was not sufficient to create widespread correlations; further data, especially in different seasons, should be collected for future research.

Visualizing the Text: Illustrations of the 1800's (Oral Presentation)

Presenting Student: Kaitlyn Wharton

Faculty Mentor: Mary Anne Lutz

This study reviews the impact and effectiveness of illustrations in relation to the works they accompany through select examples of 1800's literature. The literary works discussed are Mark Twain's *Roughing It*, Charles Dickens's *Oliver Twist* and *Pickwick Papers*, Arthur Conan Doyle's *Sherlock Holmes* stories, and Lewis Carroll's *Alice's Adventures in Wonderland*, *Alice Underground*, and *Through the Looking Glass*. The authors who developed relationships with their illustrators tended to produce works that melded well together and therefore were successful. Unfortunately, not all authors were as fortunate to have a stable illustrator or even get to know their illustrator well. Because of these setbacks, which were common for the age, the illustrators interpreted the works more to compensate for lack of insight. This method sometimes worked well, such as with Paget's *Sherlock Holmes*, but not so with Mark Twain's novel *Roughing It*. The purpose of the illustrator was to best illuminate the text by employing their understanding of the words in context and employing modest interpretation without overshadowing the work that the art accompanies. My analysis emphasizes how the relationship between author, artist, and publisher is pivotal for how effective the works of art will be and, by extension, how successful the work of literature will be as a whole.

DEPARTMENT OF GEOGRAPHY

Assessing Glacial Retreat at the La Perouse Glacier Through the Use of Landsat and Aerial Images (Poster with Display 93)

Presenting Students: Jon Stewart, Walter Bruce Huffman III

Faculty Mentor: Matthew Ramspott

The declining of glaciers in the cryosphere worldwide has become a global concern. The La Perouse glacier is located on the coast of the Alaskan Gulf in Glacier Bay National Park. La Perouse shows significant melting over time. Landsat imagery showing the glacial retreat has been recorded over a forty year period from 1973 to 2015. Along with imagery from Landsat 1 and 8, aerial photographs of the glacier from the 1950's were also retrieved. Multi-temporal analysis is effective in visualizing the retreat of the glacier. Through the use of Landsat imagery and aerial photographs, the diminishing glacier can be observed and interpreted. The data used in this project includes the earliest available cloud free Landsat imagery (from February and September, 1973) and also the most recent cloud free imagery, which is from August and February of 2013 and 2015, respectively. Change in the glacier was clearly observable over this time span. Compiled together, these summer and winter composites show seasonal change as well as longer-term progressive change.

Assessing Hydrological Changes in the Ganges and Brahmaputra Rivers Using Landsat Imagery (Poster with Display 94)

Presenting Students: Jacob Esposito, Darton Greist

Faculty Mentor: Matthew Ramspott

This project examines the location where the Ganges River meets with the Brahmaputra River in central Bangladesh. The main water source for both these rivers is glacial melt from the Himalayan mountain range. Additionally, the rivers are affected by significant seasonal rainfall during the monsoon season. Both rivers have seasonal and yearly changes in regards to the rivers' hydrologic path and the volume of water within study area. Using Landsat 4 and 5 data, the seasonal (March 2004 and November 2004), yearly (November 2003, November 2004, and November 2005), and 21 Year (November 1989 and November 2010) changes were studied. Multi-date image composites were created to examine the hydrological differences within different time periods using a Normalized Difference Water Index (NDWI), comprised of information recorded in the green and near-infrared regions of the electromagnetic spectrum, to separate land from water. For the yearly and 21 year composites, significant hydrologic path changes are expected to be seen due to the rivers' braided channel characteristic. For the seasonal composite, significant changes in hydrologic volume are expected to be seen due to the frequent flooding from the seasonal monsoon. A major impact of this flooding and yearly change is seen in Bangladesh's production of jute and rice.

Environmental Analysis of Salt Marsh Sediments of Smith Island, Maryland (Poster 63)

Presenting Student: Bradley Musser

Contributing Student: Meredith Johnson

Faculty Mentor: Phillip Allen

Located in the lower Chesapeake Bay, Smith Island (37°58'7"N 76°1'22"W) is characterized by extensive salt marsh wetland environments. Smith Island is frequently subjected to storm systems, which have the ability to impact the salt marsh communities. Storms are significant contributors to coastal erosion and removal of organic cover in and around Smith Island. Soft sediment subsurface cores were taken from the high tide location of the inner salt marshes, close to the settlement of Ewell. The cores achieved a total depth of 155cm below sea level (BSL) and were found to be almost uniform in clay sized sediment composition. Storms that inundate the high tide mark of the salt marsh impact the vegetation communities, leading to deposition of inorganics and collapse of vegetation cover. Variation in organic content with depth represents evidence of low frequency high magnitude storm events. Samples were taken from the cores every 2cm to determine the organic percentage by using the loss on ignition (L.O.I.) method. Initial analysis of the data records a decrease in the percentage of organic matter down core. Provisional interpretation of the data indicates that the inner limits of the salt marsh close to Ewell is too far inland or too sheltered to allow adequate preservation of storm activity in the stratigraphy. This implies that the current salt marshes of Smith Island around Ewell are stable ecosystems that are not easily affected by storm activity. More research must be undertaken on a new site closer to the coast of the island to assess.

Health Issues in Sub-Saharan Africa (Poster 64)

Presenting Student: Alan Tanwi

Faculty Mentor: James Saku

This research examines the key factors that create health and related problems in sub-Saharan Africa. Like many developing regions, sub-Saharan Africa is characterized by numerous health issues. While most developed countries have been able to control and reduce the incidence of communicable diseases, unfortunately, that is not the case in sub-Saharan Africa. Last year's Ebola outbreak in West Africa is an indication as to how vulnerable sub-Saharan Africa is to the outbreak of diseases. Apart from its inability to prevent the occurrence of diseases, the sub-region also lacks the institutional structures and financial resources to control large-scale outbreaks. Several factors, including cultural, social, political, and economic, are primarily responsible for the emergence and spread of diseases in sub-Saharan Africa. Some of the diseases affecting the region include Malaria, Ebola and HIV/AIDS. With the aid of maps, tables, and graphs, the major type of diseases in the sub-Saharan are identified. The trends and regional distribution are discussed. Possible solutions, including stable political systems and economic growth, are the factors identified to resolve health problems in the region.

Information Technology in Sub-Saharan Africa (Poster 73 and Oral Presentation)

Presenting Student: Matthew Kelly

Faculty Mentor: James Saku

Within the past decade, Information Technology (IT) has diffused rapidly to most areas of the developed world. While cellphone, Internet, emails, and social media are part of the daily activities of people living in the developed countries, unfortunately, that is not the case in most developing countries. There is substantial gap in the availability and use of IT between the developed and developing countries. Sub-Saharan Africa is one of the developing regions that has experienced an increase in IT use but still has problems with availability and reliability. While IT has the potential of improving the socio-economic conditions of Sub-Saharan Africans, several factors including political instability, high illiteracy rate, and low income account for problems with availability and use. Since these factors differ among Sub-Saharan African countries, the availability of IT infrastructure and use should also vary. This paper examines the types of IT available in Sub-Saharan Africa and potential differences among countries. The factors responsible for these differences are identified and examined.

Nuclear Power Generation and Thermal Effluent as Viewed Through Landsat (Poster with Display 95)

Presenting Students: Shannon Fife, Joseph Linsalata, Matthew Kelly

Faculty Mentor: Matthew Ramspott

Using data gathered from the Landsat satellite imaging system, thermal signatures of nuclear power plants were examined, showing downstream mixing of heat effluent within the water column. Thermal data was downloaded from the Global Visualization Viewer (GLOVIS) archive of imagery; this can be found through the US Geological Survey web portal. The imagery spans a large time frame, ranging from the early 1990s through 2014 via satellites Landsat 5, 7, and 8. Once the imagery was downloaded from the archive it was then loaded into the ENVI 5.1 software package, where it was processed and analyzed to show the presence or absence of thermal effluent emanating as a point source pollutant from these generating facilities: Fort Calhoun (Blair, NE), Peach Bottom (Delta, PA), and Fukushima Daiichi (Japan). Both coastal generating facilities and facilities located in riparian zones are shown, with the mixing properties of each being noted. Regions where flooding has occurred are also shown with differences in the mixing properties of the thermal effluent discharge being illustrated.

Sediment Characteristics of an Anthropogenic Disturbance Event from a Salt Marsh on Smith Island, Maryland (Poster 74)

Presenting Student: Meredith Johnson

Contributing Student: Bradley Musser

Faculty Mentor: Phillip Allen

Smith Island (37°58'7"N 76°1'22"W), Maryland, located in the lower Chesapeake Bay is characterized by extensive salt marsh wetland environments. During the mid-1980's circa 250 automobiles were buried in one location to reduce potential pollution, via material degradation, to the wetlands environments. The burial site was covered with by a clay "cap" to ensure the petrochemical materials were isolated and to prevent contamination of the environment. Examination and characterization of the anthropogenic sedimentary sequences was undertaken to determine if the clay cap has failed leading to mobility of the petrochemical materials. Sediment was collected via manual subsurface coring; with sediment analysis in the laboratory via loss on ignition and geochemical analysis being undertaken. Initial results indicate the clay cap has not failed, evident by the reduction in organic content with depth and that the anthropogenic disturbance event has had negligible effect on the current sedimentological and geochemical characteristics of the salt marsh. The data suggests that erosion and biological activity is not currently threatening the clay cap, however additional analysis is being undertaken to increase the confidence in the data.

Travel Route Analysis of White-Tailed Deer in Southwest Pennsylvania (Poster 96)

Presenting Student: Bryan Whitmore

Faculty Mentor: Francis Precht

Studies of the daily movements of white-tailed deer (*Odocoileus virginianus*) have been conducted since the early 1960s, yet few have utilized the spatial modeling capabilities of GIS. The GIS-based spatial model developed in this study predicted travel routes that deer would likely follow on a daily basis as they moved between bedding and feeding areas relative to the ridge and valley terrain of southwestern Pennsylvania. Feeding areas were delineated based on cropland as indicated on land use/land cover data for the state of Pennsylvania. Bedding areas were defined as evergreen forest on south facing slopes less than 18° based on previous habitat preference studies. A 1:24,000 scale digital elevation model (DEM) from the USGS for Hyndman, PA was used to compute slope steepness and slope aspect. In addition, the Topographic Relative Moisture Index (TRMI, Weiss, 2001) was computed. Slope steepness and TRMI were added together to create a “friction surface” describing the relative ease/difficulty of movement over the terrain of the study area. Travel routes were then calculated as the “least cost path” of movement over the friction surface between feeding and bedding areas. Known tree stand locations for hunting were included to assist in model validation. The model of daily travel routes for white-tailed deer clearly showed distinct least-cost path travel routes between feeding and bedding areas. Modeled travel routes were validated by observations of hunters using tree stands in the area; tree stands located away from the modeled travel routes (i.e. #5, 7, and 9) resulted in fewer deer sightings. Stands located along the travel routes resulted in significantly more deer sightings. The modeled travel routes developed in this study demonstrated that white-tailed deer select travel routes based primarily on slope steepness, slope aspect, and relative slope position as represented by TRMI in moving between feeding and bedding areas. This study has significant implications in predicting the spatial movement patterns of white-tailed deer. It is likely that a similar approach could be applied to other daily animal movement patterns.

DEPARTMENT OF HISTORY

Commemorating Brownsville on the FSU Campus: A Plan for Design and Interpretation (Poster 32 and Oral Presentation)

Presenting Students: Adam Kriner, Amanda Huddleston, Bobby Weatherly, Caity Felix, Eric Dodson, Madie Wilson, Steven Fernandez

Faculty Mentor: Eleanor McConnell

Brownsville was once a thriving black community in Frostburg. Tamer Brown founded the neighborhood in 1866. The community ran from east to west from Center Street to Beall Street (now the northern end of University Drive) and north to south from the rear of Frostburg State's Old Main to the back of the Compton Science Center. Nearly 240 people resided in Brownsville in 1920. Soon after, almost all the property in Brownsville was purchased by the State of Maryland in order to expand the campus of Normal School #2, now known as Frostburg State University. Today, the history of Brownsville is in danger of being forgotten. With the only building remaining rumored to be demolished within the next couple of years, there will be nothing left of the original neighborhood. We think it is important that knowledge of this community not be lost to history. The students of the Spring 2015 Public History course propose to commemorate Brownsville on the FSU campus to make sure this important part of local history is remembered. We have designed a memorial to be situated in the space along the sidewalk in between Simpson Hall and Allen Hall, once the heart of Brownsville. The design will include four panels centered on each face of the base. One panel will give a brief description of Brownsville's history; the next will display a map of Brownsville; the third will state the purpose of the monument and why it's important not to forget communities like Brownsville; and the last panel will list all the donors to show our appreciation for their contributions. At the top of the base, a circular sculpture will symbolize the transition from Brownsville to Frostburg State University. We are also interested in placing street signs along the sidewalks within the upper quad, where the streets of Brownsville were once located. In our presentation, we will describe the details of our proposal, cite possible sources of funding and support, and ask for input from the FSU community about our plan.

DEPARTMENT OF MASS COMMUNICATION AND COMMUNICATION
STUDIES

**Death as a Bonding Agent – a Rhetorical Analysis of Hillary Clinton’s 9/11
Benghazi Attack Speech (Poster 46)**

Presenting Student: Caitlin Taylor

Faculty Mentor: Brent Kice

Following the September 11, 2012 attack on the American consulate in Benghazi, Libya, Secretary of State Hillary Clinton addressed the American people, ostensibly to commemorate the four American dead. However, conducting a generative rhetorical analysis of Secretary Clinton’s speech revealed an ulterior motive: to rekindle patriotism and garner support for the United States foreign policy efforts abroad using death and mourning as a guise. Clinton attempts to accomplish her goal by appealing to values and emotions, attempting to make the deaths personal, and by linking the Libyan struggles to American ideologies, thus attempting to capitalize on the grief and shock of the American people for political gain. These three strategies – targeting the audience’s values, emotions, and ideologies – can be used outside the political sphere to influence the audience to change a reaction, belief, and/or value.

**Disassociate, Associate, and Attack: A Cluster Criticism Analysis of Malcolm X’s
“Hoodwinked” Speech (Poster 55)**

Presenting Student: Ryan Jones

Faculty Mentor: Brent Kice

This presentation is a rhetorical criticism of Malcolm X’s “Hoodwinked” speech. Cluster criticism is the method applied to this specific speech in order to analyze Malcolm X’s overarching theme. The analysis reveals that Malcolm X used a specific technique of disassociating with a group of people, associating with another group, and then attacking the disassociated group. The analysis suggests that this technique can be applied for successful business/marketing solutions.

President Barack Obama's New State of Mind (Poster 56)

Presenting Student: Alexis Harvey

Faculty Mentor: Brent Kice

In this rhetorical criticism paper, I thoroughly analyze the address given by President Barack Obama entitled "We Will Degrade and Ultimately Destroy ISIL" by using fantasy-theme criticism. This paper identifies President Barack Obama's perspective on his ideal, to destroy evil in order to protect the innocent.

DEPARTMENT OF MATHEMATICS

Possible and Impossible Constructions (Poster with Display 91)

Presenting Student: Michael Shannon

Faculty Mentor: Mark Hughes

Among the longest standing questions in the history of mathematics were problems of geometry. The ancient Greek mathematicians posed several problems including squaring the circle, doubling the volume of a cube, trisecting an angle, and constructing regular polygons. The challenge was to solve these problems using only a straightedge and compass, and no one was able to construct solutions or show that they were impossible. It wasn't until 1798 that a solution to one of these problems was found. Gauss determined which regular polygons were constructible and published it in his book *Disquisitiones Arithmeticae*. His solution paved the way for Pierre Wantzel to show that an arbitrary angle can't be trisected and the volume of a cube can't be doubled with compass and straightedge alone. The last problem, squaring the circle, was solved by Lindemann in 1882. We review and present outlines for each of these famous problems.

The Foundations of Ford Circles (Poster with Display 92)

Presenting Student: Michelle Welch

Faculty Mentor: Mark Hughes

One of the simplest ideas in the realm of mathematics is the concept of fractions. Although fractions are seen by most as an elementary concept, they have been studied and explored by mathematicians who saw them as more than a simple concept. Lester R. Ford Sr. is one such mathematician who investigated the rationals and developed an interesting representation for them using another seemingly simple geometric concept, namely, the circle. Although Ford developed this representation independently in the 1930s, his work relied on older developments in mathematics, specifically the Farey sequence, which is the sequence of all reduced fractions between zero and one having denominators less than or equal to a given positive integer, n . In this project, properties of the Farey sequence and Ford circles themselves are explored as well as how the sequence of fractions and circles are generated. These two concepts have brought mathematical results to the surface, and the visual representation of the circles themselves is remarkable to both the mathematical and artistic mind.

DEPARTMENT OF NURSING

Community Health Assessment (Poster 22)

Presenting Student: Kaylene Gray

Faculty Mentor: Mary Beth McCloud

The Community Health Assessment Survey is a requirement of the Frostburg State University Nursing class NURS 491, Population-Based Nursing Practice. The project is an overall assessment of a community of the student's choice and an identification of the community's health needs and/or problems. Factors that are taken into account for the assessment are demographic, epidemiologic, social, and environmental. After the community's health diagnoses are identified, the nursing student will make recommendations based on Healthy People 2020's recommendations for maximum community health. For this project, I have chosen Bedford County, Pennsylvania. Bedford is located in south-central Pennsylvania. Approximately 49,000 people reside in the county. The community health diagnoses that I will concentrate on for this poster project are increasing access to health care to residents in this rural area, obesity, and diabetes teaching/prevention/management of disease. Diabetes is the leading cause of death for the residents of Bedford Pennsylvania.

DEPARTMENT OF PHILOSOPHY

Getting Over Yourself through Science and Zen (Oral Presentation)

Presenting Student: Paul Rooke

Faculty Mentor: Shoshana Brassfield

The existential problem of mind, of consciousness, and of self is a long standing one in many intellectual disciplines and wisdom traditions. These problems, summarized here as the self-illusion, are analyzed first through the Eastern tradition of Zen and then through modern scientific study. A direct correlation between the two considering the nature of the self is drawn, namely that the self is a kind of emergent property in the brain. It is argued that if the self is an emergent property, then it is an illusion and thus, does not exist. This shift from the intuitive view of self necessarily allows one to trivialize much of human turmoil. Implications of this are overviewed; however, they are far reaching in the human experience. As a practical application of this shift, the topic of procrastination is analyzed and necessarily phased out as a genuine problem for the self. Though the implications outlined may at first glance seem surprising, there is much one can learn in order to still live a fulfilling life.

On the Business of Philosophy (Oral Presentation)

Presenting Student: Timothy W. Nooney

Faculty Mentor: Shoshanna Brassfield

To put things simply, it is my aim to show the reader that the business of philosophy is to generate ever more sophisticated issues. While this may seem like a radical shift from the common conception of philosophy as problem-solving; the problem generating theory of philosophy resolves issues regarding the efficacy of philosophy and its history. To support my thesis, this article shall include a case study on procrastination primarily gained by readings from *The Thief of Time*. This collection of essays features several specialists applying their field and knowledge to the issue of procrastination in order to render the reader better understand, or to perhaps inspire them to begin their own specialized inquiry. This discussion begins by asking the fundamental question of philosophy, why?

DEPARTMENT OF PHYSICS AND ENGINEERING

Apparatus for Measuring Microthermal Seeing atop FSU CCIT Building Proof of Concept (Poster with Display 65, 66, 75, 76)

Presenting Students: W. Michael Prohonic III, Adam J. Witmer-Bosley

Faculty Mentor: Jason Speights

We designed an apparatus for measuring ground-level seeing atop Frostburg State University's Center for Communication and Information Technology (CCIT) building. The measurement of ground-level seeing is important as it classifies and analyzes the turbulent layers of the atmosphere which have a direct impact upon the ability of optical devices to achieve image clarity. The apparatus utilizes two Raspberry Pi micro-processing units programmed to operate MCP9808 temperature sensors. The apparatus capitalizes upon the ideologies used in previous designs but will present an updated design to match the advancements in technology since prior implementation. The unit reads and logs temperature measurements taken at a high frequency (over 100Hz) to the order of sub-degree Celsius and separated by a 1 meter distance vector. From temperature variance and in accordance with the fundamental laws of thermodynamics, the data acquired presents a method to calculate seeing. The mean variance in temperature is used to determine ground-level seeing atop the CCIT building by calculating the refractive index structure function, temperature structure constant, and temperature structure function at ground level. Using previously derived expressions and assuming a Kolmogrov spectrum of atmospheric turbulence the apparatus measures seeing at full width half-maximum. This apparatus is a proof of concept and is successful. Ultimately, this project will be used to optimize the seeing and capabilities of the telescope in the observatory atop CCIT. In the future, this apparatus will be utilized as a multi-generational project for full implementation of sensor arrays over a varying height. Future iterations will capitalize on the work completed in this project and develop a temperature structure function as a function of height and successfully optimize the position and seeing of the telescope.

Assisted Weight Bench (Poster with Display 101, 102)

Presenting Students: Hillary Liedy, Xavier Paschall, Luke Burke, Zach Nalepa

Faculty Mentors: Craig Wilson, Eric Moore

As strength training becomes more popular, many are beginning to turn to free weights, rather than machines, in order to develop physical strength. Although free weights provide more health benefits than machine weights, they are also more dangerous. According to the NY Times, nearly a million Americans ended up in the emergency room due to weight-training injuries from 1990-2007, with more than 90% of the injuries due to free weights. One of the most dangerous free weighted exercises includes the barbell bench press. The bench press does not have many built-in safety products or precautions, with safety bars as one of the most popular safety products. The bench is placed inside a power rack, which has notches for the safety bars to attach and adjust the height for each lifter. The notches in safety racks are spaced out, so the ideal height for the safety bars may be between notches for some lifters. If the safety bar is higher than the lifter's chest, the lifter can't practice proper form, or have the full range of motion, because the barbell will hit the safety bar before touching the chest. In order to gain maximum benefits from exercise, proper form is essential. However, if the safety bars are placed below the chest, the safety feature is inadequate. If the user cannot properly finish the rep, the weight will then fall back on the chest instead of the safety bar, causing the lifter to be trapped or injured by the heavy weights. The goal for the project was to design a bench that would lower the lifter if he or she becomes pinned by the heavy weight. By using a lowering bench in coordination with safety bars placed below the chest, the barbell load will be placed on the safety bars after lowering the bench, rather than the lifter. The design also allows the lifter to have free range of motion and to use "free weights" rather than a machine in order to gain the maximum benefits from the exercise.

Capacitor Battery Hybrid Power Source (Poster 48)

Presenting Students: James Ratino, Montel Johnson, Sean Green

Faculty Mentor: Oguz Soysal

The goal of the project is to increase the run time of current electric vehicles by incorporating a capacitor bank. To test this we are using a scaled down model on an RC car and hybridizing the power source. By incorporating the Capacitor bank to the power delivery we are attempting to supplement the power delivered by the battery with a system capable of producing high amps, thus decreasing the load on the battery. This decreased load will allow for longer run times, as well as increase the overall life of the battery. To test this we measured the run time of the battery and the capacitor bank separately. Then we began testing the hybrid power source to get our new run times. This far we have been able to improve the runtime of the RC car by a longer period of time then the run time of a stand-alone bank of capacitors.

First Light at the FSU Observatory (Poster with Display 97)

Presenting Students: Dustin Ullery, Paul Rooke, Tyler Ram

Faculty Mentors: Jason Speights, Robert Doyle

Frostburg State University has a new observatory in connection with the Multimedia Learning Center which houses a 14 inch diameter Cassegrain Reflector telescope. This telescope sits atop the Center for Communications and Information Technology on a robotically controlled mounting system. Our project was to create a proof of concept portfolio of images to better gauge the capabilities of this system. While working towards this goal, several problems of collimation and Northern alignment were discovered and overcome. The poster presented showcases some of the images obtained ranging from planetary bodies to extragalactic objects.

JourneyMEN CubeSat Power System (Poster with Display 98)

Presenting Students: Nicholas Bowers, Edward Dorsey

Contributing Students: Michael Langlois, James Wise

Faculty Mentor: Marjorie Rawhouser

A group of students from FSU's satellite campus at Arundel Mills in Hanover, MD have been working with engineers from NASA Goddard Space Flight Center to design an electrical power system (EPS) and Power Distribution (PD) for a CubeSat. CubeSat's are very small-scale satellites, as small as 10 cm x 10 cm x 10 cm cubes, which provide a means for universities and companies alike to perform scientific research at a fraction of the cost of traditional satellites. The failure of many CubeSat satellites can be linked to issues within the onboard EPS and PD circuitry. Power requirements were provided by NASA engineers, an output power supply of +3.3 volts at 1 amp, +5 volts at 1 amp, and \pm 12 volts at 50 milliamps. By using solar panels on the exterior of the CubeSat and an onboard battery system, power will be supplied to the spacecraft during its sun-synchronous orbit around the Earth. The EPS and PD designs were simulated using electrical circuit simulation software. The next step will be to prototype the circuitry and perform tests to characterize the students design.

PAWS Usability Test (Poster 47 and Oral Presentation)

Presenting Students: Brooke Macklin, Matthew Sams, Pernell Parents, Sophie Davies

Contributing Students: Collis Walker, Corey Jones

Faculty Mentor: Oluwadamilola Gbenro

This project involved testing the usability of PAWS System which is the primary tool used in Frostburg State University to provide a wide variety of services. Some of the tasks include keeping track of all academic transactions such as requirements, planners, courses, schedules and transcripts/grades. Along with academics, all billing for the institution is performed on the interface. Personal information such as demographics, permanent address, and emergency contact information is securely stored for each student on PAWS. The PAWS management system is built on PeopleSoft software by Oracle Corporation. Many students have expressed their difficulties in navigating through the PAWS interface; this may be due to the large amount of tasks that can be accomplished with PAWS, this observation has led to the following objectives for the Usability study:

- To observe 10 users perform different tasks on PAWS
- To observe and take note of difficulties users may face in their task
- To analyze the usability of the interface and the design to understand how useable the PAWS interface is to the users
- To keep a list of changes or recommendations each user has for using the PAWS interface

These objectives will help us to know how accessible or inaccessible PAWS is in general and if the design of the interface is usable or should be altered to fit the needs of the different pool of users in our study.

Project Excalibur, a Better Approach to the Multi-tool (Poster with Display 99)

Presenting Students: Joseph Clements, Justus Peterson

Faculty Mentor: Craig Wilson

Have you ever desired the benefits of an array of tools, but without the inconveniences associated with carrying each tool separately? Project Excalibur confronts these inconveniences by combining the benefits of each tool without decreasing quality. In order to achieve this goal, we analyzed the qualities of each common, everyday carry tool: a knife, a multi-tool, and a flashlight. Using information from a survey completed by handymen around the nation, as well as personal preference, we were able to determine the best and worst qualities associated with each tool. A knife's best characteristic is its simplicity, but it is also its worst characteristic as that is all it is. A multi-tool's best characteristics its broad range of use, but with that comes the disadvantage of a bulky, cumbersome tool. A flashlight's best characteristic is its unique ability to provide adequate lighting for everyday tasks, but that is its only use. Project Excalibur draws on the simplicity of a knife, with the addition of the most desired tools of a multi-tool, as well as the convenience of a flashlight.

Redesign and Reconstruction of a 17.7" inch Reflector Telescope (Poster with Display 57, 58)

Presenting Students: Michael Miklewski, Zach Wolodkin

Faculty Mentor: Robert Doyle

A large portable reflector telescope at Frostburg State University is beneficial for potential education and research. The University owned a 17.5" reflector telescope that was in a state of disrepair and difficult to transport. A new design was made utilizing parts from the existing telescope to make a modern telescope. The modern telescope was designed to be easily transported. The main body of the telescope was constructed with 6061 aluminum to keep the telescope light while still being strong. The telescope has a modular design to make transportation easier. This telescope is ideal for viewing deep space objects including star clusters, nebulae, and galaxies. It can also view objects within our solar system. The telescope will be an asset to Frostburg State University and the community. It is a potential educational tool for individuals from the elementary level to post graduate.

Superconductivity Team (Poster with Display 100)

Presenting Students: Aaron Needy, Brandon Kesselring

Faculty Mentors: Hang Deng-Luzader, Gregory Latta

Completely understanding all aspects of superconductivity will be an imperative breakthrough in the electrical industry as well as the mechanical industry. We are trying to get a better understanding of how and why superconductive conditions behave in certain materials. Many companies are researching various materials to find a room temperature superconductor. With a room temperature superconductor there will be no electrical loss due to resistive heat which will enable electrical systems to be 100% efficient. We are experimenting with $\text{YBa}_2\text{Cu}_3\text{O}_7$ to research its superconductive properties to grasp a better understanding of superconductive materials. Superconductive materials have a critical temperature, which allows the material to become a superconductor when its temperature decreases below its critical temperature. At a material's superconductive point there is no electrical resistance which means there is no electrical loss. Also when a superconductor reaches superconductivity it will levitate above and below a magnet due to a diamagnetic phenomenon, explained by the Meissner effect, which will have zero friction when moving along the magnet. This is a crucial breakthrough in the mechanical industry because there will not be any losing of energy through frictional heat. From our experiment we will be able to make a plot of Resistivity vs. Temperature to show the $\text{YBa}_2\text{Cu}_3\text{O}_7$'s critical point as well as the zero resistance phenomena. We will also show the diamagnetic phenomenon when the superconductor reaches superconductivity by levitating the superconductive material above and below a magnetic strip.

Temperature Sensing Circuit Design (Poster with Display 67, 68, 77, 78)

Presenting Student: Matthew H Riley

Faculty Mentor: Wudyalew Wondmagegn

In this project, a sensor circuit was designed to sense the temperature of a system and generate a sensing signal to control the temperature. The circuit was designed based on a negative temperature coefficient (NTC) thermistor incorporated in a bridge circuit configuration. First the equation for the relationship between the temperature and the resistance across the thermistor was developed based on measured data. Then, the circuit was interfaced with the computer using National Instrument's data acquisition unit. Lab VIEW software was used for automatic data collection from a water beaker with temperature variation from 0 to 70 C. The error signal was then successfully generated based on given reference temperature. The error voltage could be used as a control signal to control the temperature of the system. The poster showcases the designed circuit, voltage vs. temperature equation, measured data, and analysis of results.

DEPARTMENT OF POLITICAL SCIENCE

Waiting to Exhale: Singlehood, Self-Efficacy, and Depression in Black Women (Oral Presentation)

Presenting Student: Janet Adesina

Faculty Mentors: Stephen Hartlaub, Timothy Magrath

This paper investigates the implications of how one's perception of the permanence of singlehood could affect mental health outcomes of middle class black women and the importance of self-efficacy in the alleviation of anxiety in black women. The theories grounding this work are intersectionality, which postulates that the different intersections of oppression affect lives in myriad ways; critical race theory, which is a critical examination of society and culture with race as a focus; and social stratification theory, which explains how hierarchies come about and how resources are clustered at the upper end of the group. In recent years, the number of Black Single and Living Alone (SALA) households has reached a quarter of the demographic with black women making up a significant number of this population. This paper therefore posits that black women who display higher rates of self-efficacy as well as valuing confidence in others are also less likely to display elevated rates of anxiety and depression. The data for this research were collected from interviews and surveys and were augmented with articles and books.

DEPARTMENT OF PSYCHOLOGY

Analysis of Cues Used by Cotton-Top Tamarins (*Saguinus oedipus*) in Solving a Matching Task (Poster with Display 87)

Presenting Students: Tyler Meiners, Cristina Weiner

Contributing Student: Eileen Peterman

Faculty Mentor: Erica Kennedy

Relational reasoning is the ability to identify and compare relationships between objects and has been observed in many primates in previous experiments. The purpose of our experiment was to see if our colony of Cotton-Top Tamarins could demonstrate relational understanding in a match-to-sample task. Twenty plastic cups served as stimuli, each with 4 foam shapes affixed to the outside of each cup. Ten of the cups featured 4 of the same shape and the same color (the “sameness” category), 10 of the cups featured 4 different shapes of different colors (the “difference” category). None of the cups were identical but fell into one of the two categories of “sameness” or “difference”. The Tamarins would, given the choice of one “sameness” cup and one “difference” cup, attempt to match it to the experimenter’s cup sharing the same relation. If the Tamarins are capable of relational reasoning, it was predicted that they would use relational cues in order to solve this matching task in order to find hidden food. The data was analyzed by recording the total number of successes versus failures and by examining possible strategies the Tamarins were using to make their selections. If the Tamarins were demonstrating relational understanding, they should have been able to use a relational rule in order to choose the correct hiding location at levels above chance. The total number of left-hand choices versus right-hand choices was also analyzed in order to determine the possibility of a side bias.

Creative Positive Attitudes to Benefit General Psychology Students: The Effects of a Gratitude Journal Assignment on Student Outcomes of Gratitude and Well-Being (Oral Presentation)

Presenting Students: Amanda L. Clay, Lucia B. Peña

Faculty Mentor: Megan Bradley

Undergraduate students (N=608) enrolled in General Psychology in Fall 2014 and Spring 2015 participated in a study examining if expressing gratitude statements in a weekly journal could improve feelings of gratitude and other areas of well-being. Participants completed an initial survey measuring baseline gratitude and other outcome areas of well-being. Afterward, participants completed five gratitude statements in a four-week time span and completed a post-survey about their experience. It was hypothesized that students' level of gratitude and overall well-being would increase after completing the four weekly gratitude journals. Results from Spring 2015 semester are forthcoming. Previous results from Fall 2014 semester results indicated that a gratitude assignment used in positive psychology research appears to be beneficial to General Psychology students.

Examination of Image Preferences in Cotton-Top Tamarins (*Saguinus oedipus*) (Poster with Display 88)

Presenting Students: Dominique Davis, Rachel Klahre, Sakkara Turner

Faculty Mentor: Erica Kennedy

Although there has been some research concerning the cognitive abilities of Cotton-Top Tamarins, little research has been done concerning their perception of 2-D photographs. This experiment investigated tamarins' ability to recognize themselves and their mates. We measured looking time and monitored behavioral signs of alarm, aggression, and affiliation in order to gauge their ability to differentiate between a picture of their mate, a novel tamarin, and themselves. There were multiple single photo exposure trials lasting 5 minutes for each enclosure and pair of tamarins. Video recordings were reviewed to confirm the looking time and behavioral cues that were recorded. We hypothesized that the tamarins would react to the photos, with higher recognition rates in the photos of their mates due to exposure.

Examining the Effectiveness of Water as Enrichment for Cotton-Top Tamarins (*Saguinus oedipus*) (Poster with Display 89)

Presenting Student: Kathryn Bell

Faculty Mentors: Erica Kennedy, Thomas Lambert

The purpose of this experiment was to see if a novel item would provide effective enrichment for a colony of Cotton-Top Tamarins. A small tub of water with toys inside was presented to the tamarins in order to serve as enrichment. These tamarins are not routinely presented with bodies of water, so the results would show if they are interested or cautious of the novel item. Each pair of tamarins was given different toys in a plastic pan of water for 10 minutes per trial. In order to determine the effectiveness of this enrichment item, actions observed included approaches to the container, touches of the container or toy, and the amount and time interacting with a toy. The toys had different characteristics such as size, color, realistic features, and buoyancy. These characteristics were analyzed to determine if one was more interesting than another for the tamarins. The actions were recorded for each tamarin in order to determine if there were any sex differences in their interactions. Approach time was also recorded for each tamarin to determine how long it took to demonstrate interest in the enrichment item. It was predicted that if the tamarins' approaches, touches, and overall interest increase over time, then the novel item was successful as enrichment.

How Can Your Critical Thinking Skills Be Both Worse and Better Than Average? (Poster 1)

Presenting Student: Cristina Weiner

Contributing Student: Crystal Rainey

Faculty Mentor: D. Alan Bensley

The purpose of our study was to examine the better than average (BTA) and the worse than average (WTA) effects in the context of critical thinking (CT) dispositions and skills. Studies have shown the BTA effect on easier tasks and the WTA effect on harder tasks, involving subjective ratings of desirable traits (Larrick, Burson & Soll, 2005; Moore & Small, 2007). A person must possess certain metacognitive skills to accurately monitor one's own critical thinking abilities (Bensley, 2011; Halpern, 1998). The BTA and WTA effects have not both been studied in a CT context. We expected: 1) the BTA effect on an easy, subjective rating of open-mindedness, a CT disposition and 2) the WTA effect on a more challenging research analysis test, measuring CT skill. Method: We tested 25 students in a research methods (RM) class ($M = 19.8$ years, $SD = 1.4$) at the start of the semester. To assess CT skill, students completed a 20-item, RM multiple-choice test. Then students estimated their score out of 20 and then the score of the average student in their class. To assess their CT dispositions, students completed other measures, including the Openness to Ideas subscale of the NEO Personality Inventory (Costa & McCrae, 1992). After completing that, students rated how open-minded they are and how open-minded is the average student in their class on a 5-point scale (1 = not at all to 5 = extremely). The order of the measures was counterbalanced. Results and Discussion: Because the scores were both skewed and resisted appropriate transformation, we ran a Wilcoxon signed-ranks test on each set of scores. The results showed that students estimated their own scores to be WTA on a challenging, research methods analysis test but BTA on subjective ratings of open-mindedness as predicted.

Touchscreen Training in Cotton-Top Tamarins (*Saguinus oedipus*) (Poster with Display 90)

Presenting Students: Kristofer Ervin, Sarah Pesj, Shane Sours

Contributing Students: Johnathan Tripp, Seyed Raoofi

Faculty Mentors: Erica Kennedy, Steven Kennedy

Cotton-top tamarins (*Saguinus oedipus*) were trained to use a touchscreen in order to test their ability to accurately touch a target item. The tamarins were presented with circles of varying sizes on the touchscreen and were trained to touch inside the circle. To introduce the Tamarins to the touchscreen, it was placed in the enclosure and they were allowed time to acclimate to it and interact with it. They were positively reinforced with a clicker followed by a food reward for interacting with the touchscreen for the duration of the training period. Once the training was complete, the program was introduced to the tamarins, who were then asked to touch the circle that appeared on the screen, and were positively reinforced for doing so with a clicker sound followed by a food reward. Each tamarin could complete a total of 10 timed trials per testing session. Testing was stopped if the tamarin failed to complete two trials in a row with five minutes maximum allocated per trial. Data was collected to determine accuracy of touchscreen use and the time needed to complete each trial.

DEPARTMENT OF SOCIAL WORK

How Class Attendance Influences Grades: An Exploratory Single System Design (Poster 21)

Presenting Student: Diamond Cannon

Faculty Mentor: Terry Russell

Over the course of a semester, a single system design was conducted on a social work student. The design explored the relationship between class participation and weekly quiz scores. The design also explored different participation factors that could contribute to passing or failing a weekly quiz. Some of the factors included attendance in class, reading the required textbook, study habits, crises during the semester, or anything else that would take time away from class. The treatment used in this study was measured by the students' participation in class and how well she read the required textbook before beginning the weekly quiz. The outcome was measured by the students' quiz scores. A visually significant pattern of association was found between class participation and weekly quiz scores. The pattern indicates that class participation improves quiz performance.

DEPARTMENT OF VISUAL ARTS

Luminous Forms (Display 41, 42, 51, 52)

Presenting Student: Marco Alvarez

Faculty Mentors: Robert Hein, Harlow Hodges, Travis English

The camera is the most powerful tool that anyone can use to convey and express the intricate passage of time. Through the combination of unrelated themes and unfamiliar forms, I construct surreal and elegant analogies. My works feature coincidental, accidental and unexpected connections, creating a diverse language that allows communication with a global audience. I depict and fabricate moments that exist to elevate the human drama in order to question our existence and to find a forgotten poetic meaning in everyday life. The main goal to any of my works is to capture the viewer; many people in our society never stop to contemplate the moment, treating life as a collection of transient situations. Once captured by my images the viewer is forced to analyze indescribable forms that do not follow anticipated norms; thus they are incited to make personal associations of the unfamiliar content.

Violence (Display 61, 62, 71, 72)

Presenting Student: Jessica Woods

Contributing Student: Antonio Simms

Faculty Mentors: Dustin Davis, Judith Dieruf

I am a freshman art major with a focus on sculpture and painting. I do mostly performance artwork using makeup to create pieces ranging from living, 3-D paintings, to fantasy creatures, to gore. The two pieces I am submitting are both unedited photographs of makeup that I did on myself and had Antonio Simms, a fellow freshman art major, photograph for me. I was inspired by the way we view violence in our culture. I wanted to juxtapose the romance and beauty of flowers with shocking gore to shed a new light on how we see gore.

HONOR'S PROGRAM

Art and Aesthetics at the September 11 Museum (Oral Presentation)

Presenting Student: Bridget Willingham

Faculty Mentor: Gregory Wood

This paper examines the intersections of art and politics at the 9/11 Museum in New York City, illustrating how designers and artists frequently struggled to address political debates that shaped the development of various exhibits at the museum site.

Broadway Responds to the September 11 Tragedy (Oral Presentation)

Presenting Student: Kim Lartz

Faculty Mentor: Gregory Wood

In the aftermath of September 11, Broadway producers and performers worked hard to help New Yorkers and the nation to heal. They dimmed their famous bright lights in solidarity, opened their doors to new patrons, and produced dramas that commented upon the September 11 tragedy.

The Culture of Clothing at Frostburg State College (Oral Presentation)

Presenting Student: Gabi Daniels

Faculty Mentor: Gregory Wood

For women and men of the early 1960s, campus officials regularly stipulated what they could and could not wear to classes and to campus social functions. This paper examines why and how these rules began to crumble as the decade of the 1960s unfolded.

The Culture of Security at the September 11 Museum (Oral Presentation)

Presenting Student: David Harper

Faculty Mentor: Gregory Wood

This paper explores the development of security procedures at the 9/11 Museum in New York, and how these procedures both build upon, and expand, the new culture of security in the United States after the September 11 attacks.

The Draft and the Vietnam War on the Frostburg State Campus (Oral Presentation)

Presenting Student: Claire Lauder

Faculty Mentor: Gregory Wood

Few events stoked as much controversy on college campuses as the Vietnam War. At Frostburg State, students were actively and critically engaged with what was one of the most debated topics in the long history of the campus.

The Gender Politics of Women's Fashions at FSC (Oral Presentation)

Presenting Student: Ashleigh Eisentrout

Faculty Mentor: Gregory Wood

During the 1960s, women's clothing became a battleground in what were the earliest years of America's culture wars. At Frostburg, women pressed for the liberalization of the campus's clothing policies, making fashion a more comfortable fit for women at college.

The King of LSD Takes a Trip to Frostburg State College (Oral Presentation)

Presenting Student: Jessica Smith

Faculty Mentor: Gregory Wood

In 1967, Dr. Timothy Leary of Harvard University – an early proponent of the recreational use of hallucinogenic drugs – visited the Frostburg State campus, stoking a significant debate among students about the changing role of drugs in American culture.

“Unless You're Free”: Free Speech at Frostburg State College in the 1960s (Oral Presentation)

Presenting Student: James Kirk

Faculty Mentor: Gregory Wood

Utilizing sources such as student newspapers and university policy statements in the Special Collections library at Frostburg State, this paper examines the social and political dimensions of the liberalization of campus free speech policies during the 1960s.

CLAS Undergraduate Research Working Group

Karen Keller, Biology (Chair)
Phillip Allen, Geography
Matthew Crawford, Chemistry
Judith Dieruf, Visual Arts
Justin Dunmyer, Mathematics
Robert Hein, Visual Arts
Mark Hughes, Mathematics
Erica Kennedy, Psychology
Brent Kice, Communication Studies
Jean-Marie Makang, Philosophy
Eleanor McConnell, History
Jill Morris, English
Benjamin Norris, Chemistry
Xunyu Pan, Computer Science and Information Technologies
Terry Russell, Social Work
Rebekah Taylor, Biology
Catherine Vrentas, Biology

William Childs, Provost (Opening Remarks)

Joseph Hoffman, Dean of the College of Liberal Arts and Sciences
Linda Steele, Program Specialist, CLAS
Cindy Troutman, Executive Administrative Assistant, CLAS
Lynn Ketterman, Liz Nelson, and Shannon Gribble, University Advancement

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