



26TH ANNUAL

student
engagement
forum

RADFORD
UNIVERSITY

APRIL 18-20, 2017

Student Engagement Forum Coordinators

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Jeremy Mobley, Scholar Citizen Initiative

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Radford University Printing Services

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About the Cover Art

The cover art is the creation of Ellen Veith, a third-year Graphic Design major at Radford University specializing in publication design and brush lettering.

There are thousands of students here at Radford University, and we continue to grow almost every year. It's no surprise that we all are vastly different from one another. Each having our own plan and direction, we still are a unified student body working toward the same common goal of success within our different fields. Such is the motive of this year's cover for the Student Engagement Forum. An array of different shapes with different sizes and colors are all placed in a unique fashion to create a cohesive whole. Something to remind us that no matter what path we take in our time at school, or even after, we are all connected by our motivation for higher learning and love for what we do.

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Welcome!

It is my great pleasure and privilege to welcome you to the 26th Annual Student Engagement Forum! The Student Engagement Forum showcases the highest levels of academic achievement and creation of new knowledge at Radford University through our campus community's undergraduate and graduate students' creative works, scholarship and research. The displayed work represents a tremendous undertaking, often involving teams of students and faculty, to make progress on answering important questions for society, such as, how to preserve oral histories, how can we help those with depression, how can we remove pollutants from water, and so many more you must read through this thick program or better yet wander room to room for the next 48 hours to see them all!

Although what you hear and see represents countless hours of work, it is only the tip of the iceberg. The ancient philosopher Seneca, when musing on the future of discovery wrote, "The time will come when diligent research over long periods will bring to light things which now lie hidden." This light of knowledge truly only comes through those long periods of time which requires great perseverance, belief, and support. I want to publicly thank all presenters for staying the course and everyone who has sparked or encouraged the needed curiosity to get started; said a supporting word or offered a shoulder to lean, or even cry on, when the inevitable challenges of conducting relevant research arose.

Much like these research projects, organizing the Student Engagement Forum is a team effort. Colin Powell noted that "There are no secrets to success. It is the result of hard work, and learning from failure." The success of this year's forum is due to the preparation and hard work put in by Katelynne Sims and Jessica Mundy. Thank you to Sally Cox and her team in Student Events, as well as David Horton and CSAT Dean's Office, and Kerie Benson in the CHBS Dean's Office, as they are easy and fantastic to work with in reserving and setting up all the rooms used for this event. I want to thank Ellen Veith from Dr. John O'Connor's graphic design class for creating an engaging cover. Mary Hagan and Kara Daniel need to be publicly applauded for helping to keep OURS running while time and energy were diverted this past month toward forum preparations. Lastly, I would like to thank Radford University for trusting me with this job, Dr. Jeanne Mekolichick for being an advocate for OURS, the Forum, and experiential learning across campus. And of course, I need to thank everyone I have had the extreme pleasure to help support this past year. You make it easy to come to work each day!

Enjoy the celebration of new knowledge and I hope to see you all next year for the 27th version of the Student Engagement Forum!

Dr. Joe Wirgau
Director, Office of Undergraduate Research & Scholarship (OURS)

April 14th SCI Performance

Off-balance

Grace Smiley

Faculty Mentor(s): danah bella Laura Gruss
Performance 7:30-8:30pm Peters B112

"Off-balance" is a dance performance that expands the use of choreography and blends together research and movement. Blending the two majors of Dance and Biology, Grace desires to reach a wider audience and display the connection between science and art. Through the guidance of danah bella, chair of the dance department, and Dr. Gruss, assistant professor in the Biology department, the evening of dance and research aims to portray the off-balances in bio-mechanics and the off-balances in social life. Through a presentation of research, the audience will get an analytical depiction of the way the body moves in dance, and through performance the audience will be encouraged to see that off-balances are not only analytical, but are a part of our daily lives and journeys. This student engagement forum will be a presentation of the research and selected video of the show. Since this presentation is after the show itself, it will take on a reflective role to display what Grace has learned in the process and ways she desires to continue with her research.

Off-balance
Senior Honors Capstone Performance and
Research Project

April 14th, 2017
7:30pm
Albig Studio Theatre
Peters Hall B112
Free Admission

For more information contact
Grace Smiley at dsmiley2@radford.edu

SCHOLAR CITIZEN
RADFORD UNIVERSITY
Department of Dance
Department of Biology

Picture: Allie Richter

Honors Capstone Showcase

Opening Remarks by Dr. Niels Christensen and Dr. Jason Davis

Honors Capstone Showcase 3:10-3:20pm CHBS 3002

Pass or Fail: A Public Value Analysis of the Federal Appeals Court Decision in O'Bannon v. NCAA

Evan Reid

Faculty Mentor(s): Reginald Shareef

Honors Capstone Showcase 3:20-3:40pm CHBS 3002

This presentation utilizes Public Management's Public Value framework to analyze whether a "public failure" occurred in the Federal Appeals court ruling in O'Bannon v. NCAA. O'Bannon argued that an antitrust violation occurred when the NCAA licensed his image for use in a sports video game after his graduation without compensating him. The NCAA's argument contended that it retained control over O'Bannon's likeness "in perpetuity." The Court of Appeals found an anti-trust violation had occurred and awarded O'Bannon damages. Public Failure occurs when people are victimized or dehumanized by non-normative economic markets. I also discuss the future of the "pay for play" issue from the market efficiency/public failure construct.

Brand Personality Study

Kalise Wright

Faculty Mentor(s): Ferrel Doss

Honors Capstone Showcase 3:40-4:00pm CHBS 3002

My capstone project is a study of fashion advertisements from different brands to learn about brand advertisement personality. Every advertisement has a personality and the categories I am focusing on are factual, educational, emotional, and humorous. I am looking at the personality of different ads from many fashion companies to study how people perceive the different ad types and also discover if there is a particular ad personality type that tends to be more effective or influential than the others.

Democratic Socialism: The Heir to Progressivism

John Kelly

Faculty Mentor(s): Matthew Oyos

Honors Capstone Showcase 4:00-4:20pm CHBS 3002

The 2016 Presidential Election saw the reemergence of progressivism in mainstream American politics largely as a result of Senator Bernie Sander's popular campaign for the Democratic nomination. Sanders is a member of the Congressional Progressive Caucus, draws much of his political philosophy from progressives like Theodore Roosevelt, and ran his campaign on the idea of economic reform for the middle class by breaking up the wealth of large companies and Wall Street. Progressivism informed much of Sanders's platform, but he described his political philosophy as democratic socialism. Sanders's campaign brought attention to democratic socialism, but also raised the questions what is the difference between progressivism and democratic socialism? In this body of research, historical analysis of primary and secondary sources regarding progressive politicians of the early 20th century is compared to the work of Sander's political career and his 2016 campaign material in order to establish the relationship between progressivism and democratic socialism.

Honors Capstone Showcase

Exploring the Effects of Increased and Decreased Levels of Juvenile Hormone on Sociality within Spiders

Skyler Carrell

Faculty Mentor(s): Jason Davis
Honors Capstone Showcase 4:20-4:40pm CHBS 3002

Sociality in spiders is an elaborate and multidimensional scale. Over the course of the year, we have been asking what chemical mechanisms regulate this complex behavioral set. Juvenile hormone (JH) regulates growth, specifically maintaining and promoting juvenile characteristics. Therefore, if JH encourages juvenile characteristics and juvenile spiders cluster, increasing levels of JH may encourage higher sociability. However, after treating adult orb-weaver spiders with JH, we found the opposite; those given the treatment maintained increased distance compared to the control. Given this, we will test JH's presence and absence on juvenile spiders and the terrestrial wolf spider for comparison. By exploring this aspect, we see how sociality varies through different life stages as well as variation in other species. We predict that the induced levels of JH will encourage density tolerance in the juvenile spiders while decreasing the level JH will result in an increase dispersion between spiders. In regards to the wolf spiders we predict they will increase in dispersion, compared to the control, as JH levels are induced, similar reaction to the orb weaver. As JH is reduced in wolf spiders' sociality will not change in comparison to the control.

Comparing Korean and English

Krista Cowan

Faculty Mentor(s): Boyoung Park
Honors Capstone Showcase 4:40-5:00pm CHBS 3002

My capstone project is about the Korean and English languages. More specifically, the similarities and differences between teaching and learning Korean and English as second languages. With this project, I explore and compare aspects of both languages, such as writing system, grammar, and sentence structure. I also discuss my own perceptions of each language's "ease of learning," which is partially based on my own experiences with independently learning Korean.

Honors Capstone Showcase

Safety and Stigma of Menstrual Suppression via Continuous Use of Oral Contraceptives

Carly Stevens

Faculty Mentor(s): Sara O'Brien
Honors Capstone Showcase 5:00-6:00pm CHBS 3rd Floor Lobby

Combined oral contraceptives (COC), commonly known as “The Pill”, are used for various medical purposes in addition to preventing pregnancy such as: menorrhagia (heavy periods), dysmenorrhea (painful periods), and endometriosis. COCs work by releasing hormones (estradiol and progestin) that inhibit ovulation, therefore suppressing menstruation. Cyclic COCs have a hormone-free interval (HFI) during which women take “sugar pills” and get their period every month. If taken continuously (no HFI), monophasic COCs can have the effect of therapeutic amenorrhea (absence of menstruation). In the US, over a quarter of all women using contraception pick the Pill as their preferred method (CDC, 2015). Surveys consistently show that the majority of women would prefer to decrease the length and frequency of menstruation, however, only a mere 2.5% of COC users in the US are prescribed a continuous regimen (Nappi, Kaunitz, & Bitzer, 2016). Why is this method not discussed and recommended to patients more often? To investigate this question, I will explore the safety and stigma behind menstrual suppression via the continuous use of oral contraceptives in a review paper. Long-term effects of continuous COC methods have not been studied beyond two years, but due to the extensive body of data on cyclic methods, scientists can extrapolate data to justify the efficacy and safety of using a continuous method of COC. By examining the history, awareness/education, and attitudes of menstrual suppression, I can begin to analyze how society has shaped the reproductive health of women and how it will influence the future of menstruation.

The Relationship Between ACL Injury Risk and Plyometric Training

Hannah Duff

Faculty Mentor(s): J.P. Barfield
Honors Capstone Showcase 5:00-6:00pm CHBS 3rd Floor Lobby

A growing amount of evidence indicates that lower extremity plyometric training may prevent first time, non-contact ACL injuries (Alentorn-Geli et al., 2009). Purpose. Because the risk of non-contact ACL injuries are higher in females than males, the purpose of this investigation is to study the effect of plyometric training on ACL injury risk in females. Methods. Thirty female middle- and high-school soccer players were recruited from an off-season training program. Player assent and guardian consent were required for participation following IRB approval. Baseline ACL injury risk was assessed through the Landing Error Scoring Scale, evaluated through motion capture software on an iPad, during a drop-landing test. Specifically, vector lines were drawn directly onto the software by the researcher for each drop landing and joint/limb angles during the landing were measured to assess ACL risk. Three drop landing scores were collected at baseline with the best score being used for analysis. Participants completed a six-week plyometric training program between the pre-test and the post-test. Training was administered twice per week, 35 minutes each session, and included a dynamic warm-up and plyometric exercises. Exercises included jumps in place, standing jumps, multiple hops and jumps, box drills, and depth jumps. Training volume will consist of 80-100, 100-120, and 120-140 jumps per session during weeks 1-2, 3-4, and 5-6, respectively. A repeated measures t-test was used to determine if Landing Error Score changes significantly from pre- to post-test. Results: Error score decreased from 6.06 to 4.82 from pre-test to post-test, and this decrease was significant ($p < .01$). Overall, 65% (11/17) of participants improved their score from pre-test to post-test and 40% (4/10) improved their score from at risk to not at risk. Discussion. Plyometric training helped to reduce ACL injury risk in a field of high school soccer players.

Honors Capstone Showcase

The effects of human interaction on corticotrophin-releasing factor in the hypothalamus of adolescent rats

Audra VanDerwerker

Emily Hilton

Kendra Stansak

Faculty Mentor(s):

Dayna Hayes

Honors Capstone Showcase

5:00-6:00pm

CHBS 3rd Floor Lobby

Corticotrophin Releasing Factor (CRF) is a primary component of the Hypothalamic-Pituitary Adrenal (HPA) axis. CRF is released from the hypothalamus in both animals and humans as part of an adaptive response to stressful situations. Importantly, interaction with human researchers in animal paradigms could be particularly stressful for animals though this component is not typically studied. Thus, stress is an often-overlooked potential confounding variable in almost all experimental studies. This project then examines the role of differential handling techniques during research studies and the influence that interaction has on brain stress levels. To that end, 28 adolescent female Sprague Dawley rats were used in this experiment. The subjects were randomly assigned to one of four conditions: (1) tickled, (2) playful, (3) restraint, and (4) control. Objectives of the study were met by analyzing CRF immunoreactivity in the paraventricular nucleus of the hypothalamus using an immunohistochemistry protocol. Pilot studies to determine the appropriate working concentration of primary antibody were conducted and then subsequent tissue was batch stained to visualize CRF. Immunoreactivity was quantified using light microscopy and densitometric analysis of the staining to allow for statistical comparison between behavioral treatments. It is predicted that lower expression of CRF will be found in the hypothalamus in rats that were in the tickled and/or playful groups as compared to restrained and/or control animals. If so, future animal research and veterinarian settings may have to adjust techniques to ensure more systematic behavioral control that what currently exists in these fields.

Representation of African American men in Advertising and Branding

Courtney Ward

Faculty Mentor(s):

Jane Machin

Honors Capstone Showcase

5:00-6:00pm

CHBS 3rd Floor Lobby

For my capstone Honors project I am researching the representation of African American men in advertising and branding within the fashion industry. More specifically, I am focusing on the shoe industry because footwear accounts for one quarter of all money spent on clothing by the African American consumer and is expected to grow by 14% by 2020. My research focuses for the first time on the representation of African American men in retail, online communications (e.g. their Twitter, Facebook, Snapchat, Instagram) and the company websites. Most existing research on the African American consumer concerns representation in print advertisements only. With the advent of digital communications methods, the importance of print advertising in building a brand is decreasing. During this qualitative research project, some of the specific questions I am examining include: Prevalence: How frequently are African American men represented in shoe branding, relative to the national population and in other industries. Target Audience: How do representations of African American men differ according to the brand's target audience (e.g. sports shoes versus formal shoes). Brand Positioning: How do representations of African American men differ according to the brand's positioning (e.g. benefits communicated, price point etc).

Honors Capstone Showcase

Pedophile in the Making

Taylor Fox

Faculty Mentor(s): Margaret Pate
Honors Capstone Showcase 5:00-6:00pm CHBS 3rd Floor Lobby

This paper explores individuals found in the criminal justice system who are attracted to minors under the age of 13, otherwise known as pedophiles. Pedophilia is a term used both socially and clinically. To the general public, a pedophile is anyone who is sexually attracted to minors; however, clinically, an individual must meet a certain set of criteria in order to be diagnosed with the mental disorder. There are two types of sexual offenders: situational and preferential. Pedophiles are considered preferential because they prefer to mate with children instead adults. While we typically think of a pedophile as distinguishable in physical characteristics from the average person, it is highly unlikely they exhibit any unique qualities that raise a red flag. In fact, most child sexual abuse occurs within the home with either a family member or an acquaintance. The media is responsible for the frenzy that the public has undergone in the last few decades when concerning pedophiles and the “stranger danger” phenomenon. This fear has instigated restrictions on sex offenders once caught. Pedophiles, once they have served their prison sentence, may even be subject to a civil commitment intended to treat them for their disorder. Many options are available in treating the disorder including cognitive-behavioral therapy and pharmacological therapy. To finish out the paper, we will conduct a case study of the pedophile Westley Allan Dodd.

Changing Waves

Danielle Green

Faculty Mentor(s): Andrew Ross
Honors Capstone Showcase 5:00-6:00pm CHBS 3rd Floor Lobby

My Senior Capstone, Changing Waves, is a series of double exposures. As a studio art major, we are required to do a thesis show in our concentration before we graduate. My exhibit plays with the idea of change throughout time and I use photographs to document this. These photographs are double exposures in order to produce a hazy look to represent the mind and memories. My project would not have progressed as much as it has without the help of Assistant Photography Professor, Andrew Ross. I thank him and all my other influences to complete this art show

A Little Dose of Being Held Close: An Analysis of Skin-to-Skin

Bridgett Oliver

Faculty Mentor(s): Sharla Cooper
Honors Capstone Showcase 5:00-6:00pm CHBS 3rd Floor Lobby

Skin-to-skin contact is a rising phenomenon in the obstetric world. Skin-to-skin contact involves placing a naked infant on a mother or father’s bare chest. This has many benefits for both the mother and the infant. Some of the benefits include bonding, early initiation of breastfeeding, maternal pain control, newborn glucose control, newborn temperature control, newborn neurological and physiological stability, decrease in newborn jaundice, and an increase in maternal confidence. Nurses are an integral part of helping to make this the standard of care for mothers and newborns, and they provide the teaching to avoid potential risks and to maximize the benefits for families.

Honors Capstone Showcase

Waking Up With A Nightmare: A Literature Review of Emergence Delirium in Military Personnel with Preexisting Post Traumatic Stress Disorder

Rachel Jones

Faculty Mentor(s): Suellen Miller
Honors Capstone Showcase 5:00-6:00pm CHBS 3rd Floor Lobby

This capstone is composed of a systematic review of literature about the phenomena of “emergence delirium” in patients with existing post-traumatic stress disorder and military experience. Emergence delirium is a rising concern that is now being brought to light by not only military anesthesia providers, but also civilian anesthesia providers who work with veterans in civilian hospitals. Post-traumatic stress disorder (PTSD) is presented in this manuscript as it relates to incidence, prevalence, and impact on the patient’s perception of quality of life. A discussion of balanced anesthesia occurs, focusing on the types of anesthesia, phases of anesthesia, and potential complications of anesthesia, including emergence delirium. The role of anesthesia providers is reviewed, targeting their role in limiting emergence delirium. Ways to prevent emergence delirium becomes the focal point of the paper including implications for practice to determine the best way to deliver anesthesia for life-saving procedures to the population of people who have existing PTSD, and more exclusively, military combat experience. Patients with military combat experience and preexisting PTSD have been shown to have an increased likelihood of experiencing emergence delirium.

Complementary and Alternative Therapy for Cancer

Lindsey Birch

Faculty Mentor(s): Jyotsna Sharman
Honors Capstone Showcase 5:00-6:00pm CHBS 3rd Floor Lobby

The purpose of this research project was to determine whether complementary and alternative medicine (CAM) could improve cancer symptoms and to further research whether it is considered safe. Research in this area is relevant because it is becoming known that certain foods, specifically plants and herbs with pigments and phytochemicals, have curative properties for the ill. In addition, pharmaceuticals, chemotherapy, and radiation are complicated with many side effects. Review of the literature was completed by locating original research articles in professional journal databases. I developed and conducted a survey with the caregivers of cancer patients to determine their perceptions of CAM therapies. Results of this research found that many cancer survivors find CAM therapies to greatly improve quality of life and reduce stress. More research needs to be conducted to determine whether CAM can be effective at treating cancer and in what scenarios CAM therapies are considered to be safe.

Cryptocurrency Analysis

Tarryn Chichester

Faculty Mentor(s): Thomas Duncan
Honors Capstone Showcase 5:00-6:00pm CHBS 3rd Floor Lobby

Cryptocurrencies operating today have come close to being considered money. They fulfil some of the necessary functions of money but still need to overcome some technical and social acceptance issues. The two cryptocurrencies that have come the closest to being successful are Bitcoin and Ethereum. If a new cryptocurrency could be created to overcome the obstacles illustrated by Bitcoin and Ethereum, and operate as gold did under the gold standard, cryptocurrencies may be the future of money.

Honors Capstone Showcase

Font Design

Sarah Mongold

Faculty Mentor(s): Ken Smith
Honors Capstone Showcase 5:00-6:00pm CHBS 3rd Floor Lobby

My Capstone Project explores the process of font design. How does one create a font that is fully functional? I seek answers to this question by creating a font of my own design.

Public Perceptions of Police

Erin Morris

Faculty Mentor(s): Maggie Pate
Honors Capstone Showcase 6:00-6:20pm CHBS 3002

This capstone explores United States citizens' perceptions of police. One hundred and seventy five participants were recruited from across the United States via Qualtrics to complete a survey on their interactions with and perceptions of police officers. Participants were asked to rate both their overall perceptions of police and their perceptions of police fairness. In addition to understanding perceptions generally, the goal of this project was to compare perceptions of individuals from different regions of the United States. Despite each region being part of the same country, there are vast differences in culture and behavior between these regions. In order to compare across region, Qualtrics used a quota sampling method to ensure there were participants represented in the sample from each region of the United States, including the South, Northeast, West, and Midwest. While general perceptions and ratings of fairness did not differ significantly across the different regions, several demographic variables were related to perceptions of the police, as well as the number of involuntary contacts individuals had with police. The results suggest that certain demographic and situational variables cause individuals to perceive the police as unfair. Results could be used to assist officers in understanding how to better relationships with individuals within the community.

Honors Capstone Showcase

Testing the effectiveness of emerging technologies for developing a sedimentation model at Claytor Lake, Dublin, Virginia - A Progress Report

Ian Gammarino

Faculty Mentor(s): Skip Watts
Honors Capstone Showcase 6:20-6:40pm CHBS 3002

Unmanned aerial vehicles (UAVs), side-scan sonar (SS), and submersible remotely operated vehicles (ROVs), are being tested for their effectiveness in characterizing the nature and rates of adverse siltation in the upper reaches of Claytor Lake, near Radford, Virginia. UAVs from Radford University's Geohazards Research Center have been flown, over selected areas, to map changing shorelines, as well as both erosional and depositional features, using sensors that incorporate a range of visible and near infrared spectra. Areas sensitive to sedimentation include docks, navigable channels, recreation sites, and water supply intake pipes. Experimental aerial assessments of silt turbidity and water visibility are being compared to data collected by more traditional methods, such as using Secchi disks. Correlations between the different methods have been made. Furthermore, side-scan sonar has been utilized to generate bathymetric maps and digital 3D models of the lakebed in these sensitive areas of the lake. Those maps and models provide a baseline for later comparisons to assist in evaluations of rates and volumes of sedimentation. Finally, after suitable targets have been identified using UAVs and sonar, the Radford University ROV submersible was deployed to provide video imagery of features of interest at those targets. This study is being done with the goal of creating sedimentation models for key places in the lake; and, to evaluate the use of near infrared imagery for sedimentation mapping.

Roundtable Discussion and Buffet

Honors Capstone Showcase 6:40-7:30pm CHBS 3002

Graduate Oral Session

Attention Deficit Hyperactivity Disorder: Enhancing the Understanding of ADHD on Executive Functioning in School-Age Students

Kenzie VanDerwerker

Faculty Mentor(s): Diane Millar
Graduate Oral Session 3:00-3:30pm Heth 22

Attention Deficit Hyperactivity Disorder can be considered a controversial topic. Many view this disorder with skepticism arguing that all of us sometimes have trouble paying attention, children especially. However, ADHD is a real and serious lifelong disorder. In recent years, there has been new research that helps give us a better understanding to the difficulties and deficits that individuals with ADHD face- and these deficits are linked to executive functioning skills. The goal of this presentation is to give professionals an in-depth look into the various presentations of ADHD and “debunk” some of the myths that go hand in hand with a label of ADHD. Understanding the severity of this disorder and the implication to an individual’s everyday functioning would benefit professionals who serve this population. There are various types of symptoms along with various types of presentations including combined presentation, predominantly inattentive presentation, and predominantly hyperactive-impulsive presentation. The argument is that by understanding the deficits in executive functions and having strategies for coping with the deficits- professionals can better serve these individuals. The executive functions addressed in this presentation include: response inhibition, working memory, emotional control, sustained attention, task initiation, planning and prioritization, organization, time management, goal directed persistence, metacognition. The format for explaining each executive functioning skill and how it would present itself as a deficit in an individual with ADHD would be presenting a general definition, relating it to an experience with an individual with ADHD. This presentation will present the information in a cohesive, easy-to follow format which includes interactive learning materials, case study examples, and small group discussions.

Selu to Peru: Understanding Biology in a Local Context through a Global Perspective

Matti Hamed

Faculty Mentor(s): Kristan Morrison
Graduate Oral Session 3:30-3:50pm Heth 22

The term science is broadly inclusive of multiple disciplines and a wide variety of skill sets; yet students, often from past negative experiences, perceive the sciences through a narrow lens. To help broaden their view, we must move away from the contemporary classroom’s heavy reliance on decontextualized science content delivery and instead focus on exploration and experimentation. Though scientific content is important, it is inert without scientifically literate citizens who are capable of engaging in public discussion of social and political concerns by finding and using scientific information. I have designed a summer program that seeks these ends of broadening students’ understanding of science, engaging them in exploration and experimentation, and developing their scientific literacy. The program blends place-based learning and global education for high school students. Place-based learning contextualizes content by relating it to the local area while global education contextualizes content by providing students with multiple social and political perspectives. The summer program will focus on relating the biological systems of the New River Valley in Southwest Virginia to the Amazon Rainforest in Peru.

Graduate Oral Session

The Effect of Fatigue on the King-Devick Concussion Test: Wheelchair Rugby

Amanda Joyce

Sarah Smith

Faculty Mentor(s):

J.P. Barfield

Graduate Oral Session

3:50-4:10pm Heth 22

The King-Devick concussion test is a sideline concussion screening tool used to determine if an athlete requires any additional medical attention after receiving a head injury. Recent studies have briefly examined fatigue as a possible factor that could alter the score of the test, therefore effecting the evaluation of a player. However, no studies have been conducted on wheelchair contact sport athletes, a population at concussion risk due to contact inherent in the sport. Purpose: The purpose of this study was to analyze the effects of fatigue on the King-Devick concussion test score in contact wheelchair sport athletes, namely wheelchair rugby. Methods: Eighteen wheelchair rugby athletes with tetraplesia (33.9+/-10.9 years, 12.0+/-11.4 years of experience, and 17.7+/-11.4 years since injury) completed pre- and post-sprint King-Devick concussion tests. Informed consent was required and IRB approval was obtained. Athletes completed a warm-up consisting of 4 sprints, then performed 6 timed sprints at full effort. After the sprints, athletes were asked to report their rate of perceived exertion (RPE) as well as perform the King-Devick concussion test a second time. Results: The average for the first baseline was a time of 60.9+/-11.8 sec and the second baseline was 55.2+/-8.4 sec. The RPE resulted in an average of 12.8+/-3.3 and the post-sprint King-Devick score produced a time of 52.56+/-8.9 sec with an average of 1.3+/-3.7 errors. Discussion: Compared to baseline scores, the athletes improved their King-Devick score. This finding provides evidence that fatigue does not play a major role in the validity of the King-Devick concussion test. These findings are consistent with similar research conducted. These findings suggest that the King-Devick test can be used at any point during practice or games to assess concussion without undue influence from fatigue.

Graduate Poster Session

Correlating Throwing Task Metrics to Assess Rotator Cuff Function: A Pilot Study

Cameron Holshouser

Cody Bailey

Faculty Mentor(s):

Brent Harper Kristen Jagger

Graduate Poster Session

4:15-5:15pm Heth 22

Throwing athletes are at risk for injury due to the natural imbalances among muscular internal and external rotators, the extreme speeds and eccentric demands, and movement pattern asymmetries of the upper extremities. The purpose of this study is to assess normal subjects and compare reliability of various metric tests which include grip strength, hand-held dynamometer strength, and isokinetic objective measures. Subjects will be recruited locally as a sample of convenience. Each subject will perform the three metric tests of grip strength, hand-held dynamometer strength, and isokinetic measures. Data will be assessed using SPSS to compare groups and between metric measures. Data is still being analyzed at this time. Isokinetics, which measures muscle strength and function at varied speed demands, is the gold standard objective measurement for muscle function, particularly rotator cuff function, at varied speeds. Unfortunately, this equipment costs approximately \$60,000. Hand grip strength and hand-held dynamometer strength assessment may be a cost effective initial diagnostic assessment for rotator cuff function deficiencies since they cost considerably less, between \$100 and \$1,000. This pilot study will provide a foundation for a future study involving baseball pitchers.

Graduate Poster Session

Implementation of Dry Cupping Combined with Exercise in Patients with Low Back Pain: A Case Series

Kimberly McDow

Faculty Mentor(s): Alex Siyufy
Graduate Poster Session 4:15-5:15pm Heth 22

The purpose was to investigate the effectiveness of Dry Cupping (DC) combined with therapeutic exercise on perception of pain and lower extremity mobility in individuals with chronic low back pain (LBP) and diminished range of motion (ROM). Three subjects received DC to the low back in 4 locations for 10 minutes. Subjects then performed 2 sets of 10 knee flexion to extension and straight leg raise (SLR) exercises with cups placed along the quadriceps or hamstrings respectively. 3 cupping treatment sessions and a final data collection session were completed. Selective Functional Movement Assessment (SFMA) was used to screen movement pretreatment to posttreatment. Subjective pain and functional ability were measured using the Numerical Pain Rating Scale, Global Rating of Change (GROC) and Oswestry Disability Index (ODI). Finally, SLR ROM was taken in both lower extremities and Pain Pressure Threshold (PPT) was taken at cupping locations. Initially all subjects had mobility dysfunction according to SFMA; three were dysfunctional for flexion and two were dysfunctional and painful for extension. Post treatment, two became non-painful functional for flexion and all three became non-painful for extension. SLR ROM improved 7 degrees on the right and 11 degrees on the left, and PPT for each cupping location improved by at least 15 N. Finally, GROC improved from 1.6 to 2 over time and ODI improved by an average of 8%. DC may be a viable technique to improve the ROM of the lower extremities and potentially improve dysfunctional and/or painful movement patterns.

The Relationship of Muscle Thickness to Rotator Cuff Muscle Function (Strength): A Pilot Study

Cody Bailey

Cameron Holshouser

Faculty Mentor(s): Kristen Jagger Brent Harper
Graduate Poster Session 4:15-5:15pm Heth 22

Muscle and tendon thickness varies between subjects and at various anatomical locations. In the literature muscle thickness measures using gray scale (B-mode) real time ultrasound (RTUS) of the supraspinatus rotator cuff muscle has demonstrated high interrater and intrarater reliability. The purpose of this study is to assess normal subjects in order to use grip strength and hand-held dynamometer metrics to determine if there is a relationship between supraspinatus muscle thickness and muscle function (strength). Subjects will be recruited locally as a sample of convenience. Each subject will have supraspinatus musculature measured using B-mode RTUS which will be compared to the two metric tests of grip strength and hand-held dynamometer strength to assess relationship. Data will be assessed using SPSS statistical analysis. Data is still being analyzed at this time. Gray scale (B-mode) real time ultrasound (RTUS) is a more affordable method of imaging for tissue based assessments and diagnostics as compared to magnetic resonance imaging (MRI) or computed tomography (CT). RTUS do not expose the subject to potentially negative radioactive emissions. A RTUS unit costs approximately \$25,000 compared to \$100 to \$1000 each for a hand grip strength or hand-held dynamometer device. Strength deficits may be the initial indicator of rotator cuff function deficiencies. If strength correlates with muscle thickness, then the less expensive assessment options may be the most cost effective initial assessment methods.

Graduate Poster Session

Student Therapist Person-First Language and Disability Focused Simulations

Sarah Miller

Faculty Mentor(s): Renae Huth Jordan Tucker
Graduate Poster Session 4:15-5:15pm Heth 22

Background and Purpose: Person-first language is one communication technique that removes preconceived biases about a patient's diagnosis, age, sex, race/ethnicity, or culture. To date there is limited research focused on person-first language in physical therapy practice; therefore, the purpose of this study is to investigate whether Physical Therapy (PT) and Physical Therapist Assistant (PTA) students' recognition of person-first language improves following disability-focused simulations. Methods: Participants included 58 students, 25 PT and 33 PTA, ranging from 18 to 54 years old with 44 females and 14 males. Paired PT and PTA students participated in lab-based simulated patient cases including: cognitive, developmental and learning disabilities; sensory and physical impairments; as well as various cultural, linguistic, and socioeconomic backgrounds. PT/PTA students switched roles between therapist and patient to practice person-first language while engaging in everyday patient care activities. Although participation in course simulation activities was required, students were not obligated to complete pre- and post- simulation activity surveys. Results: Six survey questions focused on person-first terminology were analyzed using Paired t-Tests within the IBM SPSS Statistics 22 Software Package. Significant differences were observed for two of the questions ($p < 0.05$) indicating improvement in student recognition of person-first language following disability-focused simulations. More data is needed to better understand this relationship therefore this study will be repeated fall 2017. Radford University Doctorate of Physical Therapy Program and Jefferson College of Health Sciences Physical Therapist Assistant Program collaborated to conduct this study supported by the Radford University High-Impact Practice Teaching and Learning Grant.

Selective Mutism: Enhancing Understanding and Improving Treatment Approaches

Kenzie VanDerwerker

Kelly DeCao

Katelyn Weaver

Melissa Gibson

Faculty Mentor(s): Diane Millar
Graduate Poster Session 4:15-5:15pm Heth 22

Many individuals consider selective mutism as selectively choosing to not speak in specific situations or to specific people. However, current researchers are arguing that selective mutism is a complex childhood anxiety disorder which impacts a child's ability to speak in certain situations or with certain listeners. This presentation leaps into the myths and facts about selective mutism, the impact of selective mutism on learning outcomes, and the evidence-based intervention approaches.

Graduate Poster Session

Mental Health Among College Athletes: Implications for Social Work Practice & Interventions

Julia Scales

Faculty Mentor(s): Deneen Evans
Graduate Poster Session 4:15-5:15pm Heth 22

Mental health in America has been a long standing issue. Mental health treatment has gone through many reforms and is continually shaped as best practices are developed and implemented. Mental health among college athletes however is not a heavily discussed topic. While colleges and universities pride themselves on top notch facilities, coaches, and trainers; athletes are truly the bread and butter of college athletics-and often the ones who are quietly suffering with common mental health issues. The purpose of this directed study is to understand the current plight of college athletes, in terms of their mental health. This directed study also hopes to shed light on the areas that social work practices could benefit the college sports world.

Art History Exhibitions

The African Bridge, part 1: African and African-American Arts

Faculty Mentor(s): Roann Barris Carlee Bradbury
African and African-American Arts Exhibition 2:00-3:15pm Heth 43

Student members of ARTH420 are researching the arts of various African cultures and diasporan artists. Each student is preparing a replication of an art work that represents the work of the culture he or she is studying. For the engagement forum, students are preparing posters that trace the histories of these objects and cultures. Some students will also have a replicated art work to demonstrate.

Should They Stay or Go - What is the Future for the Parthenon's Sculptures

Faculty Mentor(s): Roann Barris Carlee Bradbury
Debate: The Future for the Parthenon's Sculptures 3:30-4:15pm Heth 43

We will stage a debate to outline the key arguments made by the British Museum and the Greek government.

Accelerated Research Opportunities

Expression, Purification, and Crystallization of AS2

Anthony Kwan

Mckenzie Hunt

Faculty Mentor(s):

Kimberly Lane Tara Phelps-Durr

Accelerated Research Opportunities

5:00-6:15pm Heth 43

AS2 (Asymmetric Leaves 2), a Knotted 1-like homeobox (KNOX) gene, controls cell differentiation. AS2 is characterized, by its cysteine repeats and leucine zipper, for possible binding functions. In plants, such as *A. thaliana*, KNOX genes are turned on and off, allowing the plant's ability to create 'new' differentiated cells, e.g. flower organs. AS2 protein binds to the AS1 protein, another KNOX gene, which binds to the HIRA protein. Histone cell cycle regulator, HIRA, is a histone-interacting protein, which binds to purified core histones that prevents DNA from being unwound. In mammals, once the HIRA gene is suppressed in a cell, it is suppressed for the duration of the cell's, and its daughter cell's, life span. The primary objective of the study is to determine the 3D structure of AS2 through X-ray crystallography, which could lead to understanding on how cells can differentiate. The HIRA gene in mammals is conserved in many plant species such as *A. thaliana*, so understanding how plants can turn on/off the HIRA gene, could lead to the understanding of how the HIRA gene is deactivated in mammals. The project consists of the expression, purification, and crystallization of the AS2 protein from *A. thaliana*. The protein has been induced with IPTG at varying concentrations (0.01mM-1mM), and with other additives, sorbitol (0.1M-0.7M) and ethylene glycol (5%-7.5%), to improve solubility of the protein. Chromatography will be done to purify the protein then crystallization, and X-ray crystallography done to determine the protein structure of AS2. This project is branching out into the ASF1 (Anti-silencing function protein 1) protein as a single protein expression and as a double expression as a complex of ASF1 and AS2.

The effects of Vespa Amino Acid Mixture (VAAM) and 2,4 Dinitrophenol (DNP) on during mitochondrial metabolic reactions and in the production of ATP

Emilie Colon

Adam Weikel

Faculty Mentor(s):

Sarah Redmond

Accelerated Research Opportunities

5:00-6:15pm Heth 43

During the process of cellular respiration, cells partake in metabolic reactions to produce Adenosine Triphosphate (ATP). There are many different processes linked to the conversion of sugar into ATP. We are focused on a single process in metabolism. This is the electron transport chain, that occurs in the mitochondrial membrane and functions by the movement of electrons through the membrane, and results in the maintenance of the proton motive force. The proton motive force is the result of the membrane's electrochemical gradient, which functions by the movement of ions through a series of electron carriers, that provide hydrogen ions to power the production of ATP. The substances being examined in cauliflower mitochondrial isolates, are 2,4 Dinitrophenol (DNP), a known proton motive force uncoupler, and Vespa Amino Acid Mixture (VAAM), a commercially available sports drink derived from Asian giant hornet, a potential coupler. Cauliflower mitochondria were exposed to these substances combined in three different concentrations (0.3% each, 0.03% each, 0.003% each), the two substances seem to determine if they counteract each other's effects on in the electron transport chain. The data collected showed that at high concentrations by increasing the amount of VAAM, the over production of ATP led to cellular deterioration even if DNP was present and by lowering the concentration, while at low concentrations the VAAM counteracted solution counteracted with DNP allowing the mitochondria to function normally. By measuring the pH levels of each concentration over time, we concluded that both solutions increased ATP production VAAM enhanced proton transport while DNP did not, and that the higher concentrations combination of the two substances had a greater rate of ATP production compared to the lower concentration. increased ATP production compared to controls.

Accelerated Research Opportunities

Is a Shift Toward Rehabilitation Programs More Effective in Juvenile Detention Centers?

Myah Maisonave-Sheets

Faculty Mentor(s): Riane Bolin
Accelerated Research Opportunities 5:00-6:15pm Heth 43

Juvenile justice is an important issue in the nation, and it is one that must be carefully evaluated and fixed to produce the most positive results for the populations. Rehabilitation is a major focus of juvenile justice departments; across the nation, there has been a large reform as the detention centers began implementing various programs. These services aim to aid the populations in transitioning well back into society and minimize further negative behavior with them. The programs are made to change the individuals and give them a better chance at finding a positive life following their punishment. To further analyze the programs, we gathered data from each of the detention centers in the state of Virginia. We learned what programs were offered at the centers, and we found that multiple had weekend work programs or garden programs, designed to rehabilitate the individuals. A large number of the centers already had some of these new services to train their populations to transition better upon their release. Based on this data that we found, we created a survey to send to the centers. We are asking which of their programs, if any, have been evaluated and the results of the evaluation. We also are inquiring if there are any programs that the centers feel would benefit their specific population, and if so, what are the factors that are stopping them. We will find out if the centers feel that this reform toward programming rather than incarceration is a positive one when we learn if they would like to pursue implementing new ones. This will allow us to come to a conclusion regarding the effects of this new system and if these services should be implemented in all detention homes.

Preparation of Degradable Block Co-Polymers to Encapsulate Small Organic Pollutants from Water

Cailin Henry

Faculty Mentor(s): Amy Balija
Accelerated Research Opportunities 5:00-6:15pm Heth 43

The presence of pollutants in water systems is becoming increasingly problematic due to the rising world population. Pollutants are removed from water using techniques varying from filtration to bioremediation. Yet, these methods are becoming less effective as the concentration and diversity of contaminants increases. The goal of this project is to use bio-renewable resources to synthesize degradable block co-polymers that can be employed to encapsulate small organic pollutants from aqueous environments. To help facilitate the efficient removal of hydrophobic pollutants, these polymers contain a hydrophobic interior surrounded by a hydrophilic periphery. However, the type of hydrophobic starting material that can effectively remove pollutants is unclear. In this presentation, the synthesis and characterization of novel block co-polymers containing undecanoic \hat{P} -lactone will be discussed. Preliminary encapsulation studies using polycyclic aromatic hydrocarbons (PAHs), known persistent pollutants, will be highlighted.

Accelerated Research Opportunities

Lessons Learned from Year Two Studying the Impact of Flipping an Introductory STEM Course

Jessica Mundy

Matti Hamed

Faculty Mentor(s):

Joseph Wirgau

Accelerated Research Opportunities

5:00-6:15pm Heth 43

This research project started as part of a larger initiative to implement active learning environments into foundational Science, Technology, Engineering, and Math (STEM) courses. Many introductory STEM classes serve to codify that learning science is through the passive summary of material they would not be able to learn through experience. An alternative approach is to deliver these summaries of material through videos via a “flipped” model. The student then comes to class to participate in what would normally be considered homework, where they practice in the classroom with the professor and peers. This type of active learning not only maximizes student to faculty interactions but also peer to peer interactions. This has been shown to result in increased retention, improved attitudes toward STEM classes and learning techniques which could help to offset the declining number of STEM majors. Our research compares a traditional lecture style and a flipped classroom, to measure how students’ success is impacted. The collection of data from control and experimental sections with the same instructor provides a rare opportunity to examine the impact of teaching methods without the instructor as a variable. We will present our data for discussion from the initial implementation and initial data from year two of the study. Our data includes student video viewing habits, changes in self-perception of student efficacy, worry, usefulness, and master potential toward the subject matter, as well as the impact on grade distribution and retention. The initial data demonstrates that there is no significant differences between the control and experimental sections in both content mastery and self-assessment, however the experimental section had higher number of extreme grades. The data also indicates that those students who withdrew had abnormally low self-efficacy and classroom observation indicated a lack of social cohesion in the experimental class.

Measuring Sea Ice Thickness using Electrical Resistivity

Chris Mattson

Jahide Williams

Faculty Mentor(s):

Rhett Herman

Accelerated Research Opportunities

5:00-6:15pm Heth 43

The purpose of our research is to create a tool to measure sea ice thickness using electrical resistivity. Being able to quantify the amount of sea ice left could help us to better understand the effects of climate change. Currently, there are no methods available other than drilling that can accurately measure ice thickness over a large area. To create this device, we used an Arduino to create basic circuits using switches and transistors. These circuits will be used to measure electrical resistivity at varying depths. The design of our device involves the use of multiplexers, transistors, and switches to move the electrical current in a pre-designed order across an electrode array that is composed of metal contacts placed on the ice. To determine the accuracy of our device, it will be tested in a controlled setting.

Accelerated Research Opportunities

Fangirls Unboxed: Selling Girls on Superheroes

Dixie Seitz

Faculty Mentor(s): Scott McDarmont

Accelerated Research Opportunities 5:00-6:15pm Heth 43

The present study was conducted to gauge how companies, such as Marvel and DC, market toys to their female audience, more importantly their female characters. With more and more women and girls getting into superheroes, it's important to look at how companies are changing their tactics to appeal to this growing demographic within their fan base. By looking at current marketing trends and merchandise, it is apparent that companies are just now starting to market towards their female audience, as well as being more gender neutral with their merchandise. There are more female characters being represented in merchandise, whether it be in gender neutral products or in toy lines specifically marketed towards girls. Gender roles and gender stereotyped play are also important factors on what toys children receive from parents and family, and what they choose to play with later on. Superhero toys marketed towards girls aren't selling as much as those marketed towards boys, which is enforced by gender roles and stereotyped play. This study shows the current strategies and influences that affect how companies market their heroes and represent them to their growing female audience.

The use of DNA mapping for facial recognition in law enforcement

Haley Pflanzler

Faculty Mentor(s): Tod Burke Stephen Owen

Accelerated Research Opportunities 5:00-6:15pm Heth 43

The purpose of this presentation will be to discuss the use of DNA mapping for facial recognition in law enforcement. The benefits and limitations of this new scientific breakthrough will be highlighted. Recommendations for implementation will also be noted.

Micro controller Based Electrical Resistivity Array for Measuring Sea Ice Thickness

Jaihde Williams

Chris Mattson

Faculty Mentor(s): Rhett Herman

Accelerated Research Opportunities 5:00-6:15pm Heth 43

The objective of our project is to create a microcontroller that measures the sea ice thickness using an electrical resistivity based array. This device is important since it could help scientists compute the amount of sea ice that is left, which in turn will help us better understand the impacts of climate change. As of now, there are no accurate ways of measuring sea ice thickness over a large range. The current equipment available is not precise in the measurement of the sea ice thickness. The steps in our project will eventually lead to the implementation of an Arduino based circuit which will be used to measure resistivity at varying levels. To accomplish this, the design our device will involve multiplexers, transistors, and switches to move electrical currents across an electrode array that is composed of electrodes (metal contacts) placed on the ice. To see the accuracy of this device, we will have to test it in a controlled setting.

Accelerated Research Opportunities

Constructing a Dynamic Orbital Model of the Solar System

Morgyn Church

Faculty Mentor(s): John McGee
Accelerated Research Opportunities 5:00-6:15pm Heth 43

This project set out to construct a gravitational orbital model of the solar system through the application of elliptical geometry, orbital mechanics, and Newton's Laws of Motion. Mathematica was used for calculations as well as for constructing the orbital model itself. In order to construct the basic model, a series of three rotation matrices were needed to transform the original ellipse of each planet's orbit. The first rotation was determined by the longitude of the ascending node, the second by the inclination, and the third by the argument of the periapsis, each given by the initial conditions of each planet through Mathematica's database. Once rotated into place, the anomaly, or planet, was also located through this database along with calculations of the position and velocity vectors in this final rotated coordinate system. At this point, the two-body problem could be done with the Sun and each of the individual planets. This required direct application of Newton's Laws of Motion and a basic understanding of their relations through derivatives and integrals. Once calculated for each of the planets, the final model was constructed. However, this two-body problem may not be completely accurate. Other methods may produce better results along with application of Mathematica's numerical integration process. Future work may look further into this problem, although, it may be interesting to test the accuracy of the current model through physical observations with a telescope.

Effects of Vespa Amino Acid Mixture on the Endurance and Life Span of Wild-Type and Mutant *Drosophila melanogaster*

Tori Crapes

Faculty Mentor(s): Jason Davis
Accelerated Research Opportunities 5:00-6:15pm Heth 43

Past research with houseflies (*Musca domestica*) has shown that vespa amino acid mixture (VAAM) increases endurance and recovery from metabolic suppression; however, it significantly decreases longevity. Decreased life spans have been accredited to the deterioration of the mitochondria, as a consequence of over-production of free radicals, and resulting mass apoptosis. Our current research focuses on the effects of VAAM on fruit flies both exploring whether a similar pattern of results will be observed and comparing these results in mutant flies with a deficiency in the cytochromoxidase 4.

Predicting Mutual Fund Value

Will Mann

Faculty Mentor(s): Abhay Kaushik
Accelerated Research Opportunities 5:00-6:15pm Heth 43

We are currently studying the trends of mutual funds and how mutual funds are managed with respect to the economy and market. Including theories and trends that drive privately managed funds, publicly traded funds and ETFs. We are looking at patterns in the stock market and demographics of investors that can influence the behavior of investors to better predict the market and increase portfolio value.

Accelerated Research Opportunities

Walt Disney Interior- The Critical Views of Both Beauty and the Beast Versions and Their Comparison

Tonita Parks

Faculty Mentor(s): Carlee Bradbury
Accelerated Research Opportunities 5:00-6:15pm Heth 43

I will undertake research on feminist issues surrounding representations of medieval princesses in American popular culture. I will focus on Beauty and the Beast and will present my findings at the Student Engagement Forum this Spring. My main focus is on the representations of interiors and how historically accurate. I am researching the adaptation of the animated Disney film “Beauty and the Beast”, which is now set in live action. Determining the creativity on how interior the settings are compared from animation and live action. Film creators of the new movie contribute many similar settings including the library, ballroom, mansion, and ect. By computer generating the humans who were transformed into unrealistic objects by having them look realistic on screen. As well as, Belle’s iconic yellow dress is finally revealed on screen. Since, technology has improved over the years. Maybe, it was a better idea to wait to bring the film into live action. If “Beauty and the Beast” would of been a live action film that was set back in 1991. Creators probably would not have the same accuracies of the settings compared to animation. Many older generation creators had better designs of background settings in animation. Computer generation has helped interior design of background footage appearance more accurate on screen.

Sustainable Design of a Tiny House

Nicole Hodges

Caleb Putnam

Faculty Mentor(s): Fred Taylor
Accelerated Research Opportunities 5:00-6:15pm Heth 43

The purpose of our research is to discover sustainable methods design and of building and maintaining a “tiny” house. A tiny house is a small, mobile home which ranges from 400 to 1700 square feet. The tiny house is an on-going project in its seventh semester of construction. Each semester, the students complete one phase of the building process. This semester, we are researching eco-friendly, sustainable designs for the windows and door on the tiny house. When researching the sustainability, we are looking for qualities such as recyclability, impact on the environment during: production, transportation, installation, and its lifetime. We applied this research to different aspects of the windows and doors such as the different materials used, types of finishes and coatings, and the installation process. We also learned about the different types of windows: awning, double-hung, single-hung, and casement. This class required us to be safety certified on certain power tools since we will be using them throughout the course of the class. We also researched and used the power tools to build a framed wall at a workshop in Dublin, Virginia. The tiny house will not be completed for many more semesters, and as the tiny house develops and grows, so will the research that come with it.

Production Technology Showcase

Faculty Mentor(s): Michael Meindl West Bowers Matthew Turner
Production Technology Showcase 6:30-8:00pm CS M073

Videos are meant to be seen and the opportunity to exhibit student's work is invaluable. To meet both needs, as well as recognize the top talent, the Production Technology Showcase will feature the top student videos created by those within the Production Technology Concentration in the School of Communication during the 2016-2017 academic year. Each selected student will show his/her video, provide a short summary of his/her experience, and will answer any questions the audience may have.

“Switch” by Tyler Leigh

Switch is a 6-minute short film about that one switch in everyone's home that doesn't seem to really do anything. Or does it?

“Stepping Stones” by Rey Colon Gueits

Stepping Stones gives viewers a glimpse into the life of individuals of all backgrounds who have overcome different obstacles in order to achieve their dreams.

“Adieu” by Josh Shine

After facing rejection, an art major makes a decision that could lead him down two different paths of his college career. Alternative realities are explored side by side, as well as the value of ambition for your dream.

“Sorry” by Josh Shine

On one otherwise boring day a group of friends decide to play a quick game of Sorry. Little did they know they would be entering a world of pain.

“It's a Great Day to Have a Great Day” by Ramsey Cole

Sometimes we question how much control we have over life. Is life a poker game? Can you choose your own hand? Eric wakes up a little late and tries having a great day, but ends up wondering if today is a great day to have a great day.

“Welcome to Blacksburg” Videos by T.J. Daniels and Madison Griffin

These students were asked to create a promotional video for an assigned city (they were both given Blacksburg). They were to imagine their client being the Chamber of Commerce and were challenged to showcase the city in the best possible way.

Advanced Research in Forensic Science

Can Fordisc Accurately Categorize Ancestries of Mixed Race?: A Fordisc Using A Living Adult Mixed Race Population

Nathan Blair

Faculty Mentor(s):

Donna Boyd

Advanced Research in Forensic Science

8:00-8:15am

Heth 22

Fordisc is a software program based on Discriminant Function Analysis (DFA) which has been used for years by forensic anthropologists to help determine sex and ancestry through metric measurements. It has been found to be relatively accurate with an intact cranium. As the frequency of interracial (mixed race) populations in the U. S. grows, rigid ancestral categories like those used in Fordisc become less applicable in forensic cases. The purpose of this study is twofold. First, the ability of Fordisc to correctly categorize living populations based on measurements with soft tissue will be investigated. Second, Fordisc success in classifying individuals of mixed race (Black and White) will be tested. Cranial measurements of 20 living individuals of mixed (Black and White) known ancestral background, 10 males and 10 females, are taken as accurately as possible with soft tissue present following Ousley and Jantz (2006). After entry of all measurements into the Fordisc program, each individuals known and Fordisc-estimated ancestry will be compared. These results will increase our understanding of ancestry estimation of unknown mixed race decedents through statistical programs like Fordisc and ultimately lead to more accurate identifications of unknown decedents. Reference: Ousley SD, Jantz RL (2006) Fordisc 3.0: Personal computer forensic discriminant functions. The University of Tennessee, Knoxville

The Effects of Freezing on Decomposition When Determining Postmortem Interval (PMI)

Alexandria McAlevy

Faculty Mentor(s):

Donna Boyd

Advanced Research in Forensic Science

8:15-8:30am

Heth 22

Decomposition of human remains is environment-dependent. Previous decomposition studies (utilizing Body Farms like those at the University of Tennessee and Texas State University) have focused upon rates of decay in temperate environments, with little attention paid to colder ones involving frozen human remains. The goal of this research is to understand how freezing may affect the rate of decomposition and alter the estimation of postmortem interval. It is a validation study of prior research conducted by Roberts et al. (2016), which found increased rates of decomposition with prior freezing. This research will consist of freezing of a statistical sample (n=30) of test subjects (remains of *Sus scrofa*) at -18 degrees for a period of one week and then placing them in an enclosed outdoor environment to observe and record decay. Decomposition scores will be compared to those of *Sus scrofa* unfrozen remains left on the same surface to decay. Differential decay results will inform our estimates of PMI in human remains decaying in frigid environments.

Reference: Roberts LG, Dabbs GR, Spencer JR, Best KC (2016) A preliminary investigation into the effects of previous freezing on human decomposition. Proceedings of the American Academy of Forensic Science XXII, 80-81.

Advanced Research in Forensic Science

The Use of Mandibular Measurements in Determining Ancestry

Alexandria McAlevy

Faculty Mentor(s):

Donna Boyd

Advanced Research in Forensic Science

8:30-8:45am

Heth 22

Ancestry determination plays an important role in the identification of a Biological Profile of an unknown decedent. It has traditionally relied on morphoscopic observations and measurements of the cranium. Recently, however, the mandible has shown evidence of ancestry discrimination features. The goal of this study is to determine the validity of using the mandible for determination of ancestry. This study will use mandibles of known ancestry housed in the RU Forensic Science Institute and Department of Anthropological Sciences to test the Berg method of mandibular ancestry determination. Both morphoscopic and metric observations will be taken from each mandible and analyzed via Berg's mandibular software program. Results will be compared to known ancestries for each mandible. Results of this study will assist in identification of unknown decedents ancestry (and identity) in cases of poorly preserved or damaged crania.

Reference: Berg, G. Biological affinity and sex determination using morphometric and morphoscopic variables from the human mandible. Ph. D. Dissertation, The University of Tennessee, Knoxville, 2008.

The Effect of Water and Ambient Air Temperature and Water Mobility Upon Decomposition

Amanda Flint

Faculty Mentor(s):

Donna Boyd

Advanced Research in Forensic Science

8:45-9:00am

Heth 22

Decomposition is the process by which organic material is broken down into its simplest forms and occurs systematically immediately following death. Decomposition is an important part of a forensic investigation as it allows investigators to determine Postmortem Interval (PMI). Prior decomposition studies have focused primarily upon terrestrial environments much less is known regarding decomposition in water. There has been little research on the effects of air and water temperature, as well as water mobility, on decomposition. This research project investigates the effects of water and ambient air temperature and water motion upon decomposition and the estimation of PMI. Thirty frozen mice obtained from a pet store were placed into three five-gallon tubs filled with two and a half gallons of water. Tub 1 mice were immersed in a cool water and air temperature (45 degrees), Tub 2 mice underwent constant water movement generated through an electric current, while Tub 3 mice served as controls. Mice were left in place in the tubs for a period of three weeks, after which rate of decomposition was scored according to standard forensic anthropological methodology. It is predicted that the warmer (ambient) air and water temperature will increase the rate of decomposition. It is also expected that the motion of the water will increase the rate of decomposition. Results of this study will be used to inform interpretations of PMI in forensic cases derived from aquatic environments.

Advanced Research in Forensic Science

The Effect of Measurement Error Upon Determination of Ancestry of Unknown Decedents Using Fordisc Jill Thompson

Faculty Mentor(s): Donna Boyd
Advanced Research in Forensic Science 9:15-9:30am Heth 22

Fordisc is a software program used extensively in forensic anthropology to estimate the biological profile of unknown decedents. It uses Discriminant Function Analysis (DFA) to estimate the sex and ancestry of unknown individuals by comparing their cranial and postcranial measurements to identified forensic cases in the University of Tennessee Forensic Data Bank. Accurate measurement of cranial and postcranial skeletal remains is critical for its successful application. But the effect of measurement error upon Fordisc results is not known. This research explores this relationship. The purpose of the research is to test the effect of measurement error upon a selected sample (n=20) of crania of varying ancestry housed within the RU Forensic Science Institute and Department of Anthropological Sciences. Measurements from the standard suite of 24 cranial dimensions used in forensic cranial analysis will be varied in 2 mm increments to test the validity of ancestry estimation. Measurements most sensitive to error will be identified, and their effects upon ancestry determination explored. The results of this research will be used to reduce the effects of measurement error upon determination of the biological profile, making identifications of unknown decedents within forensic anthropology more accurate.

Chemical Analysis of Knife Residue on Sharp Force Trauma to Bone Candice Wachtel

Faculty Mentor(s): Donna Boyd
Advanced Research in Forensic Science 9:30-9:45am Heth 22

As the field of forensic anthropology progresses, a greater emphasis on trauma investigation emerges. This study aims to understand the chemical components involved in Sharp Force Trauma (SFT) on bone. Prior SFT bone studies have focused on microscopic analysis of incised bone morphology in an attempt to identify tool mark class. These studies, however, have, for the most part been unsuccessful. The current study takes a different approach in that it focuses upon the chemical signatures of SFT upon bone, with the ultimate goal of identification of tool mark class. Thirty fragments of bone were obtained from a butcher; sharp force trauma from three different knives was applied to these fragments. The three knife types were typical of kitchen use, street use, and hunting/tool use to assess a variety of common sources. Fragments were buried to also analyze the effects of burial of the chemical markers. These samples were then examined using X-ray Fluorescence or X-ray photoelectron spectroscopy (whichever proved necessary) in an attempt to isolate unique chemical markers on bone from each tool. The expectation is that findings will demonstrate chemical markers unique to each knife allowing for accurate identification of the source of the trauma applied. This research is important to future understanding of sharp force trauma and could provide vital information in determination and investigation of trauma sources in both criminal and historical contexts.

Advanced Research in Forensic Science

Ontogenetic Development of Juvenile Cranial Architecture and Its Effect on Survivability in Pediatric Non-accidental Blunt Force Trauma

Kimber Cheek

Faculty Mentor(s):

Donna Boyd

Advanced Research in Forensic Science

9:45-10:00am

Heth 22

Approximately 80% of pediatric deaths from non-accidental blunt force trauma (BFT) are attributable to Traumatic Brain Injury through subdural hemorrhage. The thin pediatric cranium lacks the adult cranial structure of a diploe surrounded by an outer and inner table, leaving it vulnerable to the effects of BFT. It is not known precisely when the mature morphology develops, although prior research suggests it is within the first year. It is hypothesized that the ontogenetic development of a more mature cranial structure is an important variable in determining BFT event outcome. This more mature architecture likely adds considerable support and strength to the adult cranium and protects against many of the deleterious effects of BFT. Thus, it is predicted that juvenile crania which have not yet developed this architecture will suffer more complex fracturing. Microscopic analysis of juvenile bone samples of known or estimated age housed within the RU Forensic Science Institute and the Department of Anthropological Sciences will be examined with a Keyence VHX-1000 microscope (5-200x) for evidence of development of the adult cranial structure in varying locations. Pediatric BFT case studies will also be analyzed with the goal of determining the most common cranial locality that results in death. Neuroanatomical correlates of these localities will be documented and correlated with the cranial architecture data to evaluate the effect of three-layered cranial architecture development on survivability.

Comparative Analysis of Perimortem Blunt Force Trauma and Postmortem Bone Breakage Microscopic Signatures in Forensic Death Investigations

Marta Paulson

Faculty Mentor(s):

Donna Boyd

Advanced Research in Forensic Science

10:00-10:15am

Heth 22

One of the most important questions for a Forensic Anthropologist focuses on the timing of observed trauma to human remains. It is often very difficult for forensic professionals to differentiate fracturing occurring at the time of death versus breakage which occurs after, due to the retention of moisture in bone for an indeterminate length of time after death. The current study presents the final results of a long-term project investigating the perimortem interval and how it affects fracture morphology on the microscopic level. The sample for this study consisted of 180 pig ribs obtained from a local grocer and processed utilizing standard forensic anthropology techniques. Thirty of the ribs were traumatized immediately after purchasing using a drop force mechanism. The other 150 ribs were put in an outdoor environment for a set number of weeks. Thirty ribs were removed from the outdoor environment on weeks 1, 2, 4, 6, and 8. The ribs were brought back to the lab where they were traumatized in the same manner as the first set. Each fractured rib was analyzed under a digital light microscope at varying powers. Each rib is analyzed macroscopically and a sample is chosen from each time interval to analyze microscopically. Fractures are categorized as perimortem or postmortem based on the morphology and type. From this analysis, a list of criteria for perimortem and postmortem injury is created. This is then tested through the use of a double blind test. After the test, the criteria lists are revised accordingly.

Advanced Research in Forensic Science

Analysis of Unknown Accelerants from Fire Debris of Common Household Materials Using GC-FID

Jill Suwala

Tori Fuller

Sarah Herring

Faculty Mentor(s):

Donna Boyd

David Hobart

Advanced Research in Forensic Science

10:15-10:30am

Heth 22

The presence of accelerants was tested using the Gas Chromatography-Flame Ionization Detector method. GC-FID and small packed columns have been proven to successfully detect and analyze ignitable liquid residues as shown in Pert, Baron and Birkett's research. The materials burned were wood, fabric and books. These materials were chosen based on the experiment performed by Borusiewicz, Zieba-Palus and Zadora who used carpet, wood and chipboard. To avoid plastics present in carpet, fabric was chosen to replace it, while books replaced chipwood because they were more likely to be present in the typical household. Using a database of 20 different standards, the accelerants were chosen. In a blind experiment, each material was burned for the same amount of time. Three different samples were used for each material and three different accelerants were chosen from the database but were the same three for each material. Accelerants were extracted by placing pieces of the burned material in a glass tube and adding hexanes. The samples were then filtered out so only the liquid was remaining. Each sample was run three different times. The unknown samples were then compared to the database samples to determine the accelerant present. Results of this study are used to validate the Pert et al. technique to identify accelerants in materials.

Retrieving Latent Fingerprints From Metal Surfaces: A Study of Evidence in Active River Environments

Nathan Blair

Faculty Mentor(s):

Donna Boyd

Heth 22

Advanced Research in Forensic Science

10:45-11:00am

In criminal cases, it is not uncommon for crucial and incriminating evidence to be discarded into river systems by perpetrators. The purpose of this study is to determine the viability of retrieving latent fingerprints from metal-based weapons (firearms, knives, tools) using fluorescent aluminum fingerprint powder after submersion in a riverine environment for variable times. In order to test the feasibility of retrieving this evidence, the researcher will acquire stainless steel and copper samples to place sebum rich, and non-sebum rich on which to place fingerprint samples from volunteers. The river water will be analyzed for pH level for two days prior to submergence of the samples and average pH values recorded. The fingerprinted samples will then be tied to a fixed point and placed into the river, as close to the center as possible. After time intervals of 1, 3, 5, and 7 days, samples will be removed and left to air dry in paper evidence bags. Once completely dry, the samples will be brushed with aluminum powder and the potential fingerprints will be lifted. The fingerprints will not be analyzed for viable use, as this research is to only determine the deterioration rate of latent prints on river-submerged metal-based evidence. Results of this study will further our understanding of survivability of fingerprint evidence in submerged riverine environments.

Advanced Research in Forensic Science

An Analysis of Socioeconomic Variables From Adjudicated RU Forensic Science Institute Child Abuse Cases From Southwest Virginia

Samuel Manning

Faculty Mentor(s):

Donna Boyd

Advanced Research in Forensic Science

11:00-11:15pm

Heth 22

Child abuse is an important societal problem that plagues our communities, particularly those in southwest Virginia, where incidences of physical abuse are three times that of the national average (9.9 per 1,000 children). Factors leading to child abuse are not well understood. This study will explore the social variables involved in this abuse. These variables include family configuration, social isolation, inadequate family support, parental age, poverty, drug abuse, and parenting practices. It is suggested that if a child's family makes less than \$15,000, that child is 22% more likely to be abused. Four theories regarding child abuse variables are explored: Psychodynamic theory, Learning theory, Environmental theory and Ecological theory. These theories regarding child abuse variables are tested through an analysis of a sample of adjudicated child abuse cases from the RU Forensic Science Institute case files. Data pertaining to family history, as well as economic and social background are considered for each case in an effort to define the critical variables associated with child abuse, with an ultimate goal of prevention of child deaths.

Variation in Decomposition Rates at Different Burial Depths in Southwest Virginia Soil

Darcey Thompson

Faculty Mentor(s):

Donna Boyd

Advanced Research in Forensic Science

11:15-11:30am

Heth 22

Decomposition of human remains varies with soil depth. Previous research has suggested that human remains decompose eight times slower at a soil depth of six feet. However, it is not known how differential depths affect the rate of decomposition. The purpose of this study is to identify correlations between differences in burial depths and rate of decomposition. This study involves the burial of remains of *Sus scrofa* at 1 foot, 2 feet, and 3 feet intervals to observe differences of decomposition at each of these depths. There will be at least six individual sets of remains for the purpose of this study, including a control group for each depth. Remains in each depth interval will be observed every week to document the decomposition process and rate. There will be two set of remains for each interval of depth and only one of each interval will be observed every week while the control remains undisturbed. The conclusions of this research will result in a better understanding of decomposition at differing depths and increase our accuracy of determining Postmortem Interval of differentially buried human remains. This research can provide further insight into future work being conducted in the fields of forensics, archaeology, and anthropology.

Advanced Research in Forensic Science

Decaying in Acid: A Study of The Effects of Household Chemicals Upon Human Decomposition

Benjamin Thompson

Faculty Mentor(s):

Donna Boyd

Advanced Research in Forensic Science

11:30-11:45pm

Heth 22

Body disposal is typically one of the most problematic issues an offender faces upon commission of a homicide. With eradication of all biological evidence the goal, chemical destruction of human remains is often considered as an effective postmortem disposal method (a la Breaking Bad). The research question explored in this study is: Can a body be completely destroyed through chemical immersion? This research investigates the effect of readily available household cleaners, including chlorox bleach, Roto Rooter drain cleaner, CLR rust remover and Seal-krete concrete cleaner, upon bone decomposition. A sample of 32 pig ribs obtained from the local grocer is subdivided into a subset of four groups of 8. Each group was immersed in a different household chemical in the presence of a fume hood; the contents of each solution was investigated in terms of its pH and chemical composition. It is hypothesized that the more acidic the pH, the greater the decomposition. Bone samples were removed and photographed at the twenty-four hour mark across a period of two weeks. Bone samples were also compared on a standard score of decomposition to assess the most effective (most destructive) chemical.

Visual Sociology Poster Session

A Day at the Beach

Gary Fox

Faculty Mentor(s):

Roby Page

Visual Sociology Poster Session

11:00-12:00pm

Heth 14

This poster is to present an exploration into, and example of, visual sociology. As a qualitative research methodology which includes the use of still photography, visual sociology is a relatively uncommon style of practicing sociological investigation. This poster will introduce visual sociology to the viewer, and illustrate visual sociology with a research project i have conducted this semester. My project is examining the cultural and developmental aspects of a youth basketball team that I help coach. This project will demonstrate how the players must socially learn not only one another, but learn to work together as a team, along with taking instructions and applying them to in game situations. Basketball is not just a physical team sport but an individual mental sport, which i hope to be able to describe through my pictures.

Case Study: Monika Mattson

Amber Ferguson

Faculty Mentor(s):

Roby Page

Visual Sociology Poster Session

11:00-12:00pm

Heth 14

This poster is to present an exploration into, and example of, visual sociology. As a qualitative research methodology which includes the use of still photography, visual sociology is a relatively uncommon style of practicing sociological investigation. This poster will introduce visual sociology to the viewer, and illustrate visual sociology with a research project I have conducted this semester. My project is a case study on my roommate, Monika. This photographic project will study her life at this moment in time as a senior at Radford University, majoring in environmental biology, and trying to navigate into adulthood while also maintaining her adventurous spirit. These pictures will explore many parts of her personality and several personal and professional roles she takes on.

Visual Sociology Poster Session

Sociology all the time, at Anytime.

Brian Snider

Faculty Mentor(s):	Roby Page	
Visual Sociology Poster Session	11:00-12:00pm	Heth 14

This poster is to present an exploration into, and example of, visual sociology. As qualitative research methodology which includes the use of still photography visual sociology is a relatively uncommon style of practicing sociological investigation. This poster will introduce visual sociology to the viewer, and illustrate visual sociology with a research project I have conducted this semester. My project involves something that I have recently become very involved with, and that is fitness. I would like to explore and experiment with the different modes of visual sociology with my camera and explanation of what I see. Archiving and documenting what happens at Anytime Fitness over a certain time, will open up, and perhaps even guide me to the understanding of something I hadn't even planned on knowing before. Thus, the visual documentation will sociologically inform not only the viewers but the subjects as well as myself about what goes on at a twenty four hour gym. I am starting very broad and intend to narrow down to a specific point or realization through what I have seen through the lens of my camera.

The Life of Thora Stickney through the Lenses of Photography

Hannah Koontz

Faculty Mentor(s):	Roby Page	
Visual Sociology Poster Session	11:00-12:00pm	Heth 14

Visual Sociology is an uncommon practice in the sciences of Sociology because it is driven on the standpoints of qualitative research. This poster is to present an exploration into and example of this type of qualitative research. The images are taken through the use of still life photography and visual sociology in order to complete a social investigation. The poster I have created has the ultimate goal of introducing visual sociology to the viewers and illustrate what I have learned this semester about this concepts. My project attempts to explain the life of my roommate, Thora Stickney, through the constructs of Visual Sociology. This is done by following the practical guidelines of Visual Sociology by capturing images that portray Thora in a way that best explains her as an individual. I will be showing this through her different hobbies and attributes that help build her personality. Visual Sociology can be a difficult form of qualitative research being that several people interpret images differently. I have attempted to gather further information about her by obtaining certain aspects in her life from her point of view in attempt to strengthen the messages portrayed in each image.

Happy Tails: A Look into Sparky's Run Dog Park

Heather Moran

Faculty Mentor(s):	Roby Page	
Visual Sociology Poster Session	11:00-12:00pm	Heth 14

This poster is to present an exploration into, and example of, visual sociology. As a qualitative research methodology which includes the use of still photography, visual sociology is a relatively uncommon style of practicing sociological investigation. This poster will introduce visual sociology to the viewer, and illustrate visual sociology with a research project I have conducted this semester. My project is on the local Radford dog park called Sparky's Run Dog Park by the Dedmon Center. I am capturing the flow of what occurs at the dog park as well as interviewing the dog owners there on their experience.

Visual Sociology Poster Session

The Life of The City Market

Katelyn St. Clair

Faculty Mentor(s):	Roby Page	
Visual Sociology Poster Session	11:00-12:00pm	Heth 14

This poster is to present an exploration into, and example of, visual sociology. As a qualitative research methodology which includes the use of still photography, visual sociology is a relatively uncommon style of practicing sociological investigation. This poster will introduce visual sociology to a viewer, and illustrate visual sociology with a research project I have conducted this semester. My project is the Ethnography, time lapse of the downtown market in Roanoke, Va. This is a place where all kinds of people come to not only shop but just to enjoy all of the beauty that Downtown has to offer.

Ball is Life

Kortney Perry

Faculty Mentor(s):	Roby Page	
Visual Sociology Poster Session	11:00-12:00pm	Heth 14

This poster is to present an exploration into, and example of, visual sociology. As a qualitative research methodology which includes the use of still photography, visual sociology is a relatively uncommon style of practicing sociological investigation. This poster will introduce visual sociology to the viewer, and illustrate visual sociology with a research project I have conducted this semester. My project is an in-depth look at a subculture of athletes who have a passion for basketball specifically. I consider these particular athletes ballers because of the way their free time is occupied with basketball, but also how their lives revolve around this sport. These ballers spend as much time playing, watching, and talking about basketball as other people go to work or school. I've chosen to study this culture because I have unintentionally surrounded myself with these people and although I love basketball, I feel like I am not a member of this community. I believe, however, that many people do not know the extent to which basketball is more than just a hobby, and they may benefit from my research to understand why basketball players work so hard and are so passionate about a sport. Unless you are part of this group, you couldn't understand how these ballers could spend hours running, working out, and being yelled at by coaches and yet still loving every second of it. Many of these players have what some would call horror stories about the time they have spent in practice or conditioning and they have spent years working on their craft. This project presents a small look into the basketball culture and looks at how ball is life.

A Day's Cycle of the Bonnie Hurlburt Student Center

Leah Besden

Faculty Mentor(s):	Roby Page	
Visual Sociology Poster Session	11:00-12:00pm	Heth 14

This poster is to present an exploration into, and example of, visual sociology. As a qualitative research methodology which includes the use of still photography, visual sociology is a relatively uncommon style of practicing sociological investigation. This poster will introduce visual sociology to the viewer, and illustrate visual sociology with a research project I have conducted this semester. My project is a day's cycle of the Bonnie Hurlburt student center, a busy hub for the students and faculty of Radford University. My goal is to showcase the Bonnie at different times of the day, with pictures taken over the course of several days, which will show how different one building can be depending on the time of day, and how the students and faculty make use of the building.

Visual Sociology Poster Session

A Deeper Look into Everyday Interaction

Lindsay Losey

Faculty Mentor(s): Roby Page
Visual Sociology Poster Session 11:00-12:00pm Heth 14

Sociology and photography both originated after the era of industrialization in the United States. However, they did not entwine until later. Analyzing photography in both objective and subjective ways can give the viewer more information about what social processes are happening in photographs. Visual sociology explores photographs to extract scientific and social meanings from them. In this project, I took photographs of my husband in his everyday environments and used them to do a case study analyzing his relationships with those around him. I also interviewed him to get an idea of his interpretation of the interactions he has with individuals who are around him regularly. I also interviewed his mother and questioned her about the way she perceived his relationships with others.

The Beauty of Bisset

Olivia Royal

Faculty Mentor(s): Roby Page
Visual Sociology Poster Session 11:00-12:00pm Heth 14

This poster is to present an exploration into, and example of, visual sociology. As a qualitative research methodology which includes the use of still photography, visual sociology is a relatively uncommon style of practicing sociological investigation. This poster will introduce visual sociology to the viewer, and illustrate visual sociology with a research project I have conducted this semester. My project is focus on Bisset park, in Radford Virginia. I will be visiting the park many times, over the next month, photographing the social cycles and patterns that appear at the park.

Vertical Lifestyle

Rebekah Cazares

Faculty Mentor(s): Roby Page
Visual Sociology Poster Session 11:00-12:00pm Heth 14

This poster is to present an exploration into, and example of, visual sociology. As a qualitative research methodology which includes the use of still photography, visual sociology is a relatively uncommon style of practicing sociological investigation. This poster will introduce visual sociology to the viewer, and illustrate visual sociology with a research project I have conducted this semester. My project will be about the subculture of rock climbers. I will illuminate what an average outdoor climbing trip looks like and indoor training at a local rock climbing gym.

Visual Sociology Poster Session

A Day in the Life of the Student Recreation & Wellness Center

Sierra Alexander

Faculty Mentor(s):	Roby Page	
Visual Sociology Poster Session	11:00-12:00pm	Heth 14

This poster is to present an exploration into, and an example of, visual sociology. As a qualitative research methodology which includes the use of still photography, visual sociology is a relatively uncommon style of practicing sociological investigation. This poster will introduce visual sociology to the viewer, and illustrate visual sociology with a research project I have conducted this semester. My project will be showing a days cycle of the Student Recreation & Wellness Center. Through my poster, I will record and display the daily cycle of activity that occurs in the center over a period of a few months time. This will enable viewers to see a different perspective of what goes on in the fitness center on a regular basis. My project will, hopefully, gain an insight of the daily human rhythms and drama occurring in the center, as well as allowing them to gain an understanding of the full reach and character of the Student Recreation & Wellness Center. I hope to successfully give viewers a better understanding of visual sociology, and the importance of the dimensions of social life through photography.

Radford Women's Track and Field: An Ethnography

Cara Myrtle

Faculty Mentor(s):	Roby Page	
Visual Sociology Poster Session	11:00-12:00pm	Heth 14

This poster is to present an exploration into, and example of, visual sociology. As a qualitative research methodology which includes the use of still photography, visual sociology is a relatively uncommon style of practicing sociological investigation. The poster will introduce visual sociology to the viewer, and illustrate visual sociology with a research project I have conducted this semester. My project is an ethnographic study of the Radford Women's Track and Field team. As a member of this group I have special access to some of the everyday activities and events in the lives of these ladies. I have made it my goal with this research to explore ways the team interacts with one another and the outside environment through photography. Pictures will shed light on different aspects of life experienced by the track team and I will review them through a sociological lens. This study is investigative and is aimed at appreciating the person and not at trying to fix or even establish an issue, simply make the culture known.

A College Senior

Samantha Jarrell

Faculty Mentor(s):	Roby Page	
Visual Sociology Poster Session	11:00-12:00pm	Heth 14

This poster is to present an exploration into, and example of, visual sociology. As a qualitative research methodology which includes the use of still photography, visual sociology is a relatively uncommon style of practicing sociological investigation. This poster will introduce visual sociology to the viewer, and illustrate visual sociology with a research project I have conducted this semester. My project is a project based on Samantha Roberts. I will post pictures that have been gathered over several weeks to show how she interacts in her daily life as a college senior at Radford University. These pictures will be accompanied by an appropriate caption.

Visual Sociology Poster Session

A Look Into Radford's National Pan-Hellenic Council (NPHC)

Kiara Charity

Faculty Mentor(s):	Roby Page	
Visual Sociology Poster Session	11:00-12:00pm	Heth 14

This poster is to present an exploration into, example of, visual sociology. As a qualitative research methodology which includes the use of still photography, visual sociology is a relatively uncommon style of practicing sociological investigation. This poster will introduce visual sociology to the view, and illustrate visual sociology with a research project I have conducted this semester. My project is about one of the three councils of Greek Life that I am a part of. I am a part of the National Pan-Hellenic Council (NPHC) which was founded in 1930 at Howard University. The NPHC is formed of 9 organizations, called the Divine 9 after Iota Phi Theta Fraternity, Incorporated joined in 1997. Alpha Phi Alpha Fraternity, Incorporated, Alpha Kappa Alpha Sorority, Incorporated, Kappa Alpha Psi Fraternity, Incorporated, Omega Psi Phi Fraternity, Incorporated, Delta Sigma Theta Sorority, Incorporated, Phi Beta Sigma Fraternity, Incorporated, Zeta Phi Beta Sorority, Incorporated, Sigma Gamma Rho Sorority, Incorporated, and lastly Iota Phi Theta Fraternity, Incorporated make up the Divine 9. Here on Radford's campus we have 5 of those organizations, Alpha Phi Alpha Fraternity, Inc., Alpha Kappa Alpha Sorority, Inc., Kappa Alpha Psi Fraternity, Inc., Phi Beta Sigma Fraternity, Inc., and Zeta Phi Beta Sorority, Inc. Many people on campus only see NPHC members as steppers and dancers but my project displays the educational programs and many community service projects the council does. In my project I'm also displaying the history behind these NPHC organizations.

Floyd Country Store

Chelsey Mathis

Faculty Mentor(s):	Roby Page	
Visual Sociology Poster Session	11:00-12:00pm	Heth 14

This poster is to present an exploration, and example of, visual sociology. As a qualitative research methodology which includes the use of still photography, visual sociology is a relatively uncommon style or practicing sociological investigation. This poster will introduce visual sociology to the viewer, and illustrate visual sociology with a research project I have conducted this year. My project explores Floyd County. More specifically, my project centers around the Floyd County Store and the community involved around the store. Through the aid of photography I hope to capture a culture that many might think of as forgotten.

Campus Outreach: the On-campus Christian Ministry

Victoria Staten

Faculty Mentor(s):	Roby Page	
Visual Sociology Poster Session	11:00-12:00pm	Heth 14

This poster is to present an exploration into, and example of, visual sociology. As a qualitative research methodology which includes the use of still photography, visual sociology is a relatively uncommon style of practicing sociological investigation. This poster will introduce visual sociology to the viewer, and illustrate visual sociology with a research project I have conducted this semester. My project is about a on-campus Christian Ministry called Campus outreach.

Humanities & Behavioral Sciences Oral Session

NATO in the Trump Era

Ryan Taylor

Faculty Mentor(s):

Paige Tan

Humanities & Behavioral Sciences Oral Session

1:00-1:20pm

Heth 22

The North American Treaty Organization (NATO) was founded in 1949 with the objective to solidify a collective defense among its member states to ensure the safety of its citizens. NATO has been involved in countless initiatives since its creation, but in recent times President Donald Trump and other critics have called into question the need for its continued existence. Through this independent research project I wish to be able to explore separate questions such as what NATO has done in the past, what the different countries contribute to its existence, and then finally determine whether or not NATO is relevant in the present. To find the answers to these questions, I will use different resources such as the databases through the Radford Library website, as well as printed texts of books about the history and importance of NATO, with references to other printed resources such as acclaimed published works such as the Washington Post and the Economist. This research will take place over the course of the next 10 weeks with aided assistance and meetings scheduled with Professor Tan every 2-3 weeks to ensure that I am indeed following the necessary procedures to complete this project. I have already outlined the times when to complete the bibliography, outline, first draft and final draft will be due, and am looking forward to being able to complete this assignment. By being able to research this question, I hope to be able to bring perspective to anyone who would follow my work and to enlighten the public on this relevant issue of whether or not NATO should remain intact.

Pat McCrory's Failed Carolina Comeback: An Analysis of the 2016 North Carolina Gubernatorial Election

Alexis Gonzaludo

Faculty Mentor(s):

Scott Dunn

Humanities & Behavioral Sciences Oral Session

1:20-1:50pm

Heth 22

The 2016 North Carolina Gubernatorial race was contentious and polarizing, with Republican incumbent Pat McCrory losing the race after a recount that put Democratic challenger Roy Cooper up by over 10,000 votes. But several factors, such as the states strong economic recovery and GOP control of the general assembly, indicated that this was McCrory's race to lose. This paper argues that Cooper's victory was a result of the tense political climate and the McCrory campaigns message of the Carolina Combeback, being overshadowed by the Trump campaigns theme of negativity. This paper also explores the implications of the McCrory campaigns claims of voter fraud. Looking at the case of North Carolina and Pat McCrory's defeat can serve as a test for politics on a national level, as Republicans now control the presidency and have majorities in the House and Senate and may be pursuing similar policies on a national level.

Business and Economics Oral Session

Blown Away: Bombs, Networks and Economic Fortitude

William Tilson

Faculty Mentor(s):

Thomas Duncan

Daniel Farhat

Business and Economics Oral Session

2:00-2:30pm

Heth 22

Does bombing those involved in terrorist activities accomplish its goals of reducing the number of terrorists, or does it instead cause a growth in terrorist numbers? To answer this, we first seek a behavioral approach to the causes of terrorism. Then, we expound on the factors behind these causes and compare them to known incidents of asymmetrical conflict. Next, without the ability to conduct field research, we use an agent-based modelling technique to predict ethnocentric behaviors in response to bombing. We conclude that asymmetrical response, such as the War on Terror, against terrorist organizations increases not only the recruitment of potential terrorists, but the number of violent terrorist incidents as well.

On Your Mark, Get Set, Go

Brianna Collins

Faculty Mentor(s):

Jane Machin

Business and Economics Oral Session

2:30-3:00pm

Heth 22

This semester I will be prototyping and testing a board game intended to empower dyslexic children. Dyslexia is the most common learning disability affecting 1 in every 10 people. Dyslexics have trouble using and processing linguistic and symbolic codes, such as alphabetic letters. It can affect spoken and written language and also hinders reading comprehension. This means most typical board games put dyslexics at a disadvantage, leading to feelings of defeat, embarrassment and frustration. Research suggests that the manner in which dyslexics process language helps them perform better in certain activities, such as pattern recognition and problem solving. I have developed a board game, "On Your Mark, Get Set, Go" designed specifically to work with the way which dyslexic children process information rather than against it. In contrast to traditional board games, then, my game will give dyslexic children an advantage over non-dyslexic children, helping to improve their confidence and self-esteem. At the Student Engagement Forum, I will present results from testing the board game with dyslexic children. I will also discuss more generally learnings from the innovation process and my plans for continuing the production of "On Your Mark, Get Set Go."

College of Science and Technology Keynote Address

Nancy E. Artis, VP Performance Associates, Inc.

Keynote Address: Career Evolution!

3:00-3:50pm

CS M073

I will use myself as an example of how the world is changing so fast especially in the science and technology fields. With that in mind the theme of a career these days is that “In Five years you will probably working in a job that did not exist today.”

Nancy Artis is a 1973 graduate of Radford College with a major in Biology and a minor in Secondary Education. Since graduation, she has lived in Massachusetts, New Jersey, Virginia, California, and Colorado. She and her husband Pat have recently returned to Virginia.

Her career has included secondary education, engineering support, corporate training, project management consulting, account management, and software sales. She is now the Vice President of Performance Associates, a software and performance engineering company that she and her husband formed in 1986.

Education is very important to she and her husband and they are always trying to find ways to give back to the next budding scholar and entrepreneur.

The Radford University chapter of Sigma Xi, The Scientific Research Honor Society, welcomes everyone immediately following the keynote address to a reception in the adjacent lobby. Learn about becoming a student member there or contact Dr. Boyd (doboyd@radford.edu) for more information on Sigma Xi.

Biology Oral Session

Modeling the Impact of Migration on Cholera Outbreaks

Sarah Rainey

Faculty Mentor(s):

Arietta Fleming-Davies

Biology Oral Session

4:00-4:20pm

CS M073

The effects of human migration on disease transmission are largely unquantified. Refugee camps possess high density, low resource conditions which enable infectious diseases like cholera to thrive. Cholera is a preventable disease, caused by the bacterium, *Vibrio cholerae*, which can contaminate food and water sources. It predominately affects impoverished and developing countries that are subjected to low water quality and poor sanitation. This study mathematically models cholera in order to determine the effect of migration from a homeland country into refugee camps on disease transmission and persistence. The dynamics of cholera outbreaks were simulated using an SIR differential equation model and parameters from prior published data. The model was run in the statistical software R at various migration rates ($\theta = .0001, .00025, .0005, .002, .005, .02, .05, .1$), and levels of camp sizes, from 200 to 100,000 refugees at an interval of 200 individuals. It was found that the refugee camp size had a greater impact on disease transmission and prevalence than the migration rate. These findings suggest that maintaining refugee camp sizes below approximately 4,300 individuals would be an efficient way to manage and minimize the disease spread.

Effects of phenazines on viruses and mosquitoes.

Melissa Kesterson

Faculty Mentor(s):

Justin Anderson

Biology Oral Session

4:20-4:40pm

CS M073

Mosquito-borne viruses cause several million deaths and are responsible for hundreds of millions of cases every year. Infection by the mosquito-borne La Crosse virus (LACV) can cause headache, nausea, vomiting, fatigue, and lethargy lasting for 2-3 days, and it is known to cause inflammation of the brain (encephalitis). We are investigating whether chemical compounds based on phenazine backbones can inhibit LACV replication. Phenazines are natural products produced by soil habitants and marine organisms and are known for their antimicrobial and antibacterial properties. We have been isolating the phenazine pigments produced by various *Pseudomonas* species bacteria. Inhibition is determined by exposing African green monkey kidney cells to the phenazines and then infecting them with LACV for 3-4 days, followed by staining of the cells to visualize plaques; control cells will not be exposed to phenazines. The effect of phenazines on virus replication is then determined by comparing plaque counts between treated and control cells using ANOVAs. These pigments are also being used against mosquito larvae to see if they inhibit growth and/or affect the capacity of LACV to be transmitted. Our results will be discussed in the context of interrupting mosquito-borne disease transmission.

Biology Oral Session

The PASSER Project: From Innovative Ecobehavioral Research to Genetic Algorithms as a Metric

Conner Philson	Drew Wolford	
Faculty Mentor(s):	Jason Davis	Andrew Ray
Biology Oral Session	4:40-5:10pm	CS M073

Ecobehavioral research on wild songbirds is typically conducted through direct, first-hand observations of birds in the field. To go beyond manual data collection, we are developing the Programmable Automatous System for Songbird Ecological Research (PASSER) Project: an attempt to create semi-automatous micro-computer enabled nests and feeders, built through computerized fabrication practices. The PASSER Project enables the production of multimodal data sets, collected 24/7/365, which can be used to explore the many factors relating to feeding and nesting. The degree to which varying environmental factors influence songbird communities, and the behavioral adaptiveness these species exhibit, can also be studied with these units. Upcoming research will focus on identifying specific spatial and temporal variations in the environment and manipulating several of these features to determine their impact on local bird species. The PASSER Project provides the capability to dynamically modulate bird's interactions with feeder units through the use of an interactive touchscreen display. A major application of the screen is the presentation of virtual moths. Birds at the feeder will be required to tap one of the moths on the screen in order to initiate food delivery. This acts in turn as a selective pressure upon the virtual moths, killing and removing that moth from the virtual population. The aggregation of these selective pressures, will result in the evolution of the virtual genome, creating an evolutionary model that responds to the selective pressure applied by the feeding birds. As a result, changes in the virtual genome reflect salient environmental features that correlate to feeding patterns in the bird population. The outcome will thus offer insight into both the modular evolutionary process of the virtual population, and the various factors influencing bird feeding behaviors.

The Madagascar Hissing Cockroach, *Gromphadorhina Bortentosa*, as a Biotransformer

Erin Dudley	Emmanuella Kumi	
Faculty Mentor(s):	Jason Davis	Laurie Bianchi
Biotransformer Oral Presentation	5:10-5:30pm	CS M073

Insects play an essential role in maintaining the health of an ecosystem through the decomposition of organic material into nutrients and energy cycled through the food web. Due to their large size, tolerance for high population density, and opportunistic feeding, *Gromphadorhina portentosa* can metabolize large quantities of a wide variety of potential foodstuffs. Our previous research has shown that royal jelly, produced by honeybees, increases the growth rate and fecundity of *G. portentosa* when administered across their life cycle. Here we will examine the process of converting organic material into nutrient rich frass by *G. portentosa* and how royal jelly may affect the rate of this conversion. Data suggests a positive trend between consistent royal jelly treatments and food consumption of less-preferred food types in controlled laboratory colonies. In order to explore the effects of long-term and short-term royal jelly treatments, we administered royal jelly to colonies of cockroaches treated with royal jelly from the beginning of their life and colonies of previously untreated cockroaches while observing various aspects of food consumption including mass and diversity of foods consumed, and measurement of fecal production. These colonies were compared to control colonies of untreated cockroaches fed a similar diet. This data will be implemented into a system using cockroaches as biotransformers to convert food waste into natural fertilizer and consumable protein.

Chemistry Oral Session

Investigation of the Mechanism of Fullerene and Carbon Nanotube Formation by Molecular Dynamics Simulation

Bismark Amofah

Faculty Mentor(s): Timothy Fuhrer
Chemistry Oral Session 5:30-5:50pm CS M073

For the first twenty years after the discovery of fullerenes, a bottom-up mechanism of assembly, where fullerenes form by successive addition of C₂ units, was generally accepted. Recent experimental and theoretical discoveries have led to questioning of this idea and the postulation of a top-down mechanism where fullerenes are believed to form from the folding up of graphene sheets and successive losses of C₂ units. This work investigates and updates that premise using Density-Functional Tight Binding molecular dynamics simulations.

An Operationally Simple Approach to Indole Derivatives From 2-alkenylanilines Utilizing an Oxidation-transannulation-elimination Sequence

Jacob King

Faculty Mentor(s): Christopher Monceaux
Chemistry Oral Session 5:50-6:10pm CS M073

The indole motif is present in a variety biologically active compounds and synthetic preparations of this motif has long been an area of synthetic interest. Recently, metal-free cyclization reactions through 2-alkenylanilines have emerged as a direct route to arrive at functionalized indoles. Herein, we describe an operationally simple route utilizing an epoxidation-transannulation-elimination sequence to furnish indole derivatives from a variety of N-tosyl 2-alkenylanilines.

Science Oral Session

The Internet of Things Requires Enhanced Security Guidelines for the Future

Erik Miller	Treemont Haga	
Faculty Mentor(s):	Chen-Chi Shing	
Science Oral Session	6:10-6:30pm	CS M073

The Internet of Things (IoT) is a relatively recent technological and economic trend that involves using computers, microcontrollers, and RFID to collect and analyze data, as well as perform tasks and services. An IoT device represents a real-world entity. These devices have the ability to create new business and employment opportunities, but they must be secure. These devices may serve a business function, or used on a consumer's home network. There are various layers of security in an IoT system: Network, Interface, Authentication, and Physical. The device must not be vulnerable to attacks in these layers. Only authorized users should be able to access the device or the service. The device must also be protected from weather and theft. These four aspects serve as a baseline for securing an IoT device.

Locating Sinkholes at the Selu Conservancy Using Infrared Aerial Imagery

James Young	Kent Weidlich	
Faculty Mentor(s):	Chester Watts	
Science Oral Session	6:30-6:50pm	CS M073

As part of an undergraduate research project, the author utilized infrared cameras, both handheld and Unmanned Aerial Vehicle (UAV)-mounted, and 3D photogrammetry, to investigate karst processes at the Selu Nature Conservancy, owned by Radford University. This research builds on previous studies undertaken 14 years ago. At that time, sinkholes were mapped using standard survey techniques and no actual openings into the ground were located. More recently, holes connecting to underground voids have opened in at least two sinkholes. With that in mind, the author used UAVs, carrying standard and infrared cameras, as well as handheld infrared cameras and a Garmin GPS system, to examine and map sinkholes in the study area. Those were then compared to existing maps. The aerial and handheld infrared cameras both reported average temperature differences between the openings and the surrounding ground for each location of about 12 degrees Celsius. This has been consistent among the openings that have been observed and investigated in the area. The author also conducted a UAV mission over the area of one of the openings to create a 3D representation of it using a 3D printer. This study could provide another tool for identifying underground openings using aerial surveying and other new methods as technology advances.

Science Oral Session

Conceptual Construction of Gigapan Virtual Lab “Actuality Enhances Virtual Reality”

Emily Cyrus	Dylan Philippart	
Faculty Mentor(s):	Parvinder Sethi	
Science Oral Session	6:50-7:10pm	CS M073

Since 2016 RU-Geology researchers have been conducting field work with the GigaPan technology for capturing panoramic images of geological terrains from a select group of U.S. national parks. The GigaPan robot was originally developed by NASA and Carnegie Mellon’s Robotics Institute as a method of combining hundreds of images into a single, extremely high-quality (gigapixel-sized) panorama. Students can then explore the encapsulated environment by zooming into areas in significant detail all the while maintaining high-definition resolution. The goal of our current research is to pilot-test the Computer-Human Interaction of such GigaPan-based laboratory exercises for use in 100-level Geology courses. Such exercises are designed to simulate a virtual field trip, through a unique data collection mode. Users utilize high-resolution panoramas in order to develop and test a working hypotheses. These virtual labs are an ideal platform for students with physical disabilities to also experience the scientific process of conducting geologic field research. Upon approval from the RU-IRB (Institutional Review Board) we randomly selected a subset of Geology 100-level students as test subjects. We then conducted a detailed pilot study to evaluate the ‘user-friendliness’ of design elements of such exercises. The pilot study included a ‘pre-test’ and a ‘post-test’ survey with approximately two to three weeks in between sessions which allowed for integration of student feedback into revision of the original exercises. Techniques for evaluation included a Likert-scale type survey and videotaping of the test subjects in a controlled environment. Results were analyzed via basic statistical techniques to highlight trends and patterns pertaining to usability and human-computer interactions. All too often, instructional-technology applications are designed based on ‘assumed best practices’ and rarely assessed via pilot tests involving test subjects that are truly representative of the target ‘end-user population’. We propose a pilot-testing and reiterative-design protocol that can be used as a basic template by other geoscience educators to design and test their own virtual laboratory exercises for teaching/learning in the geosciences.

Geospatial Science Poster Session

Identifying Spatial Distribution and Growth of Hydrilla verticillata within Aquia Creek, Virginia

Andrew Summers		
Faculty Mentor(s):	Andrew Foy	Charles Manyara
Geospatial Poster Session	1:00-2:30pm	CS Lobby

Since 1983, there has been an increase in invasive aquatic vegetation within the Chesapeake Bay watershed. Invasive aquatic species are often more successful at obtaining light and nutrients, and able to outcompete native vegetation. Areas within the bay watershed are overrun with these species, including Hydrilla verticillata. The purpose of this study is to measure the change in growth as well as the spatial distribution of Hydrilla verticillata using remote sensing techniques over the past two decades. Aquatic vegetation indices will be used to identify hydrilla blooms within the study area for each year/growing season using ERDAS Imagine 2016. The study area for this analysis is Aquia Creek, a tributary of the Potomac River in Stafford County Virginia. During the growing season Hydrilla verticillata blooms restricts boating, fishing, swimming and other recreational uses. The goal is to use this application of geospatial technology to provide useful information to help management practices of this impaired waterway.

Geospatial Science Poster Session

Crime Hotspots of York-Poquoson County, Virginia

Benjamin Williams

Faculty Mentor(s):	Andrew Foy	Stockton Maxwell
Geospatial Poster Session	1:00-2:30pm	CS Lobby

The objective of this study is to analyze crime incident data within York-Poquoson County, Virginia. Data from the year 2014 to 2015 is used to reveal areas of higher crime incidents (hotspots) to help predict the risk of future crimes that occur. The reasoning behind this study is because of the recent increase in crimes occurring within York-Poquoson County that have risen by 100 incidents since last year. This study will also identify crime hotspots within York-Poquoson County and represent them visually so it may help local law enforcement offices to improve their patrols and keep watch of areas that are at higher risk of crimes. This will be done by analyzing local points of interest within the study area of York-Poquoson County that would have correlation with crimes occurring there and past crime incidents as well. The types of crimes being analyzed will include non-violent (theft, larceny, drugs and alcohol) and violent crimes (robbery, assault, rape, and murder). The data will be put into an RTM (Risk Terrain Model) on ArcGIS 10.2.2 that receives spatial features and calculates the risk of future crimes occurring. From previous studies conducted using this type of analysis resulted in decreased crime occurrence within crime hotspots identified from an RTM from increased police presence in these areas.

Identifying Land Cover Changes in Relation to Economic Palm Oil Demands

Brayden Manchester

Faculty Mentor(s):	Andrew Foy	Charles Manyara
Geospatial Poster Session	1:00-2:30pm	CS Lobby

Oil palm cultivation plays a significant economic role for the nation of Indonesia. In 2006, Indonesia became the world's largest producer of palm oil, which has since led to land use and land cover changes and deforestation across various regions of the country. The West Kalimantan region of Indonesia engulfs 56,876 square miles of the nations total land area. Peat forests once dominated this region and over the past decade, they have rapidly declined due to the expansion of oil palm plantations. Economists predict that the global demand for palm oil will increase in future years, and if so, Indonesia will require additional land for oil palm cultivation. This project will quantify the amount of deforestation, which has occurred over the last ten years in areas of West Kalimantan where oil palm plantations exist. Remote sensing practices will be used to measure land cover changes associated with oil palm plantation locations. This particular change detection analysis will derive rates of land cover change, which can then be compared to levels of demand associated with oil palm cultivation. These results will allow predictions to be made concerning future land cover changes and the impacts they present for this region.

Geospatial Science Poster Session

The Effects of Nitrate and Algal Blooms on water quality of the New River in the City of Radford

Daniel Yoon

Faculty Mentor(s):	Andrew Foy	Stockton Maxwell
Geospatial Poster Session	1:00-2:30pm	CS Lobby

Maintaining the quality of our water is vital for all forms of life. Pollution is a detriment to the water quality. A major environmental problem that is occurring is nutrient pollution in rivers. Nutrient loading is caused by improper removal of nitrate at waste water management facilities or untreated discharge of waste water into the waterways. The purpose of this study is to determine how water quality of the New River within the City of Radford is impacted due to excess nitrate levels from wastewater discharge. The quality of water can be determined by biological, inorganic, organic, micro bacterial, physical, and chemical characteristics. The key factors for this study are nitrate levels and algal blooms. Excess amount of nitrate in waterways can lead to algal blooms which are rapid growth of algae in water, resulting in water quality degradation. Data samples were obtained through the EPA Storet database and analyzed using geographic information systems. Two data sets from different sample dates were compared and remote sensing was used to detect algal blooms under periods of high nitrate levels.

Modeling Potential Infestation Spread of the European Gypsy Moth in New Jersey

Devon Burton

Faculty Mentor(s):	Stockton Maxwell	Andrew Foy
Geospatial Poster Session	1:00-2:30pm	CS Lobby

The European gypsy moth is an invasive pest introduced to the United States in the late 1860s by an amateur entomologist. The moth's larvae are responsible for over 6,000,000 acres of hardwood forest defoliation since their introduction and bad infestations can result in tree mortality if left persisting over 2 years. Currently, most of the research and management published by the federal government exists along a quarantine border. This project, however, will focus on areas where the gypsy moth established reoccurring populations within the quarantine. The pilot study region is New Jersey because of data availability and its small size. Using geospatial-modeling technology, such as exploratory regression and geographically weighted regression, this project will create a model that will predict gypsy moth infestations. The model examines how different variables such as tree species, land use, and more affect the spread of the gypsy moth.

Geospatial Science Poster Session

Assessing Geographic Uncertainty of Intermittent Streams on 7.5 Minute Quadrangle Topographic Maps

Joseph Doten

Faculty Mentor(s):	Andrew Foy	Richard Roth
Geospatial Poster Session	1:00-2:30pm	CS Lobby

Some environmental regulations apply to perennial streams, but do nothing to regulate those that are intermittent or ephemeral. This is because headwater streams' impacts on navigable waters are not widely recognized. Problems can arise from lack of protection if headwaters are mistakenly identified as intermittent, when they are perennial. The objective of this project is to determine the amount of uncertainty in the geographic location of the point at which intermittent streams become perennial streams. This study will use intermittent streams found within the geographic extent of the USGS Radford North 7.5 minute quadrangle. Using a field identification protocol created by the Fairfax County Stormwater Planning Division, the transition from intermittency to perenniality will be determined in the field and recorded using a Trimble hand-held GPS receiver. A geographic information system (GIS) was used to analyze the spatial pattern of these errors.

The Effect of Tourism on the Carbon Footprint in Popular Destinations in the United States

Kendall Carlson

Faculty Mentor(s):	Andrew Foy	Josh Carroll
Geospatial Poster Session	1:00-2:30pm	CS Lobby

Throughout the past years, the talk about climate change and the impact of people's carbon footprint has increased. A carbon footprint is the amount of greenhouse gas emissions in the air. While this seems simple, it is difficult for people to see and know what they are doing that increases a carbon footprint. The purpose of this project is to look at popular destinations for tourism that have large tourist destinations, marches, events etc. and monitor the increase of the carbon footprint based off events. A geographic information system was used to analyze and compare carbon footprints for several large tourist destination. This gave a clear picture on how much tourism has an impact on a carbon footprint. Tourism is affecting the carbon footprint and global warming and global warming is effecting the tourism industry.

The Effects of Land Uses and Covers on Aquatic Invertebrates and Water Quality along Creeks in Pulaski and Montgomery Counties

Matthew Forsberg

Faculty Mentor(s):	Andrew Foy	Charles Manyara
Geospatial Poster Session	1:00-2:30pm	CS Lobby

Land cover is an important geographic characteristic for riparian areas, because certain types of vegetation act as a buffer and filter water before it enters a stream. The purpose of this study is to provide beneficial information for improving our environment, particularly water resources. The objective is to collect data on our streams and their health using macroinvertebrates as a proxy for water quality. The Save Our Streams (SOS) methodology, which follows the VA SOS multimetric index system was used to collect data. The results of the multimetric index were used to determine if stream conditions were acceptable or not. That data was then used in a geographic information system (GIS) to look for spatial patterns in land cover that were predictive or correlated with water quality.

Geospatial Science Poster Session

A GIS Suitability Analysis for New EMS Stations in Virginia Beach

Miranda Majette

Faculty Mentor(s):	Andrew Foy	Charles Manyara
Geospatial Poster Session	1:00-2:30pm	CS Lobby

According to the City of Virginia Beach's 2016 Consolidated EMS Statistics Report, none of the EMS departments met their response time goals (different response time goals are set for various types of incident calls). The purpose of this study is to identify if and where areas in Virginia Beach, Virginia are underserved with Emergency Medical Services. Identifying the best location(s) in the city to build one or more new EMS stations would greatly improve response time for rescue services to get to local addresses. The new station(s) will be identified through a GIS suitability analysis. Their connectivity and updated response times to local addresses will be evaluated by use of a GIS network analysis. The expected results of this study will identify the best location for a new EMS station to better serve the City of Virginia Beach.

Analysis of Spatial Variation Correlation with Time of a Historical Cemetery in Appalachian United States

Rachel Boyd

Faculty Mentor(s):	Andrew Foy	Jason Fox
Geospatial Poster Session	1:00-2:30pm	CS Lobby

This project aims to determine if the spatial distribution of graves are different based on time period. The location for identifying spatiotemporal variation is the Westview Cemetery in Radford. Currently, there is an absence of the burial records in relation to location. Without a visual guide or map, families have struggled to find an ancestor within the cemetery. As the graves span over a period from the early 19th century to present day, analyzing if spatial variation correlates with temporal variation can assist recording grave markers throughout the site. This method will use GIS applications for simple random sampling of archaeological survey. Collecting the coordinates of the random points and utilizing them in the field by leveraging GPS technology. This consists of recording all the graves markers within a 3-meter radius of each point, similar to creating a unit through simple random sampling. The results will help identify unmarked graves sites and predict future development patterns.

Accuracy Assessment of Data Collected with a UAV Photoscan and a Terrestrial Lidar

Renee Dauerer

Faculty Mentor(s):	Andrew Foy	Skip Watts
Geospatial Poster Session	1:00-2:30pm	CS Lobby

In today's world, there is a growing need for real-time data to be used in geographic information systems (GIS) analysis to solve problems. Data collected with unmanned aerial vehicles (UAV) are capable of creating geospatial products for GIS analysis. The purpose of this project is to determine the accuracy of a UAV photoscan and the accuracy of a Lidar scan in order to compare the two methods to each other. UAV data was obtained by flying an aircraft over the study area, which includes Cook Hall, Waldron Hall, and the areas surrounding them on Radford University's campus. Dr. Andrew Foy previously collected the terrestrial Lidar data used in the project. The Root Mean Square Error (RMSE) and ANOVA was used to calculate the accuracy of the two surveying methods, by using 30 sample measurements collected at the study area and comparing these measurements to the UAV calculations and the Lidar calculations. The software Pix4D was used to process the UAV data and calculate the 30 measurements. The software Licia Cyclone was used to calculate the 30 measurements for the Lidar data.

Geospatial Science Poster Session

Predicting Criminal Activity in The City of Richmond Using Risk Terrain Mapping Models

Scott Carroll

Faculty Mentor(s):	Andrew Foy	Charles Manyara
Geospatial Poster Session	1:00-2:30pm	CS Lobby

The objective of this study is to statistically prove if Risk Terrain Mapping tool being used in the City of Richmond is helping to properly predict future criminal events. Risk Terrain Mapping is a tool used by law enforcement agencies all over the world to forecast future criminal activity based on geographic points of interest in the study area (Parks, Schools, dark alleyways, etc.). Using ArcMap and different statistic tests in JMP software it would be possible to prove whether the Risk Terrain Mapping tool used with 2015 crime data is properly predicting criminal events by comparing the predictions to a hotspot map of the 2016 year. The results of this study could help to correct any flaws or error in the Risk Terrain Tools being used by The City of Richmond Police Department. Ultimately, leading to lessen criminal activity and improve public safety.

Quantifying and Assessing the Effects of Mountaintop Mining on Topography and Hydrology

Shane Carper

Faculty Mentor(s):	Andrew Foy	Stockton Maxwell
Geospatial Poster Session	1:00-2:30pm	CS Lobby

Mountaintop removal is the dominant form of extracting coal within Southern Appalachia and the number one driver of land cover and land use change in this region. To date, Mountaintop/Valley fill operations throughout the Appalachian region have converted 1.1 million hectares of forest to surface mines, and has buried more than 2,000 kilometers of stream channel beneath mining overburden that is disposed of in adjacent valleys. The purpose of this research is to examine the effects that mountaintop removal and valley fill (MTVF) mining operations have on the surrounding hydrology and topography using GIS and digital elevation models (DEM) to quantify the level of change that has taken place within the region. The results provide insight into how to mitigate the hydrologic impacts that are associated with mountaintop removal and valley fill operations by gaining a better understanding of how mining companies can use more effective techniques when reclaiming the mine site.

Accuracy of Satellite Images for Intelligence Gathering

Zachary Yarbrough

Faculty Mentor(s):	Andrew Foy	Charles Manyara
Geospatial Poster Session	1:00-2:30pm	CS Lobby

Remote sensing is a useful tool to observe the earth using satellites without having to physically collect data. This can be useful in situations where the location is dangerous or would be very difficult to physically get there. The goal of this project will be to determine which satellite will produce an image classification that is most accurate. Images will be gathered and classified based off a universal set of classes. These classifications will then be checked for errors and accuracy. To determine if there is a statistically significant difference in classifications an ANOVA test will be performed on the accuracy percentage of all the images. The results of this study will be able to help future research use the most accurate source of remote sensing imagery.

Geospatial Science Poster Session

Accurate Addressing: The Effects of Reference Data on Geocoding Accuracy

William Stanus

Faculty Mentor(s): Andrew Foy
Geospatial Poster Session 1:00-2:30pm CS Lobby

The City of Radford has recently undertaken the goal of assessing its master address file system for spatial accuracy and completeness. This is the initial step towards implementing the next generation 9-1-1 services for the City of Radford and surrounding communities. The review-process of existing address points and associated reference data has provided an opportunity to ascertain how addressing conventions or lack thereof have aided and/or hindered municipal activities within the City. The purpose of this research study is to: (1) identify areas where Radford City's addressing file system deviates from other common municipal addressing formats, (2) group those format deviations into different classification themes, and (3) determine if any single classification theme significantly contributes to the most accuracy errors during an automated geocoding process. By focusing on the spatial patterns present in Radford's addressing system and leveraging derived statistical information from those patterns we hope address problems that could arise during the geocoding process.

Geology Poster Session

Using Unmanned Aerial Systems, Lidar, and Geophysics to Study Karst at the Selu Conservancy, Radford, Virginia

Kent Weidlich

Faculty Mentor(s): Skip Watts
Geology Poster Session 1:00-2:30pm CS Lobby

The Selu Conservancy was established in 1989 when John Bowles donated 185 acres of family, land on the banks of Little River, to Radford University. It was later expanded to 380 acres through another Bowles family gift. Today the property houses an educational retreat center with classrooms, an astronomical observatory, overnight accommodations, hiking trails, and much more. The property is used for many different types of cultural and outdoor educational activities. Geologically, the Selu Conservancy is located within a doubly plunging anticline on the Cambrian-aged Elbrook and Copper Ridge Formations. The Elbrook Formation is generalized here as a tan and gray, partially dolomitized limestone, interbedded with a stylonitic, dark gray, fine-grained dolomitic limestone. The younger Copper Ridge Formation is characterized as a medium to light gray, fine-grained dolomite with algal laminations and some lenses of dolomitic, quartzose sandstones, and laminated chert. More detailed descriptions are to be found on the Geologic Map of the Radford South Quadrangle, Virginia, by Schultz and Bartholomew, 2010. The property contains numerous mapped sinkholes, found primarily within the Copper Ridge Formation. Previous mapping did not reveal the presence of caves on the property, but recent evidence suggests that a cave or caves might be present. The purpose of this study was to evaluate the use of unmanned aerial systems, infrared imagery, and LiDAR, for mapping karst features, in comparison to earlier traditional surveys and published topographic maps. Locations where openings have been found are being further explored using electrical resistivity. A progress report will be presented.

Geology Poster Session

Pyrite Mineralization as a Tool for Determining Paleoenvironment of Devonian Age Black Shales in Southwest Virginia

Zach Yates	Hunter Childers	
Faculty Mentor(s):	Parvinder Sethi	George Stephenson
Geology Poster Session	1:00-2:30pm	CS Lobby

Research of pyritized black shales can be beneficial in enhancing our understanding of the ubiquitous environmental problem of Acid Rock Drainage (ARD) in SW-Virginia. The mineralogy of pyrite is such that it readily oxidizes on contact with moisture thereby causing acid runoff which in turn can leach heavy metals from the host shales. Moreover, patterns of pyrite morphologies and concentration can also be used as a proxy for deciphering paleoenvironmental conditions that accompanied accumulation of such clay- and organic-carbon rich sediment. In this study we present results of an ongoing investigation of ARD, pyritization and paleoenvironment reconstruction of the Middle Devonian Millboro Shale that is exposed near Radford in Virginia. We extracted a total of 3.5 m of the Millboro Shale strata using a portable, gasoline-operated, concrete-cutting saw. Prior to the extraction of the stratigraphic column, a total of 30 pyritic nodules, pyritized worm burrows, and various other occurrences of pyrite were carefully sampled and labeled with information regarding their exact stratigraphic location. In lab strata were analyzed for parameters including - patterns of lamination, ichnofabric indices (i.e. levels of bioturbation), point-counts of pyrite flecks and type of macro- and micro-sedimentary structures. Samples were also examined with a Scanning Electron Microscope (SEM) and a Z-stacking Dissecting Microscope (ZDM) for ascertaining primary and secondary crystal morphologies. Ongoing analyses include investigating possible correlations between levels of bioturbation, erosional surfaces, pyrite distribution and events of benthic oxygenation possibly related to storm surge events in this setting of the Appalachian Basin.

Physics Poster Session

Thermal Wave Speed in Simulated Sea Ice

Nicholas Schrecongost		
Faculty Mentor(s):	Rhet Herman	
Physics Poster Session	1:00-2:30pm	CS Lobby

There is no definitive speed or a range of speeds for thermal wave speed in sea ice. There are tutorials on how to measure the speed, but none of them give numerical results. In addition, moderate literature research has yielded no measurements for these speeds. The Scientific goal of this research was to find the speed of a thermal waves in a tube of ice. A refrigerator set to $(-40\text{Å}^{\circ}\text{C})$, was set up along with a custom build microcontroller-based sensor to measure thermal wave speeds. Tests were conducted on ice tubes of various salinity. Salinity rangers from fresh water, sea water and super salty. Using Mathematica, the heat transfer through the ice has been graphed for various salinities.

Chemistry Poster Session

Synthesis and Characterization of Group 14 Derivatives of Xenophilic Metal Clusters

Aaron Babb

Faculty Mentor(s): George Harakas
Chemistry Poster Session 4:00-5:15pm CS Lobby

Xenophilic transition metal clusters are a class of metal clusters which contain unbridged metal-metal bonds between a metal center attached to ligands capable of back-bonding and a metal center with ligands lacking back-bonding character. The xenophilic dianion $\text{Na}_2\text{Mn}(\text{THF})_2[\text{Fe}(\text{CO})_4]_2$ (1) is an ideal building block for derivatization due to the $[\text{Fe}(\text{CO})_4]^-$ groups which are sites for nucleophilic substitution. The reactivity of 1 with EPh_3Cl (E = Si, Sn) in THF are described in this study. The reaction of 1 and SiPh_3Cl produced a color change from the dark orange color of 1 in THF to a deep red solution. The reaction of SiPh_3Cl with 1 in a 2-to-1 or 1-to-1 stoichiometry showed the same FTIR absorptions, indicating that a monosubstituted cluster is the major product. When SnPh_3Cl is reacted with 1 a pink wine color and white solid are observed. When the solvent was removed under vacuum, a light pink crystalline solid was observed. When this solid was dissolved in THF, the solution gave an FTIR spectrum identical to the reaction mixture, indicating the compound does not decompose when exposed to dynamic vacuum. Based on FTIR spectra the SnPh_3Cl reaction with 1 was complete within 15 minutes whereas the reaction of 1 with SiPh_3Cl was not complete after 19 days. The formation of a white solid, color change of the solution, and FTIR spectra of the reaction mixtures indicate the formation of group 14-Xenophilic clusters.

Modeling of Cooperative Binding in Beta-glucuronidase

Alexandra Hawks

Faculty Mentor(s): Kimberly Lane
Chemistry Poster Session 4:00-5:15pm CS Lobby

Glucuronidase is a protein that breaks down glycosaminoglycans (GAGs). GAGs provide lubrication and support the body's vital organs and joints. The human body is continually forming them. When GAGs cannot be broken down properly, they cause Mucopolysaccharidosis Type VII, more commonly known as Sly Syndrome. Sly Syndrome causes a severe build-up of fluid all over the body, and it is fatal in 100% of cases. There is no known cure. Mutations in the glucuronidase protein can affect the stability of the protein and infringe on its ability to break down the glycosaminoglycans. In this research, we used ICM Pro from Molsoft LLC to test to stability of the protein with different known mutations associated with Sly Syndrome, and compared our data to that of other researchers. We are now testing the binding ability of the active sites with different structures of glycosaminoglycans. Since $\hat{\text{P}}^2$ -glucuronidase is a tetramer with four identical subunits, the goal is to see if there is any cooperativity between adjacent active sites.

Chemistry Poster Session

Preparation of Degradable Block Co-Polymers to Encapsulate Small Organic Pollutants from Water

Cailin Henry

Faculty Mentor(s): Amy Balija
Chemistry Poster Session 4:00-5:15pm CS Lobby

The presence of pollutants in water systems is becoming increasingly problematic due to the rising world population. Pollutants are removed from water using techniques varying from filtration to bioremediation. Yet, these methods are becoming less effective as the concentration and diversity of contaminants increases. The goal of this project is to use bio-renewable resources to synthesize degradable block co-polymers that can be employed to encapsulate small organic pollutants from aqueous environments. To help facilitate the efficient removal of hydrophobic pollutants, these polymers contain a hydrophobic interior surrounded by a hydrophilic periphery. However, the type of hydrophobic starting material that can effectively remove pollutants is unclear. In this presentation, the synthesis and characterization of novel block co-polymers containing undecanoic $\hat{\text{P}}^3$ -lactone will be discussed. Preliminary encapsulation studies using polycyclic aromatic hydrocarbons (PAHs), known persistent pollutants, will be highlighted.

Expression, Purification, and Crystallization of AS2

Anthony Kwan

Mckenzie Hunt

Faculty Mentor(s): Kimberly Lane Tara Phelps-Durr
Chemistry Poster Session 4:00-5:15pm CS Lobby

AS2 (Asymmetric Leaves 2), a Knotted 1-like homeobox (KNOX) gene, controls cell differentiation. AS2 is characterized, by its cysteine repeats and leucine zipper, for possible binding functions. In plants, such as *A. thaliana*, KNOX genes are turned on and off, allowing the plant's ability to create new differentiated cells, e.g. flower organs. AS2 protein binds to the AS1 protein, another KNOX gene, which binds to the HIRA protein. Histone cell cycle regulator, HIRA, is a histone-interacting protein, which binds to purified core histones that prevents DNA from being unwound. In mammals, once the HIRA gene is suppressed in a cell, it is suppressed for the duration of the cells, and its daughter cells, life span. The primary objective of the study is to determine the 3D structure of AS2 through X-ray crystallography, which could lead to understanding on how cells can differentiate. The HIRA gene in mammals is conserved in many plant species such as *A. thaliana*, so understanding how plants can turn on/off the HIRA gene, could lead to the understanding of how the HIRA gene is deactivated in mammals. The project consists of the expression, purification, and crystallization of the AS2 protein from *A. thaliana*. The protein has been induced with IPTG at varying concentrations (0.01mM-1mM), and with other additives, sorbitol (0.1M-0.7M) and ethylene glycol (5%-7.5%), to improve solubility of the protein. Chromatography will be done to purify the protein then crystallization, and X-ray crystallography done to determine the protein structure of AS2. This project is branching out into the ASF1 (Anti-silencing function protein 1) protein as a single protein expression and as a double expression as a complex of ASF1 and AS2.

Chemistry Poster Session

Synthesis of Novel Xenophilic Metal Centers

Evan Cowling

Faculty Mentor(s): George Harakas
Chemistry Poster Session 4:00-5:15pm CS Lobby

Transition metal clusters can be broadly classified into two groups: ionic with a high amount of charge separation, and covalent clusters which are neutral or have little charge separation. Xenophilic transition metal clusters can be thought of as a hybrid of ionic and covalent clusters. The xenophilic compound $\text{Na}_2[\{\text{Mn}(\text{THF})_2\}\{\text{Fe}(\text{CO})_4\}_2]$ (1) was reacted with $\text{CpFe}(\text{CO})_2$ in THF. The IR peaks of 1 are 2000 cm^{-1} , 1911 cm^{-1} , 1880 cm^{-1} , and 1855 cm^{-1} . After the reaction of 1 with $\text{CpFe}(\text{CO})_2\text{I}$ the 1880 cm^{-1} and 1855 cm^{-1} peaks disappear, and new peaks at 2016 cm^{-1} , 980 cm^{-1} , 1953 cm^{-1} , and 1782 cm^{-1} appear in the spectra. The 1782 cm^{-1} peak is evidence for a bridging carbonyl, though it is unclear whether this is the result of substitution onto 1 or decomposition into $\text{Cp}_2\text{Fe}_2(\text{CO})_4$. Reacting 1 with $[\text{CH}_3(\text{CH}_2)_3]_3\text{SnCl}$ in THF results in a change from the canary yellow starting solution to a faint pinkish yellow solution. New peaks in the IR at 2050 cm^{-1} , 1990 cm^{-1} , and 1956 cm^{-1} and the disappearance of IR peaks from 1 indicate nucleophilic substitution onto the xenophilic anion. When 1 was reacted with $[\text{CH}_3(\text{CH}_2)_3]_2\text{SnCl}_2$ the solution FTIR had absorptions at 2081 cm^{-1} , 2041 cm^{-1} , 1995 cm^{-1} , 1981 cm^{-1} .

Synthesis and Analysis of Fullerenes in the Undergraduate Physical Chemistry Laboratory

Hannah Bell

Angel Lambert

Faculty Mentor(s): Timothy Fuhrer
Chemistry Poster Session 4:00-5:15pm CS Lobby

We present a series of experiments for the undergraduate Physical Chemistry Laboratory centered around the synthesis, characterization, analysis, and computational modeling of fullerenes. Synthesis of C₆₀ and other fullerenes is achieved by utilizing a student constructed apparatus that is fabricated inexpensively from repurposed, outdated equipment. Students also attempt fullerene synthesis through a variety of nontraditional wet chemistry methods. Verification of fullerene formation is investigated through spectroscopic analysis methods including UV-Vis spectroscopy. Computational work done by students includes modeling of geometry, spectroscopy, and statistical mechanics using Density Functional Theory. From these studies, students gain additional understanding of both structure and thermodynamic stability of C₆₀ and the other fullerenes as well as gain computational chemistry skills.

Chemistry Poster Session

Analysis of Water Sample for Volatile Organic Compounds Using GC-FID and GC-MS

Jill Suwala **Anthony Smith**
Faculty Mentor(s): Cindy Burkhardt
Chemistry Poster Session 4:00-5:15pm CS Lobby

Volatile Organic Compounds (VOCs) are carbon-based compounds that evaporate easily. Gasoline, fuel oil, paints, and solvents are just a few examples of commercial products that contain VOCs. Unfortunately, through accidental spills and improper disposal techniques, VOCs can be found in environmental samples such as the soil and water. They are also found in drinking water supplying wells. This raises health concerns as most VOCs have harmful if not toxic effects. Health problems including skin irritation, kidney and liver damage, and effects to the central nervous system can result from exposure to VOCs. Some are suspected or known carcinogens. This project involves developing a technique that can detect and quantitate the concentration of various volatile organics in water. Although techniques have been established, this particular work utilizes solid-phase microextraction (SPME) and gas chromatography with flame ionization detection. The ultimate goal is to establish limits of detection for the chosen compounds.

Structural Analysis of Novel Inhibitors Through Docking of Homology Modeled Yeast Alpha-glucosidase

Joshua Turner
Faculty Mentor(s): Sarah Kennedy
Chemistry Poster Session 4:00-5:15pm CS Lobby

Due to the increasing problem of diabetes mellitus throughout the world, research on digestive enzymes such as \pm -glucosidase has become more prevalent. The identification of the active site in $\hat{\pm}$ -glucosidase has led to competitive inhibitory drugs such as Miglitol and Acarbose. Many natural substrates have shown greater inhibition but their method of inhibition remains unclear. Our current focus is on docking natural substrates with published IC₅₀ values under 1 mM and evaluating their free energy and fit. Using a yeast \pm -glucosidase model, we have located seven potential binding pockets and the next steps in our research are to dock our compiled list of known inhibitors to each pocket to evaluate their fit. The amino acids participating in the H-bonding and stacking will be mapped on the binding pockets, and the common structures of the best-docked inhibitors will be defined. By validating literature IC₅₀ values through structural analysis, we can help clarify the drug design pathway for \pm -glucosidase and diabetes mellitus.

Method Development of Ions with Low Concentrations Using HPLC

Mwila Polomondo
Faculty Mentor(s): Cindy Burkhardt
Chemistry Poster Session 4:00-5:15pm CS Lobby

Lipsticks are cosmetic evidence that can be recovered from a crime scene to prove a link between suspects and victims which can be helpful during crime investigations. Different lipsticks were analyzed using gas chromatography-mass spectroscopy (GC-MS) in order to develop a method that could possibly be used in a forensic lab. The method development project involved finding a solvent that the lipsticks can be dissolved with, without destroying the important components of the lipstick. This method can be used to compare and contract lipsticks, which is helpful for crime investigators.

Chemistry Poster Session

Evaluation of Block Co-Polymers Prepared from L-Lactide and \hat{I} '-Decalactone for the Removal of Organic Pollutants From Water

Kristopher Moore	Haley Dietz	
Faculty Mentor(s):	Amy Baliya	
Chemistry Poster Session	4:00-5:15pm	CS Lobby

Pollution has been an increasing problem for freshwater in not only under-developed countries, but also in the New River Valley. Current methods to remove pollutants are becoming ineffective. Researchers are now focusing on alternative approaches to remove organic materials from waterways although many are costly to prepare and utilize hazardous materials. Research in the Baliya group is focusing on preparing polymers from L-lactide and decalactone, both bio-renewable resources. The resulting block co-polymers contain a hydrophobic interior and hydrophilic periphery and are ideal candidates for removing organic pollutants from water. Initial results indicate that varying the type and ratio of hydrophobic to hydrophilic groups impacts the ability to remove Rose Bengal, a model organic pollutant. In this presentation, the synthesis and characterization of a family of block co-polymers prepared from varying the mole ratio of L-lactide and decalactone will be highlighted. Preliminary encapsulation studies demonstrate that the ability of the polymer to remove pollutants is dependent on the pollutant and the ratio of hydrophilic to hydrophilic blocks.

Study of the Removal of Pollutants from Water Through the Synthesis and Characterization of Biorenewable Polymers using \hat{I} '-Decalactone and D,L-Lactide

Lauren Purser		
Faculty Mentor(s):	Amy Baliya	
Chemistry Poster Session	4:00-5:15pm	CS Lobby

The global occurrence of organic micropollutants, such as pesticides and pharmaceuticals, in water resources has raised concerns about potential negative effects on aquatic ecosystems and human health. Traditional treatment technologies are not effective to treat increasingly polluted waters. One promising method is to utilize polymers as encapsulating agents. Previous research in the Baliya group has shown that block co-polymers prepared from decalactone and L-lactide monomers act as sponges to remove organic materials from aqueous environments. The properties of the polymer change upon varying the type of monomers utilized. In this presentation, the synthesis and characterization of novel block co-polymers from decalactone and D,L-lactide is reported. Preliminary studies suggest that the D,L-lactide is successful in removing fluoranthene from water through encapsulation studies as compared to the control polymer containing L-lactide.

Synthesis of Indole Derivatives and 1,2-aminoalcohols via N-tosyl 2-Alkenylaniline Oxides

Lauren Hines	Christine Tutwiler	
Faculty Mentor(s):	Christopher Monceaux	
Chemistry Poster Session	4:00-5:15pm	CS Lobby

This work investigates the synthetic utility of 2-alkenylaniline oxides. Under acidic conditions the epoxide undergoes an oxidative transannulation-elimination sequence that affords an indole containing compound. However, when the epoxide is treated with certain nucleophiles, intramolecular N-H activation can provide regioselective control affording several interesting products including 1,2-aminoalcohols. Various functional groups are being utilized to determine how different side-group characteristics will influence the formation of an indole derivative. The variety of products that can be prepared from this process will be demonstrated.

Chemistry Poster Session

Importance of F365 in the Binding of Inhibitors in Escherichia Coli Beta-glucuronidase

Samantha Van Shufflin

Faculty Mentor(s): Kimberly Lane

Chemistry Poster Session 4:00-5:15pm CS Lobby

Camptothecin (CPT-11) is an effective chemotherapeutic agent. However, it has been known to cause gastrointestinal toxicity, creating severe side effects for cancer therapy patients. Within the liver, CPT-11 is converted to active metabolite SN-38, a topoisomerase inhibitor. This metabolite is glucuronidated to the nontoxic form (SN-38G) for excretion. In the intestines, glucuronidase cleaves off the glucuronide group of SN-38G, releasing toxic SN-38 within the intestinal tract. Inhibitor Z-77 effectively inhibits glucuronidase from interacting with SN-38G, decreasing intestinal damage during CPT-11 treatments. Phenylalanine (F365) is one of the primary residues of glucuronidase that interacts with inhibitor Z-77. In this study, F365 was mutated into alanine, leucine, tyrosine, and tryptophan to characterize the importance of the residue in Z-77 binding. Phenolphthalein glucuronide enzymatic assays were utilized to quantitatively measure mutant activity. This study will provide more information not only regarding the binding of inhibitor Z-77, but for the realm of inhibition mechanisms as a whole.

Therapeutic Ultrasonication of Nano Carbons: Increasing Fluorescence of Nano carbons for Use as Indicators in Water Systems.

Sarah Garza

Faculty Mentor(s): Francis Webster

Chemistry Poster Session 4:00-5:15pm CS Lobby

The fluorescence of Nano carbons has been seen to increase proportionally as diameter decreases, and more so when treated with a strong oxidizer. Particles built up from precursory materials such as glucose are smaller, and ultrasonication of these particles has been most successful when trying to reach smaller diameters. We have investigated this phenomenon further by replicating the basics of a previous experiment, Camphor-mediated synthesis of carbon nano particles, Goldie Oza et. Al. Functionalized graphene-oxide like carbon nanoparticles less than 100 nm in size have been synthesized using the bottom-up dehydration of glycerol with sulfuric acid. The resulting carbon gel was easily dispersed in water and other polar solvents. The carbon suspension was diluted 20 g to 400 mL in DI water and therapeutically broken apart in an enclosed sonication horn for 60 hours. After sonication, carbons were treated with Sodium Hydroxide and refluxed at 100o C to increase fluorescence. Contrary to the expected outcome, the NaOH increased the size of the Nano carbons, but did yield a higher fluorescence of the particles overall. The NaOH treated Nano carbons were then treated with Sodium Borohydride and heated again. All samples were analyzed with Quasi Electric Light Scattering or DLS, as well as UV-Vis absorption spectra for comparison. Fluorescence measurements revealed that the treatment of the Nano carbons with Sodium Hydroxide and Sodium Borohydride both increased fluorescence drastically, but the sonication of the Nano carbons was the primary influence on the size of the particles. Further analysis will be done in the infrared and with TEM to determine structure and composition. Using layer-by-layer techniques to create films, the fluorescent carbons can serve as indicators for heavy metals in water systems. Based on the functional groups on the carbons, steps may be taken to filter the water using carbon layered/infused sponges, therefore removing substances such as arsenic.

Chemistry Poster Session

Photoluminescent Carbon Nano-particles Produced from the Acid Dehydration of Glycerol

Sarah Garza

Faculty Mentor(s): Francis Webster
Chemistry Poster Session 4:00-5:15pm CS Lobby

Fluorescent carbon materials have been the focus of an increasing number of research reports after the accidental discovery of carbon nano-dots (C-dots) during the purification of carbon nanotubes in 2004. Carbon is an abundant inexpensive material and numerous precursors have been used to produce highly fluorescent but non-toxic C-dots with tunable emission properties. The fluorescent yield of these materials often increases proportionally as the diameter decreases with emissive properties that depend on the oxidizer used to form them. Particles built up from precursory materials such as glucose and sucrose have been the focus of many studies and ultrasonication of these particles has been successful when trying to reach smaller diameters. In this study, large quantities of precursor carbon materials were prepared using the acid driven dehydration of glycerol using a bottom up approach. Highly functionalized carbon nanoparticles were produced (d < 200nm) and these nano-carbon materials were easily dispersed in water and other polar solvents. Dilute carbon suspensions were then subjected to sonication using a custom 450 watt flow-through sonication system to process large quantities of smaller size nano-carbon material. Dynamic Light Scattering (DLS) was used to determine particle size and results indicated an exponential decrease in size with sonication time to a final diameter of approximately 50nm. Carbon suspensions were then chemically treated with sodium hydroxide and sodium borohydride to alter the functional group chemistry. While the original carbon nano-carbon materials were only mildly fluorescent, sodium hydroxide treatment increased both the particle size and fluorescence intensity. Treatment with sodium borohydride, however, resulted in a dramatic increase in fluorescence and no change in particle size. Chemical analysis was done using uv-visible spectroscopy, infrared spectroscopy, and raman spectroscopy, while structural characterization was carried out using transmission electron microscopy (TEM). The fluorescent yield of the carbon nano-materials is correlated with both particle size and functional group chemistry, and the potential uses for these unique fluorescent materials will also be discussed.

Method Development of Ions with Low Concentrations using HPLC

Mwila Polomondo

Faculty Mentor(s): Cindy Burkhardt
Chemistry Poster Session 4:00-5:15pm CS Lobby

The purpose of this project was to develop a separation method for the determination and quantitation of inorganic anions in water samples using High Performance Liquid Chromatography (HPLC) with ultra-violet and conductivity detection. Detection of the chosen anions (bromide, chloride, fluoride, nitrate, nitrite, phosphate, and sulfate) typically involves suppressed conductivity. However, this project utilized the HPLC as a mode of unsuppressed ion chromatography. This method development project involved formulating a mobile phase and altering flow rates so as to obtain the most resolved chromatogram in a reasonable amount of time. The limits of detection were also established for each ion of interest. The chromatogram and calibration curves will be presented.

Chemistry Poster Session

Construction of Multifunctional Coatings via Electrostatic Self-Assembly of Glycerol Based Carbon Nanoparticles and Moringa protein

Carlie Perry

Faculty Mentor(s): Francis Webster
Chemistry Poster Session 4:00-5:15pm CS Lobby

Electrostatic layer-by-layer (LbL) self-assembly of multilayer films has been the focus of a wide range of research efforts and been used to synthesize novel coatings, electronics devices, bioreactors, and drug delivery systems. Film properties can be changed through the alternate adsorption of oppositely charged polyelectrolytes in solution under various conditions. In this work, composite films were produced via layer-by-layer self-assembly using glycerol based negatively charged colloidal carbon particles and positively charged Moringa oleifera protein. The synthetic nano-carbon (<math>d < 200\text{nm}</math>) was synthesized through the dehydration of glycerol using sulfuric acid at 175°C and the particle size was controlled through sonication using a custom flow-through system. Aqueous based Moringa protein was obtained from Moringa beans using an initial lipid extraction in ethanol followed by protein extraction in water. Characterization of the LbL films including film growth, topography, composition and stability was performed using uv-visible spectroscopy, infrared spectroscopy, and scanning electron microscopy (SEM). Results showed that the composition, structure and thickness of the films were a function of the ionic strength used during adsorption. The dependence of coating thickness on ionic strength was studied using visible spectroscopy and the chemical structure of the composite film was investigated using infrared spectroscopy.

Assessment on the Impact of Flipping Introductory Chemistry, CHEM 101

Matti Hamed **Jessica Mundy**

Faculty Mentor(s): Joseph Wirgau
Chemistry Poster Session 4:00-5:15pm CS Lobby

Many introductory chemistry classes serve to codify that learning science is through the passive summary of material they would not be able to learn through experience. An alternative approach is to “flip” this model and deliver the class content outside of assigned class time through videos and then students come to class to participate in what would normally be considered homework. In the classroom students practice with the professor and peers. This type of active learning helps to maximize both student to faculty interactions and peer to peer interactions. Our research compares two years of data between students participating in a traditional class and a flipped delivery method class. The collection of data from control and experimental sections with the same instructor provides a rare opportunity to examine the impact of teaching methods without the instructor as a variable. The data from the initial implementation and the initial data from the first two years of the study will be presented. Our data includes student video viewing habits, changes in self-perception of student efficacy, worry, usefulness, and master potential toward the subject matter, as well as the impact on grade distribution and retention. The initial data demonstrates that there is no significant differences between the control and experimental sections in both content mastery and self-assessment, however the experimental section had higher number of extreme grades. The data also indicates that those students who withdrew had abnormally low self-efficacy and classroom observation indicated a lack of social cohesion in the experimental class.

Chemistry Poster Session

The Development of a Carbon Nanoparticle Coated Polyurethane Sponge for use in Water Purification

Tyreek Stewart

Faculty Mentor(s): Francis Webster
Chemistry Poster Session 4:00-5:15pm CS Lobby

Water contamination is a common problem faced globally. There are a wide variety of toxic contaminants found in water sources ranging from heavy metals, arsenic and organic pollutants. Research efforts have grown in recent years to find sustainable methods for removing these contaminants from surface, ground, and wastewater. The use of nanotechnology for water purification has become a recent approach for improved performance and the targeting of specific contaminants. In this work, we have developed a novel multifunctional nano-carbon material derived from glycerol and demonstrated a facile, low cost, time-saving method of using it to coat polyurethane foam thus yielding a versatile adsorbent for water purification. The carbon nanoparticle coated polyurethane foam (CN-PUF) was characterized using a number of techniques including infrared spectroscopy (IR), x-ray photoelectron spectroscopy (XPS), thermogravimetric analysis (TGA) and scanning electron microscopy (SEM). Column studies using the coated foam as a packing material were performed and the foam was found to be an effective adsorbent capable of removing lead, cadmium, and methylene blue dye from aqueous solution. This work demonstrated that the CN-PUF material could be produced in large quantities using coating materials from renewable sources and a readily available and inexpensive foam.

Nanostructured Functionalized Carbon Based Materials for Improved Water Purification

Spencer Hayes

Faculty Mentor(s): Francis Webster
Chemistry Poster Session 4:00-5:15pm CS Lobby

With industrialization and population rapidly increasing, so does the amount of contaminants in our water supplies which reduces the availability of clean drinking water for the world. This problem affects both developed and developing countries. A wide array of different research efforts are centralized in developing new methods or materials to help provide clean water. Our project focuses on the development of an inexpensive, multi-functional absorbent material that will improve existing filtration technology. Our material is easily synthesized with resources that are very common and also readily accessible. The process consists of controlled dehydration of simple sugars with sulfuric acid. The produced material is highly functionalized, containing sulfonic acid, carboxylic acid, and phenolic functional groups that have a high affinity to many contaminants of interest. Using this starting carbon material. We have prepared sand coated with our carbon material and tested them for the ability to adsorb Lead (II), Cadmium (II), and an organic dye Methylene Blue. Our tests have shown the ability for this composite material to remove a wide range of water contaminants and may be implemented into already existing larger scale water filtration systems.

Biotransformer Exhibit

Chemical Analyses of Frass and Hemolymph from Hormonally Modified Madagascar Hissing Cockroaches (*Gromphadorhina portentosa*)

Alex Atwood Stephanie Rowe
Samantha Van Shufflin

Faculty Mentor(s): Jason Davis
Biotransformer Exhibit 5:30-6:45pm CS Lobby

Each day, humans produce millions of pounds of unused food, much of which is discarded into landfills. Recent research in the Radford Ecophysiology lab has begun exploring the use of a biotransformer to reduce food waste and produce fertilizer using hormonally modified Madagascar hissing cockroaches (*Gromphadorhina portentosa*) as agents of decomposition. This research has shown that royal jelly, a secretion produced by honey bees, results in faster growing, more fecund, and larger roaches. Although the economic and environmental ramifications of the biotransformer appear to be promising, the biochemistry of the system is not fully understood. With this project, we set out to analyze the effects of royal jelly on both the frass and hemolymph of these roaches. To examine the differences between frass from control and royal jelly treated roaches, a chemical analysis was conducted by performing IR spectroscopy on frass samples collected from each treatment group. Results from this analysis were compared to IR spectra of commercial fertilizer, bovine feces, and potting soil to determine similarities. For the second portion of the study, hemolymph was extracted from control and royal jelly treated roaches, diluted with a surfactant to prevent coagulation, and purified in centrifuge filter tubes to extract proteins of particular importance. These purified samples were then analyzed to determine systemic differences between royal jelly fed and control roaches by separating the proteins within the hemolymph via SDS-PAGE. The chemical analyses performed suggested that roach frass is similar amongst both treatment groups, but somewhat different than commonly used fertilizers, whereas hemolymph differs across treatment groups.

Analysis of Foods Containing Cricket Protein

Kayla Ogden Brittany Mejia-Blanco
Emilee Wells Erin Dudley

Faculty Mentor(s): Laurie Bianchi Jason Davis Iain Clelland Andrew Ray
Biotransformer Exhibit 5:30-6:45pm CS Lobby

The purpose of this research project was to evaluate the nutritional value of crickets and the integration of insect protein into foods. The use of crickets (*Gryllobates sigillatus*) in flours and powders can serve as ingredient substitutions to increase nutritional value, such as protein, in products that are generally not nutrient dense. Research in this area is relevant because meat protein, traditionally and currently available, is taxing on the Earth's resources. Harvesting crickets would be sustainable, as well as offer individuals an alternate source for nutrients. Three palatable food items were prepared using either cricket powder or cricket flour products and the nutrient analysis of each was completed using Food Processor Nutrition Analysis Software. Cricket Flours brand cricket flour and powder add functional fiber, specifically chitin, with 1.16g and 2.04g per ¼ cup respectively, and a complete protein (all essential amino acids), 5.64g and 20g per ¼ cup respectively to the products. A snack bar made with cricket powder has 2 grams of functional fiber and 6 grams of protein. Two chocolate chip cookies containing cricket powder have 1 gram of functional fiber and 4 grams of protein. One blueberry muffin made with cricket flour contains 2 grams of functional fiber and 5 grams of protein. Further research could be conducted to measure consumer acceptance of insect protein in food products. This can be done utilizing sensory testing and analysis.

Biotransformer Exhibit

Modeling Optimal BioTransformer System Productivity, Costs, and Revenues

Zachary Turk

Faculty Mentor(s):	Iain Clelland	Jaehwan Jeong
Biotransformer Exhibit	5:30-6:45pm	CS Lobby

According to the most recent published statistics, it is estimated that approximately thirty to forty percent of edible food in the United States is wasted every single year. This percentage is tantamount to approximately 133 billion pounds of food or 161 billion dollars lost per year. Our research project seeks to establish an environmentally friendly and commercially pragmatic alternative to food waste disposal. Recently, insect protein has garnered increasing interest as an alternative to traditional proteins because of scale and accessibility. Through cross discipline collaboration with multiple departments, we have created a bioreactor that can transform food waste into utilizable byproducts that would be easily integrated into everyday products with a dual-system approach. The process involves feeding food waste to Madagascar Hissing Cockroaches in the first system, allowing them to grow and produce byproducts including frass (cockroach waste) and chitin. Upon reaching a certain size, the cockroaches will be ground to produce protein to feed our fish/shrimp in the aquaponics system, with the frass and chitin used as fertilizer for the plants. Sustainability is resolved by intrasystem breeding. The goal of this project is to produce a viable business using food waste and Madagascar Hissing Cockroaches in order to efficiently produce consumer marketed products from vegetables to shrimp. A linear program will find the point and scale at which the project can break even and when profit can occur. The project would then look to scale and replicate our system to be marketable to outside consumers.

Biology Poster Session I

Search for DNA Sequences Coding for Metabolic and Immune Related Proteins in *Metagonimoides* sp.

Carrie Luk

Coby Smith

Faculty Mentor(s):	Bob Sheehy	
Biology Poster Session I	5:30-6:45pm	CS Lobby

Parasitic flatworms are widely associated with human disease. Genetic analysis of a representative species genome can provide insight into more effective forms of treatment for a specific parasite; of particular interest are conserved proteins which are known to regulate a hosts immune response and are found in the genomes of related species. Comparisons of conserved protein function can begin to define possible medical strategies to combat parasitic flatworm infections. This study focuses on identifying possible proteins in a genome closely related to *Metagonimoides oregonensis* and *Opisthorchis viverrini*; the model organisms similarity is inferred from maximum parsimony trees constructed from multiple sequence alignments of the 28s and 16s ribosomal RNA gene in members of the family Heterophyidae. Here we examine proteins that can highlight metabolic pathways vital to the life cycle of isolated parasite as well as secretory proteins that deter the immune system from disposing of the parasite on its own.

Biology Poster Session I

Calcium Oxalate Crystals in Winter Bud Scales of Woody Plants

Emily Cook

Faculty Mentor(s): Gary Cote
Biology Poster Session I 5:30-6:45pm CS Lobby

In many plant families, some cells produce microscopic calcium oxalate crystals. Although the purpose of these crystals is poorly understood, one role frequently suggested is that they discourage herbivores from eating the plant tissues. These crystals have been much studied in leaves, but crystals in other parts of plants remain poorly known. While plants certainly benefit by reducing herbivory of their leaves, protection of other tissues may be more important. Students in Dr. Cote's laboratory are examining whether crystals may protect critical reproductive tissues, such as ovules and pollen. Another part of the plant for which protection would be critical would be the winter buds since they contain the next season's leaves. We are making a preliminary examination of the winter buds of several deciduous species to explore this possibility, and will report the structure, arrangement and abundance of crystals within the bud scales.

Continued Monitoring of Gray Bats (*Myotis grisescens*) in Virginia: Juvenile Recruitment, Age Identification accuracy, and Mite Loads in 2016

Cameron Comer

Faculty Mentor(s): Karen Powers
Biology Poster Session I 5:30-6:45pm CS Lobby

Gray bats (*Myotis grisescens*) are federally-endangered species whose summer breeding range includes far southwest Virginia. Since the onset of White-nose Syndrome, we conducted almost yearly surveys in the late summer to monitor the status of known populations. Analyses of data from 2009-2014 suggested a decline in reproductive success and recruitment. Based on these findings, the goals of Summer 2016 were to (1) compare the proportion of juveniles captured in June 2016, July 2016, and August (previous surveys); and to (2) compare the accuracy of age identification in June and July 2016 to August (previous surveys) via backlit wing photographs. Based on other findings from past work, we also sought to (3) compare mite loads between age classes in June, July, and August. In Summer 2016, we captured and processed 500 individuals: 155 adult females, 124 juvenile females, 57 adult males, and 164 juvenile males. Our high number of juvenile captures (49% of captures in June and 85% of captures in July) suggests recruitment may not yet be a serious threat to this Virginia population. Because in-the-field age accuracy was highest in June (95.4%) and July (94.8%), and lowest in August (80.6%), analyses of wings post field-work is strongly suggested for late summer surveys. The average number of mites per wing varied significantly across months and age class, and trends will be discussed in light of recent analyses. Summer surveys will continue in 2017 and will expand to include exit counts and investigations of recapture rates and individual health.

Biology Poster Session I

The Computational Modeling of the AS1/AS2 Complex

Taylor Lewis

Faculty Mentor(s): Tara Phelps-Durr
Biology Poster Session I 5:30-6:45pm CS Lobby

Asymmetric leaves 1 and 2 (AS1 and 2) are proteins in the mustard plant *Arabidopsis*, which encode DNA binding proteins known as transcription factors. AS1 and 2 transcription factors specifically control how KNOX genes are expressed in leaf development. These expression patterns of AS1 and AS2 are required for maintaining the silencing of the Knotted1-like Homeobox (KNOX) genes during leaf development. When translated, the KNOX genes produce homeodomain transcriptional proteins essential for shoot apical meristem (SAM). Phenotypically, mutations in the *Arabidopsis* AS1 and AS2 genes cause the leaves to appear very different compared to the wild type. The *as1* mutant is known to cause leaves to be wrinkled and curled under, leaving the petioles, the stalks that attach the leaves to the stem, shorter than seen in the wild type. The *as2* mutants have wrinkled leaves as well, however, the petioles on the plant are still visible. In both of these mutants, the structure of the developing leaves is caused by the reactivation of the KNOX genes in the leaf tissue. If the genes are mutated, the leaves do not properly develop due to undifferentiated cells remaining in the leaves. Previous research shows that AS1 and AS2 control the expression of genes that promote differentiation. The AS1 and AS2 proteins are known to physically interact, however, it is unclear exactly what regions of the proteins physically make contact. The goals of my project are to 1) computationally model AS1 and AS2, 2) computationally model the AS1 and AS2 protein interaction and 3) clone AS1 and AS2 so that the computational models can ultimately be verified. An understanding of how AS1 and AS2 bind together will provide basic information about how transcription factors regulate cellular differentiation during development.

Assessing Summer Bat Activity Using Acoustic Surveys at Radford Army Ammunition Plant, Virginia, in 2016

Heather Custer

Faculty Mentor(s): Karen Powers
Biology Poster Session I 5:30-6:45pm CS Lobby

White-nose Syndrome (WNS) has caused significant declines in summer cave bat populations in western Virginia, and recent research in the Commonwealth has suggested that acoustic surveys are the most efficient method to detect rare species. At the Radford Army Ammunition Plant (RFAAP, Virginia), pre-WNS netting documented two bat species: Brown Bats and Red Bats, and brief surveys in 2013 additionally detected Tri-colored Bats via capture and 5 more species via acoustic signatures. To fill in our knowledge gaps about uncommon species, in summer 2016, we launched a large-scale acoustic survey of the RFAAP. We deployed 12 Songmeter SMZC units at 14 sites from April-August. We recorded and analyzed >119,000 valid echolocation call sequences through Kaleidoscope (v. 4.0) and >150,00 through EchoClass (v. 3.1). Of those that were identified to species in Kaleidoscope, Silver-haired Bats (30.7%), Big Brown Bats (29.9%), Red Bats (29.4%), myotis (5.3%), Tri-colored Bats (2.5%), and Hoary Bats (2.2%) were detected. In EchoClass, identifiable calls included Red Bats (50.6%), Big Brown Bats (39.0%), Silver-haired Bats (4.8%), Hoary Bats (4.5%), Tri-colored Bats (0.7%), and myotis (0.5%). To date, >90% of 3,500 myotis calls may have been incorrectly assigned by Kaleidoscope and typically are the calls of Red Bats. The misidentification by both Kaleidoscope and EchoClass emphasizes the continued need for visual (manual) confirmation of any suspected Myotis calls. At this time, we find little evidence of Myotis species at RFAAP. Our study provides further evidence for the anticipated state listings of all cave-hibernating myotis in the Commonwealth.

Biology Poster Session I

Behavior Effects of Alternating Electromagnetic Fields on Antlion larvae (Myrmeleontidae)

Lindsey Wagner

Faculty Mentor(s):	Matt Close	Caleb Adams
Biology Poster Session I	5:30-6:45pm	CS Lobby

The environmental factors influencing pit building behaviors and spatial distribution of antlion larvae (Myrmeleontidae) are currently not fully understood. In this experiment we sought to identify whether antlion larvae are able to sense magnetic fields and whether magnetic fields have any effect on their behavior. In order to determine if antlions used magnetic fields to orient themselves, we exposed field-collected larvae to alternating magnetic fields of flux densities ranging from 20-40 μ T and recorded the spatial distribution, movement patterns, and pit building behaviors using time lapse video. Videos were analyzed to determine the sensitivity of these organisms to magnetic fields, and the specific ranges of their magnetoreception. Our results add to the existing body of knowledge the ability of magnetic fields to alter spatial distributions and behaviors of insects, and provide a method for studying similar phenomena in the laboratory setting.

The Cloning and Computational Analysis of TCP15

Mary Catherine Peters

Faculty Mentor(s):	Tara Phelps-Durr	
Biology Poster Session I	5:30-6:45pm	CS Lobby

The protein domain TCP is named after Teosinte Branched Cycloidea. Members of the TCP protein family are involved in cell proliferation in plants. The two classes of TCP proteins, TCP class I and TCP class II, were separated following an early gene duplication event. Gene duplication led to functional divergence--TCP class I subfamily are transcriptional repressors, while the TPC class II subfamily are transcription activators. The TCP transcription factors bind DNA and regulate expression of other genes. This family of transcription factors are exclusive to vascular plants. TCP15 is a cell transcription factor that has been shown to mediate responses of leaves and flowers to cytokine, a protein involved in cell signaling, and in the promotion of seed germination. TCP15 has also been shown to help in regulating the expression of cell-cycle genes for cell and organ growth in plants. The purpose of this experiment is to computationally model the 3D structure and clone the gene encoding TCP15. Protein models will be obtained using the modeling programs I-TASSER and Phyre2. ICM-Pro, a 3D molecular modeling program, will be used to analyze and compare protein structures and their interactions. For the cloning experiment, TCP15 will be amplified by PCR and cloned into an expression vector using the restriction enzyme HindIII. The TCP15 PCR product was cut using restriction enzyme HindIII, and mixed with the cloning vector, pET21a, which was also cut with HindIII. DNA ligase was added to seal the vector and TCP15 PCR together. The vector was then inserted into a host cell, E. coli by transformation. Ultimately, the TCP15 protein will be made in E. coli allowing us to confirm the computer models of this protein. An understanding of the structure of TCP15 will help us understand how this protein regulates cell-cycle genes.

Biology Poster Session I

Do White-tailed Deer (*Odocoileus virginianus*) Move Less During the Coldest Period of the Year?

Monika Mattson	Scott Klopfer	
Faculty Mentor(s):	Karen Powers	
Biology Poster Session I	5:30-6:45pm	CS Lobby

This spring, I am completing an internship at the Conservation Management Institute in Blacksburg, Virginia. The Conservation Management Institute has a mission of providing innovative solutions to research questions that affect natural resource management. I am investigating whether or not White-tailed deer (*Odocoileus virginianus*) movement is influenced by season on the Naval Air Station Patuxent River in St. Mary's County, Maryland. To answer this question, the location of each deer in this study was collected every hour during different seasonal periods throughout the year. We used an appropriate statistical comparison to determine if there were any significant differences among total movement and seasonal periods. The results of this study will be useful in expanding the knowledge of deer movement throughout the year and if conservation plans should take seasonal changes in movement into consideration when managing for this species.

Vespa Amino Acid Mixture (VAAM) Exposure in Cultured Yeast Cells Leads to Increased Production of Reactive Oxygen Species (ROS) in Short Periods of Time Causing Increased Cellular Degradation

Attia Mohamed	Samuel Stowers	
Kristy Clark	Marisa Dameron	
Faculty Mentor(s):	Sarah Redmond	
Biology Poster Session I	5:30-6:45pm	CS Lobby

Oxidative phosphorylation is the process eukaryotes use to generate most of the ATP requirements of the cell. This process takes place inside the mitochondria and is responsible for transferring protons into the proton motive force to power ATP synthase, producing reactive oxygen species (ROS) as byproducts. Vespa amino acid mixture (VAAM) has been demonstrated to increase ATP production and alter the survival rate of mitochondria in a variety of cell types. To assess the mechanisms by which VAAM affects mitochondrial metabolism and stability we exposed yeast cell cultures to varying amounts of VAAM for varying durations of time. The introduction of 0.003% to 0.3% VAAM significantly increased the amount of ROS produced by treated cells over controls within five minutes ($p < 0.001$). Combination of an antioxidant treatment with VAAM did not significantly limit reactive oxygen production in 0.003% VAAM-treated cells ($p = 0.82$). Yeast cultures treated with the higher doses of VAAM (0.03% and 0.3% VAAM) showed signs of catastrophic mitochondrial damage before the thirty-minute mark, which we believe caused the mitochondria to degrade therefore compromising the entire cell. This in turn led to lower ROS readings in all of the remaining treatments. Based on these observations we think that even low dose VAAM exposure alters oxidative phosphorylation to allow for production of toxic levels of ROS within five to ten minutes of introduction, damaging the mitochondrial membrane, and killing the cell. To demonstrate the direct effect of VAAM on the proton motive force (upstream of ROS production) we introduced 2,4-dinitrophenol (DNP), which is an uncoupler of the proton motive force. The combination of VAAM and DNP resulted in a lower level of ROS produced in ten minutes, compared to cells treated with VAAM alone ($p = 0.03$) which suggests that VAAM counters the uncoupling actions of DNP by acting as a super-coupler. These data suggest that while both VAAM and DNP used independently are detrimental to the proton motive force, when combined they become less dangerous by canceling out each others' effects.

Biology Poster Session I

Summer Internship at the Southwest Virginia Wildlife Center of Roanoke

Greg Porter

Faculty Mentor(s): Karen Powers
Biology Poster Session I 5:30-6:45pm CS Lobby

Given the constant contact between humans and wildlife in southwestern Virginia, wildlife veterinary care and rehabilitation are becoming increasingly important activities. The Southwest Virginia Wildlife Center of Roanoke is only one of two wildlife rehabilitation centers in Virginia allowed to treat and house all types of vertebrates. Aside from taking in injured and orphaned wildlife, the center also provides many educational presentations to local schools and at public events. In the summer of 2016, I spent 11 weeks interning at the center as a Category IV rehabber, meaning I was allowed to work in a center run by a Category I, II, or III without direct supervision. While my main duties were feeding, cleaning, and observation of birds, I also worked with all mammals at the center. My poster is centered around the care given for four of the most abundant residents at the center: the Virginia opossum (*Didelphis virginiana*), songbirds, birds of prey, and white-tailed deer fawns (*Odocoileus virginiana*). This successful internship has not only given me skills in animal handling and medical care, but it also allowed me to work to directly help local wildlife.

Analysis of TCP3 Protein and its Role in Regulating the AS1 Gene

Kyanna Jenkins

Faculty Mentor(s): Tara Phelps-Durr
Biology Poster Session I 5:30-6:45pm CS Lobby

For the duration of animal and plant development, undifferentiated cells must differentiate into various types of cells that function in fully developed organisms. In plants, cells can transfer between the de-differentiated and redifferentiated states indicating that the regulation of early development genes is more flexible than in animal cells. In the mustard plant, *Arabidopsis*, *Asymmetric leaves 1* (AS1), encodes a DNA binding protein, known as a transcription factor, that controls how other genes are expressed during leaf development. When AS1 is mutated, leaves don't properly develop because some cells remain undifferentiated indicating that the normal function of AS1 is to repress the expression of genes that promote differentiation. Expression of AS1 is controlled by another transcription factor, TCP3. The TCP3 protein in *Arabidopsis thaliana*, is a member of a large family of transcription factors known to be important for development. The goal of our research is to understand how TCP3 functions to regulate AS1. We've used computational modeling to determine the 3-D structure of TCP3 and will model how it binds and interacts with the AS1 to control gene expression. The 3-D structure of TCP3 was obtained by submitting the amino acid sequence of TCP3 to I-TASSER, a molecular modeling program. The 3-D model was evaluated in another molecular modeling program known as ICM-Pro. To verify the 3-D models, we will clone the TCP43 gene and express the TCP3 protein in *E. coli*. This work will provide basic knowledge about how TCP3 transcription factors regulate gene expression and control cellular differentiation.

Biology Poster Session I

Internship with Engineering Consulting Services: Remediation of Polluted Water and Soil

Taylor Michelitch

Faculty Mentor(s): Karen Powers
Biology Poster Session I 5:30-6:45pm CS Lobby

The environmental branch of Engineering Consulting Services LLC (ECS) is responsible for addressing or mitigating many environmental issues that clients face, such as restoration of contaminated soils and water, and delineating wetland boundaries. I spent a portion of my summer working with this company collecting soil samples and restoring contaminated water sources. The majority of my internship was completed outside of Quantico, VA, working with ECS partner Proact services - a water treatment company based out of Ludington, Michigan - on their water remediation plant at the Possum Point Power Station. Here, the station was pumping water out of a polluted coal ash pond and taking necessary steps to clean it before it was released into the nearby Quantico Creek. Here, I supervised several steps of this decontamination process, becoming familiar with the equipment, how each machine worked, and how to recognize when a step was not in compliance. Within my poster, I have outlined the water decontamination process of the Possum Point Power Station. I also discuss a smaller project in which I participated, quantifying soil contamination in the Bill Page Toyota excavation site in Chantilly, VA. Here, I collected soil samples to test for pesticides. This internship provided practical experience for me in the realm of water decontamination and mitigation processes.

Calcium Oxalate Crystals May Protect Reproductive Tissues in Plant Families Fabaceae and Convolvulaceae

Evan Grey

Faculty Mentor(s): Gary Cote
Biology Poster Session I 5:30-6:45pm CS Lobby

In many plant families, calcium oxalate crystals are present in some cells, visible through microscopy. The crystals may play a number of roles in the plants, including regulation of calcium levels in the plants tissues; however, one role frequently suggested is to serve as a defense against herbivory. If they do protect against herbivores, we hypothesize that they could protect critical reproductive tissues in flowers, such as unshed pollen and ovules. In collaboration with Dr. Chelse Prather at the University of Dayton, we have collected flower specimens from a patch of coastal tallgrass prairie at University of Houston, Coastal Center in Lamarque, Texas, and from Wildwood Park and roadsides in Radford, Virginia. Preliminary results showed that flowers in the Fabaceae (Pea Family) and Convolvulaceae (Morning-Glory Family) have abundant crystals in the flowers. We therefore examined a number of species of each family from each location. In flowers of these families, crystals do appear to be arranged around the reproductive structures in a manner consistent with their protecting these structures from being devoured.

Biology Poster Session I

Filament Recycler

Jacquelyn Burns

Ivelianys Mena-Perez

Ross Robertson

Iris Fuentes

Faculty Mentor(s):

Jeremy Wojdak

Biology Poster Session I

5:30-6:45pm

CS Lobby

In the Radford University Peery Hall Makerspace, there are five 3D printers that are utilized often and are useful, allowing users to make affordable products easily. A common issue with 3D printers is that there is a large amount of filament that goes to waste when objects do not print as intended, which wastes money. In order to solve this problem, my team and I, who work in the Peery Hall Makerspace, are going to build a filament recycler. The filament recycler will be composed of three main components. The first is a grinder which will take printed pieces and break it into smaller parts. The second is a reheating component that will heat up the pieces of filament so that it will be malleable. The final step is to create the final product, which will involve pushing the melted filament through a small tube so that it will be back to its original shape.

There are already premade filament recyclers, but we feel that it will be very beneficial to not only us but others if we build this and develop a kit so that other makerspaces can build their own filament recyclers as well. Multiple other community and school makerspaces have this problem, and it would be great if we could help others be able to get a hands-on learning experience with building things. In addition to that, this process is less expensive than buying a premade filament recycler. With the help of the Idea Riser, this project is more attainable.

Comparative Antimicrobial Activity of Sangre de Drago and Antiseptic Agents

Kendalyn Hersh

Faculty Mentor(s):

Joyce Caughron

Jason Davis

JayCaughron

Biology Poster Session I

5:30-6:45pm

CS Lobby

This research explores our knowledge of the antimicrobial properties of *Croton lechleri* (commonly known as Sangre de Drago), a tree that grows in the Amazon rainforest. Sangre de Drago is frequently used by the native population as a remedy for common skin infections. It is hypothesized that the taspine alkaloid is the main chemical contributing to wound healing. This tree sap was tested for its ability to kill randomly sampled skin microbiota. Phase one of this project investigated the antimicrobial activity by running sensitivity tests against known gram-positive and gram-negative species of bacteria using sap that was purchased in Puerto Maldonado, Peru. Our results showed the sap having gram-positive selectivity. Further research is needed to characterize the precise mechanism of this inhibitory activity. The second phase of research tests Sangre de Dragos ability to kill gram-positive bacteria compared to that of several commercially available antiseptic agents. Analysis of this comparison will be discussed.

Biology Poster Session I**Different Life Stages of Trout: An Internship at The Wytheville State Fish Hatchery in Max Meadows, Virginia**

Hunter Jones	Elijah Meador	
Faculty Mentor(s):	Christine Small	
Biology Poster Session I	5:30-6:45pm	CS Lobby

The Virginia Department of Game and Inland Fisheries is responsible for management of fisheries, wildlife, and boating in Virginia. They work to conserve and manage wildlife and connect people to the outdoors. The goal of the hatchery system is to manage inland fish populations to maintain optimum species levels and provide for all citizens to enjoy wildlife. The Wytheville State Fish Hatchery is one of five cold-water facilities in the state dedicated entirely to trout production. Rainbow (*Oncorhynchus mykiss*), brook (*Salvelinus fontinalis*), and brown (*Salmo trutta*) trout are hatched and reared in this facility and used to stock lakes, rivers, and streams throughout the state. As hatchery interns, we participate in activities such as trout egg collection and fertilization, fry rearing, broodstock care, daily fish culture, facility maintenance, and stream stocking across the state. We will show steps in successfully rearing trout and stages of the trout life cycle before they are released. DGIF uses stocking as a management tool to: 1) establish sport-fish in reclaimed, new, or renovated public waters; 2) supplement natural populations where reproduction is inadequate; 3) introduce predators or provide trophy fishery; and 4) provide catchable-sized fish for anglers. DGIF stocks ~ 1.2 million catchable trout each October to June, in more than 180 waterways, through the sale of freshwater fishing and trout licenses. A smaller, fingerling stocking program is also used in deep reservoirs, tail-waters below dams, high-elevation lakes, and spring-fed streams to produce quality trout fishing where wild populations are not present or not reproducing naturally.

Biology Poster Session I**Our Own Worst Enemy: Psychosomatic effects of perceived stress on IgA levels**

Erick Biggs	Kasey Blevins	Kelsey Brimer	Cameron Brown
Sandra Bryan	Haley Burger	Anna George	Mckenzie Hunt
Caitlin Jannise	Melissa Kesterson	Anthony Kwan	Jacob Marshall
Kenzie Miller	Attia Mohamed	Arpitha Mysore Rajashekara	
Rachael Pagan	Mary Peters	Allison Saenz	Gregory Steeves
Samuel Stowers	Nate Welch	Alexis Williams	Devonn Williams
Kyle Wingfield	Krista Zimmermann		

Faculty Mentor(s):

Sarah Redmond

Biology Poster Session I

5:30-6:45pm

CS Lobby

Our study is to determine and compare human IgA levels to self reported stress levels of college students and faculty at the beginning of the college semester, when stress levels are expected to be low, as compared to a later point in the semester, when stress levels are expected to be higher. This study is significant because the data will provide us with information regarding whether or not people are as biologically stressed as they report at different periods of the semester. Individuals are expected to be at a lower stress level at the beginning of the semester than at the end of the semester. Biological stressors are indications that the psychological and physical aspects of an organism are attempting to maintain an equilibrium in order to function properly. We are interested in quantifying biopsychological stressors between mental and physical stress responses and the effect of psychosomatic influence. To analyze samples for IgA molecules levels in comparison to proclaim stress levels to determine if students are as physically stressed as they are mentally feeling stressed. Stress was reported on a zero to ten scale and these reports will be compared to actual levels of human IgA attained from saliva samples. Geospatial coordinates have been taken to relate the data to location across campus. After a regression test, showing a P value of 0.206, it was clear that there was no significant correlation in the data. This tells us that, overall, the levels of IgA, and therefore stress, did not relate to the reported level of stress from the participants.

IgA You Assay? The Correlation between Sleep and Stress

Erick Biggs	Kasey Blevins	Kelsey Brimer	Cameron Brown
Sandra Bryan	Haley Burger	Anna George	Mckenzie Hunt
Caitlin Jannise	Melissa Kesterson	Anthony Kwan	Jacob Marshall
Kenzie Miller	Attia Mohamed	Arpitha Mysore Rajashekara	
Rachael Pagan	Mary Peters	Allison Saenz	Gregory Steeves
Samuel Stowers	Nate Welch	Alexis Williams	Devonn Williams
Kyle Wingfield	Krista Zimmermann		

Faculty Mentor(s):

Sarah Redmond

Biology Poster Session I

5:30-6:45pm

CS Lobby

The goal of this project is to test students and faculties stress levels in their saliva compared between the beginning of this semester and the end of the semester. IgA levels are influenced by many physiological factors, including the hormones associated with stress. The findings conclude that there is significance between IgA levels in a student or faculty based on hours since they had left class and hours until they have class. Students and faculty showed a correlation between IgA and time since being in class or work (p-value = 0.03), however no significance of the duration of the expected rest period (p-value = 0.71). The significance of this finding is that students and faculty tend to be more stressed after being in class/work based on IgA levels in their saliva.

Biology Poster Session I

Comparative analysis of stress on faculty and students based on salivary IgA

Erick Biggs	Kasey Blevins	Kelsey Brimer	Cameron Brown
Sandra Bryan	Haley Burger	Anna George	Mckenzie Hunt
Caitlin Jannise	Melissa Kesterson	Anthony Kwan	Jacob Marshall
Kenzie Miller	Attia Mohamed	Arpitha Mysore Rajashekara	
Rachael Pagan	Mary Peters	Allison Saenz	Gregory Steeves
Samuel Stowers	Nate Welch	Alexis Williams	Devonn Williams
Kyle Wingfield	Krista Zimmermann		

Faculty Mentor(s):

Sarah Redmond

Biology Poster Session I

5:30-6:45pm

CS Lobby

The most well known fact about sleep is that humans need it - while we are asleep our metabolic processes slow down and during long periods of sleep our bodies repair the damage that the stress our bodies have undergone throughout the day. Throughout the day our bodies are bombarded by signals from the environment, and undergoes biological changes in response to external and internal stimuli. Sleep is a period of time to restore the body to optimum condition to continue the process all over again the next day. The human body regulates stress by producing glucocorticoid steroid hormones, which also function as immune response suppressants. During sleep cortisol levels are decreased as they inhibit the body's period of restoration. The production of immunoglobulin A, an antibody associated with mucosal membranes, is inhibited by glucocorticoids, and thus shows a relationship with sleep and other factors associated with stress. This experiment focused on correlations between sleep and stress found on the campus of Radford University. Our groups recorded the amount of sleep participants acquired the previous night and how long they had been awake, and correlated these with the concentration of salivary IgA. According to our initial data collection there was no significant correlation between the amount of sleep ($p=0.305$) or hours awake (0.670) to IgA levels. Additional sampling later in the semester will be used to supplement this data set and mapped using geospatial coordinates.

Biology Poster Session II

Collection and Analysis of Human Salivary IgA to Understand Effect of Physical Exercise Classes on Stress

Claire Dundon	Nolan Miller
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Faculty Mentor(s):

Sarah Redmond

Biology Poster Session II

7:00-8:15pm

CS Lobby

There is a lot of evidence to suggest that stress and the Immune system are very closely related. When experiencing stress, the human immune system can be compromised in several ways and affect physiological and psychological conditions. Immunoglobulin A is an antibody that correlates to immune system strength and function. This antibody can be found and isolated from saliva samples, collected using noninvasive methods. A person with low levels of stress will have high levels of IgA, thus an overall stronger body and immune system. Those experiencing more stress will have results that show a physiological decline in IgA levels. Our study looks at the relationship between physical fitness activities and their effect on IgA secretion. By collecting samples before and after various exercise classes, (yoga, cycling, and weightlifting), we can track the level of impact they have on IgA. We expect to find that these classes lower stress, and therefore the IgA levels will be higher after the class compared to when initially collected. We also expect to see the data support our theory that yoga classes and those that are more relaxing will have a positive correlation with IgA. Calming the body and mind through these peaceful classes should help decrease stress and increase IgA production.

Biology Poster Session II

Anesthesia in Terrestrial Salamanders: Are All Modes Equal?

Ricky Miller **Cameron Brown**
Faculty Mentor(s): Matthew Close
Biology Poster Session II 7:00-8:15pm CS Lobby

Anesthetic drugs vary in their ability to induce and maintain anesthesia in animals due to variability in the form and function of the respiratory and cardiovascular systems. Anesthetics dissolved in water have been favored in aquatic species due to their relative ease to administer, minimal occurrences of overdose, and their accessibility. The unique ability of amphibians to respire through their skin has allowed immersion to also be accepted as a standard method of anesthesia delivery for many species. However, because most amphibians are also capable of gas exchange through the buccopharyngeal cavity and lungs, we asked the question of whether all anesthetics were equally effective in amphibians that rely less on cutaneous gas exchange and more on bucco-pulmonary gas exchange. We compared the effects of injectable, inhalant, and immersion anesthetics in adult tiger salamanders (*Ambystoma mavortium*) in their ability to induce anesthesia. We administered anesthetics at several concentrations commonly used in research and veterinary medicine, and measured the effects on heart rate, respiratory rate and time to sedation, induction and recovery as compared to controls. We found that when compared to controls, none of the anesthetics affected heart rate, and all suppressed respiratory rate. Additionally, both injection and immersion anesthetics had cases of slow or no induction of anesthesia at low concentrations, but were effective at high concentrations. Immersion anesthetics had the highest variation in variables tested and had longer induction and recovery times when compared to injection anesthetics. We conclude that immersion, inhalant and injection anesthetics are all sufficient to induce anesthesia in terrestrial lunged salamanders, but that they are not all equal in their induction and recovery times or in their degree of variation. These results suggest that the method of anesthesia be evaluated in species prior to carrying out research with large samples.

Effect of Endocrine Disrupting Chemicals on Mosquito Morphology and Virus Replication Ability

Ben Thiss **Josh Tulppo**
Faculty Mentor(s): Justin Anderson
Biology Poster Session II 7:00-8:15pm CS Lobby

Mosquitoes are notoriously known for being disease vectors, spreading disease quickly and efficiently as they become infected with viruses such as Zika virus. Endocrine-disrupting chemicals (EDCs) that are found in plastics are becoming a possible threat to animals and humans because they cause morphology changes and affect hormone function. Our goal is to determine whether exposure of mosquito larvae to different EDCs affects their ability to replicate virus and causes changes in the mosquito morphology. Larvae will be reared in a Bisphenol A (BPA) solution, a Bisphenol S (BPS) solution, or in water as a control. Adult female mosquitoes will be infected with La Crosse virus in a blood meal and virus will be quantified at several time points by plaque assay in Vero cells. We will also determine whether the morphology of male and female genitalia are affected by EDC exposure. Our results will be discussed in the context of vectorial capacity, the likelihood of a mosquito to transmit a pathogen, as changes in virus replication rates and mosquito reproductive success play an important role in virus transmission.

Biology Poster Session II

Calcium Oxalate Concentration in Deciduous Leaves

Christopher Smith

Faculty Mentor(s): Gary Cote
Biology Poster Session II 7:00-8:15pm CS Lobby

Microscopic intracellular crystals of calcium oxalate are produced throughout the plant kingdom. These crystals are thought to defend against herbivory, but other roles have also been suggested, including that they sequester calcium from cell walls during controlled breakdown of plant tissues. One case of such controlled breakdown is the abscission of spent leaves and floral parts, in which a layer of cells with weakened walls is formed. Calcium oxalate crystals have been extensively studied in leaf blades of many plants, but there have been few reports of crystals in leaf petioles. In Dr. Cote's laboratory, we have been studying calcium oxalate levels in multiple species of autumn-deciduous trees. We have found that distal petiole tips, adjacent to the point of abscission, showed dramatic increases in calcium oxalate over the summer into autumn, in several species, consistent with a role of crystals in preparing the petioles for abscission. *Tilia americana heterophylla* (White Basswood), a member of the Malvaceae or Mallow Family, in particular, showed an abrupt increase in calcium oxalate in the weeks preceding abscission. We are testing whether other members of Malvaceae, *Tilia americana americana* (American Basswood), *Tilia cordata* (Littleleaf Linden) and *Hibiscus syriacus* (Rose-of-Sharon) show similar changes in the distal petioles.

Use of Computational Modeling to Predict Substrates of CYP4F3

Arpitha Mysore Rajashekara

Kimberly Reuwer

Clay Branscom

Faculty Mentor(s): Peter Christmas
Biology Poster Session II 7:00-8:15pm CS Lobby

The cytochrome P450 (CYP) superfamily of enzymes catalyze oxidation of lipophilic substrates, and have diverse roles in drug metabolism, lipid homeostasis, and immune regulation. Many of these enzymes have broad and overlapping substrate specificity, and it is often a challenge to identify physiologically relevant substrates among multiple possibilities. Our studies focus on CYP4F3, which is hypothesized to regulate inflammation by inactivating a lipid mediator called leukotriene B4 (LTB4). We recently demonstrated that CYP4F3 has LTB4-independent activities, indicating that it must have alternative substrates. In this study we used the ICM-Pro computer program to model the active site of CYP4F3, to dock LTB4 to the active site, and to screen for potential new substrates. We identified the isoprenoid lipids geranylgeranyl pyrophosphate (GPP) and farnesyl pyrophosphate (FPP) as strong candidates for novel substrates, based on their ICM score and alignment in the active site. Isoprenoid pyrophosphates are required for membrane attachment and function of many proteins by a process called prenylation, and aberrant prenylation is associated with many disease states. Our predictions would help to explain LTB4-independent actions of CYP4F3, and raise the interesting possibility that CYP4F3 regulates protein prenylation by modulating the levels of GGPP and FPP in cells.

Biology Poster Session II

Keeping Forest Ecosystems Healthy: Determining Sustainable Harvest Levels of Blue Cohosh, an Appalachian Medicinal Plant

Eric Allen

Faculty Mentor(s):	Christine Small	
Biology Poster Session II	7:00-8:15pm	CS Lobby

Non-timber forest products are materials collected from forests other than timber. These include foods, medicines, and floral products. They are significant culturally and economically, as many local and regional communities in the Appalachians and worldwide rely on them as sources of food, wellness, and income. The conservation status of many non-timber forest products, including blue cohosh, is uncertain, and without sustainable harvesting practices, there could be declines in many of these species in the long term. Blue cohosh (*Caulophyllum thalictroides*) is an Appalachian perennial wildflower whose roots have many medicinal properties. It is used as an herbal remedy to improve uterine muscle tone, aid in childbirth, stimulate menstrual flow, and reduce cramps. Native Americans also used it as a contraceptive. Our research is focused on predicting growth of blue cohosh roots and rhizomes, the plant parts collected for medicinal value. We collected samples of blue cohosh from permanent research plots in Virginia National Forests, and are using image analysis software to calculate surface area of leaves and other above-ground structures. Our findings will help harvesters and forest managers estimate below-ground biomass without digging up and destroying the entire plant. This is one step towards finding sustainable ways to harvest this and other economically important medicinal plant species and to protect forest ecosystems. Because the market for non-timber forest products is growing and demands on natural populations are increasing, ongoing research is necessary to sustain these products and to keep forest ecosystems healthy.

Negative Impacts of Vespa Amino Acid mixture (VAMM) on NAD⁺/NADH Balance in Yeast are Neutralized by Both Antioxidants and 2,4-dinitrophenol

Samuel Stowers

Attia Mohamed

Kristy Clark

Marisa Dameron

Faculty Mentor(s):	Sarah Redmond	
Biology Poster Session II	7:00-8:15pm	CS Lobby

Nicotinamide adenine dinucleotide (NAD) is a coenzyme that is present in all living cells and participates in oxidative metabolism and the production of a proton gradient within in the mitochondria. This proton motive force is a key power source for ATP production in eukaryotic cells. Vespa Amino Acid Mixture (VAAM) is a commercial pre-work supplement that we have previously shown to increase the production of ATP through the enhancement of the proton motive force. NAD⁺/NADH ratio was assayed in cultured yeast cells exposed to VAAM in the presence of an antioxidant mixture or 2,4-dinitrophenol (DNP), which uncouples the proteins in oxidative phosphorylation. Yeast cells exposed to 0.3% VAAM and the antioxidant mixture had lower NAD⁺/NADH ratios after 30 minutes than cells treated with VAAM alone ($p < 0.0001$), which could help maintain mitochondrial function and cell survival. Presence of the antioxidant mixture did not significantly lower ATP production compared to cells treated with VAAM alone ($p = 0.71$), suggesting that the antioxidant acts downstream of any impact VAAM has on the proton motive force, likely by neutralizing reactive oxygen species. Presence of DNP and VAAM together normalized NAD⁺/NADH ratios into a range similar to untreated controls, while exposure to either substance alone showed signs of toxicity ($p = 0.0002$). We hypothesize that VAAM acts as a super-coupler within the inner mitochondrial membrane, which can result in over activity of oxidative phosphorylation and the loss of mitochondrial and cellular function.

Biology Poster Session II

Calcium Oxalate Crystals in Petioles of Deciduous Trees in the Mallow Family in the Fall and the Spring

Connor Gavan

Faculty Mentor(s): Gary Cote
Biology Poster Session II 7:00-8:15pm CS Lobby

Calcium oxalate crystals are present in many plant species, although their precise roles in the plant are unknown. Dr. Cote and his students have suggested that crystals in petioles may facilitate abscission of deciduous leaves in autumn by removal of calcium from cell walls. They have photographed microscopic crystals and chemically measured calcium oxalate levels in several deciduous tree species. Of these, *Tilia americana* ssp. *heterophylla* (white basswood) has presented intriguing results in that crystal abundance and calcium oxalate levels both increase rapidly in the fall before leaf drop. We decided to extend these studies to three other woody species in the same plant family, the Malvaceae or Mallow Family, readily available in our area: *Tilia americana* ssp. *americana* (American basswood), *Tilia cordata* (littleleaf linden) and *Hibiscus syriacus* (Rose-of-Sharon). Here we report the structure, arrangement and relative abundance of crystals in the petioles of these species in early spring after bud break and in the fall before leaf drop.

Analysis of Transposable Element Sequences in *Metagonimoides* sp.

Coby Smith

Carrie Luk

Faculty Mentor(s): Bob Sheehy
Biology Poster Session II 7:00-8:15pm CS Lobby

In this research study we are studying a parasitic flatworm that we had originally believed to be *Metagonimoides oregonensis*. These parasites have a very broad range of hosts, infecting both vertebrates as well as invertebrates. However, when comparing its sequences to those in the NCBI database, we realized that what we had was actually a closely related organism. When analyzing the sequences of our organism's genome we found multiple sequences encoding for transposable elements, which are interesting as they provide useful information about the evolutionary components of this organism. As part of this experiment we identified segments of the genome with high sequence similarity to other organisms. In doing so we have been comparing the abundance of transposable elements in our organism with those in the genus *Schistosoma* as well as trying to gain a better understanding of the genetic makeup of our organism.

Biology Poster Session II

A Summer at the Wytheville State Fish Hatchery: Triploid Trout and Chilodonella Challenges

Codie Gleason

Faculty Mentor(s):	Karen Powers	
Biology Poster Session II	7:00-8:15pm	CS Lobby

In summer 2016, I devoted my time learning about the biology, ecology, and anatomy of brown trout (*Salmo trutta*) and rainbow trout (*Oncorhynchus mykiss*). Both species are bred and raised at the Wytheville State Fish Hatchery, operated under the Virginia Department of Game and Inland Fisheries. As an intern, my jobs were to: assist with collecting the eggs and milt of the trout, keep clean the grounds and all fish ponds, weigh and transport fish, assist with record keeping, and aid in the stocking and maintenance of the creeks, creek banks, and walking paths of Crooked Creek. Fish raised on the premises are vulnerable to disease, especially from parasites such as the protozoan ciliate *Chilodonella ucinata*. This parasite was detected in a pond of fingerling brown trout during my time at the facilities. This event, triggered by issues of overcrowding, poor feeding conditions, and decomposing food, provided an opportunity for further research learning. My time spent at the hatchery not only helped me gain knowledge and hands-on experience in handling fish, but also allowed me to make connections to wildlife conservation, wildlife management, and aquaculture. This practical knowledge is key as I pursue a future career in environmental biology.

Floral Development

Megan Calvanese

Faculty Mentor(s):	Tara Phelps-Durr	
Biology Poster Session II	7:00-8:15pm	CS Lobby

In both plants and animals, the development of organs is dependent on a group of undifferentiated cells being instructed to differentiate into specific types of cells that will function within the organ. Floral development is a model for understanding how undifferentiated cells become differentiated. The ABC model of organ identity describes when and where different genes are expressed and how the combination of gene expression specifies each type of floral organ (sepal, petal, stamen, carpel). One gene required to initiate the entire floral development program is *SEPALLATA* (*SEP*). *SEP1* encodes a *MADS* box protein that functions with other ABC model proteins that promotes the conversion of leaves into floral organs. One of the proteins that *SEP1* binds to is *AGAMOUS* (*AG*). *AG* in accordance to the ABC model is required for the specification of stamens (male part of the flower) and carpels (female part of the flower) during flower development. The purpose of my work is to determine how *AG* physically interacts with *SEP*. My goal is to computationally make 3D models of *AG* and *SEP* using the modeling software *PHYRE2* and *ITASSER*. Once the individual proteins are modeled, a model of how *AG* binds *SEP* will be created using the *ICM-Pro* software. To verify the computer models, the *AG* and *SEP1* genes will be cloned and the proteins expressed in *E. Coli* allowing us to ultimately confirm the 3D structure of the proteins. An understanding of how these proteins bind each other will help us better understand how proteins that regulate cellular differentiation work in both plants and animals.

Biology Poster Session II

The Effects of Streptomycin on Harvester Ant (*Pogonomyrmex badius*) Colony Identity

Amber Martin

Faculty Mentor(s):

Joyce Caughron

Biology Poster Session II

7:00-8:15pm

CS Lobby

In this experiment, we looked into the disruption of colony identity in Harvester ants (*Pogonomyrmex badius*) with the consumption of antibiotics. Streptomycin was given to a group of Harvester ants that were taken from the same colony. Another group of ants were also taken from the colony and given de-activated streptomycin. The interactions between control ants (non-antibiotic), de-activated ants, and activated streptomycin were recorded on whether they attacked, followed, or ignored the other groups. The ants were placed in separate habitats in the same ant farm with plastic tubes connecting the habitats. The streptomycin is hypothesized to change the natural microbiome inside the ant's gut, thus changing the chemical composition of the pheromones released. With a change in pheromones the ants will not recognize the members of their own colony and will display aggressive behavior.

Biology Poster Session II

Investigating top-down influences on Wild Surkey survival at Radford Army Ammunition Plant

Shane Brandes

Faculty Mentor(s): Karen Powers
Biology Poster Session II 7:00-8:15pm CS Lobby

Given the permanence of coyotes (*Canis latrans*) on RAAP Radford Army Ammunition Plant, New River Unit, we sought to understand their presumed impact on turkey reproduction. Determining if coyotes are the primary predator species is essential to successfully manage for turkeys and other ground-nesting birds. In March, we plan to create artificial turkey nests in ideal or suitable nesting habitats at the RFAAP. Artificial nests will be baited with unwashed chicken eggs to simulate turkey eggs. Remotely-triggered Reconyx Hyperfire (Reconyx, Inc., Holmen, WI) wildlife cameras will be used to provide 24-h surveillance of these artificial turkey nests. Barbed wire fur-catchers will be used to capture fur for isotope testing, as a way to determine if these nest visitors typically include turkeys in their diet. By knowing and understanding the natural history of wild turkeys, and the predation pressures they face during the reproductive season, managers can determine how the population is being regulated, and which techniques they can employ to sustain or increase the population size.

The effects of Vespa Amino Acid Mixture (VAAM) and 2,4 Dinitrophenol (DNP) During Mitochondrial Metabolic Reactions and in the Production of ATP

Emilie Colon Adam Weikel

Faculty Mentor(s): Sarah Redmond
Biology Poster Session II 7:00-8:15pm CS Lobby

During the process of cellular respiration, cells partake in metabolic reactions to produce Adenosine Triphosphate (ATP). There are many different processes linked to the conversion of sugar into ATP. We are focused on a single process in metabolism. This is the electron transport chain, that occurs in the mitochondrial membrane and functions by the movement of electrons through the membrane, and results in the maintenance of the proton motive force. The proton motive force is the result of the membranes electrochemical gradient, which functions by the movement of ions through a series of electron carriers, that provide hydrogen ions to power the production of ATP. The substances being examined in cauliflower mitochondrial isolates, are 2,4 Dinitrophenol (DNP), a known proton motive force uncoupler, and Vespa Amino Acid Mixture (VAAM), a commercially available sports drink derived from Asian giant hornet, a potential coupler. Cauliflower mitochondria were exposed. When these substances combined in three different concentrations (0.3% each, 0.03% each, 0.003% each), the two substances seem to determine if they counteract each others effects on in the electron transport chain. The data collected showed that at high concentrations by increasing the amount of VAAM, the over production of ATP led to for cellular deterioration even if DNP was present and by lowering the concentration, while at low concentrations the VAAM counteracted solution counteracted with DNP allowing the mitochondria to function normally. By measuring the pH levels of each concentration over time, we concluded that both solutions increased ATP production VAAM enhanced proton transport while DNP did not, and that the higher concentrations combination of the two substances had a greater rate of ATP production compared to the lower concentration. increased ATP production compared to controls.

Biology Poster Session II**Exercise and Depression****Aaron Kildea****Dianna Showers****Ryan Nichols**

Faculty Mentor(s):

Kathleen Poole

Biology Poster Session II

7:00-8:15pm

CS Lobby

Depression is the most common mental health condition in America. The disease negatively affects mood by causing persistent feelings of sadness and loss of interest. Depression affects approximately 26% of the U.S. adult population, which makes it a pressing issue for Americans. It is estimated that by the year 2020, depression will be the second leading cause of disability worldwide. Although some forms of depression may not be preventable, current evidence suggests that regular exercise along with healthy lifestyle choices can be effective in preventing depression. Certain risk factors for depression include: low self-esteem, traumatic or stressful events, family history of depression, bipolar disorder, alcoholism or suicide, and physical inactivity. Someone suffering from depression might have symptoms such as: mood change, change in sleeping patterns, drastic weight fluctuation, irritability, social difficulties, and even thoughts of suicide. These symptoms can very negatively affect an individual's quality of life and well being. A proven, cost-effective alternative approach to pharmacological treatment of depression is exercise and physical activity. Exercise releases neurotransmitters and endorphins that naturally treat depression. A correlation has been shown between physical inactivity and an occurrence of depression. Therefore, it is hypothesized that those who are physically active are less likely to be depressed due to the positive aspects of exercise such as social interaction, increased body temperature, and beneficial hormone secretion. The purpose of this study is to show the positive effect exercise can have on the treatment of depression.

Depression and Aging**Carolyn Ansel****Lexi Phonasa****Marilyn Whitaker**

Faculty Mentor(s):

Kathleen Poole

Biology Poster Session II

7:00-8:15pm

CS Lobby

Aging and depression can occur when people get older and feelings of sadness, loss, anger, or frustration interfere with daily life for weeks or longer (Medline Plus, 2016). According to Mental Health America (2016), two million out of 34 million Americans ages 65 and older suffer from a form of depression as a result from getting older. There are various symptoms of depression in relation to aging, which include: persistent sadness, anxious, empty mood, as well as feelings of hopelessness, guilt, worthlessness and pessimism (Help Guide, 2017). The mental health of older adults can be treated through promoting active and healthy aging. Mental health-specific health promotion for older adults involves creating living conditions and environments that support wellbeing and allow people to lead healthy and integrated lifestyles. Promoting mental health depends largely on strategies which ensure the elderly have the necessary resources to meet their basic needs such as: security and freedom, social support, and community development programs (Help Guide, 2017). Aging and depression can be prevented by avoiding isolation, getting adequate sleep, and engaging in regular physical activity (Help Guide, 2017). Risk factors for aging and depression include being female and having chronic health conditions associated with poor nutrition (NIMH, 2016).

Biology Poster Session II**Let's Talk About Suicide Prevention**

Chelsie Townsend	Deja Calloway	Morgan Fielding
Faculty Mentor(s):	Kathleen Poole	
Biology Poster Session II	7:00-8:15pm	CS Lobby

This project is on depression and suicide prevention. Ultimately, this presentation is used to educate people on suicide prevention and hopefully save a life. Suicide is the 10th leading cause of death in the U.S. On average there are approximately 121 suicide attempts in one day. The highest suicide rates are in the elderly that are 85+ and also people in the age range of 45 -64. Approximately half of all suicides are carried out by firearms. Although college students are not the highest risk population, educating everyone could help possibly save a life. Although, there is no way to pinpoint the exact reason for committing suicide, some of the leading causes include depression and anxiety. Warning signs include severe changes in mood or behaviors and talk of feeling worthless or killing themselves. Some risk factors that may affect someone has a lot to do with their personal history, their environment, and their health status. Additional risk factors include: history of abuse disorders, chronic health conditions or pain, and mental health conditions such as schizophrenia, bipolar disorders, and many more. One strategy to prevent suicide includes taking advantage of emergency hotlines such as the National Suicide Prevention Hotline. Prescription medications and some forms of therapy can also be effective in preventing suicide.

Depression in Adolescent Females

Jessica Masta	Taylor Bertrand	Gabrielle Saulnier	Anna Pankow
Faculty Mentor(s):	Kathleen Poole		
Biology Poster Session II	7:00-8:15pm	CS Lobby	

Depression is the most common mental health disorder in the U.S. among teens and adults, affecting over 300 million people. A study done over the course of 7 years showed that out of 496 females between the ages of 12 and 20, 1 in every 6 girls experienced Major Depression Disorder. Within a one-year period, the most common age for young girls with depression was 16. It is estimated that 20% of teens experience depression before reaching adulthood and 17.3% of those teens are female. Symptoms include: excessive sleeping/fatigue, restlessness and agitation, mood changes, and weight fluctuation. The most common treatments for teens with depression are prescribed medication and the use of therapy. Depression can be linked to mood disorders, with similar risk factors such as self-esteem issues, being the victim of a trauma (usually sexual assault), and obesity. Preventative measures like eating a healthy diet, getting adequate exercise, and finding ways to reduce stress through relaxing activities can help adolescent females avoid this disorder.

Biology Poster Session II

Postpartum Depression

Mary LaVacca	Brittany Cox	Lacy Hall
Faculty Mnetor(s):	Kathleen Poole	
Biology Poster Session II	7:00-8:15pm	CS Lobby

With childbirth, there comes a lot of emotions and hormonal changes with the body. The new mother may experience feelings of happiness, nervousness, gloominess and uncertainty. Although this is somewhat common, there are more severe feelings of mood swings, crying spells and depression that are not as common. The sadness that comes after childbirth is called postpartum depression, and it is characterized by mild to severe depression, irritability, feeling overwhelmed, difficulty bonding with the baby, fear of not being a good mother, thoughts of harming yourself or the baby, thoughts of death or suicide, trouble sleeping, etc. Typically called “baby blues” at first, these feelings can progress in severity from just a few weeks to up to six months after birth. Numerous things can put a new mom at risk for postpartum depression, but one is more likely to experience it if she has a family history of bipolar disorder, depression, difficulty breast-feeding, baby has health problems, a weak support system, financial problems, etc. While there are treatments out there for the severe cases, baby blues tend to fade on their own within a few days to two weeks. For the serious cases, there are medications such as antidepressants and anti-anxiety medications, electroconvulsive therapy, or psychotherapy. To achieve the best possible outcome, it is important for the new mother to set realistic expectations of herself, maintain a healthy support system, and to make time for herself in order to cope with the healing process.

The Effects of Depression and Anxiety

Sarah Frazier	Cristal Iden	
Cory Lane	Anthony Masanque	
Faculty Mentor(s):	Kathleen Poole	
Biology Poster Session II	7:00-8:15pm	CS Lobby

The purpose of this poster is to raise awareness about depression and anxiety. One out of 20 Americans ages 12 years or older have had or currently have depression in the past two weeks in 2009-2012. Anxiety is the most common mental illness in the United States. It affects over 40 million people from ages 18 years and older and up to 18% of the population. Depression is the feeling of persistent sadness or depressed mood. Anxiety is when a person has a constant worry about daily activities or school. Comorbid depression and anxiety are very common conditions. Patients that have been diagnosed with anxiety disorders are often times clinically depressed. The symptoms for depression include changes in eating, sleep, or energy patterns, loss of social interests, and self-injury. The symptoms for anxiety include racing thoughts, poor concentration, trouble sleeping, sweating, dizziness, and trouble breathing. The treatment for both include medication, however, an individual should contact his or her healthcare provider for evaluation. Other treatments are increasing physical activity levels, regulating sleep patterns, and eating better. The key to success when treating patients with comorbid depression and anxiety is early recognition. Risk factors include: alcoholism, increased risk of HIV, obesity, lack of physical activity, insomnia, and epilepsy. Prevention techniques include stopping bullying, preventing youth violence and child mistreatment, caring for a child after a disaster, and caring for a child after birth.

Biology Poster Session II**Depression Among Adolescent and Young Adult Males****Megan Sullivan****Savannah Ludwig****Kayla Hill**

Faculty Mentor(s):

Kathleen Poole

Biology Poster Session II

7:00-8:15pm

CS Lobby

Depression is defined as the feelings of severe despondency and dejection. When it comes to depression for young male adults there are a few factors that make it different from depression in other groups of people. Less men are diagnosed with depression each year than women. Men tend to express the different symptoms in a different way. They often have a loss of interest in usually pleasurable activities, they become fatigued, have changes in appetite, and have trouble sleeping. Women tend to have more feelings of sadness than men. Some risk factors for men may include certain medications, childhood trauma, family history of depression or other mental illness, and history of alcoholism and use of illegal drugs. One in seven young men aged between age 16 and 24 experience depression or anxiety each year which amounts to almost 6 million cases among men per year. When feeling any of these symptoms it is important to see a doctor immediately. Some treatment options they may offer to you may include medication or even therapy depending on the severity. In order to prevent depression among male young adults, they should avoid drug and alcohol use and get regular exercise and sleep.

SCI Symposium**Introduction to Mindfulness****Eileen Lagos**

Faculty Mentor(s):

Forrest

Shoemaker

SCI Symposium

12:30-12:50pm

Heth 14

Mindfulness is a practice that has been used for thousands of years. Mindful practices can be found and have evolved from many different faith traditions. In the 1970's, Jon Kabat-Zinn used his personal practice in mindful meditation and yoga to connect with his studies on chronic health conditions. Kabat-Zinn founded the monumental, Mindfulness Based Stress Reduction (MBSR) program that has helped thousands of individuals endure their medical conditions that would normally be treated with rehabilitation, surgeries, or medications. The meditation practices were found to be effective in minimizing stress, anxiety, collective sense of well-being, and living more intentionally. Given the increased support of meditation and mindfulness practices, faculty from the Counselor Education department at Radford University created an Introduction to Mindfulness course in Fall of 2015. This course teaches the history of mindfulness, techniques for regular use and allows students time to reflect on the progress made through the semester. For the class, we read *Mindfulness for Beginners*, written by Jon Kabat-Zinn, who connects his studies on MBSR with thought provoking passages about attitudes and practices that students can apply to their every day lives. Students currently enrolled in the course can attest to the benefits and positive results from consistent practice in mindfulness and meditation. There will be messages from students sharing their personal experiences including activities and techniques that were shown throughout their enrollment in the course. Having been taught only five semesters so far, this course has seen incredible progress toward fully embracing mindfulness at our university. This presentation will focus on ways practicing mindfulness can develop an overall sense of awareness to our environment, improvement in relationships and enhance the appreciation we should show our body and mind.

SCI Symposium

Can we collaborate to protect and sustainably harvest Appalachian medicinal plants?

Caroline Leggett

Faculty Mentor(s):	Christine Small	
SCI Symposium	12:50-1:10pm	Heth 14

We can see the forest for the trees but tend to walk right over the herbs. But these plants are vital to local and regional economies and the health of forest ecosystems. Appalachian plants like ginseng, sassafras, ramps, wild yam, black cohosh, goldenseal and bloodroot have been used for centuries for medicinal, culinary, floral and other purposes. With discovery and use, however, comes overuse and the need for conservation management. We have good systems to manage forests for timber and wildlife, but not for food and medicinal products. Ginseng, for example, has been harvested to near extinction. For more than a decade, scientists, students and citizen scientists from the US Forest Service, Radford University, and local community groups have collaborated to collect data at national forest research sites in Virginia in order to understand the effects of "wild harvesting" on Appalachian forest plants. The goal is to create economically and ecologically sound sustainable management plans. This research has shown that black cohosh, a medicinal plant used to treat menopausal symptoms, is very sensitive to harvesting and requires long recovery periods to maintain healthy natural populations, emphasizing the need to continue to monitor and study culturally and economically important species like these. The collaboration also has produced models correlating black cohosh above-ground growth to root mass, to assist in plant inventories and conservation management. Can we help our forest understory recover? Can we create jobs, ways to improve forest growth and sustainable harvests of beneficial plants? How can you help this unique service and research project?

Aging and Depression

Carolyn Ansel

Faculty Mentor(s):	Lexi Phonasa	Marilyn Whitaker
SCI Symposium	Kathleen Poole	Pam Frasier
	1:10-1:30pm	Heth 14

Aging and depression is when people get older and feelings of sadness, loss, anger, or frustration interfere with daily life for weeks or longer (Medline Plus, 2016). According to, (Mental Health America, 2016) 2 million out of 34 million Americans ages 65 and older suffer from a form of depression as a result from getting older. There are various symptoms of depression in relation to aging which includes: persistently sadness, anxious, empty mood, feelings of hopelessness, guilt, worthlessness and pessimism (Help Guide, 2017). The mental health of older adults can be treated through promoting active and healthy ageing. Mental health-specific health promotion for older adults involves creating living conditions and environments that support wellbeing and allow people to lead healthy and integrated lifestyles. Promoting mental health depends largely on strategies which ensure the elderly have the necessary resources to meet their basic needs, such as: security and freedom, social support, and community development programs (Help Guide, 2017). Aging and depression can be prevented by avoiding isolation, adequate sleep, and regular physical activity (Help Guide, 2017). Risk factors for aging and depression include being female, and having chronic health conditions associated with poor nutrition (NIMH, 2016).

SCI Symposium**Roots with Wings****Kortney Perry****Eileen Lagos****Sara Garvin****Cearra Cargo****Chelsey Mathis**

Melinda Wagner

Andy Dinh**Samuel Montana**

Heth 14

Reyo Hodges**Cara Myrtle**

Faculty Mentor(s):

SCI Symposium

1:40-2:00pm

Now celebrating the tenth anniversary of the “Roots with Wings” project, the oral histories of Floyd County residents have been documented and preserved at the Old Church Gallery in Floyd County. The Old Church Gallery offers insight and guidance to the “Roots with Wings” project. This project is a collaboration between Radford University students, Floyd County High School (FCHS) Media Technology and Sociology classes, and members of the Floyd community. Place-based education incorporates the immersion of students in local culture and history, to create a foundation for applying their education. The project is a multi-stage approach that teaches FCHS students invaluable skills, and allows RU students to gain experience as mentors and researchers. The goal of this project is to preserve Floyd County stories and create important archives of oral history. This year's project centers around the themes of community and neighborhoods while exploring the importance of community in Appalachia and the evolution of neighborhood structures over generations. In Spring 2017, 10 RU student mentors, RU faculty, high school staff, and community volunteers met weekly to teach 48 FCHS students interviewing techniques, transcription skills, audio, and video recording skills. These informative demonstrations prepared students to conduct formal interviews, which were used in the making of final documentaries that capture the histories of four Floyd County Residents. Our research presents key themes through interviews and qualitative analysis. Our results document the evolution of Floyd County, as well as the integral roles of church, family, and land regarding the construction of community and neighborhoods.

SCI Symposium**Senior Health and Wellness Fair****Ajla Becirevic****Alex Harris****Britney Phekoo****Brittany, Blanco****Cory Toler****Emilee Wells****Jenny Cook****Kayla Ogden****Lauren Sigmon****Meredith Brubaker****Samatha Koester****Morgan Wyatt****Zach Manuel**

Faculty Mentor(s):

Jyotsna Sharman

SCI Symposium

2:00-2:30pm

Heth 14

In NUTR 317, students learn about the nutritional requirements, eating behaviors, and nutritional concerns of older adults. On February 23rd, students participated in the Senior Health and Wellness Fair at Christiansburg Recreation Center. The learning experience was integrated into the students academic curriculum. The purpose of this service-learning experience was two-fold: (a) It provided students an opportunity to apply classroom learning, nutrition knowledge and communication skills to benefit local senior residents by educating them on nutritional aspects of health promotion and disease prevention. It also helped students improve their critical thinking skills, foster teamwork by increasing interaction with classmates outside the classroom setting, engage with the community, and help improve their confidence while executing social responsibility. (b) It met the needs of the target community. By offering nutritional screenings and information to the senior residents, this project aimed at increasing health awareness, motivating attendees to make positive changes in their food choices and eating practices, and also educating them about the nutritional resources available in the community. After the culmination of this experience, students completed a reflection activity that guided them in examining their own perspectives and assumptions about themselves, their community, the organization and people they work with in the community, and the impact of these perceptions on their service. The activity further encouraged students to consider their goals as personally and/or professionally community-oriented people. Finally, this activity facilitated students in their exploration of self, as well as the community needs and issues, rather than asking them to develop pre-mature solution to complex civic challenges.

Radford Model United Nations, SRMUN 2017 Conference Presentation**Ivan Thirion Romo****Brady Guertin**

Faculty Mentor(s):

Paige Tan

SCI Symposium

2:40-3:00pm

Heth 14

We will talk about our experience and what we learned during our SRMUN 2017 conference in Charlotte.

SCI Symposium

Nutrition Education on Campus and in Broader Community

Emily Anderson	Christopher Anglin	Morgan Bishop	Kassidy Broome
Taylor Cannaday	Grace Currey	Sarah Danaceau	Jane Everett
Cailin Henry	Rebecca Journigan	Hillary Nolan	Caroline Poff
Chase Thompson	Ashley Timbrook	Audra VanDerwerker	
Madison Williams	Seana Wilson	Kasey Yost	Alyssa Zilka
Faculty Mentor(s):	Jyotsna Sharman		
SCI Symposium	3:00-3:45pm	Heth 14	

In the core course Introduction to Nutrition, students learn about the importance of good nutrition to health at various stages of life and in different lifestyles, with a specific emphasis on options for eating healthy on campus. They also learn how socioeconomic, cultural, and psychological factors influence eating practices and lifestyle behaviors of individuals. The high performing students enrolled in the Honors section of this course were challenged to plan a presentation to educate individuals on nutritional recommendations consistent with the Dietary Guidelines for Americans. The goal of the project was to help individuals either on campus or in the broader community to make healthy food choices, adopt healthy nutrition-related practices, change eating behavior, and/or enhance their nutritional well-being. The effort provided enrolled students with opportunities to use their acquired nutrition knowledge purposefully in real-life situations, and encouraged them to develop their personal efficacy, critical-thinking and problem-solving skills, and also soft skills as leadership, collaboration, communication. After the culmination of this meaningful, purposeful and service-oriented project, students reflected on their experience and learning, and explored their emergence as responsible and caring citizens and activists.

ePortfolio Showcase Description

The Scholar-Citizen ePortfolio Showcase is a forum in which students graduating with distinction from the Scholar-Citizen program share their progress and accomplishments as they have worked toward developing the skills, knowledge, and critical habits of mind that will empower them to be agents of change for themselves, for their families, and for their communities. Presentation of a Scholar-Citizen ePortfolio is a graduation requirement for those who wished to be conferred status as Scholar-Citizens or Scholar-Citizen Fellows. This distinction, once conferred, is noted on the student's academic transcript and signifies excellence in applying disciplinary knowledge to address the challenges confronting our local, national, and global communities.

Center for Gender Studies Oral Session

Center for Gender Studies Keynote: Dr. Theresa Burriss

Women of Change, Women of Courage: Appalachian Activists

Center for Gender Studies Symposium 3:30-4:30pm Heth 22

Women of Change, Women of Courage: Appalachian Activists is a project of oral histories, or “herstories,” gathered from women of the Central/Southern Appalachian region, namely Southwest Virginia, Southern West Virginia, Eastern Kentucky, Northeast Tennessee, Western North Carolina, and North Georgia. Throughout Appalachian history, women have taken an active role in bringing positive change to their families, communities, and region. Some of these women were born and raised in the mountains, while others moved here from other areas or have direct ancestral ties to the land as a result of out-migration. Appalachian women activists are abundant and have been for well over a hundred years. Unfortunately, these women rarely enjoy the attention or credit they deserve. People in the region and beyond are unaware of the rich history and accomplishments of these women activists. With this project I hope to remedy the deficiency.

Predicting the Academic Success of College Women

Karina Bevins	Cassandra Homick	Rebecca Wiegmann	Lara Barbir
Julianna Williams	Katie Easter	Celine Fadi	
Faculty Mentor(s):	Jeff Aspelmeier	Ann Elliott	Anja Whittington
Center for Gender Studies Symposium	4:45-5:00pm	Heth 22	

A longitudinal study of academic success identifies factors that predict the first semester GPA and second semester enrolment of women enrolled in their first semester of college. Initially, 123 freshmen, recruited from the Psychology Department participant pool, completed measures of resilience, psychological functioning, social-support, self-esteem, and attachment security during the first 4 weeks of the semester. During the last four weeks of the semester, 52 participants returned to complete measures of resilience, psychological functioning, social-support, locus of control, and social desirability and participants provided permission to obtain their Fall 2016 GPA and Spring 2017 enrolment data from university records. Regression and Logistic regression models were used to evaluate the group of variables that best predict first semester GPA and persisting to the second semester of college.

Depression in Adolescent Females

Jessica Masta	Taylor Bertrand	Gabrielle Saulnier	Anna Pankow
Faculty Mentor(s):	Kathleen Poole		
Center for Gender Studies Symposium	5:00-5:15pm	Heth 22	

Depression is the most common mental health disorder in the U.S. among teens and adults, affecting over 300 million people. A study done over the course of 7 years showed that out of 496 females between the ages of 12 and 20, 1 in every 6 girls experienced Major Depression Disorder. Within a one-year period, the most common age for young girls with depression was 16. It is estimated that 20% of teens experience depression before reaching adulthood and 17.3% of those teens are female. Symptoms include: excessive sleeping/fatigue, restlessness and agitation, mood changes, and weight fluctuation. The most common treatments for teens with depression are prescribed medication and the use of therapy. Depression can be linked to mood disorders, with similar risk factors such as self-esteem issues, being the victim of a trauma (usually sexual assault), and obesity. Preventative measures like eating a healthy diet, getting adequate exercise, and finding ways to reduce stress through relaxing activities can help adolescent females avoid this disorder.

Center for Gender Studies Poster Session

Post-traumatic Stress Disorder Distinction among Women and Children Exposed to Domestic Violence

Courtney Kalmanson

Faculty Mentor(s):

Nicole Petersen

Center for Gender Studies Symposium 5:15-6:30pm

Heth 22

Patriarchal standards of society allow men to hold the power in heterosexual and familial relationships. This type of power often leads to domestic violence (DV) against women and children. DV is a risk factor for mental health problems. Commonly, women and children develop Post-traumatic Stress Disorder (PTSD) in response to DV. This paper focuses on the PTSD symptomatology distinction between women and children. Past research has found that across ages of children, intrusion symptoms seem to be the most prevalent, with avoidance symptoms less prevalent. It has also been found that women report higher levels of intrusion and hyperarousal symptoms. However, large discrepancies exist in the prevalence of symptoms of each cluster across age due to the cross-sectional nature of past research. Participants will be recruited from domestic violence shelters and will be surveyed using the Posttraumatic Stress Disorder Checklist. Participants will be broken down into three groups, children ages 7 -12, 13-18 and women 18 and older. Assessing different age groups will lead to a more accurate depiction of the PTSD symptoms. It is predicted that children will exhibit more intrusion and avoidance symptoms, while women will experience more intrusion and hyperarousal symptoms. Severity and duration of DV will be a moderating variable between symptomatology clusters of PTSD among women and children. This will help clinicians better predict symptomatology among children and women survivors of DV.

Fangirls Unboxed: Selling Girls on Superheroes

Dixie Seitz

Faculty Mentor(s):

Scott McDarmont

Center for Gender Studies Symposium 5:15-6:30pm

Heth 22

The present study was conducted to gauge how companies, such as Marvel™ and DC™, market toys to their female audience, more importantly their female characters. With more and more women and girls getting into superheroes, it's important to look at how companies are changing their tactics to appeal to this growing demographic within their fan base. By looking at current marketing trends and merchandise, it is apparent that companies are just now starting to market towards their female audience, as well as being more gender neutral with their merchandise. There are more female characters being represented in merchandise, whether it be in gender neutral products or in toy lines specifically marketed towards girls. Gender roles and gender stereotyped play are also important factors on what toys children receive from parents and family, and what they choose to play with later on. Superhero toys marketed towards girls aren't selling as much as those marketed towards boys, which is enforced by gender roles and stereotyped play. This study shows the current strategies and influences that affect how companies market their heroes and represent them to their growing female audience.

Center for Gender Studies Poster Session

Infidelity and Trust in Relationships

Lataja Allen

Elijah Dashiell-White Akira Harris Rebecca Cain

Faculty Mentor(s):

Pamela Jackson

Center for Gender Studies Symposium 5:15-6:30pm Heth 22

Many college students desire a committed relationship. While interpersonal connections are important, these committed relationships are not always compatible with the individuals' current environment or how they plan to achieve their future goals. This incompatibility, can lead to infidelity and trust issues. This study will examine the ways in which infidelity affects how much individuals trust their partners, and whether a specific gender shows higher rates of infidelity. A survey will be conducted through the SONA system, targeting approximately 150 male and female students at Radford University. The survey will contain demographic questions, The Trust in Close Relationships Scale (Rempel, Holmes, & Zanna, 1985), and other questions regarding past relationships and experience with infidelity. It is anticipated that females will develop more trust issues after becoming a victim of infidelity. However, it is expected that males will admit to involvement in infidelity more frequently than females. These findings are expected due to the societal gender norms in the American culture.

Women's Risk of Sexual Aggression in Bar Culture

Rachel Dotson

Faculty Mentor(s):

Nicole Petersen

Center for Gender Studies Symposium 5:15-6:30pm Heth 22

Current research shows that women are at a high risk for experiencing sexual aggression in bar settings. This study will use video scripts of intoxicated actors and actresses, who will be acting out different levels of intoxication, towards the end of the video they will experience some sort of sexual aggression (grabbing around the waist/sexual comments). Participants will be asked to watch the videos and then fill out a brief survey on their perceptions of the drunk actor or actress. They will also be surveyed about their perceptions of bar culture and their own personal experiences within bar settings. This includes any history of sexual assault, of physical assault within a bar setting. It is predicted that drunk female actresses will receive a more negative evaluation from participants (both male and female) than the drunk male actors. The more intoxicated a female actress appears to be the higher likely hood that she will be blamed for any sexual aggression she experiences, as opposed to her male counter part who is acting out the same level of intoxication. Perceptions about the who is responsible for preventing and causing sexual assault are important for understanding why these types of assaults occur.

Center for Gender Studies Poster Session

The Influence of Racial and Ageist Stereotypes on Future Healthcare Providers' Recommendations for Breast Cancer Treatments

Victoria Dunsmore

Faculty Mentor(s):

Nicole Petersen

Center for Gender Studies Symposium 5:15-6:30pm

Heth 22

My poster will be examining the racial and ageist stereotypes that exist among future healthcare providers, and how these stereotypes influence a provider's recommendation of treatments for breast cancer patients. This poster will be a proposal of the experiment I will be conducting for my thesis. Vignettes will be used to present the participant with a case-study of a hypothetical woman who has undergone a mastectomy. Following the vignette, a questionnaire will be used to see how the participants' subconscious stereotypes may affect their treatment recommendations for the hypothetical patient. I will be recruiting students from the Nursing and Pre-Med programs from the Radford University campus; their information will be de-identified as to not reveal who responded. I hypothesize that based off past research, the participants will be less likely to recommend breast reconstruction surgery, or sexual therapy, for older, minority patients who underwent a mastectomy; Specifically, participants will be less likely to recommend either reconstructive surgery or sexual therapy, to the vignettes that describe older, Asian-American women, compared to any other minority. This information will be used to help medical training programs bring awareness to diversity and the implicit stereotypes that may coincide with various groups of people. This education will help current, and future, healthcare providers to be more objective when recommending post-op treatments to women who have undergone a mastectomy, due to breast cancer.

Pluralistic Ignorance and Sexual Behaviors: A Comparison of Heterosexual and Homosexual Men on Hook-up Behaviors (Proposal)

Charles Woods

Faculty Mentor(s):

Nicole Petersen

Center for Gender Studies Symposium 5:15-6:30pm

Heth 22

Hook ups are increasing on college campuses (Lambert, Kahn, & Apple, 2003). The role of Pluralistic Ignorance and sexual behaviors have ranged from dating behaviors to sexual frequency to comfort for sexual behaviors during a hook up (Cohen & Shotland, 1996; Lambert, Kahn, & Apple, 2003; Reiber & Garcia (2010). Prior literature has focused on heterosexual males and females with consistent findings that suggested participants overestimated how often and/or how comfortable their peers are with sexual behaviors (Lambert, Kahn, & Apple, 2003; Reiber & Garcia, 2010). The current study would like to fill a gap in the literature by extending this paradigm to examine how pluralistic ignorance for sexual behaviors relates to heterosexual and homosexual males. Researchers will ask the participants to report their personal frequency and comfort with various sexual behaviors during a hook up. The participants will then estimate how frequent and comfortable they believe their peers of the same sexual orientation and the other sexual orientation are with the same behaviors. Few past researchers have examined the differences between heterosexual and homosexual males on sexual behaviors. Those that have researched the area, found that homosexual males reported higher levels of sexual activity when compared to heterosexual men (Dodge et al., 2016; Howard & Perilloux, 2016) The current researchers believe that findings will be consistent with past literature and reveal that sexual orientation may not affect peer estimation. This project will compare beliefs and self-reports of hook up behaviors between heterosexual and homosexual men that is under researched.

Primate Behavior Research

Social Behaviors During Feeding and Nonfeeding Times in Ring-Tailed Lemurs (*Lemur catta*)

Candice Wachtel	Kasey Blevins	Leanna Hall	Dakota Townsend
Faculty Mentor(s):	Cassady Urista		
Primate Behavior Research	10:00-10:20am	Heth 22	

Lemurs have interested researchers since their discovery. Ring-tailed lemurs are prosimians that naturally live on the island of Madagascar and live in hierarchical groups that spend much of their day looking for food. This article is intended to explore the mechanics of social and feeding behavior in ring-tailed lemurs in the wild and provide a comparison for what is seen in captivity. Through data collection and observations taken from the North Carolina Zoological Park, evidence for the level of aggression and sociality before, during, and after feeding was taken. The inter-workings of the ring-tailed lemurs behavior in captive environments verses in the wild may provide insight to the psychology of prosimian social hierarchy. In conclusion, the *Lemur catta*'s behavior during non-feeding times showed to be more social than the original hypothesis, and less aggressive during feeding times (due to the method of feeding).

Space use and interactions between Ring Tailed Lemurs (*Lemur catta*) and Red Ruffed Lemurs (*Varecia rubra*) at the North Carolina Zoo

Jill Thompson	Courtney Hicks	Anna George	Zac Murphy
Faculty Mentor(s):	Cassady Urista		
Primate Behavior Research	10:20-10:40am	Heth 22	

Territoriality and use of space are important components of any animal's behavior. Use of space has implications for the relationship between group members and other species in that territory. There are also important implications for conservation with territoriality and use of space. This research looks at the use of space between two captive populations of lemurs at the North Carolina Zoo. Ring Tailed Lemurs and Red Ruffed Lemurs were examined for territorial behavior and territory use. It was found that these two species were territorial towards each other and occasionally showed signs of aggression due to sharing space. It was also found that the use of their territory was opposite in this captive setting than previous research done in the wild. The Red Ruffed Lemurs spent no time in the trees, while the Ring Tailed Lemurs spent equal time between the ground and the trees. The reason for this could be the restricted habitat provided in the zoo, with the lack of trees and other natural resources.

Male *Hamadryas* baboons: A study of interactions

Kimber Cheek	Alexandra McAlevy	Caitlin Jannise	Ginger Frogel
Faculty Mentor(s):	Cassady Urista		
Primate Behavior Research	10:40-11:00am	Heth 22	

Hamadryas baboons show a one male unit (OMU) harem style living arrangement, that can then be organized into clans and colonies. Literature suggests that the dominant males do not often interact with other dominant males. Their behaviors are specific to the females in their OMU and include herding, mounting, grooming, and other relationship establishing behaviors. In the following study, five OMUs of *Hamadryas* baboons were observed at the North Carolina Zoo in Asheboro NC, with the intent to compare the behaviors outlined in the literature to observed behavior in captive *Hamadryas* baboon populations. The results follow literature findings very closely, other than two specific incidences in which two OMU male leaders acted out of context towards one another. Overall, dominant males in captive *Hamadryas* baboon populations act in accordance to past research findings.

Primate Behavior Research

Affiliative Behavior of Female Chimpanzees in a Captive Setting

Hanna Mitchell	Tara Abdul	Gerald Pierre	Raven Grandberry
Faculty Mentor(s):	Cassady Urista		
Primate Behavior Research	11:00-11:20am	Heth 22	

Social relationships between female chimpanzees (*P.troglodytes*), who migrate between carefully constructed fission-fusion groups, were studied at the zoo in Asheboro, North Carolina. Chimpanzees in the wild usually have a group dynamic of female dispersal and male philopatry, leading to males having closer bonds within a group than would non-kin females. Strong affiliative relationships between females are very rare in these groups, among which inclusive fitness is not a factor. Even though wild female chimpanzees are mostly solitary primates, captive animals do not always show the same behaviors as their wild counterparts. Using a series of focal animal samples, the affiliative behaviors of female chimpanzees towards one another were investigated in this study. Behaviors such as spatial proximity, grooming, food sharing, etc. were observed. It is commonly thought that females have little to no affiliative behaviors towards one another since food foraging is mainly solitary. Since these females are in a captive setting, and food foraging is not practiced, our research set out to examine whether they would still display a tendency to be solitary. This study further confirms the assumption that female chimpanzees are mostly solitary primates. The females' time was mostly spent isolated away from the group, with only the presence of their offspring to keep their company. When time was spent together between females, it often involved eating or sitting near each other, but not very much time was spent on grooming; which promotes the development and maintenance of social bonds.

Behavioral interactions between silverback and juvenile male western lowland gorillas (*Gorilla gorilla gorilla*) in captivity

Holly Rindorf	Elizabeth Grandy	Madison King	Rebecca Titus
Faculty Mentor(s):	Cassady Urista		
Primate Behavior Research	11:20-11:40am	Heth 22	

Male interactions have been found to be variable amongst groups of western lowland gorillas (*Gorilla gorilla gorilla*). Understanding how male gorillas interact with one another can help primatologists to gain an understanding of group dynamics. The North Carolina Zoo houses one silverback male, one seven-year-old male and two four-year-old males, along with the mothers. The objective of this study was to understand the interactions between the silverback male and the juvenile males, along with the interactions between the seven-year-old male and the two four-year-old males. The study was conducted by doing multiple rounds of all occurrence sampling; which focused on proximity as well as interactive behaviors between all males. The results showed that although all juvenile males came into a close proximity of the silverback, there was no interaction between the silverback and the juveniles throughout the observations. They also found that there was a good deal of interaction between all juvenile males. This suggests that there was no preference in interaction from the silverback and that all three juveniles interacted with each other equally. This research created a basis of understanding of male-male group dynamics between juveniles and silverbacks in captivity, although more data and a larger sample size would be required to conclude anything substantial.

Primate Behavior Research

Silverback gorilla behavior and interactions with gorilla troop at North Carolina Zoo

Khalia Bowden	Marisa Dameron	Heather Loberger
Faculty Mentor(s):	Cassady Urista	
Primate Behavior Research	11:40-12:00pm	Heth 22

Silverback western lowland gorillas (*Gorilla gorilla gorilla*) act as the leaders of their group. This is seen in their interactions with other members within the group, by maintaining control of the group, keeping a close watch over his troop members and dominance displays. In our population of lowland gorillas at the North Carolina Zoo, we observed the interactions of the male silverback gorilla with individuals that arrived at the enclosure at the same time period as him in comparison to the gorillas already inhabiting the enclosure prior to his arrival. We expected to see most of the silverback's interactions occur between the oldest juvenile male and the oldest adult female, that arrived at the enclosure at the same time as the silverback. These interactions were expected to be affiliative more often than agonistic. Over a period of two days (October 22, 2016 and October 30, 2016) we recorded the silverback's behavior at the enclosure to note his solitary actions as well as his interactions with others in his group. We characterized certain behaviors as affiliative or agonistic, as well as noting the visitor density during each observational period. The results indicate that the male silverback was more solitary than social. The silverback interacted more with the oldest juvenile male and the oldest female adult as predicted. We found little correlation between visitor density and the silverback's behavior. Our data supports the current understanding of silverback behavior in a captive setting.

Psychology Poster Session I

Entry Points into the History of Mental Health Treatment

Emily Ludwig	Stephen Casazza	
Faculty Mentor(s):	Thomas Pierce	
Psychology Poster Session I	3:00-4:15pm	CHBS Lobby

While modern psychology and psychiatry have yielded a variety of effective and empirically supported treatment approaches for various mental health disorders, a review of treatments across history reveals seemingly strange or even cruel treatment of the mentally ill. The present poster will provide snapshots of mental health treatments across time, providing context and rationale behind those methods based on the theories of mental health popular at the time of their practice. Treatments for mental illness have included, but have not been limited to, spiritual interventions, medical procedures, institutionalization or incarceration, medicinal interventions, and modern talk therapies. Literature review is used to uncover the theories, beliefs, and research behind various practices in mental health.

Psychology Poster Session I

Joseph Rhine: The Scientific Pursuit of Psi Phenomena

Kendra Stansak	Michaela Reardon	
Faculty Mentor(s):	Thomas Pierce	
Psychology Poster Session I	3:00-4:15pm	CHBS Lobby

Joseph Rhine was a parapsychologist researcher who focused on “extrasensory” phenomena such as telekinesis, clairvoyance, and precognition. This poster focuses on Rhine’s career, including his research at Duke University, and subsequent founding of the Rhine Institute. Also included is an overview of common research methods used by parapsychologists of that era, including general extrasensory tests, face card target tasks, prediction of card orders, and the basic extrasensory technique task. The subsequent decline of parapsychological research and state of the field today is also discussed. Though parapsychology is no longer seriously studied today, it represents an interesting and unconventional chapter in the history of psychology.

Work-Family Conflict and Intent to Turnover: A Moderated Mediation Model

Teresa Ristow	Ashley Youngs	
Faculty Mentor(s):	Nicole Petersen	
Psychology Poster Session I	3:00-4:15pm	CHBS Lobby

This paper presents a model of moderated mediation for work-family conflict and intent to turnover. The argued mediator being job satisfaction and the moderator employee fit based on the congruence between work-family values of an organization and individual. The model is supported through previous literature establishing a relationship between work-family conflict and intent to turnover (Butts, Casper & Yang, 2013). The relationship between work-family conflict and intent to turnover is then expanded through a mediator of job satisfaction. Allen et al. (2013) states that work-family conflict influences self reports of employee job satisfaction. Once this mediator relationship has been established, the relevance of employee fit as a moderator is examined through organizational and employee value congruence in terms of work-family values based on Cable and Edwards (2004). In order to support this model, we will recruit 300 employees from a company and will distribute a self report survey. The expected results of the study are that work-family value congruence will lead to higher job satisfaction and thus a lower intent to turnover. In the case of value incongruence, it will lead to lower job satisfaction and thus a higher intent to turnover.

Psychology Poster Session I

A literature review of recent research on counselor trainees' personal agency factors and counseling/training outcomes

Ashley Suk

Faculty Mentor(s): Pei-Chun Tsai
Psychology Poster Session I 3:00-4:15pm CHBS Lobby

Based on Larson's (1998) Social Cognitive Model of Counselor Training (SCMCT), counselors' personal agency factors (e.g., psychological flexibility, supervisory working alliance, attachment to supervisors) play a critical role in counseling and training outcomes (e.g., counselor self-efficacy, counselors' willingness to disclose in supervision sessions). Personal agency factors imply the various motivational, cognitive, and affective processes that take place within the trainee therapists while counseling clients, and have consistently been found to have a crucial role in how said therapist develops (Larson, 1998; Marmarosh et al., 2013; Mehr, Ladany, & Caskie, 2015). This study aimed to conduct a literature review of most recent research of the last 5 years to provide an overview on the associations between counselors' personal agency factors on counseling/training outcomes. The impact of personal agency factors on counseling and training outcomes is a highly significant area for study because it can be used to inform the curriculum of training programs and enhance the supervision process in order to help trainee counselors become more effective and become better clinicians. Further discussion will be provided in the poster session.

The History of Functional Contextualism

Lara Barbir

Alissa Goldstein

Faculty Mentor(s): Thomas Pierce
Psychology Poster Session I 3:00-4:15pm CHBS Lobby

Functional Contextualism is a philosophy underlying a modern third-wave psychotherapy known as Acceptance and Commitment Therapy (ACT). Functional contextualism has roots in behavioral and contextual sciences, which are the first and second waves of therapy, respectively. This poster will describe the philosophies and psychotherapeutic traditions that contributed to functional contextualism and the creation of ACT. Specifically, the roots of behaviorism as well as pragmatism, which contributed to contextualism, will be introduced. Finally, future research directions of functional contextualism will be discussed.

Psychology Poster Session I

Job Satisfaction as a Moderator to the Relationship of Work-family Conflict on Organizational Commitment

Ciera Cannizzaro	Holly Symosky	
Faculty Mentor(s):	Nicole Petersen	
Psychology Poster Session I	3:00-4:15pm	CHBS Lobby

Work-family conflict has been a construct that has been operationalized in multiple ways. For the purpose of our research, we define work-family conflict as “an inter role conflict in which pressures from the work role are incompatible with pressures from the family role” (Allen & Armstrong, 2006). The negative relationship between work-family conflict and commitment, and work-family conflict and job satisfaction has been examined, but no research has shown job satisfaction to moderate the work-family conflict and organizational commitment relationship. We hypothesize that work-family conflict will negatively predict organizational commitment. Additionally, we expect to find job satisfaction to be a significant moderator in this relationship. We expect a minimum of 200 participants working in diverse fields and are limiting our participants to employed parents working full-time. We plan to use existing measures of work-family conflict, affective commitment, and job satisfaction to create our survey. Planned analyses include a hierarchical regression. We believe the results of this study will help explain the work-family conflict and organizational commitment relationship, and reveal job satisfaction as a moderator.

Work Engagement, Organizational Commitment, and Job Burnout: Generational Differences in the Workplace

Michael Kirkland	John Borkoski	
Faculty Mentor(s):	Nicole Petersen	Benjamin Biermeier-Hanson
Psychology Poster Session I	3:00-4:15pm	CHBS Lobby

While younger employees continue to enter the workforce, there is a growing concern among researchers and practitioners alike that there are meaningful and substantive differences between generations on a variety of work-related attitudes (Costanza, Badger, Fraser, Severt, & Gade, 2012; Xiaorong & Hui, 2016). Previous research has established that younger generations tend to display higher levels of turnover intention and have lower levels of work engagement and organizational commitment when compared to older generations (D’Amato & Herzfeldt, 2008; Park & Gursoy, 2012). However, relatively few studies have examined job burnout as a possible alternative explanation as to why younger employees feel less engaged and committed in their organizations, ultimately leading to higher rates of turnover (Lu & Gursoy, 2013). The present study will investigate moderating effects of generational membership on the relationship between work engagement and job burnout, as well as its moderating effects on the relationship between organizational commitment and job burnout. To test this, surveys assessing work engagement, organizational commitment, and job burnout will be distributed to 250 participants. It is hypothesized that levels of work engagement and organizational commitment will significantly differ depending on the generational membership of the employee. Specifically, we expect to find the effects of work engagement and organizational commitment on job burnout to be significantly moderated by generational membership, and that this relationship will be strongest for younger generations. Implications for the relation of work engagement and organizational commitment to job burnout between generations will be discussed.

Psychology Poster Session I

Out of controller: A study on video game violence and aggression

Ashley Suk	Cassandra Homick	Becca Wiegmann
Faculty Mentor(s):	Nicole Petersen	
Psychology Poster Session I	3:00-4:15pm	CHBS Lobby

While violent content in video games and aggression have been extensively studied, there is little consensus about the link between the two in existing literature. As such, the purpose of this study is to determine if violent or nonviolent content of a video game can induce aggression, using a uniquely manipulated video game that is custom-created for the purposes of this study. Participants will be instructed to play one of two versions of the same video game (violent or nonviolent) for 60 minutes. Immediately following the play session, participants will fill out the Buss Perry Aggression Questionnaire and a researcher-created survey to measure video game specific frustration.

A Comparison of the Anxiolytic Effects of Chlordiazepoxide in Different Lighting Conditions

Rachel K. Gattoni	Brad T. Newman	Parker N. Stinnett	Michael E. Hastings
Faculty Mentor(s):	Pamela A. Jackson		
Psychology Poster Session I	3:00-4:15pm	CHBS Lobby	

One-trial tolerance (OTT) refers to the diminished anxiolytic effects of a benzodiazepine upon a rat's re-exposure to the elevated-plus-maze (EPM). Due to the widely-documented occurrence of OTT, the present investigation was conducted to determine if changing a condition from the initial exposure to the maze would diminish OTT by assessing the anxiolytic effects of chlordiazepoxide (CDP) in an EPM under 2 different lighting conditions. For the first trial, 20 male, Long-Evans rats were randomly assigned to receive either the placebo or CDP and to run the EPM in either white or red light. For the second trial, all conditions remained the same, except each rat ran the EPM in the opposite lighting condition from the first trial. The present study predicted that by manipulating an aspect of the testing environment, OTT effects would not be present upon the rat's re-exposure to the maze. Rats under the influence of CDP in red light were also predicted to be less anxious than those in white light.

Psychology Poster Session I

Relationship Between Processing Speed and Social Skills in Individuals With and Without Autism Spectrum Disorder

Karina Bevins

Faculty Mentor(s):	Nicole Petersen	
Psychology Poster Session I	3:00-4:15pm	CHBS Lobby

This planned study investigates the relationship between processing speed (the ability to perform simple tasks quickly and automatically) and social skills (the ability to interact and communicate with other people effectively) in individuals on the autism spectrum as well as neurotypical individuals. Though some previous research has established a connection between autism and processing speed impairment, little has been done to investigate a possible relationship between processing speed and social skills. It may be possible that the ability to think quickly and respond to stimuli appropriately contributes to level of social success. Because impaired social functioning is associated with autism, investigating its relationship to processing speed may need to be explored. In this study, the researcher plans to acquire around 50 participants in two groups: a group with autism and a comparison group of similar individuals without autism. Participants will be administered an intelligence scale (WAIS-IV) and a social skills measure (to be determined) and scores will be compared. It is expected that the ASD group will score lower on the Processing Speed Index than the comparison group. It is also predicted that lower scores in both groups will correlate with poorer social functioning.

Overcoming Attractiveness Stereotypes: Can Accuracy Motivation Reduce Stereotyping?

Nicole Trapeni Elizabeth Click Kayla Hall

Faculty Mentor(s):	Jeffrey Aspelmeier	
Psychology Poster Session I	3:00-4:15pm	CHBS Lobby

The present study investigates the relationship between attractiveness and perceived personality characteristics. The purpose of this study was to test whether accuracy motives moderate the attractiveness stereotype effect. Approximately 100 Radford University undergraduates were recruited through Sona Systems. The study used a 2 (high accuracy motive vs. low accuracy motive) x 3 (high, moderate, and low attractiveness) factorial design. Participants rated three photos of women, one attractive, one average, and one unattractive across personality characteristics. Accuracy motives were manipulated by creating two versions of the survey. Half of the participants were given directions to answer simple questions based on accuracy and offered feedback while the other half was directed to answer the same set of questions on their best ability with no feedback. The interaction between attractiveness effect and motivation effect was expected to be significant. Participants in the low accuracy motivation condition were expected to rate attractive photos more positively than average and unattractive photos. Participants in the high accuracy motive condition were expected to provide neutral ratings (neither positive nor negative) across all three photo conditions.

Psychology Poster Session I

Does paired distinctiveness explanation for illusory correlation effect

Caitie Brandon	Sarah Davis	Bex McGee
Faculty Mentor(s):	Jeffery Aspelmeier	
Psychology Poster Session I	3:00-4:15pm	CHBS Lobby

Approximately one hundred undergraduate Radford University students participated in the study. This study replicates the paired distinctiveness illusory correlation effect, where the frequency of relatively infrequent negative social characteristics paired with numerical minority status is overestimated. Participants will estimate the absolute and relative frequency of the number of times they saw majority targets paired with positive traits, majority targets paired with negative traits, minority targets paired with positive traits, and minority targets paired with negative traits. The present study tests two competing hypotheses. If the previously observed paired-distinctiveness illusory-correlation effect is truly the result of negative traits being more distinctive than positive traits then there should be no observed main effect for balance vs. imbalance conditions and no interaction between the IV (group x characteristic condition) and the moderator (balance x imbalanced condition). Alternatively, if the illusory correlation effect is simply a result of the relative infrequency of the negative characteristics then the following pattern of results is expected. The overall frequency estimates made by participants in imbalanced conditions should be higher than the estimates made by participants shown balanced stimuli. The interaction between the IV (group x characteristic condition) and moderator (balanced by imbalanced) should also be significant. For the competing hypotheses the main effect for group x characteristic condition should be significant. Participants should also significantly over-estimate the frequency estimates for the minority/negative pairing, compared to the other three pairings (majority/positive, majority/negative, and minority/positive).

Predictors of Rape Myth Acceptance: Gender, Empathy, Narcissism, and Misconceptions about Sexual Assault.

Erin Fircetz	Christina Hargis	Amy Robertson
Faculty Mentor(s):	Jeff Aspelmeier	
Psychology Poster Session I	3:00-4:15pm	CHBS Lobby

The current study investigated the relationship between the misconceptions of rape, gender, empathy, and narcissism and acceptance of rape myths. Approximately 100 participants were recruited from the psychology department participant pool to participate in an online study. Participants completed the Illinois Rape Myth Acceptance Scale, The Toronto Empathy Scale, Narcissistic Personality Inventory, and an author constructed measure of misconceptions about rape. The order in which scales were completed was randomized to control for order effects. It was expected that the predictors as a group would significantly predict rape myth acceptance. It was expected that people who hold misconceptions about rape would be more likely to endorse rape myths. It was expected that males would score higher on rape myth acceptance than women. It was expected that participants who scored higher on the empathy scale would score lower on rape myth acceptance. It was also expected that participants who scored higher on the narcissistic scale would score higher on rape myth acceptance.

Psychology Poster Session I

Do Neuroticism and Openness Moderate Pluralistic Ignorance for Racial Equality Norms?

Michael Marmol	Jordan Shupe	Krysti Streeter
Faculty Mentor(s):	Jeff Aspelmeier	
Psychology Poster Session I	3:00-4:15pm	CHBS Lobby

The study investigates pluralistic ignorance in attitudes toward racism, which is demonstrated by a discrepancy between individuals' own attitudes and perceptions of others' attitudes. The study assessed whether neuroticism and openness moderates pluralistic ignorance in attitudes for racial prejudice. Approximately 100 participants recruited from Radford University's undergraduate research pool completed the International Personality Item Pool (Goldberg et al., 2006), the Modern Racism Scale (McConahay, Hardee, & Batts, 1981), and a modified version of the modern racism scale where participants rated what they think the attitudes of the average student at Radford University are. For Neuroticism, a significant interaction between target (self vs. other attitudes) and neuroticism was expected. Participants high in neuroticism self and other ratings of racism were not expected to differ, both would be high. Among people low in neuroticism, self ratings of racism were expected to significantly lower than peer ratings. For openness, the interaction between target ratings and openness was expected to be significant. People low in openness were expected to have significantly lower self-ratings of racism compared to their estimates for others. Participants high in openness were expected to have low self-ratings of racism and low estimates for others.

Do Attitudes about Drinking Moderate Pluralistic Ignorance about Hookup Norms

Noah Glover	Harsharan Malinao	Sequoia Morris
Faculty Mentor(s):	Jeff Aspelmeier	
Psychology Poster Session I	3:00-4:15pm	CHBS Lobby

The present study investigates pluralistic ignorance (PI) about hookups, which reflects the discrepancy between one's own attitudes and the attitudes the people believe their peers hold with respect to comfort with hooking up. Specifically, this study tests whether PI about hookups is moderated by PI for drinking norms. Approximately 100 undergraduate students recruited from the Psychology Department subject pool will complete measures of their attitudes toward drinking and hookup, and estimates of their peers' level of comfort with binge drinking and hookups. The main effect for target ratings (self vs. peer) was expected to be significant. Reported levels of one's own comfort with hookups is expected to be significantly lower than estimates of peers' level of comfort. Also, the main effect for the pluralistic ignorance in comfort with binge drinking (high vs. low PI) will be significant. It's expected that individuals high in pluralistic ignorance with regard to binge drinking will report higher comfort level with hookups compared to participants with low pluralistic ignorance for binge drinking. There should be a significant interaction between target ratings and the level of pluralistic ignorance for binge drinking. Among participant high in alcohol PI, it is expected that Participants' self-reported comfort with hookups will be significantly lower than the estimates they make for their peers. Among participants low in alcohol PI, it is expected that rating of comfort with hookups made for one's self and one's peers will not significantly differ and they will both be relatively low.

Psychology Poster Session I

Predictors of Rape Myth Acceptance: Gender, Empathy, Narcissism, and Misconceptions about Rape.

Erin Fircetz	Christina Hargis	Amy Roberson
Faculty Mentor(s):	Jeff Aspelmeier	
Psychology Poster Session I	3:00-4:15pm	CHBS Lobby

The current study investigated the relationship between the misconceptions of rape, gender, empathy, and narcissism and acceptance of rape myths. Approximately 100 participants were recruited from the psychology department participant pool to participate in an online study. Participants completed The Illinois Rape Myth Acceptance Scale (McMahon, 2010), The Toronto Empathy Scale (Totan, Dogan, & Sapmaz, 2012), Narcissistic Personality Inventory (Andreassen, Pallesen, & Griffiths, 2017), and an author constructed measure of misconceptions about rape. The order in which scales were completed was randomized to control for order effects. It was expected that the predictors as a group would significantly predict rape myth acceptance. It was expected that people who hold misconceptions about rape would be more likely to endorse rape myths. It was expected that males would score higher on rape myth acceptance than women. It was expected that participants who scored higher on the empathy scale would score lower on rape myth acceptance. It was also expected that participants who scored higher on the narcissistic scale would score higher on rape myth acceptance.

Pet Ownership on College Student Stress

Miranda Holland	Rebecca Cain	
Faculty Mentor(s):	Pamela Jackson	
Psychology Poster Session I	3:00-4:15pm	CHBS Lobby

It has been said that having pets can bring people happiness (e.g., Wilson, 1991), but can they bring us less stress? What about in college students where time and money is often limited? College students undergo an immense amount of stress and it is at this point in their lives when many of them yearn to own a pet, maybe as a substitute for far-away family and friends. However, will owning a pet result in more stress or less? This study hypothesizes that college students who own pets will experience less stress overall than those students who do not own a pet. Data will be collected through a survey administered via the Psychology Department SONA system to students here at Radford University. The survey will contain demographic questions, the Positive and Negative Affect Schedule, the Perceived Stress Scale, and questions related to pet ownership (Watson, Clark, & Tellegen, 1988; Cohen, Kamarck, & Mermelstein, 1983). The expected results are that those who own pets will have significantly more positive affect and experience less stress over than those students that do not own pets. However, this may differ between men and women, especially given that female college students frequently express higher levels of stress in general than males.

Psychology Poster Session II

Examining Differences in Work Values between Generational Cohorts to Predict Commitment

Persephone Rogers

Faculty Mentor(s): Nicole Peterson
Psychology Poster Session II 3:00-4:15pm CHBS Lobby

Throughout the years, workplaces within the United States have become blended entities of various cultures, norms, and values, and is constantly evolving. The purpose of the present study is to examine differences in work values amongst generational cohorts in order to predict commitment. It is hypothesized that participants known as Baby Boomers will have higher work values than both Generation Xers and Millennials. Lastly, it is hypothesized that Millennials will have higher levels of narcissism compared to Baby Boomers and Generations Xers. Two hundred participants between the ages of 18 to 65 will be recruited via social media to participate in this study. Work values is being measured using the Work Centrality Scale (Paullay, Alliger, & Stone & Romero, 1994). Narcissism is being measured using the NEO Personality Inventory Revised Scale (Goldberg, 1999). Generational cohort is being measured via self-report and scaled using Lamm & Meeks' study on moderating effects of generational differences (2009). Generational cohort, work values, and narcissism will be obtained using a qualtrics survey taken by each participant. The proposed research method will be tested using regression analyses.

Emotional Labor: A preliminary study of its effect in a moderated-mediated model

Sean Knight

Faculty Mentor(s): Ben Biermeier
Psychology Poster Session II 4:45-6:00pm CHBS Lobby

Although studies have established the relationship between employees' justice perceptions and counterproductive work behaviors is mediated by leader-member exchange (LMX), few have examined potential moderating effects on this relationship. The purpose of this study was to investigate if there is a moderating effect of emotional labor on the mediated relationship LMX has between CWBs and justice perceptions. Counterproductive work behaviors (CWBs) are defined as volitional acts that harm organizations and their employees (Spector & Fox, 2002). Justice perceptions is broken down into three types: Distributive justice relates to equity theory, concentrating on the relative comparisons individuals make between the number of "inputs" and "outputs" as a means of determining their perception of justice (Colquitt et al., 2001). Procedural justice is the extent to which processes are carried out in a fair and unbiased manner, while interactional justice can be defined as how employees perceive the interpersonal interactions that occur during and after the decision making process (Colquitt et al., 2001; Flaherty & Moss, 2007). LMX relates to the quality of the relations between leaders and group members or superiors and subordinates. This relationship has implications on how employees perceive organizational justice which has been found to be negatively related to CWBs. It is hypothesized the moderator; emotional labor will affect the mediated relationship. We define Emotional labor as the process of regulating both feelings and expressions for the organizational goals (Morris & Feldman 1996). To test this, surveys assessing these four constructs will be distributed to approximately 250 participants.

Psychology Poster Session II

Investigating the Role of Orexin in Cannabinoid Reward and Feeding Behaviors in Female Rats

Emily Hilton	Kendra Stansak	
Faculty Mentor(s):	Dayna Hayes	
Psychology Poster Session II	4:45-6:00pm	CHBS Lobby

Marijuana use in adolescent populations is on the rise with recent estimates indicating that 44.5 percent of 12th graders report having smoked marijuana at least once in their lifetime. Orexin (Hypocretin) is a neuropeptide known traditionally to play a role in arousal, wakefulness, and especially appetite. More recently though, evidence has accumulated suggesting that orexin may play a significant role in modulating the reinforcing effects of drugs of abuse, especially cannabinoids. Specifically, when an orexin receptor blocker (SB334867) is administered, self-administration of a cannabinoid receptor agonist significantly decreases in rodents. However, cannabinoid exposure counter-intuitively decreases in food intake in rats and introduces an important confound to the orexin reward literature. Thus, it is important to more clearly elucidate the role of orexin signaling in the behavioral responses to drug exposure and food intake. To that end, adolescent female rats were divided into 3 treatment groups: synthetic cannabinoid agonist exposure (CP-55,940; 0.35 mg/kg; i.p.), food-yoked control, or saline control. Following a battery of behavioral tasks, rats were transcardially perfused and brains were collected for sectioning through the limbic cortices. Tissue sections are currently being stained for orexin immunoreactivity in the nucleus accumbens and hypothalamus, regions known to be involved in drug reward and food intake, respectively. It is expected that orexin levels will be altered in the CP 55,940-exposed group and/or the food-yoked group as compared to the saline group. These results could inform better treatment options for marijuana-related use and abuse.

The Perception of Tattooed Individuals: A Comparison Between Men and Women

Angie Austin	Kortni Beeson	Jennifer Madonia	Breanna Boyd
Katiana Ford	Katherine Chinchilla	Charles Woods	
Faculty Mentor(s):	Jeff Willner		
Psychology Poster Session II	4:45-6:00pm	CHBS Lobby	

Tattoos are increasing in popularity. Adults in the United States having at least one tattoo increased from 14% to 21% between 2008 and 2012 (LeBlanc, Hollinger, & Klontz, 2012). Although there is an increase in tattoos, previous studies have found that negative stigmas of tattoos have remained. These studies have shown that observers gave lower, less positive, or more harmful attribute ratings to people with tattoos (Galbarczyk & Ziolkiewicz, 2017; Degelman & Price, 2002; Resenhoef, Villa, & Wiseman, 2008; Wohlrab, Kappeler, & Brewer, 2009). Previous studies have not looked at how tattoos affect perception with both men and women nor asked participants to self-report their experiences with tattoos. This research will fill this gap by having participants report self-experience with tattoos and rate male and female photographs, with and without tattoos, on attributes of attractive, aggressive, dominant, masculine/feminine, potential partner, potential parent, health, artistic, religious, and intelligence. The current study proposes that men and women with tattoos will be rated higher in aggressive, dominant, and masculine attributes but will be rated lower in intelligence, health, potential partners, and potential parents. Additionally, the current authors believe that men with tattoos will be rated higher in attractiveness. This project will contribute to existing knowledge regarding tattoo perceptions but will expand on previous literature to include findings on whether there will be attribute perception differences between men and women.

Psychology Poster Session II

The Behavioral Effects of Social Housing Conditions on Male Long-Evans Rats

Makenzi Gallagher	Camille Hamway	Kendyl Smith	Rebecca Cain
Faculty Mentor(s):	Dayna Hayes		
Psychology Poster Session II	4:45-6:00pm	CHBS Lobby	

Rats are social entities. Emerging regulations suggest that they should not be housed individually during experimental manipulations due to elevated stress levels experiences when alone. However, despite the social nature of these animals, several research protocols traditionally require singular housing in order to collect individualized data or samples. Thus, new caging scenarios are being developed that aim to alleviate this problem by allowing adequate social interaction without compromising experimental methodology. One such cage utilizes a barrier through which rats can partially interact with one another (sniff, touch, groom, etc.) while still remaining separated. This study, then, will use a version of this new housing condition (separated) in comparison with 3 other commonly used housing practices (social, solitary with bedding, and solitary with wire floor) to analyze behavioral effects in adult male Long-Evans rats. Specifically, after remaining in the housing conditions for 4 weeks, animals will be tested in an open field apparatus to investigate locomotor activity and anxiety effects following differential social interaction experiences. It is expected that the rats housed in solitary conditions would be less active and exhibit more anxiety than the socially housed animals. Moreover, it is anticipated that the animals in the separated condition will perform similarly on the behavioral task to the animals housed according to previous best practices, socially. The results of this study will inform future decisions in animal husbandry for a multitude of research paradigms.

The Effects of Chlordiazepoxide in Different Light Conditions on Rats

Alexa Kowski	Kim Bradley	Gabrielle Smith	Kathryn Johnson
Michael Hastings			
Faculty Mentor(s):	Pamela Jackson		
Psychology Poster Session II	4:45-6:00pm	CHBS Lobby	

A common occurrence in anxiety tests for rats is the one-trial-tolerance effect. In other words, anti-anxiety drugs appear to work in the first trial but during the second trial the anxiety seems to return. In our study, we attempted to counteract this by having a variance in external stimuli, the lighting in the room. In this experiment, the effects of chlordiazepoxide were evaluated on Long-Evans rats in an elevated-plus-maze under white light and red light conditions. The subjects of the experiment were all male rats who were 70-days old at the beginning of handling. Every rat was semi-randomly assigned to a lighting condition and a drug, either chlordiazepoxide or a placebo. While on the elevated-plus-maze we measured the activity level by the number of arm entries during each of two trials, one in red light and one in white light. Anxiety levels were also measured by the percentage of time spent on the open arms compared to enclosed arms, as well as the number of entries into the opens arms, and number of feces. The rats that received chlordiazepoxide experienced less anxiety, and rats in red light conditions showed increased activity compared to rats that received the placebo or the white light condition.

Psychology Poster Session II

Theories of Intelligence: Rationalist and Empiricist Bases

Anna Vandevender

Faculty Mentor(s):	Ann Elliott	Thomas Pierce
Psychology Poster Session II	4:45-6:00pm	CHBS Lobby

There are many theories of intelligence that have been acknowledged within the field of psychology. Differentiating between the philosophical foundations that inform each of these theories often leads to a dichotomy between rationalist and empiricist assumptions about the nature of the human mind, the ways that humans arrive at knowledge, and whether or not intelligence is a modifiable characteristic of humans. These fundamental differences in conceptualization of intelligence have led to diversity in the methodologies that are used to measure intelligence as well as interventions that are used to assist those considered to have limited intellectual abilities. Additionally, these fundamental differences have fostered social movements impacting the lives of many people throughout the past several centuries. They likely have a continued impact on the ways that current societies view knowledge and learning, impacting the views that students have of their own intellectual abilities and achievements. This presentation will review distinctions between these two approaches to measuring intelligence and their implications for the use of intelligence tests.

Effect of Everyday Activities on Affect in Adults with Moderate to Severe Dementia

Katarina Alatis Indoce Cox Tristen Huff Victoria Dunsmore
Michaela Reardon Taylor Conyers

Faculty Mentor(s):	Jenessa Steele	
Psychology Poster Session II	4:45-6:00pm	CHBS Lobby

Alzheimer's disease is the most common form of dementia, with new cases expected to increase by 35 percent by the year 2030 (Alzheimer's Association, 2015). The cognitive symptoms of this disease result in a loss of functional independence and an increasing need for care (Advokat, Comaty, & Julien, 2014); this typically results in the placement in long term care facilities such as nursing homes and rehabilitation centers. Many of the activities provided for individuals in these care facilities are not suited for persons with dementia because they are not activities suited for an individual's optimal level of functioning; this can result in agitation, apathy, anxiety, and irritability. Ideal activities are those that rely on implicit memories while actively engaging participants with their environment (Judge, Camp, & Orsulic-Jeras, 2000). Previous studies have demonstrated a positive impact on affect with the use of everyday activities (Giroux, Robichaud, & Paradis, 2010). The present, within-subjects study is currently assessing affect of an individual with moderate dementia throughout the delivery of a painting activity. Affect is assessed using a subset of the PANAS which relies on observation by the researcher during the delivery of the activity. This study has implications for working with adults with Alzheimer's in both long term care facilities and at home. The results from this study will be a step toward tailoring activities to individuals' needs.

Psychology Poster Session II

Job Demand and Employee Innovation: Perceptions of Organizational Politics as a Moderator

Kaylah Galloway

Faculty Mentor(s):	Nicole Petersen	Benjamin Biermeier-Hanson
Psychology Poster Session II	4:45-6:00pm	CHBS Lobby

Previous research has suggested that increased job demands promote higher levels of innovation in employees (Bruce & West, 1996). This is because innovative work behavior (IWB) is often used as a coping strategy for intensified work environments. Building on that research, this study incorporates perceptions of organizational politics (POP) as moderator in the job demands-IWB relationship. Using anonymous survey data from a convenient sample, it is predicted that greater perceptions of organizational politics will positively affect the influence of job demands on IWB while lower perceptions of organizational politics would have no significant effect on the job demands-IWB relationship. The potential implications for this research are also discussed.

Keywords: Innovative work behavior, perceptions of organizational politics, job demands

Effects of Housing on Anxiety and Activity in Rats

Miranda Holland Rebecca Stamm Michael Hastings

Faculty Mentor(s):	Pamela Jackson	
Psychology Poster Session II	4:45-6:00pm	CHBS Lobby

Living conditions and their impacts on physical and emotional development are undeniable. In order to simulate the various social and economic environments in which typical research animals live, two cohorts of eight rats each (sixteen total rats) were placed in four different living conditions. Groups one and two were housed socially. Group SOC included two rats living together with no separation. Group SEP rats were housed together but separated by a barrier that allowed only limited contact. Groups three and four were housed in isolation. The SOL group was housed alone in a cage with a divider but without a rat on the other side. The fourth group was also housed in solitary but in a hanging stainless-steel cage without bedding (SSS). The rats were housed in these conditions for four weeks before they were exposed to the elevated-plus-maze. This task measured anxiety and activity levels. The expected results are that the impoverished rats, SOL and SSS, will experience higher anxiety and stress levels than the socially housed rats.

Psychology Poster Session II

Do Party Attitudes Moderate the Effect of Pluralistic on Ignorance and Infidelity Norms?

Katie Reeve	Jessica Cassidy	Paige McPeak
Faculty Mentor(s):	Jeff Aspelmeier	
Psychology Poster Session II	4:45-6:00pm	CHBS Lobby

The purpose of this study was to investigate the relationship between pluralistic ignorance towards attitudes about cheating on a significant other and whether this effect was moderated by attitudes about partying. Participants, about 100, were recruited through Radford University's SONA (student research participation) program and completed a 10-15-minute survey. Participants answered questions regarding their attitudes about partying, attitudes about cheating for self and peers, and demographic questions. A 2x2 factorial design was used. A main effect for the target (self vs. peer) ratings was expected. It was expected that peer ratings of comfort with cheating would be significantly higher than self-ratings. It was also expected that there would be a significant main effect for partying. These participants who have positive attitudes toward partying were expected to have significantly higher comfort levels than those with negative attitudes. It was also expected that there would be a significant interaction between target ratings and partying attitudes. Participants with positive views about partying, were expected to have significantly lower self-ratings for comfort with cheating than peer-ratings. Among participants who express negative views about partying, self and other comfort ratings for cheating were not expected differ, both would be low.

RU Ready to Party: Does Motivation for Attending College Moderate Pluralistic Ignorance about Drinking Norms?

Victoria Dandar	Imani Moore	Savannah Reynolds
Faculty Mentor(s):	Jeffrey Asplemeier	
Psychology Poster Session II	4:45-6:00pm	CHBS Lobby

The study investigated discrepancy between self-reported attitudes and perceived attitudes of others regarding comfort with alcohol and whether pluralistic ignorance about drinking norms was moderated by motivation for attending Radford University. Approximately 100 undergraduate students recruited from the Psychology Department participant pool completed measures of their own comfort with risky drinking behaviors, perceived attitudes of others' comfort, and motivation for attending Radford University (Social vs. Academic Motivation). The main effect for target (self vs. other) was expected to be significant. Participants' self-reports of own comfort with alcohol were expected to be significantly lower than ratings of peers' comfort. The second main effect (motivation for attending) was expected to be significant; participants who attend for academic aspects were expected to report significantly lower comfort with alcohol for themselves and peers than participants who attend for social aspects. The interaction between target ratings (self vs. other) and motivation for attending (academic aspects vs. social aspects) was expected to be significant. The pattern for the interaction was expected to show participants who were motivated to attend for academic aspects were expected to demonstrate lower levels of pluralistic ignorance (low ratings for self and others) regarding attitudes toward alcohol consumption compared to participants who were motivated to attend for social aspects.

Psychology Poster Session II

The Effects of Job Insecurity on Emotional Exhaustion as Moderated by Locus of Control and Resulting in Counterproductive Work Behaviors

Cara Ganoe	Katharine Korthase	
Faculty Mentor(s):	Nicole Petersen	
Psychology Poster Session II	4:45-6:00pm	CHBS Lobby

The purpose of this study is to establish boundary conditions of self-regulation theory as related to counterproductive work behaviors. Self-regulation theory states that deliberate, thoughtful actions deplete finite resources within the individual, resulting in an inability to regulate future behavior. Specifically, we propose that job insecurity will result in emotional exhaustion, leading to increased frequency of counterproductive work behaviors. Additionally, we expect that the relationship between job insecurity and emotional exhaustion will be moderated by locus of control. Data will be collected through a convenience sample survey.

Transcribing Local History: Our Look into the Lost Archives of Botetourt County

Nicholas Stepheson	John Kelly	Alan Mendoza	Taylor Quesenberry
Alexander Davis	Jack Blalock	Megan Maddy	
Faculty Mentor(s):	Sharon Roger Hepburn		
Psychology Poster Session II	4:45-6:00pm	CHBS Lobby	

Based on a digitization project in collaboration with the Botetourt County Courthouse, students in HIST 392, Working with Digital Archives, have transcribed a portion of a collection of rare and valuable documents owned by the Courthouse and digitized by the Department of History. Many of these documents are from the 18th Century and some are originals signed by well known Founding Fathers including Patrick Henry, Thomas Jefferson, James Madison, and James Monroe. Students will be presenting a poster session highlighting some of these documents and their work thus far on the collection.

Serving Adolescents With Autism Spectrum Disorder

Kaitlyn Jones	Regan Flores	
Faculty Mentor(s):	Diane Millar	
Psychology Poster Session II	4:45-6:00pm	CHBS Lobby

The majority of intervention research with children with autism spectrum disorder has focused on young children (i.e., toddlers, preschoolers, and kindergartners). There is a grave shortage of research addressing best practices for therapy targeting communication skills with adolescents. Research has shown that adolescents face more complex social interactions compared to younger children, and there is a wider gap between adolescents with autism spectrum disorder and their peers at this stage of development. It is critical that speech-language pathologists, educators, and other team members understand how to best assist adolescents with autism spectrum disorder with social communication skills necessary for interactions with peers and academic success. This presentation is a discussion of the current research supporting best-practices for teaching social skills with adolescents with autism spectrum disorder. It will also describe the development of a pilot afterschool therapy program implemented with four children in the community with autism spectrum disorder.

Health and Human Performance Poster Session

The Acute Effects of (PNF) Proprioceptive Neuromuscular Facilitation Stretching on Muscular Power.

Amanda Joyce	Sarah Smith	Kelly Baker
Faculty Mentor(s):	David Sallee	
6:30-7:45pm	CHBS Lobby	

The purpose of the study is to measure the impact of (PNF) proprioceptive neuromuscular facilitation stretching on measures of muscular power. While there is variability within the results, in general PNF stretching has shown to negatively impact muscular power in some studies while have no negative effect in others. Participants will perform a brief warm up consisting of walking for 5 minutes. Once the warmup is complete, the participant will perform three vertical jump tests with a Tendo analysis belt attached. The TENDO device will be used to measure movement velocity. The average of the three vertical jump tests and velocity measures will be recorded as the pretest measure. At this point subjects will be selected at random to participate in the PNF stretching group or the control group. Those selected for the PNF stretching group will participate in the following protocol. The PNF stretching will be applied according to the “hold-relax” technique. The following exercises will be performed with the subjects laid in a supine position: hip flexion with knee extension and hip flexion with knee flexion. The stretching protocol will be focused on the hamstring muscles and will be repeated 3 times by alternating the stretched limb. The overall duration of the stretching exercises will be approximately 2.5 minutes. The control group will lie supine for the 2.5-minute stretching period to mimic the postures of those performing the PNF protocol. The vertical jump testing protocol will be repeated as a posttest measure. Results are expected to replicate previous studies by either reducing power output or having no effect.

The Impact of Foam Rolling Self Massage on Measures of Hip, Knee, and Ankle Mobility.

Briana Smith	Dianna Showers
Faculty Mentor(s):	David Sallee
6:30-7:45pm	CHBS Lobby

The purpose of this study is to measure the impact of foam rolling self-massage on measures of mobility. Previous studies have shown that 90 seconds of foam rolling increases the range of motion of the muscles treated. While there has been consistency in the results reported from these studies, relatively few studies have been completed. Additional research is necessary to determine if results are stable across the muscles that are treated. This study will provide additional evidence to determine the impact of foam rolling on measures of mobility. This data may help athletes improve their performance and potentially reduce rates of athletic injury.

Health and Human Performance Poster Session

The Analysis of Kinematic Variables in the Snatch: Are Bar Trajectories Predictive of Successful

Donald Tredway Mathew Koldewey Cody Kelly Aaron Kildea
Faculty Mentor(s): David Sallee
6:30-7:45pm CHBS Lobby

The study is designed to investigate kinematic variables in the snatch. The snatch is a movement performed in Olympic weightlifting competition. Specifically, the research is investigating the relationship between the position of the weightlifting bar in relation to the lifters cervical vertebrae (C7) and hip (greater trochanter). The starting position of these anatomical points in relation to the position of the weightlifting bar will be compared with the successful nature of the lift as defined by the lift being judged as successful in weightlifting competition. Research suggest that a smaller starting angle between the aforementioned anatomical points and the weight bar are associated with greater likelihood of successful performance. The study will be performed by filming competitors in an Olympic Weightlifting competition. Cameras will be places at 45 degree angles to the lifter at approximately 9 feet from the lifting platform. Videotape of performance in the weightlifting event called the snatch will be analyzed. The position of the weightlifting bar will be tracked in relationship to the athletes' cervical spine (C7) and their hip joint (greater trochanter). The investigators will measure the kinematic variable from the recorded video tape using Sports Motion Software. Results are expected to confirm that smaller starting angles will be indicative of greater success in the snatch.

The Acute Effects of Foam Rolling and Static Stretching on Muscular Power.

Donald Tredway Mathew Koldewey Cody Kelly Aaron Kildea
Faculty Mentor(s): David Sallee
6:30-7:45pm CHBS Lobby

The purpose of the study is to measure the impact of static stretching compared to foam rolling on measures of muscular power. While there is variability within the results, static stretching has shown to negatively impact muscular power and foam rolling has shown no impact or improvement in muscular power. Participants will perform a brief warm up consisting of walking for 5 minutes. Once the warmup is complete, the participant will perform three vertical jump tests with a Tendo analysis belt attached. The Tendo device will be used to measure movement velocity. The average of the three vertical jump tests and velocity measures will be recorded as the pretest measure. At this point participants will be assigned randomly into three groups. One group will perform a series of 6 static stretches for the hips and thighs. A second group will perform a series of foam rolling exercises for the same muscle groups. The total time in these exercises will be 8 minutes. A third group will serve as the control and sit idle for 8 minutes. The vertical jump testing protocol will be repeated as a posttest measure. Results are expected to replicate previous studies by reducing power in the static protocol and improving or having no effect on the foam rolling group

Health and Human Performance Poster Session

The Impact of Dynamic Stretching on Bar Speed

Kyle Palmer	Colin Hill	Jordan Lundin
Faculty Mentor(s):	David Sallee	
6:30-7:45pm	CHBS Lobby	

The purpose of this study is to measure the impact of dynamic stretching on muscular power output. Previous research indicates that dynamic stretching has no impact or a positive impact on measures of muscular power. Studies have typically used vertical jump as a testing modality. The research team will determine if dynamic stretching in the lower extremity has an impact on muscular power as measured via bar speed in the second pull of the power clean. Power will be analyzed using a Tendo Power Analyzer before and after the implementation of a lower body dynamic stretching session. Measures will be taken over multiple days to reduce the effect of fatigue on the participant. No current studies that the investigators could locate have used this testing modality (bar speed) to determine the impact of dynamic stretching on muscular power.

The Impact of Stride Length on Acceleration in a 10 Yard Sprint.

Nickolas Capozzoli	Andrew Breeding
Faculty Mentor(s):	David Sallee
6:30-7:45pm	CHBS Lobby

The purpose of this student is to determine the impact of stride length on acceleration. Researchers note two major elements that contribute to running speed. One is stride length and the other is stride frequency. While stride length appears to play a major role, coaches typically instruct athletes to take short strides during acceleration. The point is to keep the center of gravity forward of the base of support to contribute to acceleration. This brings into question if this is an appropriate strategy for coaching athletes in acceleration. This study will examine stride length as a contributing factor to speed development. Do faster athletes take shorter strides during acceleration? Participants will be videotaped during acceleration to determine stride length. They will also be timed in a 10-yard sprint. Data will be compared to determine correlation between stride length and sprint speed during acceleration.

Health and Human Performance Poster Session

The Acute Effects of Static Stretching Duration on Measures of Muscular Power.

Timothy Kugel	Aaron Kildea
Faculty Mentor(s):	David Sallee
6:30-7:45pm	CHBS Lobby

The purpose of the study is to measure the impact of static stretching duration on measures of muscular power. Previous studies have shown that the duration of static stretching is an important factor to consider when designing pre-event activities. Muscular power tends to decrease to a greater extent based on the duration of static stretching. Participants will perform a brief warm up consisting of walking for 5 minutes. Once the warmup is complete, the participant will perform three vertical jump tests with a Tendo analysis belt attached. The Tendo device will be used to measure movement velocity. The average of the three vertical jump tests and velocity measures will be recorded as the pretest measure. At this point subjects will be selected at random to participate in the static stretching groups or the control group. Those selected for the static stretching group will complete the following protocol. The static stretching will be applied using variations in time in which the stretch is applied. Participants hamstrings will be stretched to a point of mild discomfort. The stretch will be applied for 15, 30 or 45 seconds. The stretching protocol will be focused on the hamstring muscles and will be repeated 3 times by alternating the stretched limb. The overall duration of the stretching exercises will be approximately 2.5-9 minutes. The control group will lie supine for the 2.5-9 minutes stretching period to mimic the postures of those performing the testing protocol. Control subjects will be matched in number to the total participants in each static stretching duration group. The vertical jump testing protocol will be repeated as a posttest measure. Results are expected to replicate previous studies by reducing power output based on the duration of the stretching protocol.

The Impact of Static Stretching on Bar Speed

Ethan Hatch	Ricky Murray
Faculty Mentor(s):	David Sallee
6:30-7:45pm	CHBS Lobby

The purpose of this study is to measure the impact of static stretching on muscular power output. Previous research indicates that static stretching has a negative impact on measures of muscular power. Studies have typically used vertical jump as a testing modality. The research team will determine if static stretching in the lower extremity has an impact on muscular power as measured via bar speed in the second pull of the power clean. Power will be analyzed using a Tendo Power Analyzer before and after the implementation of a lower body static stretching session. Measures will be taken over multiple days to reduce the effect of fatigue on the participant. No current studies that the investigators could locate have used this testing modality (bar speed) to determine the impact of static stretching on muscular power.

Health and Human Performance Poster Session

The Relationship Between ACL Injury Risk and Plyometric Training

Hannah Duff

Faculty Mentor(s):

J.P. Barfield

6:30-7:45pm

CHBS Lobby

A growing amount of evidence indicates that lower extremity plyometric training may prevent first time, non-contact ACL injuries (Alentorn-Geli et al., 2009). Purpose. Because the risk of non-contact ACL injuries are higher in females than males, the purpose of this investigation is to study the effect of plyometric training on ACL injury risk in females. Methods. Thirty female middle- and high-school soccer players were recruited from an off-season training program. Player assent and guardian consent were required for participation following IRB approval. Baseline ACL injury risk was assessed through the Landing Error Scoring Scale, evaluated through motion capture software on an iPad, during a drop-landing test. Specifically, vector lines were drawn directly onto the software by the researcher for each drop landing and joint/limb angles during the landing were measured to assess ACL risk. Three drop landing scores were collected at baseline with the best score being used for analysis. Participants completed a six-week plyometric training program between the pre-test and the post-test. Training was administered twice per week, 35 minutes each session, and included a dynamic warm-up and plyometric exercises. Exercises included jumps in place, standing jumps, multiple hops and jumps, box drills, and depth jumps. Training volume will consist of 80-100, 100-120, and 120-140 jumps per session during weeks 1-2, 3-4, and 5-6, respectively. A repeated measures t-test was used to determine if Landing Error Score changes significantly from pre- to post-test. Results: Error score decreased from 6.06 to 4.82 from pre-test to post-test, and this decrease was significant ($p < .01$). Overall, 65% (11/17) of participants improved their score from pre-test to post-test and 40% (4/10) improved their score from at risk to not at risk. Discussion. Plyometric training helped to reduce ACL injury risk in a field of high school soccer players.

Depression and Aging

Carolyn Ansel

Lexi Phonasa

Marilyn Whitaker

Faculty Mentor(s):

Kathleen Poole

6:30-7:45pm

CHBS Lobby

Aging and depression can occur when people get older and feelings of sadness, loss, anger, or frustration interfere with daily life for weeks or longer (Medline Plus, 2016). According to Mental Health America (2016), two million out of 34 million Americans ages 65 and older suffer from a form of depression as a result from getting older. There are various symptoms of depression in relation to aging, which include: persistent sadness, anxious, empty mood, as well as feelings of hopelessness, guilt, worthlessness and pessimism (Help Guide, 2017). The mental health of older adults can be treated through promoting active and healthy aging. Mental health-specific health promotion for older adults involves creating living conditions and environments that support wellbeing and allow people to lead healthy and integrated lifestyles. Promoting mental health depends largely on strategies which ensure the elderly have the necessary resources to meet their basic needs such as: security and freedom, social support, and community development programs (Help Guide, 2017). Aging and depression can be prevented by avoiding isolation, getting adequate sleep, and engaging in regular physical activity (Help Guide, 2017). Risk factors for aging and depression include being female and having chronic health conditions associated with poor nutrition (NIMH, 2016).

Health and Human Performance Poster Session

Let's Talk About Suicide Prevention

Chelsie Townsend	Deja Calloway	Morgan Fielding
Faculty Mentor(s):	Kathleen Poole	
6:30-7:45pm	CHBS Lobby	

This project is on depression and suicide prevention. Ultimately, this presentation is used to educate people on suicide prevention and hopefully save a life. Suicide is the 10th leading cause of death in the U.S. On average there are approximately 121 suicide attempts in one day. The highest suicide rates are in the elderly that are 85+ and also people in the age range of 45 - 64. Approximately half of all suicides are carried out by firearms. Although college students are not the highest risk population, educating everyone could help possibly save a life. Although, there is no way to pinpoint the exact reason for committing suicide, some of the leading causes include depression and anxiety. Warning signs include severe changes in mood or behaviors and talk of feeling worthless or killing themselves. Some risk factors that may affect someone has a lot to do with their personal history, their environment, and their health status. Additional risk factors include: history of abuse disorders, chronic health conditions or pain, and mental health conditions such as schizophrenia, bipolar disorders, and many more. One strategy to prevent suicide includes taking advantage of emergency hotlines such as the National Suicide Prevention Hotline. Prescription medications and some forms of therapy can also be effective in preventing suicide.

Depression in Adolescent Females

Jessica Masta	Taylor Bertrand	Gabrielle Saulnier	Anna Pankow
Faculty Mentor(s):	Kathleen Poole		
6:30-7:45pm	CHBS Lobby		

Depression is the most common mental health disorder in the U.S. among teens and adults, affecting over 300 million people. A study done over the course of 7 years showed that out of 496 females between the ages of 12 and 20, 1 in every 6 girls experienced Major Depression Disorder. Within a one-year period, the most common age for young girls with depression was 16. It is estimated that 20% of teens experience depression before reaching adulthood and 17.3% of those teens are female. Symptoms include: excessive sleeping/fatigue, restlessness and agitation, mood changes, and weight fluctuation. The most common treatments for teens with depression are prescribed medication and the use of therapy. Depression can be linked to mood disorders, with similar risk factors such as self-esteem issues, being the victim of a trauma (usually sexual assault), and obesity. Preventative measures like eating a healthy diet, getting adequate exercise, and finding ways to reduce stress through relaxing activities can help adolescent females avoid this disorder.

Health and Human Performance Poster Session

The Effects of Depression and Anxiety

Sarah Frazier	Cristal Iden	Cory Lane	Anthony Masanque
Faculty Mentor(s):	Kathleen Poole		
6:30-7:45pm	CHBS Lobby		

The purpose of this poster is to raise awareness about depression and anxiety. One out of 20 Americans ages 12 years or older have had or currently have depression in the past two weeks in 2009-2012. Anxiety is the most common mental illness in the United States. It affects over 40 million people from ages 18 years and older and up to 18% of the population. Depression is the feeling of persistent sadness or depressed mood. Anxiety is when a person has a constant worry about daily activities or school. Comorbid depression and anxiety are very common conditions. Patients that have been diagnosed with anxiety disorders are often times clinically depressed. The symptoms for depression include changes in eating, sleep, or energy patterns, loss of social interests, and self-injury. The symptoms for anxiety include racing thoughts, poor concentration, trouble sleeping, sweating, dizziness, and trouble breathing. The treatment for both include medication, however, an individual should contact his or her healthcare provider for evaluation. Other treatments are increasing physical activity levels, regulating sleep patterns, and eating better. The key to success when treating patients with comorbid depression and anxiety is early recognition. Risk factors include: alcoholism, increased risk of HIV, obesity, lack of physical activity, insomnia, and epilepsy. Prevention techniques include stopping bullying, preventing youth violence and child mistreatment, caring for a child after a disaster, and caring for a child after birth.

Depression Among Adolescent and Young Adult Males

Megan Sullivan	Savannah Ludwig	Kayla Hill
Faculty Mentor(s):	Kathleen Poole	
6:30-7:45pm	CHBS Lobby	

Depression is defined as the feelings of severe despondency and dejection. When it comes to depression for young male adults there are a few factors that make it different from depression in other groups of people. Less men are diagnosed with depression each year than women. Men tend to express the different symptoms in a different way. They often have a loss of interest in usually pleasurable activities, they become fatigued, have changes in appetite, and have trouble sleeping. Women tend to have more feelings of sadness than men. Some risk factors for men may include certain medications, childhood trauma, family history of depression or other mental illness, and history of alcoholism and use of illegal drugs. One in seven young men aged between age 16 and 24 experience depression or anxiety each year which amounts to almost 6 million cases among men per year. When feeling any of these symptoms it is important to see a doctor immediately. Some treatment options they may offer to you may include medication or even therapy depending on the severity. In order to prevent depression among male young adults, they should avoid drug and alcohol use and get regular exercise and sleep.

Health and Human Performance Poster Session

Exercise and Depression

Aaron Kildea	Dianna Showers	Ryan Nichols
Faculty Mentor(s):	Kathleen Poole	
6:30-7:45pm	CHBS Lobby	

Depression is the most common mental health condition in America. The disease negatively affects mood by causing persistent feelings of sadness and loss of interest. Depression affects approximately 26% of the U.S. adult population, which makes it a pressing issue for Americans. It is estimated that by the year 2020, depression will be the second leading cause of disability worldwide. Although some forms of depression may not be preventable, current evidence suggests that regular exercise along with healthy lifestyle choices can be effective in preventing depression. Certain risk factors for depression include: low self-esteem, traumatic or stressful events, family history of depression, bipolar disorder, alcoholism or suicide, and physical inactivity. Someone suffering from depression might have symptoms such as: mood change, change in sleeping patterns, drastic weight fluctuation, irritability, social difficulties, and even thoughts of suicide. These symptoms can very negatively affect an individual's quality of life and well being. A proven, cost-effective alternative approach to pharmacological treatment of depression is exercise and physical activity. Exercise releases neurotransmitters and endorphins that naturally treat depression. A correlation has been shown between physical inactivity and an occurrence of depression. Therefore, it is hypothesized that those who are physically active are less likely to be depressed due to the positive aspects of exercise such as social interaction, increased body temperature, and beneficial hormone secretion. The purpose of this study is to show the positive effect exercise can have on the treatment of depression.

Riboflavin supplementation may reduce symptoms of headaches and migraines

Courtney Burton	
Faculty Mentor(s):	Laurie Bianchi
6:30-7:45pm	CHBS Lobby

The purpose of this project is to evaluate research regarding supplemental riboflavin and reduction of neurological symptoms associated with migraines and headaches. The hypothesis is supplementation with riboflavin will reduce symptoms associated with migraines and headaches. Migraines are the third most prevalent illness in the world and affect more than 12% of the U.S. population. Analysis of the literature was completed using research obtained from databases including NIH PubMed, Wiley Periodicals, and McConnell library database. Five research articles were found using keywords 'migraine', "headache", "riboflavin", and "vitamin B2". Each research article critique evaluated independent and confounding variables, controls, study design, statistical tests and outcomes. Results of this project found insufficient mitochondrial activity in the brain during migraine attacks may be controlled with high doses of oral riboflavin. Results concluded participants who suffer from migraine attacks and headaches reported lower incidence of symptoms after consuming high dosages of riboflavin. This project supports the hypothesis that riboflavin may lower migraine and headache symptoms when orally ingested in high dosages. Definitive research is needed for use of supplemental riboflavin as treatment of headaches. Future research should evaluate if a threshold level of riboflavin is necessary to provide for sufficient mitochondrial activity in the brain of individuals who have migraines.

Health and Human Performance Poster Session

Soy isoflavones may reduce risk of cardiovascular disease

Marquitta Foster

Faculty Mentor(s): Laurie Bianchi
6:30-7:45pm CHBS Lobby

The purpose of this research project is to critique research regarding soy isoflavones and risk of cardiovascular disease (CVD). The hypothesis is soy isoflavones reduces risk of CVD by improving serum lipid levels. In the U.S. each year, an estimated 600,000 deaths occur due to CVD. Soy foods have been correlated with reduced risk of CVD. The National Institute of Health PubMed database was used to retrieve original research articles regarding soy isoflavones and CVD. Key words used were “soy isoflavones” and “cardiovascular disease”. Papers chosen consist of a combination of basic science, randomized controlled trials, and meta-analysis papers. Studies critiqued indicate that soy isoflavones given either as a purified form or naturally occurring in soy protein improve serum lipid profiles of animals and human subjects. These studies added soy isoflavones to uncontrolled diets or assessed substitution of soy protein for animal protein in general. The five papers selected support the hypothesis that soy isoflavones in the diet are correlated with improved serum lipid profiles. However, many studies are not able to distinguish if the improved outcomes are a result of the soy isoflavones alone or soy protein. Future research should include randomized controlled trials in which soy isoflavones are added to meals that are consistent in percentage of macronutrients provided, but differ in source of protein and fat (ex. animal vs. plant) to eliminate confounding variables.

The Impact of Foam Rolling Self Massage on Bar Speed

Ryan Oakes Mathew MacDonald Mather Hollandsworth

Faculty Mentor(s): David Sallee
6:30-7:45pm CHBS Lobby

The purpose of this study is to measure the impact of foam rolling self-massage on muscular power output. Previous research indicates that foam rolling has no impact or a positive impact on measures of muscular power. Studies have typically used vertical jump as a testing modality. The research team will determine if foam rolling in the lower extremity has an impact on muscular power as measured via bar speed in the second pull of the power clean. Power will be analyzed using a Tendo Power Analyzer before and after the implementation of a lower body foam rolling session. Measures will be taken over multiple days to reduce the effect of fatigue on the participant. No current studies that the investigators could locate have used this testing modality (bar speed) to determine the impact of foam rolling on muscular power.

Digital Media Showcase

Your Choice

Alana Abbott	Luisa Cutting	Paul Toomey
Faculty Mentor(s):	Jane Machin	
Digital Media Showcase	4:00-4:45pm	Walker 279

"Your Choice is an app designed to reward people for staying off their phones. Our initial focus will be on cell phone use in the classroom. Our app works with proximity Beacons, placed under each student's chair. Upon sitting down, the beacon's signal opens an app on the student's phone. The app does not block any cellphone functionality. Rather, it simply monitors the phone for activity. Instead of punishing students for using their phone, this app rewards them for each minute they remain off their phone. The longer the student stays off their phone, the more minutes they earn. Teachers can incentive students to remain off their phone by linking class credit to these minutes. For example, if the student stays off their phone over 90% of class time, the teacher could increase their final letter grade. With the support of the CITL Idea Riser, we have the opportunity to prototype and test our idea. This semester our teams' goal is to not only to have a working prototype but also to outline a strategic plan for future development. In the long run we intend to place this app inside cars, offering incentives to drivers (such as reduced insurance costs) for remaining off their phone while the car is in motion.

"

The Pocket Caddy

Erin Ferguson	Ali Maghraoui	Chad Ring
Faculty Mentor(s):	Jane Machin	
Digital Media Showcase	4:00-4:45pm	Walker 279

Golf caddies are responsible for making the game of golf more enjoyable for the golfer. Tasks the caddy performs include choosing the correct club for each hole, determining yardage between the ball and the green, providing performance information, and making suggestions for game improvement. At a cost of around \$100 per round, however, using a caddy frequently quickly becomes cost prohibitive for many players. Thanks to the CITL Idea Riser, our team is working this semester to prototype and test our innovation idea, the Pocket Caddy. The Pocket Caddy is a system that uses Beacon proximity technology to perform many of the jobs of a traditional caddy. The quarter-sized beacons are located throughout the golf course. The Pocket Caddy mobile app listens for signals from these beacons. When you are in proximity of a beacon, a notification pops up on your phone, giving you information to help improve your game. This includes identifying your current distance from the hole, the wind direction, the dew quantity and recommending which club you should use. At the Student Engagement Forum, we will present results from our research on a prototyping the Pocket Caddy on a real golf course. We will also discuss what we have learned putting the innovation process into action.

Digital Media Showcase

Master of Special Education Comprehensive Portfolio

Jillian Kelly

Type of Media: ePortfolio

Digital Media Showcase 4:00-4:45 pm Walker 279

Programming in Music: Creating a Mono Synth

Justin Watts

Type of Media: Max/MSP Mono Synthesizer

Digital Media Showcase 5:00-5:45 pm Walker 279

Interior Design Portfolio

Brianna Koppelman

Type of Media: ePortfolio

Digital Media Showcase 5:00-5:45 pm Walker 279

F-Stop and Look Into Our Lens!

Radford on Camera: Trae Price, Daniel Willingham, Benicia Lovely, Annie Schroeder

Type of Media: Film

Digital Media Showcase 5:00-5:45 pm Walker 279

Children of the Flowers

Marcus Reed

Type of Media: Digital Photography Edit

Digital Media Showcase 5:00-5:45 pm Walker 279

Radford University School of Dance and Theatre Presents:

Student *Choreography* Showcase

APRIL 26 & 27, 2017 AT 7:30 P.M.
ALBIG STUDIO THEATRE | PETERS HALL B112
FREE ADMISSION



For more information, call 831-6850.

**RADFORD
UNIVERSITY**
Department of Dance

Wednesday April 26th, Student Choreography Showcase

An evening of exploratory dance, Student Choreography Showcase highlights the voices of emerging choreographers enrolled in the Department of Dance's Choreographic Studies II class. Join us as we laugh, play and holler alongside these up and coming artists.

Free admission.

For more information call (540) 831-6850 or visit www.radford.edu/dance.

Student Choreography Showcase: Alexis Miller

7:30-9:30pm

Peters B112

Shyness, hurt, loneliness, hope. This minimalistic pedestrian solo is based on a significant personal life experience and is a part of my capstone, A Metamorphic Journey. Choreographing on myself was a unique process. Although I am only able to view my choreography through mirror or video, this opportunity enables me to retell my story through both creation and performance of my own movement. My choreographic process for this piece began with a story I wanted to share. After thinking through and remembering the feelings and emotions I had experienced, I began creating movement through improvisation. I sought out movement which I felt expressed my emotions and told my story. I found that incorporating chairs as props and the choreographic techniques of levels, dynamics, and repetition aided in portraying my narrative. Through my work, I hope the audience will be able to relate it to themselves in some way and find hope.

Student Choreography Showcase: Caitlin Godsey

7:30-9:30pm Peters B112

As a choreographer, much of the inspiration for my work stems from the trials and experiences of everyday life. I personally believe that dance can be a therapeutic process; which connects me to many of my works. Much of my style and movement is pedestrian, incorporating gestures and detailed motifs. The main focus of my choreography is to express emotions to the audience and make them feel something. My piece, the End shows the struggles involved in relationships, whether that be with another person or an attachment to something else in someones life. This piece contains a duet within a group piece, highlighting the push and pull of emotion between the two characters. It is a battle of mind and heart. The ensemble acts as force behind the push and pull theme, showing the influences that appear in our lives. The movement has an off-balanced quality and partner work is included to show the support or lack thereof that many experience in a variety of relationships in their lives. I hope the audience can take something from this piece, whether that be relating to the intended theme or finding their own personal connection.

Wednesday April 26th, Student Choreography Showcase

Disassociation of Identity: Courtney McClendon

7:30-9:30pm Peters B112

Courtney McClendon is currently in the process of researching Dissociative Identity Disorder, with the plans to take what is learned and showcase it as a piece of choreography, presented as a part of the Student Choreography Showcase in April. The choreography will feature a group of dancers as different personalities of the same person, in this way showing how the collective of individuals inside a single person all interact and control each other. This allows for the audience to witness how a single person can be affected by the many versions of themselves harbored inside that have grown out of a single, original personality. Those affected by this disorder are often aware of the other personalities inside them but associate with these personalities as different people in competition for the same body. Even though these personalities, or dancers in this case, are aware of each other they do not directly interact and do not hold the same memories or personal experiences. Throughout the piece the audience will be able to travel with the dancers as they work against each other as well as together for the best outcome, and show how living with disorders does not mean the individual has any less value.

Regardless: Kelly Noah

7:30-9:30pm Peters B112

Overall my choreography can be described as quirky, detailed, and direct. Every movement is intentional, right down to where I look and where my hands are placed. My choreography usually takes a while to take form because I am so detailed, I think about every part of the body and what it's purpose is at that moment. I generally begin the process by improving to music that inspires me and naturally moves my body. From there I pick out pieces I liked, little details and emotions, and then I incorporate them into my work. My solo is inspired by the quote, I took it off, I did not want to carry it with me anymore, it's about letting go of something or someone simply because you need to. It's about doing what's best for yourself in the long run even if it is difficult at the moment. My main goal for this piece is to push myself in terms of creativity; to find new and different ways to show or express something. I want to be able to break away from what I'm used to and explore all of the endless possibilities that choreography holds.

Student Choreography Showcase: Matthew Robinson

7:30-9:30pm Peters B112

Where time goes to be spent is a dance theatre solo featuring both spoken monologue and modern dance movement. The mental struggle of personal purpose and mortality versus the continuous march of time, which many encounter somewhere along their timeline, is revealed through almost hallucinatory interactions with a doctor and visual trips into gentle and violent human emotion via dynamic changes of soft and strong movement. Move 4 Move is a lively, quintet dance piece exploring the relationship between ones past and present self. I pull vestiges of movement from childhood shenanigans, over nine years of martial arts training, and the many, many stylistic movement influences I have encountered since beginning my career in dance, to create a live, non-linear collage of my past and present. The movement is tied together with spirited and atypical music to prevent too many serious tones as this piece is not about conceptual comprehension. Its a release of breath pieces of someone elses history to enjoy through movement that maybe will make you want to get up and dance, or do whatever it is that makes you, you.

Wednesday April 26th, Student Choreography Showcase

Student Choreography Showcase: Nicole Diambra

7:30-9:30pm Peters B112

Capt(ion)ure, a group dance piece that combines elements of different art forms to show how art is created live for the audience. Art forms other than dance utilize materials and most often result in a permanent piece of viewable work. Dance, dissimilarly results in work that while completed and finished, is more temporal and fluid. While the work is constructed in front of the viewer it is also deconstructed as the shapes and structures continually transform. With this in mind, Capt(ion)ure showcases the work of the dance by using the art of photography to freeze choreographic moments in time and allow the audience to more fully partake of the aesthetic of the dance. Furthermore, the piece captures the choreographer's interpretation of different art forms such as pottery, painting, and film through the manipulation of different shapes and textures created through the movement. Midnight, a solo work choreographed and performed by myself, illustrates the doubts that come along with pursuing ones dream career. In a world that culturally praises high income and success, pursuing a career in dance is often seen as useless or frivolous. The negativity surrounding the art field often infiltrates and shakes the confidence of those involved. Midnight both explores the world of dance from my current perspective and also holds a reminder of why I chose to pursue this career; when the purpose gets lost in the doubt from others and self- doubt, remembering the girl that danced for an indiscriminating audience is crucial.

Student Choreography Showcase: Allison Richter

7:30-9:30pm Peters B112

In this Body, is an autobiographical piece based on the choreographer's recent diagnosis of Mitral Valve Stenosis. This piece examines learning the news for the first time and the frustration she now has with herself, society, and changing lifestyle. She explores organic movement with new mediums and challenges that abstract the psychic and emotional realm of humanity. Yoga has also influenced much of her movement with new discoveries that extend the artist's work of exploration of both mind and body. The performance presented as a solo seeks to open the eyes of the audience to the awareness of disease and illness and the ongoing effects it has on a person physically, emotionally, and psychologically.

Student Choreography Showcase: Sydney Crawson

7:30-9:30pm Peters B112

My piece is a fictional dance that portrays the story of a soldier who suffers from Post Traumatic Stress Disorder after returning home from war. The dance begins with pedestrian-like movement as four dancers who are portraying soldiers make their way through the horrors and devastations of war. The dance transitions to the lone surviving soldier being back at home with her significant other. Night terrors reveal the struggle for the soldier to transition between war and being home. As the nightmare subsides the movement changes to portray characteristics of PTSD that have begun to affect her relationship with her significant other. This piece seeks to show the difficulties that soldiers with PTSD struggle with through movement, sound, and vocalization. Throughout the piece, movement has been interwoven to portray outbursts, irritability, tenseness, startled, lack of trust, and being detached. Haunting memories and flashbacks are shown through the other dancers. This piece includes ensembles, duets, and solo moments, which are all strung together to create a complete work.