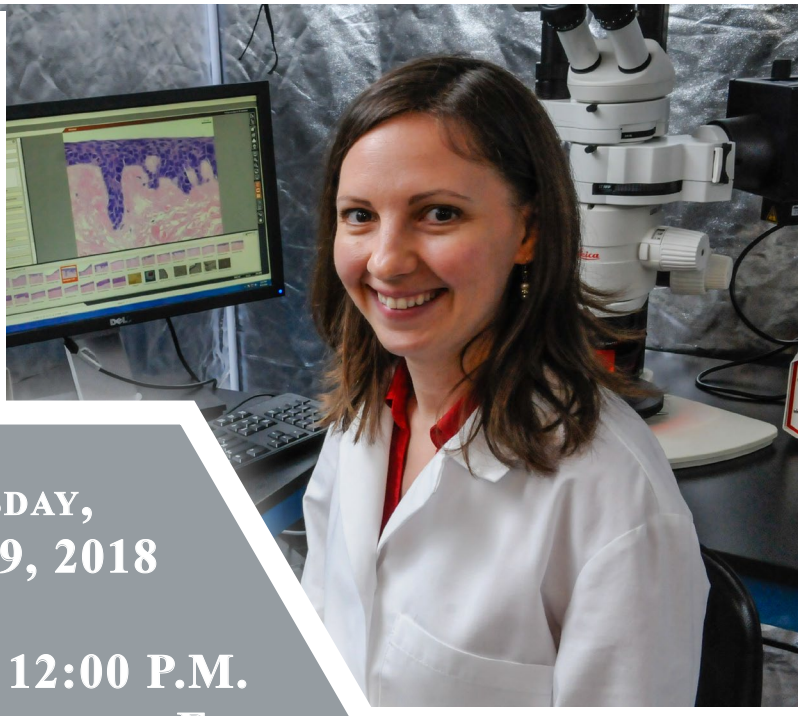
Old Dominion University

The Graduate School

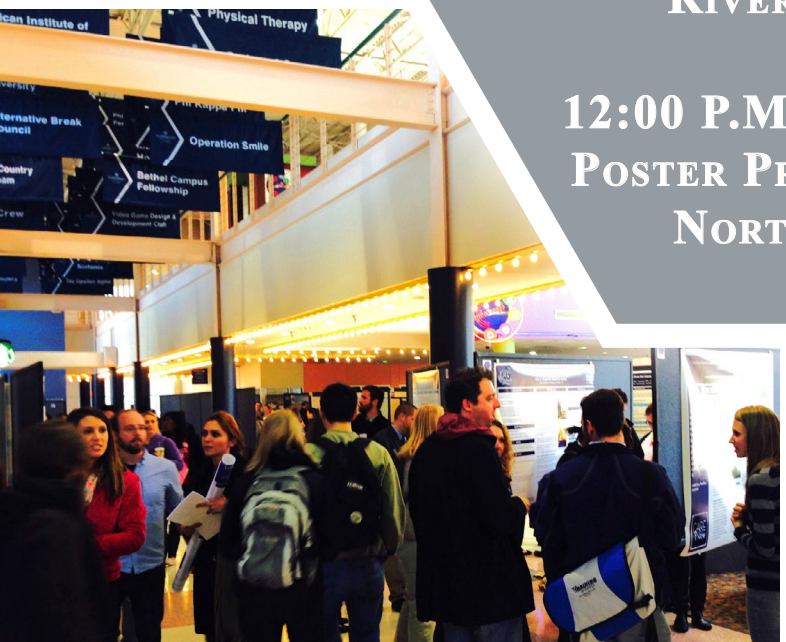
Graduate Research Achievement Day 2018

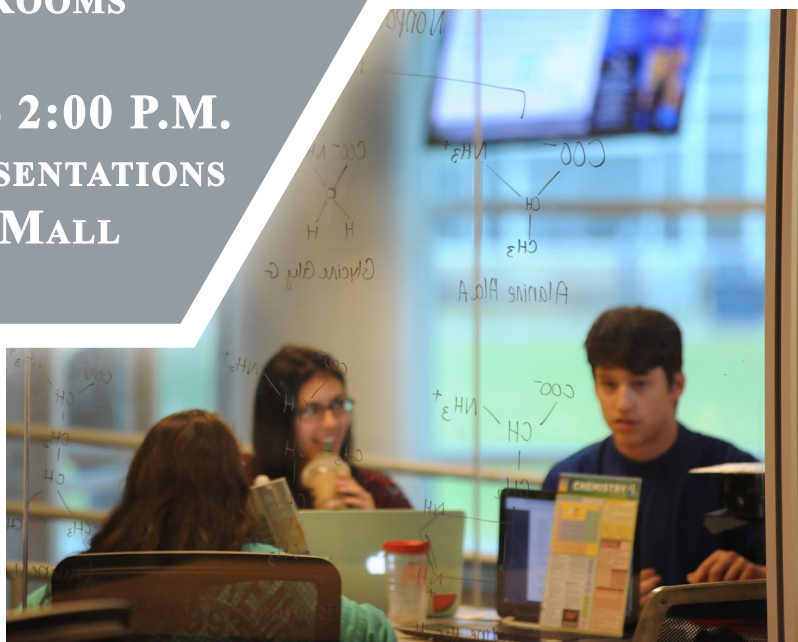


Thursday,
March 29, 2018

10:00 A.M. - 12:00 P.M.
Graduate Networking Event
River Rooms

12:00 P.M. - 2:00 P.M.
Poster Presentations
North Mall





OLD DOMINION
UNIVERSITY

March 29, 2018

Dear Colleagues,

Welcome to the 2018 Annual Graduate Research Achievement Day! I am delighted that the Graduate School is once again hosting this event, which honors and celebrates the excellent research of our graduate students.

Graduate education is being recognized increasingly in the Commonwealth, across the nation, and around the world as a vital means of addressing many of society's complex challenges. Our graduate students, with the assistance of their advisors and other faculty, bring their interests, creativity, and hard work to bear on complex questions within and across a broad spectrum of disciplines. The high level of work that they produce underscores the quality of graduate education here at Old Dominion University.

Today, you will have the opportunity to see our graduate students' posters, which deal with a wide range of research topics both within and across disciplines. I hope you enjoy your interactions with our graduate students. They contribute significantly to the teaching, research, and service mission of Old Dominion University, and I have no doubt you will be hearing more about them in the years to come.

Again, welcome and thank you for attending.

Sincerely,

Augustine O. Agho, Ph.D.
Provost and Vice President for Academic Affairs

Office of the Provost and Vice President for Academic Affairs
2022 Koch Hall, Norfolk, VA 23529-0011 • Phone: 757/683-3079 • Fax: 757/683-6888 • www.odu.edu/acadaffairs

OLD DOMINION UNIVERSITY

IDEA FUSION

March 29, 2018

Dear Colleagues:

Welcome to the 2018 Graduate Research Achievement Day (GRAD) sponsored by the Old Dominion University Graduate School!

Today's event brings together more than ninety of the University's best and brightest graduate students to share their research-in-progress. The numerous topics covered by our students' posters address many of the world's most significant social, economic, and technological challenges, while offering an excellent view into current multi- and inter-disciplinary scholarship. As such, GRAD demonstrates the high quality of the University's master's and doctoral programs.

I commend all of today's participants for taking the time to prepare their posters, as well as their faculty advisors for their expert mentoring. You will enjoy interacting with these outstanding students. The problems they are researching today will lead to solutions tomorrow.

Again, welcome and thank you for attending GRAD 2018!

Sincerely,

Robert Wojtowicz, Ph.D.
Dean of the Graduate School

The Graduate School
2019 Koch Hall, Norfolk, VA 23529
Phone: 757/683-4885 · Fax: 757/683-5499 · www.odu.edu/graduateschool

COLLEGE COLOR KEY

COLLEGE OF ARTS & LETTERS	RED
STROME COLLEGE OF BUSINESS	GREEN
DARDEN COLLEGE OF EDUCATION	PURPLE
BATTEN COLLEGE OF ENGINEERING & TECHNOLOGY	BLUE
COLLEGE OF HEALTH SCIENCES	GREY
COLLEGE OF SCIENCES	ORANGE

Participants' name badges and poster boards are color coded for the colleges they represent.

Batten College of Engineering and Technology

Title of Presentation: Design and Implementation of an Artificial Neural Network Controller for Quadrotor Flight in Confined Environment

Presented By: *Ahmed Elhussein Eltayeb Mekky*
Department: Mechanical & Aerospace Engineering

Abstract: Quadrotors offer practical solutions for many applications, such as emergency rescue, surveillance, military operations, videography and many more. For this reason they have recently attracted the attention of research and industry. Even though they have been intensively studied, quadrotors still suffer from some challenges that limit their use, i.e. trajectory measurement, attitude estimation, obstacle avoidance, safety precautions, cybersecurity, etc. One major problem is flying in a confined environment, such as closed buildings and tunnels, where the aerodynamics around the quadrotor are affected by close proximity objects, which result in tracking performance deterioration, and in sometimes instability. To address this problem, researchers followed three different approaches; the Modeling approach, which focuses on the development of a precise dynamical model that accounts for the different aerodynamic effects, the Sensor Integration approach, which focuses on the addition of multiple sensors to the quadrotor and applying algorithms to stabilize the quadrotor based on their measurements, and the Controller Design approach, which focuses on the development of an adaptive and robust controller. In this research, a learning controller is proposed as a solution for the issue of quadrotor trajectory control in confined environments. This controller utilizes Artificial Neural Networks to adjust for the unknown aerodynamics on-line. A systematic approach for controller design is developed, so that, it could be followed for the development of controllers for nonlinear systems of similar form. One goal for this research is to develop a global controller that could be applied to any quadrotor with minimal adjustment. A novel ANN structure is presented that increases learning efficiency and speed. In addition, a new learning algorithm is developed for the ANN, when utilized with the developed controller. Simulation results for the designed controller when applied to the Qball-X4 quadrotor are presented that show the effectiveness of the proposed ANN structure and the developed learning algorithm in the presence of variety of different unknown aerodynamics. These results are confirmed with real time experimentation, as the developed controller was successfully applied to Quanser's Qball-X4 quadrotor for the flight control in confined environment. The practical challenges associated with the application of such a controller for quadrotor flight in confined environment are analyzed and adequately resolved to achieve an acceptable tracking performance.

Batten College of Engineering and Technology

Title of Presentation: Investigation of Matrix-Platelets Interactions During Sintering of Ice-Templated Ceramics and Relation to Macroscopic Compressive Response

Presented By: *Mahesh Banda*
Department: Mechanical & Aerospace Engineering

Abstract: Ice-templated ceramics exhibit a macroscopic structural anisotropy, but at microstructural length-scale contain equiaxed grains within the lamella walls and lamellar bridges. Our recent work has revealed that introduction of anisotropic grains (platelets) has significant effects on the structural evolution at multiple length-scales of ice-templated alumina ceramics. Moreover, grain-level modifications can result in marked improvements of macroscopic mechanical response. However, there is a need to thoroughly understand the interactions of fine-grained alumina matrix and anisotropic alumina platelets, and microstructure evolution during high-temperature sintering. Presence of fine, equiaxed grains can lead to template grain growth, significant coarsening of the platelets, and generation of the microporosity within the lamella walls. In this work, our goal is to understand the progressive interactions of fine-grained template scaffolds during sintering. Moreover, our aim is to connect the local structural modifications to the macroscopic mechanical response, and identify the parameters that are critical to tailor the properties. The results will further advance the process-structure-property relationships of ice-templated porous materials.

Title of Presentation: Uniaxial Compressive Response of Multilayered Ceramic-Polymer Composites Both in Quasistatic and Dynamic Regimes of Loading

Presented By: *Sashanka Akurati*
Department: Mechanical & Aerospace Engineering

Abstract: In recent years, bioinspired ceramic-polymer composites with multilayered architecture have drawn significant attention because of the possible synergy of strength and damage-tolerance. Polymer infiltration of ice-templated ceramics has emerged as a promising and versatile technique to develop this class of novel composites, which can be utilized for a number of structural applications including in high-strain rate environments. In spite of the growing interests, there is limited understanding of compressive mechanical response of ice-templating based multilayered ceramic-polymer bulk composites and investigation on their dynamic behavior is almost non-existent. Moreover, for this class of materials there is a need to understand the orientation-dependence of properties. In this study, our goal is to understand the effects of freezing front velocity (FFV) on the uniaxial compressive response of alumina-epoxy composites both in quasi-static and dynamic loading conditions. Our aim is to relate the modifications in FFV and observed microstructural changes to the mechanical response of multilayered alumina-epoxy composites in low and high rates of loading. The findings can be further useful in predicting and processing high strength composites.

Batten College of Engineering and Technology

Title of Presentation: Multiwalled Carbon Nanotube Based Solid State Supercapacitors

Presented By: *Johnathan Blincoe*
Department: Electrical and Computer Engineering

Abstract: Mankind has an ever-increasing dependence on energy that keeps growing as technology continues to advance. Clean energy generation and green storage solutions have become heavily researched topics in a global effort to power society with minimal environmental impact. Supercapacitors are thought to be the future of energy storage for their energy densities comparable to the best batteries with the ability to charge and discharge like a capacitor. These are devices that commonly use nanomaterials and pseudocapacitive materials in combination to fabricate electrodes. The nanomaterials are generally carbon based with high specific surface area and conductivity, and the pseudocapacitive materials use faradaic redox as an energy storage mechanism. Together, a supercapacitor electrode can store massive energy through faradaic redox at a high rate with the assistance of organized nanoparticles that can act as wires. For my research, stainless steel substrates are first electrochemically polished for a clean starting point. Then multiwalled carbon nanotubes and nickel chloride are sonicated in isopropyl alcohol. Two substrates are placed in a cell, the cell is filled with suspension, and voltage is applied across the substrates. This causes electrophoresis of the carbon nanotubes, depositing them onto the cathode while electroplating nickel on as a binder. Two identical substrates are made and assembled with electrolyte to form a symmetrical supercapacitor. This is then characterized based on its electrical response and ability to store and discharge energy. In the future, pseudocapacitive materials will be implemented into the electrode and electrolyte design.

Title of Presentation: Picosecond Pulsed Electric Field Stimulation of Neural Stem Cells

Presented By: *Ross Petrella*
Department: Electrical and Computer Engineering

Abstract: Picosecond pulse electric fields (psPEF) have the potential to elicit intracellular changes in mammalian cells in a non-contact manner using a high powered antenna. To investigate this possibility we have combined a psPEF electrode with a commercially available 3-D printer, which allowed us to deliver pulses with high spatial precision. When the electrodes are continuously powered and its position is shifted by the 3-D printer, large numbers of cells on a surface can be exposed to a uniform psPEF. With two electric field strengths (20 and 40 kV/cm), neural stem cell (NSC) responses, including cell viability, proliferation, and gene expression assays, were quantified and analyzed. Our results show that psPEF at this intensity was not cytotoxic with no significant cell death reported. There was an increase in NSC metabolic reduction which was independent of electric field strength. NSCs exhibited an electric field dependent proliferation response with higher electric fields producing less proliferation. Further, NSCs showed an up regulation of glial fibrillary acidic protein (GFAP) after 24 hours to 40 kV/cm, which is characteristic of astrocyte specific differentiation. Such electro-manipulation of pluripotent and multipotent cells could be a tool in both neural and tissue engineering.

Batten College of Engineering and Technology

Title of Presentation: Development of a Substrate Derived from Porcine Brain Extracellular Matrix for the Three-Dimensional Culture of Neural Stem Cells and Neurons.

Presented By: *Martina Zamponi*
Department: Electrical and Computer Engineering

Abstract: Traditional methods investigating the molecular mechanisms of neurodegenerative disease entail the use of two-dimensional cell or animal models. Combined, they have been efficient methods for the basic study of disease pathology, pharmacological development, and testing of treatments. However, traditional 2-D culture for the use of mimicking disease models lacks the ability to recapitulate normal physiological conditions with extreme accuracy. Novel approaches to the study of the molecular processes of disease entail the fabrication of protein-derived hydrogels for three-dimensional culturing of cells. Many such structures have been produced using substrates extracted from animal or human tissue, specifically extracellular matrix (ECM) components, granting a more faithful representation of the human physiological conditions. Animal-derived, commercially available products (Matrigel), have been successfully applied to the development of three-dimensional neuronal culture models and the study of neurodegenerative diseases. In addition, human mammary tissue-derived hydrogels are regularly applied in our lab to the study of breast cancer dynamics, and they have shown to allow survival of injected neural stem cells. With the notion that the cellular microenvironment has direct impacts on cell fate, and the goal to produce an accurate model to study the mechanisms characteristic of neurodegenerative disease, we report a novel method for the production of three-dimensional hydrogels derived from porcine brain tissue. Here we investigate our novel method adapted from existing protocols to determine the effects that a more accurate in vivo like environment has on neural stem cells derived from induced pluripotent stem cells. We demonstrated the efficiency of our protocol in the removal of cells and preservation of extracellular matrix components of the native tissue, and we evaluated the suitability of the final product as a substrate for neural stem cells and neuron cultures.

Title of Presentation: Triple Junction "Shed" Electrostatic Design and High Voltage Performance for the 200kv CEBAF Gun Upgrade

Presented By: *Gabriel Palacios Serrano*
Department: Electrical and Computer Engineering

Abstract: High-energy nuclear physics experiment performed at the Continuous Electron Beam Accelerator Facility (CEBAF) in Jefferson Lab (JLab) require the use of a DC high voltage photogun to generate polarized electron beams from strained GaAs negative electron affinity photocathodes. The photogun is based on a tapered ceramic insulator that mechanically holds the cathode electrode and extends into the vacuum chamber. This concept minimizes metallic surface area biased at high voltage, reducing the possibility of field emission, determinant for the reliable operation. Increasing the operating voltage from nominal 130kV to 200kV is being implemented to provide lower beam emittance, therefore better transmission through the injector and improved photocathode lifetime. These requirements motivated the incorporation of a triple-junction screening electrode for robust operation at 200kV. The screening electrode minimizes the electric field at the insulator-metal-vacuum region, thus minimizing the risk of arcing along the high voltage cable termination that plugs into the ceramic insulator. This work describes the electrostatic design criteria followed using COMSOL electrostatic field simulation software and presents high voltage conditioning results of the 200kV CEBAF photogun upgrade.

Batten College of Engineering and Technology

Title of Presentation: Expanding the Class of Globally Convergent Fliess Operators

Presented By: *Irina Winter Arboleda*
Department: Electrical and Computer Engineering

Abstract: A common representation of an input-output system in nonlinear control theory is the Chen-Fliess functional series or Fliess operator. Such a functional series is said to be globally convergent when there is no a priori upper bound on both the L1-norm of an admissible input and the length of time over which the corresponding output is well defined. It is known that every Fliess operator having a generating series with Gevrey order 0<=s<1 is globally convergent. In this paper it is shown that there exists a subset of series with Gevrey order s=1 which also exhibit global convergence. In particular, the example of Ferfera, which arises in the context of system interconnections, is shown to be one such example.

Title of Presentation: Design and Use of 3D Bioprinting Systems

Presented By: *John Reid*
Department: Biomedical Engineering

Abstract: Understanding the microenvironmental factors that control cell function, differentiation, and stem cell renewal represent the forefront of developmental and cancer biology. Accurately recreating and modeling these dynamic interactions in vitro requires precision-controlled deposition of multiple cell types in well-defined three-dimensional (3D) extracellular matrix (ECM). For this reason, the precision and repeatability offered by computer-aided design (CAD) and computer-numerically controlled (CNC) techniques in biofabrication processes are quickly becoming an industry standard. The first objective of this study was to create a 3D bioprinting device to increase the reliability of routine 3D cell culture experimentation. To circumvent the high-price, barrier to entry of commercial bioprinters, this project aimed to adapt a commercially-available, 3D printer into an inexpensive, 3D bioprinter. To achieve this task, goal-based computer simulations were utilized to identify, evaluate, and optimize the performance of a 3D bioprinting system. Results enabled a system with reduced needle clogging, single cell print resolution, and maintenance of cell viability. The minimal disruption of cell function was confirmed by the retention of pluripotency marker TRA-181 in bioprinted human induced pluripotent stem cells (hiPSCs) 7 days post printing. Next, we utilized this system to investigate the coordinated cell-cell and cell-matrix interactions during the initial stages of tissue formation by generating 3D bioprinted arrays of individual, mammary epithelial cell (MEC) organoid-structures. Through our quantifiable, 3D bioprinting approach, we were able to direct the self-assembly of large MEC structures through organoid fusion events among individual, bioprinted organoids along the printing template. Last, we demonstrate how our 3D bioprinting platform maintained experimental consistency among multiple 3D scaffolds and experimental conditions, and presents the capability to generate high-fidelity, 3D arrays with more than one cell type. These studies may eventually contribute to the development of high-throughput assays for screening tumor samples, pharmaceutical testing and tissue engineering.

Batten College of Engineering and Technology

Title of Presentation: Practical Applications of Neurosurgical Ontologies for Various Craniotomic Approaches Through Potentiated Computer Assisted Surgery

Presented By: *Austin Tapp*
Department: Biomedical Engineering

Abstract: The development of imaging devices has enabled the delivery of multimodal information, leading to descriptive patient-specific data sets and simulated planning of surgical procedures. These substantial influxes of medical imaging information have the potential to be harnessed, processed and utilized in Computer Assisted Surgery (CAS). As CAS becomes increasingly common for a variety of surgical fields, there is a need for representation, storage and processing of surgical knowledge in a structured, integrated and standardized format that can easily be adapted to match case-specific imaging information. One such format, represented in this study as an ontological model, supports coarsely defined intracranial and intranasal neurosurgical approaches which will display discrete and well-understood steps based on patient information obtained during a surgical procedure. Through various manipulations, these ontologies, which will be ratified by neurosurgeons, are reproduced in a Semantic Web format, and allow integration of modern imaging analysis and medical modeling software that provide live feedback and utilize algorithms to suggest surgical approaches with the highest rates of success based on information obtained and analyzed in real time. Semantically mapped neurosurgical approaches can be interpreted by both humans and machines and uncover vast possibilities of potential real-time data analysis, integration, and processing of intra-operative medical images (MRI, CT, ultrasound) to greatly expand the ability for surgeons to provide ideal care for any patient. These intraoperatively obtained images are then applied to preoperative models, thereby updating and accounting for brain shift and estimating resected tumor volumes. Every step of a surgical procedure may include annotated medical images of each patient, display additional personalized anatomical landmark information along the patient's surgical corridor, and guide a surgeon through any combination of procedures with a "surgical GPS"-like display, allowing the physician to elect for the best surgical approach, exponentially increasing the chances of a successful outcome.

Title of Presentation: In Silico Analysis and In Vitro Validation of the Electric Field Distribution in a Cylindrical Wire Quadrupole Electrode Configuration

Presented By: *Hollie Ryan*
Department: Biomedical Engineering

Abstract: The electric field distribution in an air and liquid dielectric gap between a cylindrical wire quadrupole electrode configuration has been studied by implementing the Finite Integration Technique (FIT) using CST Studio Suite commercial software. Using this numerical simulation method to obtain approximation-free solutions of Maxwell's equations in their integral form, the ability to produce a distal nanosecond pulsed electric field sufficient to elicit a biological response is determined. The electrodes were first modeled surrounded by air at normal conditions, then by a liquid dielectric, which served as cell growth medium, contained in an open cylindrical Teflon culture dish. A high DC voltage was applied independently or simultaneously via discrete ports with positive polarity at one wire or at opposing wires. Numerical analysis on the electric field intensity gradient along the cylindrical gap axis, as well as on the potential distribution in the air or liquid surrounding the electrodes, was carried out considering different electrode geometries. The maximum field intensity was mainly associated with the wire radius r and the electrode gap distance d. Finally, results of experiments used to validate the simulated electric field distribution in vitro are presented. These employ a multiphasic nanosecond pulse generator and quadrupole electrode device to induce cell membrane permeabilization, visualized by fluorescence microscopy using the green dye, YO-PRO-1 Iodide.

Batten College of Engineering and Technology

Title of Presentation: Molecular Simulations of Lipid Electropore Formation and Pore-Mediated Calcium Transport With an Improved Ca2+ Model

Presented By: *Federica Castellani*
Department: Biomedical Engineering

Abstract: Molecular dynamics simulations of lipid membranes are widely used to facilitate the understanding of phenomena at the atomic and molecular level that cannot be observed with conventional experimental methods. Molecular dynamics tools are particularly useful for the analysis of electric-field-induced pore formation in lipid bilayers. Atomic and molecular interactions in molecular dynamics simulations are governed by sets of properties and functions called force fields. For our studies of membranes in electric fields, to better understand how the physical and mechanical properties of the membrane constituents and the interactions among them are influenced by the force field, we have compared properties such as area per lipid, lipid order parameter, ion coordination number, and ion binding, specifically for the older GROMOS-OPLS and the newer CHARMM36 force fields. During these comparisons we noticed significant deficiencies in the CHARMM36 Ca2+ model. Here we describe the unacceptable behavior of the standard CHARMM36 Ca2+ model in aqueous systems, and we propose modifications to the model that result in more realistic interactions between Ca2+, water, and phospholipids. We also present initial results from simulations of pore-mediated ion transport in these systems. We track the electric field- and diffusion-driven passage of ions through field-stabilized pores over time, calculate the resulting currents and conductances, and relate these transport properties to the pore geometry. We note, among other things, that equilibration of Ca2+ with a phospholipid bilayer takes at least 10 Âµs, a much longer time than would be expected from published simulation studies of ion binding to phospholipids.

Title of Presentation: Anaerobic Digestion of the Liquid Phase from Hydrothermal Carbonization of Municipal Solid Waste for Evaluating and Enhancing the Biochemical Methane Potential

Presented By: *Kameron Adams*
Department: Civil Engineering and Environmental Engineering

Abstract: Hydrothermal carbonization (HTC) is observed as a scalable technique to convert wet biomass or organic waste (e.g. food waste and MSW) to carbon-rich solid fuels. Literature reports operating conditions of HTC ranging from 180-300Â°C based on different feedstocks which produces three main products; hydrochar green coal (75-80%), liquid phase with total organic carbon (TOC) (15-20%) and gases which is mainly CO2 (5%). The liquid phase of HTC contains high loads of organics and inorganics and without recovery would be lost and still be considered a waste product which could increase the load at wastewater treatment facilities and also a loss of organic carbon which could have been used for energy applications. In this study the liquid phase from HTC of MSW was used as the feedstock for biological treatment to evaluate biodegradability and biogas yields. A mixture of known composition (paper, plastic, metal, glass, food) representing waste that typically goes to the landfill has been created for testing under the proposed process. Preliminary testing and optimization of HTC reactor temperatures has been carried out at 280Â°C recovering 7g (35% of starting material) of solids and 375ml of liquid with a TOC of 6.8 g/L making it amendable for subsequent biological treatment. Biomethane potential (BMP) test using bench scale bottle test was performed on the liquid phase to generate experimental data on biogas yields and compared with theoretical yields to understand biodegradability; based on this data, microwave and ultrasonic pre-treatments will be applied to the liquid phase in order to increase biogas yields.

Batten College of Arts and Letters

Title of Presentation: The "Trump Effect?" Challenges to U.S. Hegemony in Cross-Cultural Higher Education: A Case Study of International Students at Old Dominion University

Presented By: *Raven Showalter*
Department: International Studies

Abstract: Scholars and politicians today fear that international student enrollment at U.S. institutions of higher education may be declining. While some attribute potential enrollment decline to domestic politics, others believe that globalization may be allowing student flows to diversify across many nations, thus limiting the U.S.'s share of students and soft-power influence. To assess the extent to which U.S. hegemony in cross-cultural higher education is being challenged, I trace the origins of educational exchange at Western colleges and universities from their earliest incarnations in the Medieval Era to the present. I also draw a parallel between the Bush administration after 9/11, when visa policies became increasingly regulated and limitations for individuals from Muslim countries were put in place, to the current administration under Trump, where similar proposals to alter existing visa legislation, as well as travel restrictions for individuals from several Middle Eastern countries have emerged. By conducting a small-scale case study of a public research university, Old Dominion University, I find that although some individuals feel threatened and alarmed by the current political environment, the majority of international students are not deterred from earning their degrees in the United States. However, international students are becoming increasingly aware of alternative programs and work opportunities in rival countries, like Canada, the U.K., Australia and Germany. If the political environment of the U.S. does not improve over the next few years, I conclude that greater numbers of international students will chose to study, work and live elsewhere. U.S. preponderance in cross-cultural higher education is being challenged by both internal and external factors, and without serious attention to either, detrimental decline over the next few years is a distinct possibility.

Title of Presentation: Association Rule Mining for Islamic Radicalization in the United States

Presented By: *Ryan Roberts*
Department: International Studies

Abstract: Since the attack on the World Trade Center in 2001, homegrown terrorism (HGT) is an emerging security threat that has researchers and policy-makers puzzled. While the September 11th attackers were foreign nationals affiliated with Al-Qaeda, HGT involves the radicalization of native citizens carrying out terrorist attacks in their home country without formal ties to terrorist organizations. Considering the disparate living conditions between the West and the conflict zones where terrorist organizations form, why does homegrown Islamic-inspired radicalization occur in the United States? This dynamic process has produced several interrelated explanations that integrate demographic, economic, social, political, and psychological factors. Using data provided by the Profiles of Individual Radicalization in the United States (PIRUS), this paper uses an association rule model to mine data for the analysis of Islamic-inspired radicalization in the United States. Subjectively, association modeling is useful in examining the "interestingness" of results when compared to the theoretical framework of radicalization. This is inferred by which factors appear relevant, how factors cluster, and the frequency with which factors appear together. Objectively, rule mining generates the conditional probability of factors occurring along three metrics. Confidence, the probability that items occur together, support, the frequency that items occur together, and lift which uses an a priori algorithm to assess the quality of a rule. Additionally, lift measures the strength of a rule over the random co-occurrence of the antecedent and consequent given the level of support. The PIRUS dataset includes 457 observations of radicalization in the United States from 1980-2016 across 22 different factors. The results show the importance of social networks, especially familial ties, and suggest new modes of inquiry related to ethnicity and global events not typically associated with Islamic radicalization in the United States.

Batten College of Arts and Letters

Title of Presentation: Deterrence, War, and Disarmament: How an Interdisciplinary Approach Can Make Serious Disarmament Talks Viable

Presented By: *Ryan Nixon*
Department: International Studies

Abstract: Having a serious nuclear disarmament talk, even with less-than-cooperative states, is not unthinkable. Largely absent from nuclear policy literature are analyses that ask two simple questions: How can deterrence fail? And what would a nuclear war in the twenty-first century look like? This interdisciplinary literature review examines several fields of study to answer these questions, including climatology, physics, sociology, psychology, and economics. Using game theoretical models, deterrence can break down in four non-mutually exclusive ways. First, mutual uncertainty pressures combative states to strike first out of fear that they will receive a first strike. Second, non-credible threats can serve to encourage the stronger side to take out nuclear weapons sites to prevent itself from suffering an attack. Third, escalation of conventional war can lead to nuclear volleys. Finally, nuclear terrorism can lead to either retaliation against the host nation; furthermore, nuclear terrorism can resemble a military nuclear attack. A nuclear war, limited or total, could have devastating climatological effects, reducing global temperatures and likely causing greatly reduced agricultural yields; would likely shatter societies, reduce collectible rents and therefore taxes, and separate large parts of societies from the acutely affected states; and devastate uninjured individuals no longer able to rely on the state for security and stress those rebuilding and burying the dead. In other words, even a small nuclear war between the US and North Korea would be catastrophic at the global level. Finally, this research suggests that the evidence is accessible. The studies are available for scrutiny and replication. If state leaders accept the evidence of how deterrence can break down and what that would look like, then serious disarmament talks can occur now, rather than when there is no other choice.

Title of Presentation: University Institutions and Their Positive Effects on the Student Community

Presented By: *Ivan Trent*
Department: Humanities

Abstract: The primary function of a university is educating its students in order to make a difference in the community and bring positive attention to the university. In regards to Old Dominion University (ODU), with a current population of approximately 25,000 students (ODU Fact Book, see Appendix I), ODU has the resources to grow. Undergraduate admissions at ODU are increasing, student housing has been prioritized for undergraduates, and the resources and activities have shown an increasing growth as well. However, upon looking at the data, graduate admissions has decreased significantly over the past ten years (See Appendix I). For this research, I have combined the data of the student population from 2004 to 2014 and used the population in respect to the data the Learning Commons (LC) sent in an email to form a descriptive analysis. This paper will use qualitative and quantitative methods in exploring how successful ODU is in trying to create a more cohesive campus community by examining the Learning Commons (LC). In order to measure the success, this paper will delve into what a LC is, the planning stages for the University, the implementation, and evaluating if the LC is used. For this paper, the primary hypothesis is that the LC is a hub for the University, both in terms of social network and social capital. Many students benefit from the resources it provides, however, there are weaknesses as addressed in this paper. Furthermore, the paper will tie student engagement to demonstrate that the LC is an essential space for the University. Finally, this poster will explore possible ideas in better enhancing the LC experience.

Batten College of Arts and Letters

Title of Presentation: Institutional Racism in Hampton Roads: Virginia Beach Diversifying Municipal Contracting Disparity Study

Presented By: *Lily Kunda*
Department: Humanities

Abstract: In 2016, the way the City of Virginia Beach awarded city contracts to small businesses and entrepreneurs came in to question by local black businessmen who believed the city unequally awarded contracts by giving preferential awarding to white owned businesses. Local black businessmen and entrepreneurs went to city council and demanded that a third party disparity study be performed to assess the racial inequity of the awarding of contracts. In response to demands for the study, the city of Virginia Beach resisted and stated that issues of racism do not exist and that a study was not necessary despite the fact that only 6.5% of city contracts are being awarded to minorities. Previous research on black entrepreneurship has stated that it is a site of struggle nationwide and throughout history due to racism, cronyism, redlining, unequal access to loans, lack of access to social capital, perceptions of less quality in comparison to white businesses and a general lack of power in the black community (Jones, 2017, p. 320). My research builds on previous research by viewing Virginia Beach's perceived racial inequality through Gramsci's lens of hegemony as something that it continuing to occur with consent from the business community and the city. Furthermore, I argue that the way the city awards contracts is an example of institutional racism because several linked institutions in the city are working together to keep power away from black entrepreneurs in the form of denying city contracts. In the case of Virginia Beach's disparity study, this includes the city government, the city council, the mayor, the business community and even the black entrepreneurs who have allowed it to happen as long as it has.

Title of Presentation: A Sentiment Analysis of Peoples' Attitude about Kurdistan Independent Referendum

Presented By: *Khadijeh Salimi*
Department: Political Science and Geography

Abstract: The Kurdistan independence referendum was held on 25 September 2017, and the results showed that almost 93 percent of the people who live in the region of Iraqi Kurdistan voted in favor of Kurdistan independence. The result showed a considerable success for Iraqi Kurds, but it has become not only a national security issue for Iraq, but also a regional security issue as it has become a motivation for other Kurds in Iran, Turkey, and Syria to rebel against the central government and become independent. Consequently, each of these three countries is going to choose a policy regarding this referendum for the sake of their national security. The objective of this study is to predict how these countries' officials may react to this event. To address this objective, I assume there is an important relationship between citizens' attitudes toward a political event and governments' foreign policy. Using social media such as Instagram and Twitter nowadays are an inevitable part of expressing feeling and attitudes about everything from personal life to political perspective of an event. Thus, the internet is a significant source of data that enables us to collect data about people's attitudes. I collected the data from Twitter and used a data mining approach to reveal people's attitudes. The results show that Israel's intervention in this event as a third party caused a strong wave of opposition toward the referendum. Another interesting result is the dominant anti-western ideas in the area. Finally, we can observe a real direct correlation between people's attitudes and what the government did after the referendum.

Batten College of Arts and Letters

Title of Presentation: U.S. Navy Women Line Officers: Trailblazers in Uniform

Presented By: *Reinetta A. Vaneendenburg*
Department: English

Abstract: Women have served in the U.S. Navy since the War of 1812 and now constitute about 18 percent of its ranks. However, the history of women, specifically the line officers, deserves increased historical documentation and public attention. While some may remember the Women Accepted for Volunteer Emergency Service (26,000 WAVES) from WW II, there is scant awareness of how, after the demise of the WAVES, women continued to wear the Navy uniform--and transitioned from support functions to warfighters. The objective of this poster is to create a visual product that combines the history of Navy women line officers with trailblazers in the field in a pictorial representation of the women's uniforms. Pulling these disparate pieces together will reflect the development of the uniform as women's' roles in the sea service flourished--to put this in the forefront in understandable language void of military jargon. Three parts of the story would be depicted on this poster. A PowerPoint deck has been drafted that illustrates the trailblazer's first woman pilot, first woman astronaut--and a cryptic history of the Navy's integration of women into its ranks as well as major American social or historical events. The visual design and depiction of the uniforms in appropriate settings is the third element and this rendering is in progress. The goals of the poster are to increase awareness of this important phase of social change, to engage the viewers in a dialogue about how women have progressed and shown resilience in a male-dominated industry and to encourage others who would like to collaborate on this project with me. I am seeking Navy women line officers who would like to share their experiences as well as others who have relevant observations or memories that would further this discussion.

Title of Presentation: Gender Related Differences in Behavioral Determinants of Exercise Related Injury Prevention Programs are Present

Presented By: *Ariana Moran*
Department: Physical Therapy and Athletic Training

Abstract: Context: Previous research indicates that females perceive higher risk of injury, participate in more preventative health behaviors, and have higher rates of lower extremity injury than males. Therefore, behavioral determinants of exercise-related injury prevention program (ERIPP) participation may differ between genders and implementation strategies may need to be customized for each gender. Objective: To identify differences in the behavioral determinants of ERIPP participation between genders. Design: Cross-sectional survey. Setting: Large public university. Participants: Physically active college students. Interventions: Participants completed paper versions of the Health Belief Model Scale (HBMS). The HBMS utilized the 6 constructs of the Health Belief Model to assess behavioral determinants of ERIPP participation. The HBMS consisted of 9 subscales (susceptibility, consequences, fear of injury, benefits, barriers, community self-efficacy, individual self-efficacy, general health cues, external health cues) and 37 items. Response options ranged along a 7-point Likert scale from strongly agree (3) to strongly disagree (-3). Positive scores on each subscale except barriers was associated with increased likelihood of participation in ERIPPs. The independent variable was gender. Main Outcome Measures: The dependent variables were the subscales of the HBMS. Total scores, medians, and interquartile ranges were calculated for each HBMS subscale, and analyzed. Mann-Whitney U tests and non-parametric effect sizes (ES) were used to compare scores between genders. Alpha was set at $P<0.05$. Results: Males perceived significantly fewer consequences of injury, more benefits and barriers to participating in ERIPPs, more individual self-efficacy, and more external health cues when compared to females. Conclusions: Based on these findings, it cannot be determined whether males or females would be more likely to participate in an ERIPP. However, the differences found in the attitudes and perceptions towards ERIPPs suggest that intervention strategies to improve participation may need to be gender specific.

Title of Presentation: Professional Post-Baccalaureate Athletic Training Students Interest in a Doctor of Athletic Training Degree: Demographics and Descriptives

Presented By: *Emma Hoffman and Savanna Paladin*
Department: Physical Therapy and Athletic Training

Abstract: Introduction: The profession of athletic training (AT) is transitioning to a professional master's degree being the minimum degree level for entry to practice. This transition has occurred previously in other healthcare disciplines such as physical therapy, occupational therapy and nursing. Because of the degree level change, the terminal clinical degree in athletic training must evolve as well, therefore, the Doctor of Athletic Training (DAT) degree will likely become the new post-professional degree in athletic training. Purpose: Our purpose was to gauge professional post-baccalaureate students' perceptions of the DAT degree along with their interest and influencing factors to interest in a DAT program. Methods: This study utilized a cross-sectional design. Participants were identified via enrollment in one of 66 CAATE accredited professional master's programs. Participation was achieved via program director assent and completed in paper format (N=250). The instrument was 75 items comprised of short answer and likert-scale questions encompassing seven themes including: curricular content, interest, and post-graduate employment opportunities. Descriptive statistics and Mann-Whitney U tests were conducted, alpha was set at $p<0.05$.Results: Participants were grouped into not interested or interested. Mann-Whitney U tests identified a statistically significant difference between groups on importance of potential influential factors including career advancement ($U=5150.5$, $p<.000$), desired employment ($U=5094$, $p<.000$), and family support ($U=6059.5$, $p<.009$). Conclusion: It can be concluded that individuals interested in pursuing a DAT feel that career advancement and the ability to achieve their desired employment setting are influential factors to their decision to pursue a DAT. These individuals also reported the ability to take courses full time or courses in person are important factors in their decision to pursue a DAT.

College of Health Sciences

Title of Presentation: Acute Onset Bell's Palsy in a Seventeen-year old, Female High School Basketball Player: A Case Study

Presented By: *Zachary Kershaw*
Department: Physical Therapy and Athletic Training

Abstract: Background: A seventeen-year-old, female high school basketball player with acute onset Bell's Palsy. The patient presented with acute symptoms including altered speech, partial left-sided facial nerve paralysis, drooping and swelling of the oral commissure, as well as left sided drooping of lateral corner eyelid. The patient had equal motor and neurological functioning of upper and lower extremities. The patient had no known previous history of reported symptoms or associated ongoing medical conditions. Differential Diagnosis: An onsite evaluation by the Athletic Trainer attempted to rule out life threatening conditions and determined possible differential diagnoses that, in addition to idiopathic Bell's palsy, included stroke, acute allergic reaction, brain tumor, and Lyme's disease. Treatment: Emergency room referral resulted in a confirmed diagnosis of idiopathic Bell's Palsy. Patient was prescribed a corticosteroid regimen for acute management. Patient was returned back to full participation with no restrictions five days following initial onset. Progress and determination of readiness to return to sport was analyzed using clinician based outcomes; House-Brackman Scale, Sunnybrook Facial Grading System, and patient reported outcome; Facial Disability Index. Uniqueness: Bell's Palsy is a rare condition that affects about 20 to 30 people per 100,000 annually, causing full or partial paralysis of the facial nerve. Although an episode of Bell's Palsy in a patient of this age with no previous neurological dysfunction is likely rare, the immediate identification and referral was advantageous in the accurate treatment of the patient; resulting in quick recovery with no long-lasting effects. Conclusions: In the case of an onset of idiopathic Bell's Palsy, it is essential for the Athletic Trainer to be able to recognize the onset of associated signs and symptoms, and to facilitate immediate referral to expedite appropriate treatment.

Title of Presentation: Comparison of Behavioral Determinants of ERIPP Participation between Collegiate and Club Sport Athletes

Presented By: *Abrianna D'Onofrio*
Department: Physical Therapy and Athletic Training

Abstract: Context: Previous research has indicated that the behavioral determinants of exercise-related injury prevention program (ERIPP) participation may differ between individuals who participate in different levels of sport. It is unclear whether differences in behavioral determinants exist between collegiate varsity athletes and club sport athletes. If differences do exist, specialized implementation strategies for those who participate in different levels of sport may be needed. Objective: To compare behavioral determinants of ERIPP participation in collegiate varsity and club sport athletes. Design: Cross-sectional. Setting: Paper survey at a large public university. Participants: Physically active individuals including 124 collegiate athletes and 122 club sport athletes volunteered to participate. Interventions: Participants completed a paper version of the Health Belief Model Scale (HBMS). The HBMS was designed to assess the behavioral determinants of ERIPP participation based on the six constructs of the HBMS. The HBMS consisted of 9 subscales (susceptibility, consequences, fear of injury, benefits, barriers, community self-efficacy, individual self-efficacy, general health cues, external health cues) and 37 items. Responses were measured along a 7-point Likert scale ranging from strongly agree (3) to strongly disagree (-3). Positive scores on all subscales except barriers are interpreted as an increased likelihood of ERIPP participation. The independent variable was group (varsity/club sport). Main Outcome Measures: The dependent variables were the subscales of the HBMS. Mann-Whitney U tests and corresponding non-parametric effect sizes (ES) were calculated to examine group differences. Alpha was set at p=0.05 for all analyses. Results: Varsity athletes perceived more fear of injury, less barriers to implementing an ERIPP, and more external health cues than club sport athletes. Conclusions: These factors indicate collegiate varsity athletes are more likely to participate in an ERIPP than club sport athletes. These results indicate that implementation strategies may need to be customized for different levels of the physically active population.

College of Health Sciences

Title of Presentation: The Relationship between Foot Posture, Dorsiflexion Range of Motion and Lower Extremity Biomechanics During a Drop-Landing Task

Presented By: *Kathleen Hogan*
Department: Physical Therapy and Athletic Training

Abstract: Context: Foot posture and dorsiflexion range of motion (DROM) deficits have been linked to lower extremity injuries. However, it is still unknown whether these variables influence lower extremity biomechanics during functional activity. Objective: Examine the relationship between foot posture, DROM, and lower extremity biomechanics during drop-landing. Participants: Fifteen physically active adults (9 females, 6 males, age:22.6±2.4years, height:1.69±0.07m, mass:66.40±9.95kg) volunteered to participate. Participants were excluded if they reported a history of lower extremity injury within 6 weeks or lower extremity surgery. Intervention: Participants completed a single testing session that included static foot posture assessment, weight-bearing DROM evaluation, and a biomechanical analysis of a drop-landing task on the dominant limb. Outcome Measures: Total FPI-6 score, average DROM, and average hip, knee, and ankle sagittal and frontal plane kinematics and kinetics were used for analysis. Pearson correlations (r) along with coefficient of determination (r2) were performed between the FPI-6, DROM, and biomechanical variables. In cases where both FPI-6 and DROM significantly correlated to a biomechanical variable, multivariate linear regression was used to model the relationship. Results: FPI-6 scores were significantly correlated with knee abduction angle at initial contact (r=-0.59, p=0.021), ankle sagittal plane excursion (r=-0.63, p=0.013), and knee adduction moment (r=0.60, p=0.017). DROM significantly correlated with knee adduction moment (r=-0.59, p=0.020). The combination of FPI-6 and DROM accounted for 56% of the variance in knee adduction moment (r=0.746, p=0.008). No statistically significantly relationships were identified for hip variables (p>0.05). Conclusion: Participants with a more pronated foot posture displayed less knee adduction angle at initial contact and decreased ankle sagittal plane excursion. Those with less DROM and a pronated foot posture exhibited an increased maximum knee adduction moment indicating an increase in valgus knee loading. Collectively, these findings provide evidence that the structure of the foot and ankle can significantly influence lower extremity biomechanics.

Title of Presentation: Older adults with Type 2 Diabetes Classified as Fallers Have Slower Reactions, Decreased Strength and Impaired Postural Stability Compared to Non-fallers.

Presented By: *Rachel Simmons*
Department: Physical Therapy and Athletic Training

Abstract: For older adults with type 2 diabetes (T2DM), general declines in strength, reaction time (RT), diminished postural control and the presence of neuropathy can be collectively viewed as mitigating factors for increased risk of falling. A previous fall is also a strong predictor of a future fall. This study was designed to investigate the differences in lower limb strength, RT, postural control and coordination for 81 older individuals with T2DM classified as either fallers or non-fallers. All persons were diagnosed with peripheral neuropathy and were categorized by fall status (faller or non-faller). Twenty-one persons were classified as fallers (age 67.5+6.0 years) while the remaining 61 persons did not report falling previously (age 67.1+4.6 years). No significant clinical differences were noted between the groups in BMI, HbA1c, and neuropathy score. Balance was assessed using a force platform under the following conditions: Eyes open/closed firm surface, eyes open/closed foam surface, and postural tracking task. RT were assessed for the hand and foot. While there were no differences between groups in level of peripheral neuropathy, fallers exhibited a number of differences: slower reactions for the hand and foot, decreased knee extension and flexion strength, and diminished proprioception. Fallers exhibited impaired balance during challenging balance tasks characterized by increased postural sway in both the AP and ML directions, and a greater number of errors during the postural tracking task. In conclusion, neuropathy, slower reactions, and diminished strength and balance control means that older persons with T2DM generally have a higher risk of falling. However, even within this population, those T2DM persons who have recently suffered a fall exhibit greater impairment in postural control. While the presence of neuropathy affects motor function related to balance, it cannot solely account for differences in postural control between those T2DM persons classified as fallers compared to non-fallers.

College of Health Sciences

Title of Presentation: Nurse Clinical Competency, Self-Efficacy, & Job Satisfaction

Presented By: *Katherine Colbert*
Department: Nursing

Abstract: Nurse Clinical Competency, Self-Efficacy, and Job Satisfaction PROBLEM: One of the greatest challenges in health care is ensuring clinically competent nursing staff provide quality patient care within a dynamic healthcare environment. However, clinical competency alone does not determine performance. Nurse clinical competency is intertwined with self-efficacy and job satisfaction, and influenced by the healthcare environment. PURPOSE: The purpose of this study was to determine the relationships between nurse clinical competency, self-efficacy, job satisfaction and nurse characteristics. EBP QUESTIONS: RQ1: What degrees of nurse clinical competency exist among registered nurses in the Commonwealth of Virginia? RQ2: Are there correlations between nurse clinical competency, self-efficacy, job satisfaction, and nurse characteristics? METHODS: This study was based on cross-sectional, descriptive, correlational research. The Nurse Clinical Competency tool was adapted for this study. This tool, along with the validated Self-Efficacy in Clinical Performance survey, Halfer-Graf Job/Work Environment Satisfaction Survey, and a researcher-developed demographic questionnaire, were used to measure variables. Spearman's rho and descriptive statistics were mainly used for analysis. OUTCOMES: This study defines the degree of clinical competency and self-efficacy of registered nurses practicing in the Commonwealth of Virginia, as well as the factors impacting job satisfaction and dissatisfaction. It also identifies statistically significant correlations between these constructs. SIGNIFICANCE: The knowledge derived from this study will add to the body of nursing knowledge and provide guidance that may be beneficial to administrators and organizations developing nurse recruitment and retention plans, and educators developing nurse orientation, ongoing education and training, and competency plans.

Title of Presentation: Nurse Resilience and Spirituality: Impact on Perception of Grief Support and Work Environment

Presented By: *Debi Bucci*
Department: Nursing

Abstract: PROBLEM: Unresolved grief is associated with job dissatisfaction and high turnover rates among registered nurses (AACN, 2017). Personal well-being is affected by the nurse's capacity to manage feelings of loss, failure, and grief following adverse outcomes (Perrin, Jones, & Winkelman, 2013; Wilson, 2014; Wisekal, 2015). Contributing factors, such as resilience and spirituality, may influence the nurses' perception of grief support and work environment health (Anderson, Ewen, & Miles, 2010; Dougherty, Pierce, Ma, Panzarella, Rodin, & Zimmermann, 2009; Wisekal, 2015). PURPOSE: The purpose of this study was to assess whether self-reported resiliency and spirituality impact the registered nurse's perception of grief support following patient death and perception of work environment health. EBP QUESTION: RQ1. Is there a relationship between self-reported resilience and perceived grief support in registered nurses? RQ2. Is there a relationship between self-reported spirituality and grief support after patient death in registered nurses? RQ3. Is there a relationship between a registered nurse's self-reported resilience, and their perception of work environment health? RQ4. Is there a relationship between a registered nurse's self-reported spirituality, and their perception of work environment health? RQ5. Is there a relationship between a registered nurse's grief support and their perception of work environment health? METHODS: This study used a non-experimental correlational design. A convenience sample of 136 registered nurses at Sentara Leigh Hospital in Norfolk, Virginia participated in an anonymous survey. OUTCOMES: Data analysis demonstrated high levels of self-reported resilience, spirituality, and grief support positively correlated with the nurse's perception of work environment health SIGNIFICANCE: Positive correlations between resilience, spirituality, and grief support with work environment health, may support organizational initiatives such as resilience training and spirituality support in the workplace. Building capacity for resilience and spirituality in nurses may increase job satisfaction and decrease turnover.

College of Health Sciences

Title of Presentation: Pain Management in the Adult African American with Sickle Cell Disease

Presented By: *Terrinda Alston*
Department: Nursing

Abstract: PROBLEM: Sickle Cell Disease (SCD) is a chronic, inherited hematologic disorder that affects over 100,000 Americans. Those individuals with SCD face a multitude of challenges including financial strain and psychosocial impacts. The psychosocial impact includes negative stigmatization placed on these individuals. Healthcare providers have been known to discriminate against those with frequent pain crisis. These patients are characterized as drug-seekers, manipulative, and exaggerating pain severity. PURPOSE: The purpose of this study was to examine the knowledge, attitudes, and beliefs of healthcare providers, MDs and NPs related to the management of pain in the adult AA with SCD and to explore whether there is a relationship between the knowledge, attitudes, and beliefs of the healthcare providers and their approach to treatment modalities. METHODS: A non-experimental, cross-sectional, descriptive, correlational research design was used. Participants included MDs and NPs working in hematology and/or oncology and pain management. Participants were recruited through the national professional organizations: Advanced Practitioner Society of Hematology and Oncology and the American Academy of Pain Medicine. 52 surveys completed. Results: Data was analyzed using descriptive statistics, independent-samples t- test, and Pearson correlation. There was no significant difference in the level of knowledge, perceptions and treatment approach between MDs and NPs, indicating further research is needed. SIGNIFICANCE: The study helps identify opportunities for improvement and the development of educational programs for clinicians. Results from the study help to guide development of organizational policies and help standardize pain management protocols across the health care continuum related to the management of pain in this population.

Title of Presentation: Effects of Provider Attitude on Sickle Cell Care

Presented By: *Steven Marshall*
Department: Nursing

Abstract: Background and Significance: Sickle cell disease (SCD) is a complex condition that includes pain crises requiring hospitalization. Pain management is a complex and challenging component to their care. Providers who have a negative attitude towards sickle cell patients do not provide the same quality of care as those who have a positive attitude. Negative provider attitudes may result in increases in hospital length of stay, thirty day readmissions, and total sickle cell related emergency department (ED) visits for these individuals. Purpose: To determine whether a sickle cell education program will improve provider attitudes towards this population. The study will assess the attitudes of providers before and after an educational program regarding SCD. Further examination will include evaluating potential improvements in quality outcomes. Methods: Participants included physicians, nurses, and nurse technicians who care for individuals with SCD. The SCD educational program will include a pre-survey based on the General Perceptions about Sickle Cell Patients Scale. The initial post-survey will immediately follow the program after allowing participants a ten-minute break. After a period of twelve weeks an additional post-survey will be given. Data regarding hospital length of stay, thirty day readmissions, and total sickle cell related emergency department visits for individuals with sickle cell disease will be for twelve weeks prior to and following the educational program. Results: Analyses includes descriptive statistics, within group bivariate analysis, Wilcoxin T test as well as the paired t test. Data will likely demonstrate provider attitudes towards this patient population improved after the education program. The effects on hospital quality data will likely reflect a decreased length of stay, decreased thirty day readmissions, and decreased emergency room visits for this patient population. Implications: Following the education program, providers will have an increased knowledge and insight into the challenges faced by those individuals with sickle cell disease. It is difficult to understand pain control in individuals who live with pain on a daily basis. Increasing this understanding and empathy will lead to higher quality of care for these individuals.

College of Health Sciences

Title of Presentation: The Impact of a Telephonic Outreach Program on Patient Outcomes

Presented By: *Esscence Hall*
Department: Nursing

Abstract: Background: Patients discharged from the hospital without proper instructions, follow-up appointments, and an overall clear plan of care inhibits self-management behaviors. Purpose: This study explored whether participation in a telephonic outreach program enhanced self-management behaviors and improved utilization outcomes, for patients discharged home with congestive heart failure. Relevance: Lack of quick access to follow up care often leads to patients being unable to manage their care at home, returning to the ED and being readmitted to the hospital. Quickly introducing telephonic outreach post-discharge provides the education needed to reduce recidivism and improve patient outcomes. EBP Questions: Do patient characteristics have a significant effect on outcomes: CHF related 30-day readmissions and/or ED returns within 72 hours. Is there a difference in CHF-related 30-day readmissions and ED returns within 72 hours between patients: participating in the telephonic outreach program and those not participating; partially completing the program vs participating; completing the program vs not participating; receiving a post-discharge call ≤ 48 hours compared to > 48 hours? Is there a difference in self-management behaviors between patients based on call back timeliness for those partially complete the telephonic outreach program and completing the program? Methods: This study was conducted using a non-experimental descriptive design in the form of a retrospective chart review with non-equivalent comparison groups. A convenience sample of adult patients with a CHF diagnosis and discharged home from Sentara Healthcare between January 2015 and June 2017. Results: Results from this study indicated the Cipher program was effective for significantly reducing readmissions and better managing some aspects of self-care only when the patients completed all 4 of the scheduled calls. Implications: An assessment into the possible cultural and psychosocial barriers to health success; development of new programs and enhancing technology are all identified opportunities from this study.

Title of Presentation: Nurse Resilience and Spirituality: Impact on Perception of Grief Support and Work Environment

Presented By: *Monique Farrington*
Department: Nursing

Abstract: Problem: In response to the fiscal impact and increasing costs of healthcare, businesses are offering workplace primary care clinics to provide affordable and convenient access to primary care clinics at the worksite for the employees and their dependents. A local shipyard offers primary care services at their worksite; yet utilization remains suboptimal. Purpose: The purpose of this study was to explore perceptions of the workplace primary care clinic and to determine factors that would encourage its use. EBP questions: What are participants' perceptions and knowledge related to the worksite clinic? What other factors impact participants' workplace clinic utilization and permit the clinic to meet the participants' needs? Is there a significant difference in clinic knowledge between users and nonusers? Method: This study utilized a descriptive and between group comparative design. Participants were shipyard employees and their dependents, at least 18 years old, and selected the health plan that allowed access to the workplace clinic. Participation was voluntary. A convenience sample was asked to complete an anonymous online survey. Outcome: 29 participants had used the clinic; 8 had not. Users of the clinic were more likely to be women, married, salaried shipyard employees with an annual income over $50K, and lived between 5 and 30 miles from the clinic. Non-users of the clinic were equally men and women. Most worked full-time with an annual income less than $30K and lived greater than 15 miles from the clinic. Overall, perceptions were favorable towards the workplace clinic. However, both groups had uncertainty about employer access to their health information. There was no statistically significant difference in clinic knowledge between users and nonusers. Both groups had a lack of knowledge of some services and fees. Significance: The study findings suggest that marketing strategies highlighting services offered at the workplace clinic would be beneficial.

College of Health Sciences

Title of Presentation: Impact of a Standardized Breastfeeding Educational Program on Novice Nurses

Presented By: *Sandra Hearn*
Department: Nursing

Abstract: PROBLEM: Breastfeeding rates continue to fall below the recommended rates for Healthy People 2020. Nurses lack the necessary lactation education to provide in-hospital breastfeeding support. Research supports, nurses with no lactation training, may contribute to early maternal breastfeeding cessation. Mothers view postpartum breastfeeding support provided by nurses as valuable, however, hospitals often lack standardized and mandatory training for nursing staff. PURPOSE: The purpose of this program evaluation was to determine the impact a comprehensive standardized breastfeeding educational program had on novice nurses' knowledge, attitudes, and intent for supporting maternal breastfeeding in a military facility. A pre- and post- test survey was administered to a group of novice nurses who were required to participate in the educational program in order to work on a variety of units caring for breastfeeding mothers and infants. METHODS: A pre-experimental, correlational design was utilized. Sample: 35 novice nurse participants. Program: Nurses participated in a comprehensive standardized breastfeeding educational program consisting of three components: A 20 hour on line breastfeeding program followed by a six-hour instructor led didactic course with a low fidelity simulation component. Measures: Pre- and post nurses' knowledge, attitudes, and intent to support maternal breastfeeding were measured using the Breastfeeding Knowledge and Attitudes Questionnaire (BKAQ) and the Nursing Support Questionnaire (NSQ) during three time points. RESULTS: Novice nurses demonstrated a statistical significant change in their breastfeeding knowledge and intent to provide maternal support following the educational program (p value=.028, p value=.040, respectively). There was no statistical significance in their attitudes toward breastfeeding pre- and post-intervention. CONCLUSION: Standardized breastfeeding program shows promise in improving novice nurses' knowledge and intent to support maternal breastfeeding utilizing a combination web based, simulation and instructor led components.

Title of Presentation: Screening Rates, Elevated Risk, and Correlates of Postpartum Depression in an Obstetric Population

Presented By: *Molly Long*
Department: Health Sciences

Abstract: Introduction: Postpartum depression (PPD) affects approximately 1 in 9 women. However, screening rates for PPD are inconsistent and low among physicians. Physicians most often rely on clinical assessment to evaluate PPD but this method is often inaccurate or inconsistent in evaluating or diagnosing PPD. The current study had 3 objectives: 1) to assess overall screening rates of PPD; 2) to examine elevated PPD score rates; 3) to identify correlates of elevated PPD. Methods: Archival data from an obstetrician/gynecology practice provided data for the current study. A total of 557 medical records were examined for the following: demographics, mental health history, PPD screening tools, elevated PPD screen recommendations and adherence. PPD screening frequency was assessed at 2 time points: intake appointment and 6-week post-delivery follow-up. Results: The screening rates were relatively high at intake (335/557, 60.1%) and at 6-week follow-up (476/557, 85.5%). Elevated PPD score rates at intake were 18.2% (n = 61/335) and 13.0% (n = 62/476) at 6-week follow-up. The following bivariate correlates of elevated PPD risk were observed: history of depression, history of anxiety, younger age, Medicaid/Medicare health insurance, and single marital status. Full regression models will be presented at the conference. Conclusion/Implications: This research adds new knowledge regarding screening rates of PPD and elevated PPD screens, thereby enhancing quality of service provision for mothers. This study provides the basic science to inform an educational intervention addressing screening rates and correlates of PPD; such training may enhance provider knowledge, attitudes, and skills regarding PPD would be beneficial.

College of Health Sciences

Title of Presentation: Walking and Chewing Gum at the Same Time is Easier Than You Think: The Influence of Chewing on Healthy Adult Gait

Presented By: *Brittany Samulski*
Department: Nursing

Abstract: Purpose: The study examines the impact chewing speed has on gait dynamics. Background/ Significance: Gait requires neural input for successful performance and has been shown to change while performing a cognitive dual-task. Chewing gum has been linked to increased sustained attention and improved cognitive functioning, but there is no study directly examining the effect of chewing gum on gait dynamics. Subjects: Fifteen young adults (20-40 years) and fifteen older adults (over 60 years) completed this study. Methods and Materials: Participants chewed at a specified rate and walked at a preferred rate. The four chewing conditions were: 1)no chewing (control), 2) chewing at the individual's preferred rate, 3)fast rate (120Hz), and 4)slow rate (60Hz). Gait was measured via a 20-foot pressure-sensitive walkway. Accelerometers were placed on the Achilles tendon to record heel strike during gait, and on the cheek to record jaw motion during chewing. Analyses: Differences between each chewing condition and age group were calculated using an analysis of variance for walking speed and cadence. Coordination of jaw occlusion and heel strike was established by comparing the timing of each via accelerometry and EMG tracings. Results: An individual's gait speed changes to match a specified chewing rate, regardless of age. Individuals walked significantly slower and with a slower cadence when chewing at a slow speed compared to all other conditions. Conversely, gait cadence increased significantly during fast chewing. Conclusions: This study establishes a baseline measure of gait metrics during the concurrent task of chewing in healthy adults. Typically the completion of two simultaneous motor tasks should interfere with one another's performance. Current findings indicate an intrinsic motor coordination between the rhythmical behaviors of chewing and walking in healthy aging neurological systems. Funding Source: None, work completed as part of PhD coursework

Title of Presentation: Phylogeny and Evolution of Prophages in 42 Genomes of *Mycobacterium marinum*

Presented By: *Janis Doss*
Department: Biological Sciences

Abstract: Bacteriophages (phages) are viruses that infect bacteria. Sometimes the phage lyses the host cell, releasing progeny phages, but some phages also have the ability to incorporate their genetic sequence into the host genome. Prophages are important drivers of evolution in prokaryotes, especially due to their role in horizontal gene transfer; they can even transmit virulence factors such as antibiotic resistance genes. Little is known about prophage phylogeny and evolution in aquatic mycobacteria. Bioinformatics techniques were used to track the emergence and evolution of prophages in 42 sequenced genomes of *Mycobacterium marinum*. M. *marinum* is a zoonotic aquatic pathogen, causing skin lesions and systemic infections. These strains cover a wide evolutionary range from closely related to more divergent, allowing us to observe prophage insertion and degradation over both large and small temporal scales. This study of prophage phylogeny revealed that many prophages are present within these *M. marinum* genomes; consistent with other prophage studies, the majority of them are highly degraded. Some prophages are found throughout several genomes and some are unique, indicating that the prophages likely entered their hosts at different times during the evolution of these strains. For instance, phiMmar02 from *M. marinum M* is found throughout many of the genomes in both intact form and in varying degrees of degradation. The phylogeny of this prophage is consistent with the predicted phylogeny of the host genomes, demonstrating that these prophages can stay within the host genome for a great length of time. Prophages can help us to better understand bacterial and phage genetics, virus-host interactions, and horizontal gene transfer. In further studies we will attempt to induce prophages from the mycobacterial strains that appear to contain complete prophages and we will investigate the phylogeny of prophages in other strains and species of mycobacteria.

Title of Presentation: Effects of Neighborhood and Landscape Fruit Availability on Avian Frugivore Response to Multiple Annual Fruit Production of Tropical Tree (*Guarea guidonia, Meliaceae*)

Presented By: *Spencer Schubert*
Department: Biological Sciences

Abstract: Birds play an important role as seed dispersers for many plant taxa around the world, and mutualistic relationships between frugivorous birds and plants is particularly common in tropical forests. Unlike temperate ecosystems, where growing seasons are shaped by abiotic factors, many tropical ecosystems are relatively aseasonal. Consequently, some tropical plants have evolved with subannual (i.e. multiple per year) reproduction. Previous studies have investigated the effects of inter-annual variability in fruit resource production (e.g. masting) on functional and behavioral response of avian seed dispersers, but these dynamics remain relatively unknown in systems with subannual fruit availability. Muskwood (*Guarea guidonia, Meliaceaee*) is mahogany tree widely distributed in Neotropical wet forests. In the Dominican Republic, reproduction is defined by 1-6 distinct flowering episodes per year that correspond to multiple peaks in fruit ripening February-August. From March-July 2017, I sampled foraging activity of frugivorous birds at 24 focal trees. Each tree was sampled with a minimum of three focal observations corresponding to non-overlapping subperiods (i.e. 15 Mar-15Apr, 29 Apr-29 May, 10 Jun-10 Jul). For each observation, an observer watched the crown of the tree for a continuous two-hour period (144 total hours), recording all detections of arriving birds and estimating the number of fruits ingested. I estimated ripe fruits on focal trees and similarly quantified neighborhood-level fruit availability of all plants within a 15-m radius for each observation. My results suggest feeding rates are best explained by a combination of landscape-level conspecific fruit availability i.e. trees bearing ripe fruits outside of peak fruiting in the population attracting more seed dispersers and neighborhood-level fruit abundance. Understanding these dynamics may offer insight into the evolution of reproductive phenology in tropical plants.

College of Sciences

Title of Presentation: No Free Lunch: Phenotypic Plasticity Comes at a Cost for Some Corals

Presented By: *Harmony Hancock*
Department: Biological Sciences

Abstract: Corals live close to their thermal maxima, making them susceptible to warming oceans. Acclimatization is an organism's ability to be flexible, or plastic, in response to environmental conditions. Recent studies suggest coral acclimatization may be an important mechanism for predicting coral survival under climate change. Acclamatory potential was tested in two massive coral species, *Porites lobata* and *Goniastrea retiformis*, by exploiting the natural temperature variability of three microhabitats on Ofu Island, American Samoa. Corals were collected from a site characterized by moderate temperature variability, and transplanted to sites of low, moderate and high temperature variability. Heat shock assays were performed at the beginning and end of the seven-month transplant period to measure performance. Measurements of growth, chlorophyll retention and symbiont density revealed a similar trend for both species. Corals from the warmest site outperformed corals from the coolest site in heat shock assays, but growth rates of these corals were significantly lower. These results suggest that while corals from warm environments may be more tolerant of heat shock, resiliency comes at a price to overall fitness.

Title of Presentation: Evaluation and Modeling of TickBot: a Tick-Killing Robot

Presented By: *Alexis White*
Department: Biological Sciences

Abstract: Southeastern Virginia is a mixing bowl for ticks and tick-borne pathogens with recent invasions sweeping in from both the north and the south. More than 90% of ticks in the Hampton Roads area of Virginia collected (part of a long-term active surveillance project) are lone star ticks (*Amblyomma americanum*), which are an aggressive human-biting tick species. TickBot is a tick-killing robot that lures ticks, using movement and carbon dioxide, to a permethrin treated cloth as it circles a predetermined perimeter. Previous studies have shown TickBot's ability to protect a treated area from lone star tick encounters for approximately 24-hours. In the summer of 2017, TickBot was implemented at the Child Development Center at NASA Langley, Hampton, Virginia. TickBot supplemented other integrated tick management (ITM) methods used at this site including a mulch barrier and frequent mowing. Mathematical models can be used to explore tick population dynamics, quantify risk of tick-borne disease, and identify strategies to reduce that risk. Using the data from our surveillance project, along with the results from TickBot field studies, a mathematical model was developed to explore optimal ITM usage of the TickBot. Results of this model show the relationship between frequency of TickBot application and probability of tick encounter in the treated area.

Title of Presentation: An Indirect Mutualism Between Host-Specific Insects and Hackberry Trees (*Celtis spp*), Mediated by Migratory Songbirds.

Presented By: *Chance Hines*
Department: Biological Sciences

Abstract: We examined how ephemerally abundant leaf-galling hackberry psyllids (*Pachypsylla spp*) benefit their obligate hosts, hackberry trees (*Celtis spp)*, by attracting foraging migratory songbirds in a coastal region of eastern Virginia. Standardized foraging bird transects conducted during the 2016 and 2017 autumn migration revealed that hackberry was a preferred songbird foraging tree during both years, but the preference was exhibited before and during the psyllid irruption. Hackberry psyllid abundance was a significant predictor of the timing of hackberry seed dispersal. Interestingly, areas where hackberry was present were also epicenters of seed dispersal for other commonly consumed fruits. The patterns of foraging and seed rain observed were supported by field experiments where hackberry leaves were placed beneath isolated eastern baccharis (*Baccharis hamifolia*) shrubs. Migrant songbirds spent more time foraging and deposited more seeds in baccharis shrubs where hackberry leaves had been placed relative to controls. To our knowledge, this is the first example of migratory songbirds mediating an indirect mutualism between a parasite and its host.

Title of Presentation: First Report of *Candidatus Rickettsia mendelii* in Ixodes brunneus Ticks Collected in the United States

Presented By: *Alexandra Cumbie*
Department: Biological Sciences

Abstract: *Rickettsia spp.* are intracellular bacteria commonly found in ticks and other acarids including lice and mites. Some of the more commonly known *Rickettsia spp.* are widely studied because of their pathogenicity. These include *Rickettsia rickettsii*, the causative agent of Rocky Mountain Spotted Fever, found in American dog ticks, and *Rickettsia prowazekii,* the causative agent of typhus fever, found in common body lice. Less known are the non-pathogenic rickettsial species which are commonly thought of as being endosymbionts for their arthropod vector. One such organism is *Candidatus Rickettsia mendelii*, a recently reported rickettsial species, which is phylogenetically related to R. bellii. Thus far, it has only been reported in black-legged tick species in the Czech Republic from birds and vegetation. In our study, we collected black-legged ticks from birds in Virginia. Upon examining the *Ixodes brunneus* ticks collected, we found these ticks also were infected with *Candidatus Rickettsia mendelii*, as determined by sequencing of their gltA gene. This is the first time that this rickettsial species has been reported in black-legged ticks in North America. This research indicates a need for the identification of endosymbiont rickettsial species existing in ticks from different locations as we do not understand or know what role these play in pathogen transmission. This information could also provide insight into pathogen-vector-host activity and migration/movement of different rickettsial species from different geographic origins.

College of Sciences

Title of Presentation: Irish Ethnobotany

Presented By: *Amanda Newbold*
Department: Biological Sciences

Abstract: During a multi-disciplinary study abroad program in May 2017, plants and botanicals of Ireland were researched, photographed, and identified. The objective of the study was to learn the ethnobotany in Ireland through an interprofessional global health class. The garden served as the epicenter for the neighborhood, schools, and community as a source of nourishment, medicine, and fellowship. A natural healer, who specialized in the utilization of botanicals, presented several botanicals with a long, successful health history in Ireland. The plants included Nettles (*Urtica dioica*), Blackberries (*Rubus spp.*), Dandelion (*Taraxacum officinale*), Rue (Ruta graveolens), Gorse (*Ulex europaeus*), Onion (*Allium cepa*), Carrageen/Irish Moss (*Chondrus crispus*), and Garlic (*Allium sativum*). Nettles are often boiled and consumed to improve circulation. Blackberries are an antibiotic for the blood. Dandelion is boiled in a tea or eaten to ease stomach pain. Rue is good for kidney health and is used as a natural diuretic. Gorse is boiled and consumed for a severe cough and the stem/leaves are a cure for extreme itching. Onion is customarily steamed in ashes and eaten as a sore throat cure. Irish moss is consumed for an upset stomach. Garlic is traditionally boiled in milk and consumed to soothe the common cold. Several Potentilla species, from the Rose family, were commonly boiled and consumed as a bog root tea. The tea has antimicrobial and antifungal properties and was regularly used to treat sore throats, dysentery, and diarrhea. *Potentilla argentea* in particular is known for its many health benefits and is an herbal remedy used for its antioxidant and anti-inflammatory properties. *Equisetum arvense*, or horsetail, is also used for its anti-inflammatory response. Research confirmed that a community garden is an important part of the residents' livelihood and is an integral part of medicine in rural Ireland. The study concluded that a multi-disciplinary approach incorporating traditional and herbal medicine is necessary when introducing ethnobotany into global health practice.

Title of Presentation: Bone Morphogenic Protein Receptor 1a Signaling Controls Generation of Inflammatory IL-17 Secreting CD4+ Effector T Cells

Presented By: *Colin Simms*
Department: Biological Sciences

Abstract: Despite recent advances, regulation of pathogenic inflammatory CD4+ T cells is not well understood. Here, we provide extensive evidence that generation of cells expressing pro-inflammatory cytokines, such as IL-17 and IFN-γ, are controlled by bone morphogenic protein receptor 1α (BMPR1α), a receptor for TGF-β family cytokines. While the many functions of TGF- β in regulating immune system homeostasis and generation of T cell subsets has been extensively studied, the role of bone morphogenic proteins (BMPs) and their receptors in controlling initiation, maintenance and resolution of immune responses, is much less appreciated. BMPs represent the largest subset of cytokines in the TGF-β family and regulate a wide-range of biological activities, however, to date, no systematic studies have been reported on the role of BMPs and their receptors in regulating T cell functions. We report that BMPR1α is upregulated in activated CD4+ T cells, and in the presence of BMPs, inhibits the generation of Th17 cells. CD4+ T cells lacking BMPR1α preferentially differentiate into effector cells expressing elevated levels of IL-17, IFN-γ, Rorc, and other transcription factors and cytokines that define the Th17 lineage. BMPR1α-deficient CD4+ T cells enhanced local inflammation and amplified the severity of chemically-induced colitis. These findings provide conclusive evidence that, in CD4+ T cells, BMPs have opposing function to TGF-β and describe BMPR1α as a critical element in controlling T cell lineage commitment and the effector profile of adaptive immune response.

College of Sciences

Title of Presentation: The Role of Northern Short-tailed Shrews in the Maintenance of *Borrelia burgdorferi*

Presented By: *Laura Bitzer*
Department: Biological Sciences

Abstract: The role of small mammals in the maintenance of tick-borne pathogens has considered the white-footed mouse the most important reservoir of *Borrelia burgdorferi*, the causative agent of Lyme disease. To understand the role of other small mammals, shrew tissue samples were collected from the Hampton Roads area and donated by the Virginia Museum of Natural History. These tissue samples span a large portion of Virginia, and temporally the past century (1911-2017). Preliminary testing of shrew tissue samples indicated greater than 50% prevalence of *Borrelia spp.* infection (n=330). Ticks removed from shrews showed more than 90% prevalence (n=33). Sequencing a portion of the *Borrelia spp.* positive shrew and tick samples showed some of the Borrelia present in shrews or associated ticks were *B. burgdorferi* (4/4 and 6/10 respectively). Additional testing is needed to determine the exact relationship between shrews and the Borrelia species they may harbor.

Title of Presentation: Delayed-Type Hypersensitivity and Interferon-Gamma Response in Striped Bass (*Morone saxatilis*)

Presented By: *Jessica Miller*
Department: Biological Sciences

Abstract: Type IV delayed type hypersensitivity (DTH) and expression of INF-γ have been used for detection of mycobacterial infections in humans and in animals. We tested DTH reactions in striped bass (*Morone saxatilis*) experimentally infected with *Mycobacterium marinum*. Captive striped bass inoculated with PBS or with live *M. marinum* were injected in the caudal peduncle and the mid-venter region with purified protein derivative (PPD) and heat-killed *M. marinum*. The fish were observed and the width of the caudal peduncle at the injection site was measured post-injection. Fish were exsanguinated and the anterior kidney was aseptically removed for the isolation of leucocytes that were cultured. Cells were incubated for 24 and 48 hours with PBS, *M. marinum* particulate, or *M. marinum* PPD. These cells will be tested for IFN-γ transcription and quantified with RT-qPCR. These data will be used to advance the development of a non-lethal diagnostic assay for mycobacterial exposure in fishes. This will facilitate disease ecology research in striped bass and other species, and improve containment and control methods in aquaculture.

Title of Presentation: Synthesis, Characterization, and Electrocatalytic Studies on Two Novel Cobalt(III) Complexes

Presented By: *Michael Celestine*
Department: Chemistry and Biochemistry

Abstract: The amount of fossil fuels on the planet is limited and with the recent surge in their global use, the necessity to find their replacement is increasingly critical. In addition to the limited supply, their use is believed to have observable adverse effects on the global climate and on human health. Hydrogen is a clean renewable energy source as its byproduct upon combustion with oxygen is water. The production of hydrogen via some first-row transitional metal complexes is believed to be a cheaper alternative when compared to noble metal catalysts. Certain cobalt-containing complexes such as cobaloximes were recently reported to reduce protons in various solvent media for the production of hydrogen. Two complexes, [Co(bpy)2(PCA-(CF3)2)](PF6)2H2O (1) and [Co(phen)2(PCA-(CF3)2)](PF6)2-1.25H2O (2) (where N-N = 2,2-bipyridine (bpy) or 1,10-phenanthroline (phen), and PCA-(CF3)2 = N-(3,5-bis(trifluoromethyl)phenyl)pyridine-2-carbothioamide), were synthesized and characterized via NMR (1H, 13C, and 19F), UV-visible, FT IR, and mass spectroscopies. In the electrocatalytic studies the CoIII/II redox couples were observed at +0.04 V and +0.05 V and the CoII/I redox couples were observed at -1.05 V and -1.07 V for complexes 1 and 2, respectively. It is observed through the spectroelectrochemical data that the two complexes were very stable as the cobalt(I) species with the loss of the PCA-(CF3)2 ligand not being observed in the spectra; and from the electrocatalytic studies the two complexes cobalt(I) species were observed to react with protons in solution to produce hydrogen.

Title of Presentation: Design, Synthesis and Study of N-acetyl D-glucosamine-based Triazole Derivatives as Organogelators

Presented By: *Dan Wang*
Department: Chemistry and Biochemistry

Abstract: Low molecular weight gelators (LMWGs) are small molecules that are able to immobilize organic solvents or aqueous solutions and form reversible gels. Among the different classes of small molecular gelators, carbohydrate derivatives have gained much attention since they are naturally abundant, renewable and biocompatible. Recently we have shown that certain glycosyl triazole lipids are effective LMWGs for many solvents including toluene, alcohol and water. In this study, we incorporated different spacers between the triazole functional group and the sugar moiety and analyzed their gel forming properties. The rational design strategy has led to a new series of effective supramolecular gelators. In this presentation, the synthesis and characterizations of these new triazole analogs will be presented, their applications as soft materials for drug delivery will also be discussed.

Title of Presentation: Synthesis and Gelation Properties of a Series of 4,6-o-alkylidene Protected Monosaccharides

Presented By: *Kristen Bashaw*
Department: Chemistry and Biochemistry

Abstract: Carbohydrate derivatives have intrinsic bio-compatibility which are useful in the formation of environment friendly new materials. Carbohydrate based low molecular weight gelators (LMWGs) have attracted increasing attention due to their potential broad applications in many fields spanning from biomedical research to advanced materials. The resulting gels are fully reversible due to the noncovalent driving forces for gelation. Many different structural classes have been shown to be effective gelators. Previously we have found that 4,6-O-benzylidene acetal protected D-glucose and D-glucosamine derivatives formed robust organogels and hydrogels. In this study, we synthesized a series of D-glucose and D-glucosamine derivatives with 4,6-O-alkylidene acetal functional group and studied their gelation properties in several organic solvents and water. A few analogs were found to be effective LMWGs for both organic solvents and water. In this presentation, the synthesis, characterization, and controlled release of naproxen using the gelators will be presented.

Title of Presentation: Folding of the Intrinsically Disordered Par-4 Tumor Suppressor and Its Role in Cisplatin Treatment of Cancer

Presented By: *Andrea Korell*
Department: Chemistry and Biochemistry

Abstract: The field of structural biology plays a key role in the advancement of cancer research and the development of new innovative therapeutics. Prostate apoptosis response-4 (Par-4) is a 38kDa intrinsically disordered tumor suppressor protein. Par-4 down-regulation is observed in many forms of cancer while Par-4 up-regulation is characteristic of neurodegenerative diseases like Alzheimer's. Cleavage of Par-4 by caspase-3 forms an approximately 23kDa fragment (cl-Par-4) that encompasses both the Selective for Apoptosis Induction in Cancer Cells domain (SAC domain) and the leucine zipper domain responsible for homodimeric coiled-coil formation. This cleaved fragment is necessary for nuclear translocation after which Par-4 exerts its pro-apoptotic effect, inhibiting pro-survival genes like TOPO-1 and NF-Æ™B. We aim to uncover unknown structural information about cl-Par-4 including folding within the Selective for Apoptosis Induction in Cancer Cells (SAC) domain and the effects of pH and salt on coiled-coil formation in the leucine zipper domain. Additionally, Par-4 down-regulation confers resistance to the chemotherapeutic drug cisplatin in cancer cells. Consistent with this finding, cisplatin exerts a stabilizing effect on cl-Par-4 and increases cellular Par-4 levels. Cisplatin will be combined with cl-Par-4 to determine structural changes in Par-4 upon binding and the specific amino acids involved in the interaction. These questions will be investigated using a state-of-the-art NMR/SAXS/computational approach to provide structural information about this interaction which could further be utilized in cancer therapy. A structural understanding of the Par-4-cisplatin interaction could open pathways for new therapeutic approaches to treat cancer using both Par-4 and cisplatin to provide a synergistic anti-tumor effect.

Title of Presentation: Structural Determination of the Picornavirus Replication Complex as a Potential Target for Novel Therapeutics

Presented By: *Meghan Warden*
Department: Chemistry and Biochemistry

Abstract: Picornaviruses constitute a family of positive-stranded RNA viruses, divided into seven genera. Several members of the Picornaviridae family cause a wide range of diseases in humans including the common cold, poliomyelitis, hand foot and mouth disease, and dilated cardiomyopathy. The Picornavirus genome, consisting of ~7.5 kb, is replicated through a highly conserved mechanism. Negative-stranded copies are generated through the action of a viral RNA replicase. Subsequently, positive-stranded RNA is replicated from the negative-stranded template and utilized to further infectivity. Presumptive cloverleaf-like structures located at the 5';untranslated region (5-CL) in positive-stranded RNA and the 3-untranslated region (3-CL) in negative-stranded RNA, are essential elements in replication. Each cloverleaf consists of three stem loops (B, C, and D) and one stem (A), which interact with a variety of virus and host factors. In this presentation, the solution structures of human rhinovirus isotype 14 SLB and 5Â-CL are investigated, in addition to human coxsackievirus B isotype 3 SLB and SLD of the 3-CL using nuclear magnetic resonance spectroscopy and other techniques such as small-angle X-ray scattering. A deeper understanding of these structures will offer invaluable information about Picornavirus replication. The results from these studies have the potential to elucidate unique drug targets in hopes of developing more effective treatments that are transferable across the entire family.

Title of Presentation: The Role of the Stringent Response in *Clostridium difficile* Virulence and Survival

Presented By: *Astha Pokrel*
Department: Chemistry and Biochemistry

Abstract: Clostridium difficile, which is tolerant of an array of antibiotics, is responsible for causing Clostridium difficile infection (CDI). The public health impact of CDI is compounded by an extremely high recurrence rate therefore, development of new preventive strategies are urgent. Studies have indicated that starvation triggers *C. difficile* spore formation but the exact mechanisms of C. difficile propagation, virulence and persistence are unclear. Here, we targeted a globally conserved bacterial stringent response (SR) pathway, mediated by the accumulation of guanosine pentaphosphate (pppGpp) and guanosine tetraphosphate (ppGpp). In a number of pathogens, the SR regulates stress survival through virulence factors production. Notably, chemical inhibition of (p)ppGpp synthetase activity by ppGpp analogs has also been demonstrated in some bacteria although, such synthetase inhibitors fail to perturb (p)ppGpp synthesis universally. We report that *C. difficile* encodes a large bifunctional Rel/SpoT homolog (RSH), and two small alarmone synthetases. We also show impaired *C. difficile* Îrsh survival during stationary phase growth and demonstrate reduced bacterial tolerance to ampicillin, which is suggestive of RSH's potential role in enhancing beta lactam antibiotic survival. We aim to molecularly and structurally characterize RSH and in that attempt, we have cloned full length RSH and four truncated synthetase domain constructs. Expression of *C. difficile* (p)ppGpp synthetase domain is toxic to E. coli growth. Furthermore, while *E. coli* cells accumulate detectable cytoplasmic ppGpp under starvation stress *C. difficile* cells appear not to, indicating that the SR in this organism is triggered by stresses other than nutrient deprivation. Our investigation on ppGpp synthesis due to starvation in *C. difficile* is ongoing, but we are also comparing ppGpp levels in wild type *C. difficile* +/- ampicillin. Ultimately, we aim to study the effects of available synthetase inhibitors against the *C. difficile* SR pathway and to design *C. difficile* specific (p)ppGpp synthase inhibitors.

Title of Presentation: Using Antimicrobial Peptides to Combat the Human Pathogen *Clostridium Difficile*.

Presented By: *Adenrele Oludiran*
Department: Chemistry and Biochemistry

Abstract: The use of naturally occurring peptides to combat one of the most dangerous human pathogens in the world now is not only a welcome development but urgent. *Clostridium difficile* is a Gram-positive bacterium that can survive multiple classes of antibiotics. *C. difficile* infection causes up to $5 billion in medical costs and 45,000 deaths yearly in United States alone. Host-Defense Peptides (HDPs), natural antimicrobial peptides produced, in vertebrate mast cells are employed, display broad spectrum antimicrobial activities through innate immune system. Piscidins, fish-derived HDPs can also form complexes with copper (Cu), a known antimicrobial transition metal, to enhance its activities. Two well characterized piscidin peptides (p1 and p3), along with their metallic complexes, inhibit their cell growth, viability, and biofilm formation in *C. difficile*. Copper treatment of *C. difficile* and other facultative anaerobic bacteria *Pseudomonas aeruginosa* and *Escherichia coli.* Unexpectedly, oxidative stress from copper treatment appears to have different effect in aerobic and anaerobic conditions. Increase copper concentration appears to stimulate biofilm formation in anaerobic conditions, in contrast to what has previously been observed in aerobic conditions. Growth inhibition and cell killing do not appear to be oxygen dependent, suggesting that the role of oxidative stress in stimulating biofilm formation merits further examination.

Title of Presentation: Characterization of Long-range Interaction Networks in Proteins Using Key Network Principles

Presented By: *Zeinab Haratipour*
Department: Chemistry and Biochemistry

Abstract: To appreciate the native three-dimensional structure of a protein which governs its functional properties, we need to fully understand the protein folding process. Within this field we are most interested in researching protein folding to determine how proteins with different sequences, secondary structures and functions share the same overall topology. We have proposed that a specific subset of the long-range interaction network between select amino acids is an important determinant of the native topology. This hypothesis is tested using a set of nine proteins that share a Greek-key topology but differ in sequence, secondary structure and function. The model proteins are selected from three different superfamilies: the Death Domains, η±/β plaits and Immunoglobulins. During this presentation, the results from three computational network approaches will be discussed. In the first test, the network parameter betweeness-centrality (BC), is calculated for all amino acid residues in each protein. Our analysis shows that the positions with the highest BC value are in similar geographical locations in all nine proteins which suggests they are key to governing the network. In the second test, the network diameter is calculated for each protein network. Nodes are then removed from the protein network and the diameter is recalculated. Removing of amino acid residues that have the highest BC value results in a larger increase in the diameter than those that are selected randomly. In the third test, the behavior of nodes with high BC value is compared with randomly selected nodes in the creation of a giant cluster. By applying the same number of residues, high BC nodes make a giant network faster than randomly selected nodes. In summary, it can be concluded that there are specific contacts and residues in all nine proteins that show similar behavior and indicate the potential importance in governing the Greek-key topology.

Title of Presentation: Computational Exploration of the β-grasp Fold for Structure, Stability, and Folding

Presented By: *John Bedford*
Department: Chemistry and Biochemistry

Abstract: Protein folding is an area of biochemistry that is vast and heavily researched yet unresolved. Some would argue it is one of the greatest mysteries of biology. Thus understanding the process of protein folding and how proteins could misfold is critical as misfolded proteins play a role in many disease states. A firm knowledge of all things comprising proteins is necessary when trying to solve this mystery. One of the simplest concepts, yet most complex, is that of residue-residue interactions. Understanding which interactions form first and which are most critical for a protein's structure, function, and stability is vital and we propose that these contacts will be the most persistent. Ascertaining this information was done through the use of molecular dynamics techniques. Using molecular dynamics, a model protein was put in an in silico environment, that is similar to that of the cell, to be studied. The immunoglobulin-binding domain of protein G was used as model protein for this study. It is small and contains mixed alpha-beta secondary structure and a β-grasp fold. It is also found in a mesophilic organism. By studying this protein one can see which contacts are easily broken and which persist the longest within the protein structures as they are unfolded. This is done by analyzing select pairs of contacts and counting how many times those residues come within a given distance of each other. This presentation will cover the results of our study.

Title of Presentation: Developing Molecular Tools to Determine Stringent Response in *Clostridium Difficile.*

Presented By: *Asia Poudel*
Department: Chemistry and Biochemistry

Abstract: *Clostridium difficile* infection (CDI) is one of the most common cause of nosocomial diarrhea in developed world. The management of the infection is challenged as the bacterium exhibits resistance to most of the antibiotics in use. Therefore, development of alternative therapeutics and in-depth understanding of resistance mechanisms are imperative against CDI. Stringent response, an adaptive bacterial response during environmental stress, has been recognized as one of the cause for the loss of antimicrobial susceptibility among many pathogens but it has never been characterized in *C. difficile*. The stringent response drives cellular reprograming of transcriptional as well as translational machinery via two intracellular signaling molecules - guanosine pentaphosphate (pppGpp) and guanosine tetraphosphate (ppGpp). Both multidomain long RSH and single domain small alarmone synthetases (SASs) catalyze the production of these signaling molecules. RSH family enzymes are well characterized but the SAS family was discovered recently and its function and regulation are poorly understood. *C. difficile* possesses genes encoding these enzymes whose expression is believed to be regulated by various environmental cues including antibiotic stress. We study the structural and functional characterization of *C. difficile*'s SASs (RelQ and RelC) and their relationship with antibiotic resistance mechanism. Currently, we are developing methodology to express and characterize these proteins in E. coli. In addition, we are also developing reporters to analyze the spatiotemporal expression of these proteins and determine what environmental stresses trigger the *C. difficile* stringent response.

College of Sciences

Title of Presentation: Tracing Actin Filament Bundles in 3-Dimensional Electron Tomography Density Maps of Hair Cell Stereocilia

Presented By: *Salim Sazzed*
Department: Chemistry and Biochemistry

Abstract: Cryo-electron tomography is an effective method to visualize the 3-dimensional organization of large cellular machineries in their native cell and tissue context.. Due to electron reconstruction artifacts, resulting in noisy density maps of anisotropic resolution, challenges that are augmented by molecular crowding and high complexity inherent in biological specimen. Although a number of image processing methods have recently been proposed to detect filaments in a 3D volume, we found that significant manual work was needed to trace the objects of interest in the cryo-electron tomograms of hair bundle stereocilia. In this work we developed a strategy for effective filament tracing method that allowed fast volumetric model building of a filament bundle in a resolution-anisotropic high noise environment. A comparison of automatically traced filaments with manual traced filaments revealed an average model coordinate discrepancy of less than 3 voxels for 326 of 330 filaments in stereocilia.

Title of Presentation: REXTAL: Regional Extension of Assemblies Using Linked-Reads

Presented By: *Tunazzina Islam*
Department: Chemistry and Biochemistry

Abstract: It is currently impossible to get complete de-novo assembly of segmentally duplicated genome regions using genome-wide short-read datasets. Here, we devise a new computational method called Regional Extension of Assemblies Using Linked-Reads (REXTAL) for improved region-specific assembly of segmental duplication-containing DNA, leveraging genomic short-read datasets generated from large DNA molecules partitioned and barcoded using the Gel Bead in Emulsion (GEM) microfluidic method (Zheng et al., 2016). We show that using REXTAL, it is possible to extend assembly of single-copy diploid DNA into adjacent, otherwise inaccessible subtelomere segmental duplication regions and other subtelomeric gap regions. Moreover, REXTAL is computationally more efficient for the directed assembly of such regions from multiple genomes (e.g., for the comparison of structural variation) than genome-wide assembly approaches.

Title of Presentation: Synthesis and Study of Sugar Derived Molecular Gelators and Their Applications

Presented By: *Joedian Morris*
Department: Chemistry and Biochemistry

Abstract: Low molecular weight gelators (LMWGs) have gained increased attention over the past years due to their wide variety of applications. We have synthesized and studied several monosaccharide derivatives that can function as molecular gelators in water or aqueous solutions. These compounds were prepared using D-glucosamine as the headgroup and various ester functional groups were incorporated. The gels obtained by the glycolipids can be useful biomaterials for enzyme immobilization and drug delivery carriers. A few representative gelator compounds were characterized and the resulting gels were studied for the sustained release of trapped drug molecules. In this presentation, the synthesis and analysis of these molecular gelators will be presented and the applications of these soft gels will also be discussed.

Title of Presentation: Synthesis Characterization of Novel Titanium(IV) Schiff Base Salen Complexes using various spectroscopic techniques and X-Ray crystallography

Presented By: *Raj Gurung*
Department: Chemistry and Biochemistry

Abstract: Titanium-containing complexes have been reported to be important for their catalytic and material applications through the coordination of a tetradentate Schiff base ligand, viz. N, N-ethylene bis(salicylideneiminate) dianion (salen). Salen is a known ligand, which has been reported as a rigid and planar coordination upon coordination with various metal centers. Numerous chiral titanium-containing salen complexes have been extensively studied due to their catalytic properties which have been useful in organic synthesis such as polymerization, oxygenation of an alkene, and epoxidation. However, studies reporting the characterization of achiral titanium(IV) salen complexes are scarce due to their intricate nature. The main hypothesis is as follows: the rigid tetradentate salen ligand will be able to control the coordination properties of titanium(IV) salen complexes creating a uniform environment around the titanium(IV) metal center and the ligands in the axial position will be able to stabilize the mononuclear complex. Such complexes would be comparatively less expensive and easier to prepare synthetically, and thus could represent an excellent alternative to the synthesis of the more expensive chiral titanium(IV) complexes. Our research group has designed a series of octahedral titanium(IV) Schiff base complexes with various substituted phenols as ligands. Such complexes were analyzed for their purity and characterized using elemental analysis, electrochemistry, UV-visible, 1H, 13C, 19F, and 49Ti NMR and FTIR spectroscopies. From the elemental analysis data, the complexes were proposed to have the general structural formula, [Ti(salen) OPh-X)2] (where X = F, NO2 and CH3). Based on the results from our study, we concluded that achiral titanium(IV) Schiff base salen complexes can be synthesized more efficiently, and at a cheaper cost when compared to chiral titanium(IV) salen complexes.

Title of Presentation: Demonstration of Horizontal Gene Transfer from Genetically Engineered Cyanobacteria to Wild-Type E. coli

Presented By: *Cherelle Barnes and Thu Nguyen*
Department: Chemistry and Biochemistry

Abstract: The designer algae approach could provide a new generation of agriculture technology for renewable energy production without requiring arable land or freshwater resources, which could be strategically important to many parts of the world for sustainable development. However, biosafety regarding genetically engineered (GE) cyanobacteria must be addressed before the synthetic biology approach could be widely used for practical applications. One of the possible biosafety risks, in the event of accidental release of GE organisms, is horizontal gene transfer (HGT) from GE cyanobacteria to other organisms, such as *E. coli*. HGT events can sometimes be noticed in certain genomic analyses, but it is not entirely clear how often such events occur. Does it occur at a time scale of million years, hundreds of years, or a few days? To answer this type of fundamental question, we have recently created a unique set of DNA constructs containing various selectable markers, such as the antibiotic resistance gene and fluorescent protein tags. The DNA constructs were cloned into a pUC57 plasmid and delivered to the host, *Thermosynechococcus elongatus* BP1, via electroporation. The resultant GE Thermosynechococcus cells were used to test for HGT by co-incubating them with the wild-type E. coli cells in a liquid culture. The cells from the co-culture were then plated on LB agar media in the presence and absence of the relevant antibiotics. The resulting colonies were then counted to assess the HGT frequency. Our experimental results have demonstrated that the DNA construct with the transgenes in GE Thermosynechococcus was horizontally transferred into E. coli cells within 24 hours of co-culturing. This may represent a significant finding on GE cyanobacteria biosafety risk assessment, potentially valuable to the biotechnology community and policy makers, as well as the general public.

Title of Presentation: An Efficient Numerical Model of Bioparticle Transport

Presented By: *Charles Armstrong*
Department: Mathematics and Statistics

Abstract: Numerical models of bioparticle transport are of interest to medical researchers for their applications in the development of lab-on-a-chip (LOC) devices. One potential use for LOC technology is in measuring the deformation of red blood cells, which can provide diagnostic information for diseases such as malaria. In this work we compute the membrane deformation of a spherical capsule in shear flow. The capsule membrane is modeled as an infinitely thin shell suspended in a fluid domain. The fluid velocity is computed using the lattice Boltzmann method and the interaction between the fluid and the membrane is modeled using the Immersed Boundary method. Implementation of the Full Approximation Storage multigrid method during the computation of the fluid velocity allows for an increased time step, which results in efficiency gains of a full order of magnitude. The accuracy and convergence of the method is discussed and compared with previously proposed numerical methods.

College of Sciences

Title of Presentation: Submarine Groundwater Discharge in the Chesapeake Bay: Quantifying the Importance of Field Parameters

Presented By: *Charles Carlson*
Department: Ocean, Earth and Atmospheric Sciences

Abstract: Terrestrial and oceanic forces drive water flow near the coast to produce submarine groundwater discharge (SGD). In order to quantify the contribution of SGD to geochemical and hydrologic budgets for the lower Chesapeake Bay, this investigation models three transects that were selected to span different topographic gradients. Each two-dimensional transect measures 5 km in the shore-perpendicular direction, with vertical elevations ranging from 10 m above sea level to 50 m below sea level. First, a suite of code displays NOAA topography and bathymetry, allows the user to choose a transect location, and outputs a numerical domain for a series of steady-state calculations solved by a USGS program, SUTRA. SUTRA's finite element and finite difference method computes buoyancy-driven and variable-density flow, solves the coupled solute transport equation, and predicts areas of discharge and recharge near the coast. Models suggest SGD in all transects, with freshwater discharging below sea level and seawater recirculating in steep bathymetry. Of the parameters explored in sensitivity tests, permeability has the greatest effect on SGD. This series of models provides a framework for identifying zones of high groundwater flow and suggests which field measurements would be most valuable to better constrain the groundwater contribution to the coast.

Title of Presentation: Improved Reconstructed Sea-Level Dataset for the Indian Ocean

Presented By: *Praveen Kumar*
Department: Ocean, Earth and Atmospheric Sciences

Abstract: Lack of Tide Gauge (TG) data, both spatially and temporally for the study of past sea-level (SL) variability in the Indian Ocean (IO) has motivated attempts to develop new and improved SL products. With some of the world's most densely populated and vulnerable coastlines, planning and mitigation efforts rely on accurately differentiating the long-term trend in global mean sea level from internal variability, which in turn requires a long SL dataset. Reconstructions and re-analyses are methods available to fill spatial and temporal gaps left by TGs. However, there have been inconsistencies identified across these products, one such example being, the disagreement in the inter-product Pacific-independent decadal SL variability in the Southwest IO. This bivariate reconstruction method uses cyclostationary empirical orthogonal functions (CSEOFs), combining SL and sea surface temperature data to create a SL reconstruction. With such reconstructions, one way to improve the dataset is selecting and using only good quality TGs. In the IO, out of 157 available TGs, we use only 21 and in doing so we have developed a more robust gridded SL product spanning 1950 - 2013. It shows a strong agreement to the AVISO data in terms of its correlations, minimal differences between trend maps, and when compared to the reconstructed dataset by Hamlington et al., 2011, this product is seen to have better SL and more realistic estimates of SL in the IO. Signals associated with the Indian Ocean Dipole (IOD) can be better resolved using this dataset as the correlation between the Dipole Mode Index (DMI) calculated from ER-SST and the reconstruction is 0.56 from 1950 - 2013. Using this product, we investigate whether the drop in SL over the Equatorial Northern IO seen in the AVISO dataset for the years 2002 and 2006 is a part of decadal variability or not. These results will provide an improved understanding of how SL trends and variability can be modulated by internal climate variability in the IO.

Title of Presentation: Numerical Simulation of Microbunching Instability

Presented By: *Dallan Duffin*
Department: Physics

Abstract: Particle accelerators are an important tool for understanding the subatomic realm. The development of these machines can costly and difficult; therefore, there is interest in simulating computationally how a particular design behaves. There is an ongoing interest in the calculation of self-forces between the accelerated particles which are difficult to calculate analytically. Of these self-forces, coherent synchrotron radiation allows for systemic, non-linear effects that compromise the quality of the beam including microbunching instability. We present an innovative particle tracking simulation including self-forces at a feasible computational cost. We test the code's validity by comparing to an earlier study on microbunching instability. A modulated flat-top distribution is compressed by a bunch compressor. The ratio of modulation amplitudes before and after compression are tested for a range of modulation wavelengths. The results are then compared to the earlier study.

Title of Presentation: DREAM Based DAQ System for the BONuS Experiment at Jefferson Lab

Presented By: *Jiwan Poudel*
Department: Physics

Abstract: The BONuS experiment has been designed to study the free neutron structure at Jefferson Lab using spectator tagging technique in d(e,ep)X inelastic scattering. We detect the scattered electrons by the standard CLAS12 detector, but backscattered low momentum spectator protons in this experiment are detected installing a new RTPC detector. Signals on the RTPC readout are directly sent to the DREAM electronics which pre-processes those signals and buffers them in 512 cell circular memory. While processing signals, DREAM chip performs the amplification, filtering, shaping, discrimination and sampling. A FEU is used to assemble eight DREAM chips along with ADCs for getting digitized output data coherently. Each compact chip contains 64 channels, so we easily handle total 17280 readout pads of our detector using 34 FEUs. Gigabit Ethernet link are used to send out data from FEU to the backend unit, whereas a USB cable is used for the slow control of the FEUs and DREAMs. Slow-control allows to configure various parameters such as gain of the amplifier, shaping parameters, discrimination in the trigger building process and many more. We can also fix event-size from the slow-control, which qualifies DREAM for dead-timeless readout of up to 20MHz with a trigger rate upto 20KHz. During the last year, we performed a detailed study of DREAM performance with a prototype RTPC which provided some promising results. These results are very significant for BONuS12, and we believe it would be notable to other physics experiments as well.

College of Sciences

Title of Presentation: Social Anxiety is Related to an Electrocortical Marker of Cardioceptive Attention

Presented By: *Nathan Hager*
Department: Psychology

Abstract: Enhanced attention to body state, including physiological sensations of anxious arousal, has been observed in socially anxious individuals. For example, compared to those low in social anxiety, people high in social anxiety respond to false feedback of increased heart rate with greater anxiety and self-focus and display better cardioceptive accuracy (Stevens et al., 2009; Wells ; Papageorgiou, 2001). However, no study has examined whether social anxiety is associated with increases in the heartbeat evoked potential (HEP), an electrocortical marker of cardioception (Montoya, 1993). The current study extracted the HEP from a sample of 38 undergraduate volunteers with high (HSA, n = 19) and low (LSA, n = 19) levels of social anxiety as they performed a change detection task. False feedback of accelerated heart rate was randomly given on 50% of trials. EEG epochs were locked to the R-peak of heart beats during trials with and without accelerated heart rate cues. A significant interaction between group and cue indicated greater HEP amplitude in HSAs during heart rate acceleration cue trials compared to standard trials. HSA's HEP amplitude during the heart rate acceleration cues was also greater compared to LSAs. These findings are the first to directly link social anxiety to increased attention to heart beats as indicated by the HEP. This is consistent with prior findings and cognitive theoretical models of social anxiety disorder. Our data suggest the HEP may help clarify the role of interoceptive attention in studies of social anxiety and other anxiety disorders. These results complement other literature connecting increased HEP to obsessive compulsive disorder (Yoris et al., 2017) and decreased HEP to depression (Terhaar et al., 2012).

Title of Presentation: Booster Efficacy for Extending Alcohol Reductions Post-Intervention

Presented By: *Michael Young*
Department: Psychology

Abstract: While alcohol interventions for college students reduce drinking short-term, those effects diminish in the long-term (i.e. 3 months; Carey et al., 2016). Targeted feedback after the intervention (i.e., boosters) may extend effects. In the current study, 561 college students completed an online intervention, and were randomly assigned to receive tailored feedback (i.e., a booster email) two weeks later. Participants completed online surveys both prior to intervention and 4 weeks later. Split-plot ANOVAs revealed a significant three-way interaction between booster, age (21 vs legal), and sex for drinking quantity, $F = 8.53$, $p = .004$, partial $\eta^2 = .029$, and peak drinks, $F = 1\ 1.383$, $p = .001$, partial $\eta^2 = .038$. The study found that booster status had a significant simple effect on the interaction between age and gender. Specifically, while gender typically had driven drinking levels for most participants, women over 21 years old had higher drinking peaks when given a booster than their underage counterparts did ($F(1,287) = 4.85$, $p = .028$, partial $\eta^2 = .017$). This suggests that women 21 and older were not as affected by booster facilitated interventions. Additionally, they found a significant interaction between time and age for drinking quantity, $F = 7.88$, $p = .005$, drinking frequency, $F = 11.36$, $p = .001$, and peak drinking, $F = 5.51$, $p = .023$. This suggests that post-intervention boosters were more effective for legal drinkers. No other effects were significant. Future research should focus on improving the efficacy of booster emails for other demographics, or explore alternative intervention supplements with broader impacts. Specifically, future research should tailor the boosters to better address students of different ages and genders.

College of Sciences

Title of Presentation: Facets of Emotion Regulation and E-cigarette Use in a College Sample

Presented By: *Laurel Brockenberry*
Department: Psychology

Abstract: Significance. Maladaptive emotional states are associated with cigarette use, but little is known regarding e-cigarette use. The current study investigates whether deficits in emotion regulation strategies are associated with: 1) e-cigarette susceptibility among non-users and/or 2) e-cigarette use. Methods. Survey data were collected from a local community college and a historically African-American University in the Southeast (N = 1547, M age = 20.2, 68.3% African-American). Respondents answered questions related to emotion dysregulation (Difficulties in Regulating Emotion Scale; DERS), e-cigarette susceptibility (modified version of Susceptibility to Smoke Index), and use. The DERS contains six subscales (Awareness, Clarity, Impulse, Nonacceptance, Strategies, and Goals). Results. ANCOVAs were conducted to examine differences in emotion regulation between susceptible and non-susceptible non-users (n=641). After controlling for school of origin, school type, and student status, susceptible non-users reported worse scores on Goals (F = 5.70, p = .017, partial ^{2} = .009) and Clarity (F = 5.74, p = .017, partial ^{2} = .009) subscales. No significant differences were detected for overall emotion dysregulation and the Strategies, Impulse, Awareness, and Nonacceptance subscales. Further, one-way ANCOVAs revealed that e-cigarette ever-users reported worse overall emotion regulation (F = 4.60, p = .03, partial η^2 = .004), as well as poorer scores on Strategies (F = 4.87, p = .03, partial η^2 = .004), Goals (F = 7.68, p = 006, partial η^2 = .007), and Impulse (F = 7.93, p = .005, partial η^2 = .007) subscales. No significant differences were detected for the Awareness, Clarity, and Nonacceptance subscales. Conclusions. Emotion regulation difficulties correlate with e-cigarette susceptibility and initiation. Deficits in planning (Goals) appear to be particularly important. Further research should investigate emotion regulation training, particularly related to goal setting, as a tool for improving mental and physical health, especially among those susceptible or currently using e-cigarettes.

Title of Presentation: The Impact of Sexual History on Mental and Physical Health Outcomes Among Sexual Minority Women

Presented By: *Alexander Shappie*
Department: Psychology

Abstract: Individuals who hold a monosexual identity (i.e., attraction to only one sex/gender) frequently report sexual behaviors that are discordant with their sexual identity (e.g., lesbians who report having had sex with men). Furthermore, sexual identity tends to be particularly fluid during the emerging adulthood period. However, few studies take these findings in to account when operationalizing sexual orientation. Indeed, of the 286 individuals in the current sample who identified as lesbian, 39.5% reported not being exclusively attracted to women. In addition, of the 257 lesbians who reported a sexual history, 54.9% reported having had sex with men during their lifetime. Thus, the present study investigated whether there were significant group differences in reported mental and physical health outcomes based upon participant's sexual history. A sample of 656 SMW, aged 18 to 30, were recruited via Facebook advertising. Two Multivariate Analyses of Variance were conducted to examine lifetime and past-year sexual history with physical and mental health dependent variables. Results indicated those who reported having sex exclusively with men reported greater negative mental and physical health symptoms than those who reported having sex with both men and women, and the same trend appeared when comparing those who had sex with both men and women to those who had sex exclusively with women. Interestingly, physical health symptoms differed significantly among the three groups when sexual history was defined by the previous year, but not when sexual history was defined across the participant's lifetime. In contrast, mental health symptoms differed significantly among the three groups for both timeframes. This study represents a starting point for future work to investigate how sexual behavior and sexual identity may impact mental and physical health, particularly among young adults who may have potentially dynamic sexual identities. Implications and future directions, as well as limitations, are discussed.

Title of Presentation: Sexual Orientation, Relationship Status, and Negative Sexual Minority Identity

Presented By: *Charlotte Dawson*
Department: Psychology

Abstract: Sexual minority women face unique challenges that affect their health and well-being. The 2011 Institute of Medicine (IOM) report emphasized the importance of considering the experiences of distinct subgroups among sexual minority individuals rather than analyzing them as one group (Graham et al., 2011). The present study examines the association of sexual identity (lesbian vs. bisexual) and relationship status (partnered vs. single) to negative sexual minority identity. Past research has suggested that bisexual individuals report a more negative identity than lesbian and gay individuals (Balsam; Mohr, 2007; Oliveira et al., 2012). Therefore, it is hypothesized that there will be a main effect of sexual identity, such that bisexual women will have a more negative identity. In addition, many studies have examined the protective effects of relationships for heterosexual couples. These studies suggest that individuals in committed relationships are generally happier and less likely to experience mental health problems (Braithwaite; Holt-Lundstad, 2017; Simon & Barrett, 2010). This study tests the hypothesis that those who are partnered will have a more positive identity than those who are single. Five hundred ninety-five self-identified sexual minority women, ranging in age from 18 to 30 years old, were recruited using Facebook ads and completed an online health survey. To assess negative identity, participants completed the Lesbian, Gay, Bisexual Identity Scale (LGBIS; Mohr; Kendra, 2011). Four of the subscales (Acceptance Concerns, Concealment Motivation, Difficult Process, and Internalized Homonegativity) were used to create a negative identity higher order subscale (Cramer et al., 2017). A 2 (Lesbian/Bisexual) x 2 (Single/Partnered) ANOVA revealed a significant interaction such that partnered status was associated with a more positive identity for lesbian women, but not for bisexual women. Simple effects and an ANCOVA were performed to further investigate this interaction. Limitations and future directions are discussed.

Title of Presentation: Latent Hazard Anticipation in Young Drivers: A Review and Meta-Analysis of Training Studies

Presented By: *James Unverricht*
Department: Psychology

Abstract: Young drivers are over-represented in motor vehicle crashes, and are shown to be poor at anticipating potential threats on the roadway compared to their more experienced peers. Literature demonstrates the effectiveness of driver training programs at improving young drivers' latent hazard anticipation performance. Various hazard anticipation training studies have been undertaken on different population demographics using different training scenarios presentation modes and multiple evaluation testbeds. These error-based feedback training programs (3M) allow trainees to make a mistake, show them how to mediate the mistake, and provide them with an opportunity to master the target skills. The current meta-analytical review focuses on 19 peer-reviewed training studies that utilized eye movements to measure improvements in drivers' latent hazard anticipation performance, following training. The role off our moderating factors (mode of delivery PC-based or non PC-based; presentation of training egocentric or exocentric; method of evaluation on-road or driving simulator; and age of sample teen novices aged 16-17 or young drivers aged 18-21) on the training effects were explored. Overall, the current meta-analysis suggest that: a) superficial improvements in training programs does not necessarily further improve the drivers' latent hazard anticipation; b) drivers who completed a training program with both egocentric and exocentric training views achieved greater levels of latent hazard anticipation performance than those who completed a training program that contained either view, but not both; and c) the effect sizes of the 3M-based training programs on latent hazard anticipation were greater for young drivers aged 18-21 years than teen drivers aged 16-17.

College of Sciences

Title of Presentation: Protective Behavioral Strategies: Exploring Prediction Strength by Scale

Presented By: *Melissa Colangelo*
Department: Psychology

Abstract: Protective behavioral strategies (PBS) are often examined as a mechanism to help college students reduce alcohol-related problems. PBS use is typically negatively associated with alcohol consumption, but inconsistencies in this association indicate a potential measurement issue. Studies have explored the effect of response scale on PBS and its association with alcohol use, but none yet have compared items across measures. The current study examined two validated PBS scales to see which is a stronger predictor of alcohol use, and if there is an interaction by sex. Participants (N=988) were randomly assigned to a PBS survey: the PBSS or the SQ, with both using the same response options. PBS use did not differ across sexes, nor did sex interact with scale type. Predictably, higher PBS use was associated with lower alcohol consumption, beta= -0.224, p<.001. Also, male participants consumed more alcohol than female participants, beta= -0.182, p<.001. Importantly, no difference was found between the scales, nor were any interactions between sex, PBS scale type, or PBS use significant. After controlling for response scale, findings imply there is no significant difference in the predictive ability of the PBSS and the SQ for alcohol use; this is consistent across sex.

Title of Presentation: Incivility as a Barrier to Embeddedness Among Engineering Students: Does Gender Matter?

Presented By: *Katelyn Reynolds*
Department: Ocean, Earth and Atmospheric Sciences

Abstract: To meet the current demand for engineers, research has focused on how to attract and retain qualified candidates in the field, especially those that are underrepresented (e.g., women; NSB, 2016). The present study investigates incivility and embeddedness, which have been found to be antecedents of retention in both the workplace (Cortina, Magley, Williams, & Langhout, 2001; Mitchell, Holtom, Lee, Sablynski, Erez, 2001) and the collegiate setting (Caza & Cortina, 2007; Major, et al., 2015). To extend previous research, both constructs were examined simultaneously among undergraduate engineering students. Undergraduate, first-year engineers completed an online survey indicating the extent to which they experienced incivility in engineering, the primary source of the uncivil treatment, and their level of embeddedness in engineering. A comparison of means and three hierarchical moderated regressions were used to test the proposed hypotheses. Results indicated that men and women experienced similar levels of incivility in engineering. In addition, incivility significantly predicted two of the three dimensions of embeddedness: fit and links. Gender moderated the relationship between incivility and engineering fit such that men who experienced incivility experienced lower engineering fit while incivility did not influence engineering fit for women. Gender did not moderate the relationship between incivility and engineering links or sacrifice. Future research should examine persistence in relation to these variables to determine if embeddedness mediates the relationship between incivility and persistence in one's engineering major. HEP to depression (Terhaar et al., 2012).

Title of Presentation: Examining Trust in a Robotic Peacekeeper Wielding Lethal or Non-lethal Weapons Across Cultures

Presented By: *Shelby Long*
Department: Psychology

Abstract: The employment of armed robotic peacekeepers may befeasible in the near future. The impact of trust in such interactions must be considered. Research suggests that cultural background and lethal weapon presence may affect human trust and compliance. The current study investigated trust of an armed peacekeeping robot by American, Japanese, and Chinese participants. Experimenters predicted overall trust in robots would differ among groups, but specific hypotheses were not made about the presence of lethal weapon backup. Sixty participants performed a virtual shopping task, occasionally interrupted by robotic peacekeepers that requested a personal item. Analyses showed that general trust in robots differed significantly among groups. American participants rated significantly higher trust in robots than Japanese participants. The effectof lethal weapon backup was not significant. Our findings suggest that culture should be considered when employing robots for peacekeeping duties.

Title of Presentation: Automated Vehicle Hacking: An Examination of Public Understanding and Effect of Brief Training

Presented By: *Wyatt McManus*
Department: Psychology

Abstract: Autonomous vehicles (AVs) are expected to be safer than human-driven vehicles. However, the increased automation level of AVs will lead the systems to be more susceptible to cyberattacks. Cyberattacks could result in many dangerous situations such as intentional car accidents, kidnapping, and terrorism. Prior research, mostly in the format of surveys, has found that respondents are concerned about the cyberattacks on AVs when prompted with a specific question regarding cyber attacks. However, a small percentage of respondents brought up cyberattack as a concern in free-response surveys. Moreover, empirical research on how people behaviorally respond to cyber-attacks is sparse. If cyberattacks occur, human drivers will have to respond to the threat. The current study aimed to empirically explore how individuals respond to AV hacking scenarios. Participants performed an autonomous driving task in a driving simulator. Each participant learned the driving route first, then a cyberattack was implemented during an automated driving session. We manipulated whether participants received a brief training/priming on potential cyberattacks in AVs before the experiment. We measured (1) the rate at which participants noticed the attacks, and if they did, (2) how long it took them to respond to the attack, and (3) the types of responses they made once they realized the car had been hacked. Our preliminary results showed that the training group demonstrated higher awareness rates and faster reaction times than did the non-training group. Further data will be collected and the implications for AV design and future research will be discussed.

Title of Presentation: Using Graphic Organizers to Improve Solving Word Problems for Students with Math Learning Disabilities: A Review of the Literature

Presented By: *Nouf Altaweel*
Department: Communication Disorders and Special Education

Abstract: Mathematical skills are necessary to prepare students for their future life (Moran, Swanson, Gerber, & Fung, 2014). Word problems are one math skill involved in Mathematical Standards of Learning (Virginia Department of Education, 2009). However, students with math learning disabilities (MLD) struggle with word problem, and increasing the quality and quantity of teaching is required to help students with MLD to improve their word problems skills (Bouck, Bouck, Joshi, & Johnson, 2016). Educators need evidence-based strategies that use classroom available technology and address the common deficits faced by students with math disabilities. For instance, a graphic organizer was described as a visual model that helps students to organize the content by making links between concepts (Cummins, Kimbell-Lopez, & Manning, 2015). Thus, the purpose of this paper is to review the empirical research that investigated the effectiveness of graphic organizers for solving math word problems for students with MLD. A total number of six studies spanning from 2010 and 2016 were reviewed.

Title of Presentation: A Survey of Higher Education Instructors' Perceptions of Freedom of Speech on College Campuses

Presented By: *Jane Roitsch*
Department: Communication Disorders and Special Education

Abstract: A survey of higher education faculty was administered to determine their insight and knowledge about freedom of speech on college campuses. As higher education faculty work with a variety of students, patients, families and groups and act as agents of colleges and universities, they are often asked to demonstrate caution in their use of language as it relates to what can be shared and what cannot. Little is known about how much these higher education faculty who serve as instructors are aware of what freedom of speech actually means. Full survey available here: https://odu.co1.qualtrics.com/jfe/form/SV_e517r09BEdi2da5. Respondents ranged in age from 25-65+ years of age; 17 respondents had a Master's Degree; 15 had a PhD or higher than Master's Degree; 26 females, 6 males. Three main distinctions regarding freedom of speech can be drawn from the survey results. Most individuals felt their freedom of speech was protected (25); 30 of the respondents found freedom of speech to be personally important. Persons beyond master's degrees reported to perceive their school's culture as more hostile toward liberal beliefs than persons with master's degrees. The results of this study suggest that persons who work in higher education on college campuses mostly feel their freedom of speech is protected, and almost all find the topic to be personally important. These results encourage graduate school programs to include specific information for college instructors about freedom of speech programs regarding preparation of future higher education faculty, specifically focusing on instructors beyond the master's degree level, especially as professional graduate school programs play an integral role in preparing higher education faculty for entry-level practice and ultimately achieving professional competence. This study's findings encourage institutions to monitor perceptions of higher educators throughout their careers, during varying political climates, to be knowledgeable of effective best practices for themselves and their students.

College of Education

Title of Presentation: Integration of Mobile Technology into Evidence-Based Practices for Students with Emotional and Behavioral Disorders in Classroom: A Review of the Literature

Presented By: *Nora Altaweel*
Department: Communication Disorders and Special Education

Abstract: With mobile technology (MT) expanding rapidly in classrooms, it may create new opportunities for teachers to elaborate the implementation of evidence-based practices (EBPs) and enhance learning outcomes for students with emotional and behavioral disorders (EBD). However, there remains a relative paucity of research reviewing the effectiveness of integrating MT into EBPs, sometimes known as emerging practices (EPs), for students with EBD. The purpose of this review is to synthesize the research on the effectiveness of EPs for students with EBD in the K-12 classroom environment. A total of 11 empirical studies, published in peer-reviewed journals from 2008 to 2017, were reviewed. Results suggest that EPs may increase academic engagement for students with EBD during academic instructional situations. The findings appear attributable to several capabilities that MT holds in the existing EPs (e.g., enabling individually-tailored practices). Yet, drawing conclusions remains challenging due to some empirical and practical limitations in relation to: (a) the unique power of EPs in isolation from some interfering variables, (b) generalizability of documented findings to various settings and EBPs, and (c) additional demands and workload involved. Future research studies will likely further address the three areas of limitation toward conclusive claims concerning the effectiveness of EPs for students with EBD. Implications for educational research and practices are discussed

Title of Presentation: Promoting Social Skills with Animal Assisted Interventions (AAI) for Children Diagnosed with Autism Spectrum Disorder (ASD)

Presented By: *Gabriela McWhorter*
Department: Communication Disorders and Special Education

Abstract: As Autism Spectrum Disorder (ASD) becomes the fastest growing disability in the United States, with prevalence rates of 1 in 68 children (CDC, 2014), establishing effective interventions is becoming more paramount. McConnell (2002) concluded that children with ASD were less likely than neurotypical peers to respond to social initiations, produced fewer vocalizations, kept a greater distance from peers, and engaged in more atypical behaviors. Interventions that simply manipulate the proximity that children with ASD share with socially competent peers are not sufficient to produce rich social interactions; additional intervention is required. An emerging way to increase positive social interactions is to include animals, a practice known as Animal Assisted Interventions (AAI). AAI not only assists in increasing pro-social behaviors, but can also act as motivation for the acquisition of skills. Furthermore, animals in therapy can also act as a transitional object between two people (Martin & Farnum, 2002). This is to say, the child will first bond with the animal then extend that bond to other people. Similarly Krakova, Talaroviova & Olexova, (2010) utilized guinea pigs as transitional objects and claimed an increased quantity, and also quality of the social interaction between peers. Furthermore, Grigore and Rusu (2014) combined the presence of a therapy dog and social stories to find significantly improved frequency of social interactions, while decreasing the levels of prompts needed. They concluded that AAI, specifically the inclusion of a dog, would be a cost-efficient way to improve the results of a social story to improve social skills for an individual with ASD. Another study applied AAI to one-on-one ABA sessions and found that the presence of the dog not only increased social engagement and also decreased aggressive behaviors from the child with ASD (Silva, Correia, Lima, Magalha, & Sousa, 2011).

College of Education

Title of Presentation: It's Just Like Getting a Lot of Information Secondhand: "The Lived Experiences of First Generation Doctoral Students of Color"

Presented By: *NeShaun Borden*
Department: Counseling and Human Services

Abstract: First generation college students are students whose parents have not earned a 4- year postsecondary degree. Research on first generation college students consistently finds that there are additional barriers to academic success in higher education for this population (Holley and Gardner, 2012). Although about 37% of current doctoral students identify as first generation, there has also been a consistent decrease over the last twenty years of first generation college students enrolling in and completing doctorate degrees in the United States (Survey of Earned Doctorates, 2015). Even though there is an abundance of literature related to undergraduate first generation students, there is a lack of research on the subjective experiences of these students, specifically in graduate school (Holley & Gardner, 2012). Building on the work of Gardner and Holly (2011), this paper seeks to address a gap in the literature by exploring the lived experiences of first generation doctoral students of color. Social Capital and Critical Race theories offer insight into the impact of race and social capital on the graduate school experience.

Title of Presentation: Entsminger Fellows Program Evaluation

Presented By: *Amy Kurfist*
Department: Counseling and Human Services

Abstract: The program for which the forthcoming program evaluation study is designed is The Entsminger Fellows, which is comprised of interdisciplinary cohorts of faculty and staff charged with spreading an entrepreneurial ecosystem to all parts of ODU, made possible by a generous gift from alumnus Lee Entsminger (Entsminger Fellows, 2017). The Entsminger Fellows program began in 2014 and is housed within the Strome Entrepreneurial Center at ODU. The five-year program was the result of a $100,000 gift from alumnus Lee Entsminger to promote campus-wide entrepreneurship and innovation (O'Hallarn, 2014). The origination of the program coincided with the ratification of the ODU 2014-2019 Strategic Plan, which featured promoting an entrepreneurial culture as one of the five identified goals (Old Dominion University Strategic Plan, 2014). As the Entsminger Fellows program is underway for the fourth of its five intended years, questions have begun to arise among the program leadership and other key stakeholders as to the value of continuing the program as-is with a fifth cohort and how the program might endure beyond the initial five years. To recognize how to continue with the program and what potential changes to make, it is necessary to understand the successes and challenges experienced to date. This evaluation serves to identify, in year four, the twenty-four current and previous fellows reported self-assessments in two key areas: engagement in and satisfaction with the fellowship experience. The research for this study will be completed utilizing a mixed-methods, non-experimental, descriptive/comparative design. The quantitative aspect of the descriptive/comparative design describes the existing phenomenon (engagement and satisfaction) by using numbers to characterize individual or groups (current and previous fellows). The qualitative aspect of the design expands upon the data collection to isolate the causes of the behavior which cannot be identified through numerical analysis alone.

College of Education

Title of Presentation: Identity Beliefs and Physical Activity Engagement: Experiences of Adults with Visual Impairments

Presented By: *Nicole Kirk*
Department: Human Movement Sciences

Abstract: Research indicates that adults with visual impairments are typically less likely to engage in physical activity or sport than their sighted peers. While many factors contribute to this lack of activity, little research has investigated this phenomenon using motivational theories as conceptual frameworks. Expectancy-value theory states that individuals are more likely to engage in behaviors that they find valuable and expect to be successful when performing. The model further recognizes identity beliefs (i.e. whether an individual believes that they are a type of person who should engage in a behavior) impact the value one ascribes to the behavior. The purpose of this study will be to explore the perceptions of individuals with visual impairments about their sport and disability-related identities. This qualitative study will utilize interpretive phenomenological analysis to investigate participants' experiences in physical activity and sport. Five to seven adults with visual impairments will be purposively sampled. Semi-structured, audio-recorded interviews and reflective notes will serve as the primary sources of data. Interviews will be guided by a protocol rooted in the constructs of expectancy-value theory. Analysis will follow a three-step procedure informed by interpretive phenomenological analysis. Interviews and associated notes will be examined at the case level for emergent themes, followed by a constant comparison process to develop recurring themes. Findings will be further contextualized through the lens of expectancy-value theory. Data collection will begin in March 2018.

Title of Presentation: Impact of Standardized Breastfeeding Education Program on Novice Nurses

Presented By: *Amanda Yessick*
Department: Human Movement Sciences

Abstract: Background/Purpose: Autism spectrum disorder (ASD) is characterized by social communication and social interaction deficits and stereotypic tendencies (American Psychiatric Association, 2013) which can present difficulties in physical education (Healy et al. 2013). Gaining insight into this population's experiences within PE can create an understanding of direct challenges, preferences, motivations, and aversions through research. Students with ASD are experts on their personal experiences, and it is the job of the researcher to translate those experiences to facilitate physical educators' awareness and understanding of teaching this population in PE. However, little research exists that examines the embodied experiences of students with ASD in their PE settings. Therefore, the purpose if this study is to explore the experiences of students with ASD in PE and how those experiences attribute to the meaningfulness and value of PE and physical activity. Method Four participants with a primary diagnosis ASD who attend a self-contained PE class will be purposively selected for this study based on eligibility criteria (i.e. having an autism diagnosis, verbal communication, receptive understanding, willingness to be photographed and video-recorded, participation in physical education classes, and being available for a face-to-face interview). Data will collected utilizing an electronic scrapbook interview methodology. More specifically, participants will be photographed engaging in various PE activities which will be stored in electronic folders. The pictures will then be utilized as visual prompts during video-taped, semi-structured interviews to elicit meaningful and accurate representations of their feelings about PE. Semi-structured interview guides will be used to ensure that the same lines of inquiry are pursued across participants (Patton, 2002). Methodological triangulation, researcher reflexivity, and peer debriefing will be utilized to support trustworthiness.

College of Education

Title of Presentation: Using Repeated Reading Intervention for Struggling Readers in Elementary Schools

Presented By: *Khaled Alotaibi*
Department: Communication Disorders and Special Education

Abstract: Students with learning disabilities encounter challenges while reading books or passages. Finding effective strategies to improve their reading fluency and comprehension is essential for their success in school and in life. Though there are numerous approaches for improving the reading skills of students with learning disabilities, repeated reading interventions have often been used with these students. However, recent reviews have reported mixed results in the use of repeated reading interventions. Thus, the purpose of this review was to investigate the effectiveness of repeated reading intervention with students with learning disabilities to improve their reading fluency and comprehension. Limitations of repeated reading interventions will be discussed, along with implications for future research.

Title of Presentation: A Review of the Literature on Anger Management Interventions for Elementary Students

Presented By: *Raka Alshammari*
Department: Communication Disorders and Special Education

Abstract: The number of students who exhibit anger and behavioral issues is a serious problem in schools. Poor anger control may lead to poor academic performance, preventing them from being successful in school and life. This is especially true for elementary school students. The purpose of the present review of the literature is to evaluate the effectiveness of anger management interventions on decreasing anger and aggressive behavioral problems among students in elementary schools. The study used a systemic approach to identify 36 empirical studies supporting the use of anger management interventions to decrease the anger and aggressive behaviors of elementary-aged students. Results of the review indicated that anger management intervention may be considered as an effective intervention for elementary students with an anger and aggressive behaviors. The results of reviewed studies indicated that anger management interventions lead to decreased anger and aggressive behaviors among elementary school students. Implications for future research and practice are discussed.

Title of Presentation: Towards a Pedagogy of School Libraries

Presented By: *Stephanie Trzeciakiewicz*
Department: Teaching and Learning

Abstract: This study explores the link between the pedagogy of music, art and physical education to that of a school library program. It is the first step in building an articulated pedagogical taxonomy based on information literacy knowledge and skills, along with the teaching of dispositions including curiosity, the love of reading, and persistence to find the best information. The methodology used for this preliminary examination is to interrogate the national curriculum standards for physical education, music education, and art education to determine the correlations with school library curriculum. We have also conducted a literature search to find unique aspects of content pedagogy that would apply to the areas of library curricula that focus on dispositional and lifelong learning attributes. This study is the first step in a move toward an articulated pedagogical taxonomy of librarianship that expresses the expanded universe of libraries and information. In the same way that physical education is based on a taxonomy of physical or athletic ability and the fine arts are built on a taxonomy of sensory skills combined with appreciation and understanding, further research in this area will result in a taxonomy based on not only the information literacy knowledge and skills, but also a taxonomy based on dispositional attributes. It will be a library taxonomy based on the teaching of curiosity, the love of reading, a persistence to find the best information, a discerning eye to sifting through real and fake news, and to be an ethical and responsible information user.

College of Education

Title of Presentation: A Summative Content Analysis of Algebra I High-Stakes Tests

Presented By: *Deana Ford*
Department: Teaching and Learning

Abstract: The purpose of this research was to describe and better understand how mathematics vocabulary words and phrases are used in a mid-Atlantic state Algebra I end-of-course exam to inform mathematics instruction from a disciplinary literacy perspective. Using summative content analysis, two Virginia Algebra I end-of-course exams were examined to determine how mathematics vocabulary and phrases were used and represented. Results revealed three primary themes. First, disciplinary vocabulary in mathematics was a central feature of the exams analyzed. Second, global mathematical vocabulary, or words with more than one meaning, represented a majority of the math vocabulary in the exams. Third, process and application-based vocabulary were central components of the test. These results highlight the central role of disciplinary literacy in the EOC exams. Suggesting that teaching vocabulary from a disciplinary literacy perspective may increase students understanding of the concepts, which could potentially promote increased scores on mathematics high-stakes tests and disciplinary learning in mathematics.

Title of Presentation: The Role of Stereotype Vulnerability in Minorities' Declining Science Motivation: A Parallel Growth Curve Analysis

Presented By: *Delaram Totonchi*
Department: Educational Foundations and Leadership

Abstract: This four-year longitudinal study examined the associations between the changes in stereotype vulnerability and motivation in 416 underrepresented minorities (URM) enrolled in an elite university. Latent growth curve analyses indicated that students' stereotype vulnerability and cost perceptions increased during college, whereas their competence beliefs, intrinsic-value, attainment-value, and utility-value declined. Parallel growth analysis revealed that higher second-year stereotype vulnerability was related to lower intrinsic-value and higher effort-cost in the second year as well as a decrease in attainment-value and utility-value and an increase in cost perceptions throughout college. These findings shed light on how changes in stereotype vulnerability relate to URM's declining motivation in STEM, a key relation for understanding URM STEM persistence that has not been previously studied.

College of Education

Title of Presentation: Local Fiscal Effort and Student Success Metrics

Presented By: *Zachary Haney*
Department: Educational Foundations and Leadership

Abstract: School finance relative to student achievement includes the analysis of resource inputs and student output. Definitions of success using achievement metrics vary in how resource value is described through monetary, quantitative, or cost-effective means and these differences can impact the understanding of what resources are actually valued. This study focuses on local fiscal effort, the amount above the required fiscal effort to fund schools, and the relationship between this input in 136 Virginia school districts from 2010-2016 and their graduation rates and accreditation rates from similar years.

Title of Presentation: Does Tension Tapping Technique Improve Perceived Well-Being During Group Acceptance and Commitment Therapy in Incarcerated Men: A Proposed Study

Presented By: *Abie Tremblay*
Department: Counseling and Human Services

Abstract: A preponderance of incarcerated persons in the U.S. have experienced at least one significant traumatic event prior to incarceration. Evidence-based practices, specifically cognitive behavioral therapy, are widely used in rehabilitation of incarcerated persons in the U.S. These practices have limited success in perceived well-being of the prisoners and recidivism. Tension tapping technique (TTT) is successful in treating trauma in diverse populations. It is hypothesized TTT will support cognition repair/reconnection, improve a sense of well-being, and support successful rehabilitation.

Title of Presentation: Consumer Acculturation Scale

Presented By: *Kristina Stuhler*
Department: Marketing

Abstract: It is clear that the United States immigrant population is large, incredibly diverse, and dynamic. Marketers have long been aware of this substantial population and have primarily tried to reach these consumers through ethnic-based segmentation methods. However, there is increasing evidence that ethnic identity may no longer be an appropriate way to reach these consumers. An increasingly important way to understand this large immigrant consumer segment is to study the process of acculturation of these immigrant groups (Davis, Mohan, and Rayburn, 2017). Cultures are constantly in collision, and as a result, acculturation is taking place at all times. Acculturation is when different cultures come together causing changes in one, both, or multiple cultures, resulting in something new. There can be changes in entire groups of people as well as for individuals (Sam and Berry, 2006). There are currently many scales available to measure acculturation, however, there is no scale that is able to measure consumer acculturation for many different subcultures. We propose a scale that acknowledges the theoretical possibility of acculturation into different specific segments in a consumption context that can be used for all ethnic groups. This proposed scale focuses on the outcome of sociocultural adaptation, or changes in consumption in the marketplace, that can help marketer's better serve consumers throughout their consumer journey. Understanding immigrant consumers through the development of an acculturation scale will allow a better strategic fit between ethnic consumers and service personnel. In this era of relationship marketing where companies are building closer relationships with customers, service firms will have better mechanisms for matching the proper employees with customers to ensure the success of brands as well as cater to the specific needs and desires of different consumer acculturation segments.

Title of Presentation: The Power of Music in Advertisement: Exploring the Moderating Role of Life Satisfaction on The Effectiveness of Music-Evoked Nostalgia

Presented By: *Leila Khoshghadam*
Department: Marketing

Abstract: Advertisers constantly look for creative ways to capture consumers' favorable response and positive attitude toward the advertised brand. Nostalgia is one of these prominent themes which underlies many of the desired marketing and advertising strategies (Cosgrove and Sheridan 2002; White 2002). Thus, it is not surprising that marketing practitioners increasingly use nostalgic cues such as themes, images, and jingles in advertising and products (Bambauer-Sachse and Gierl 2009). Recent investigations have demonstrated nostalgia as an emotion that can be triggered by music (Janata et al. 2007). So, the question here is: is it possible that music-evoked nostalgia generates a positive attitude toward the brand and increase the purchase intention or not? The current study provides two contributions to the literature. First, this paper offers a framework to evaluate the effectiveness of music-evoked nostalgia on generating a positive attitude toward the brand and increasing the purchase intention. In addition, while the result of the investigations suggests a desirable response to the nostalgic advertisement, the research shows that this effect is contingent upon the product type and level of individuals' life satisfaction. More specifically, it is shown that for low involvement products the music-evoked nostalgia will generate the positive attitude toward the brand and increase the purchase intention. However, for the high involvement products, the level of life satisfaction can moderate the relationship between the music-evoked nostalgia and positive attitude toward the brand and purchase intention. In summary, the results indicate that the extent to which individuals pay attention to the nostalgic feeling triggered by the music in the advertisement is dependent on the product type and individuals' current life satisfaction.

Strome College of Business

Title of Presentation: Founders With Foreign Exposure

Presented By: *Veronika Ermilina*
Department: Management

Abstract: Foreign entrepreneurship is more challenging than domestic entrepreneurship for that ventures started by foreign founders suffer from not only the liability of newness, but also the liability of foreignness. Foreign founders, comparing with the domestic counterparts, lack of critical resources, such as domestic knowledge, network, and legitimacy, to achieve optimal performance. Nevertheless, studies also suggest that foreign founders have better human capital and that their ventures are more innovative than companies started by domestic entrepreneurs. Founders with foreign exposure import new knowledge, practice, and routine into local community, benefiting the domestic economy through diversity and innovation. Hence, it is important to understand the factors that affect the performance of ventures started by founders with foreign exposures. This study explores the relationship between the direction of founders movement and the financial performance of early-stage ventures; revenue generation and capital acquisition in particular. Founders who are from low-income countries and launch their new ventures in high-income countries may face different challenge than founders from high-income countries but starting businesses in low-income countries. Furthermore, we also explore whether the degree of foreignness, e.g. completely foreign founders versus local-born founders with some foreign exposures, affects their ventures' ability to generate revenues and to raise equity. To examine these questions, we leverage the dataset developed by Entrepreneurship Database Program at Emory University, consisting of more than 8,000 early-stage ventures. We can identify ventures started by founders with various degree of foreignness and match them with ventures started by domestic entrepreneurs. The preliminary findings suggest that founders from low-income countries but start the businesses in high-income countries perform worse than the domestic counterparts. However, founders from high-income countries but start the business in low-income countries can raise more equity and generate revenues comparable to those launched by domestic entrepreneurs.

Title of Presentation: Hampton Roads Residents Preferences for Dune and Beach Management

Presented By: *Donta Council*
Department: School of Public Service

Abstract: The management of dunes and beaches in Hampton Roads is critical to the region's tourism industry and to provide protection from storms and flooding. During the summer of 2017, we surveyed over 675 residents of Hampton Roads to gauge their preferences for the management of dunes and beaches. An overwhelming majority felt that all taxpayers should have a say in maintenance practices along with government regulations to assist with the protection of beaches and dunes. Residents leaned towards localized input from citizens as preferred methods of management and understood the importance their tax dollars play in funding those methods. While residents supported the maintenance of dunes and beaches, there is a split on the appropriate methods to be used. In addition, the majority of participants were supportive of new taxes to fund beach protection.

Strome College of Business

Title of Presentation: Policy Uncertainty and Companies' Financial Flexibility

Presented By: *Hamed Yousefi*
Department: Finance

Abstract: The capital structure is how a firm finances its operational and growth activities. Broadly speaking, firms have two options to fund their activities: issuing debtor issuing equity. Surprisingly and despite the prediction of the dominant theories, there is a puzzling empirical consistency in the capital structure literature. Many firms appear to borrow less than the dominant theories predict. This unorthodoxy, caused a new stream of studies which suggest that it is financial flexibility that primary drives Firms' choice of leverage. In other words, flexibility enables companies to undertake investment in the future, when asymmetric information and contracting problems might otherwise force them to forego profitable growth opportunities(3). Having this said, financial flexibility, yet, is not fully discovered. Lack of consensus measurement method and ambiguities about causes and effects of financial flexibility are still the research questions of many studies. The present research project aims to investigate the effect of policy uncertainty on the financial flexibility of firms. Policy uncertainty related to tax, government spending and regulatory and monetary policy can negatively affect the gross domestic production and corporate activities(4). To be specific, the present project tries to answer the basic question whether uncertainty is associated with a higher (lower) level of financial flexibility? We expect to see a positive relationship between the policy uncertainty and financial flexibility of the firms which shows the tendency of the firms to save for the rainy days. In the next level, we investigate the purpose of achieving higher financial flexibility during the uncertainty period, i.e., we try to understand what does a firm retain its flexibility for? Is it something related to firm risk-taking behavior or is it a safety valve to pay dividend in time?

Title of Presentation: Prospect Theory, Reverse Disposition Effect, and the Housing Market

Presented By: *Zhaohui Li*
Department: Finance

Abstract: Prospect theory was first established by Nobel Prize winner (Kahneman and Tversky: 1979). This theory shows us that people treat losses and gains asymmetrically in their value functions. In particular, an equal-sized loss looms larger than an equal-sized gain. We model a house seller's pricing decision under a prospect value function. Our model shows that reference dependence generates a disposition effect, which is magnified by loss aversion. Surprisingly, diminishing sensitivity will lead to a local reverse disposition effect in which a seller's asking price can be decreasing with increasing potential loss. Our model also predicts a larger price dispersion in a cold market and reaffirms the price-volume relation. We find consistent evidence using multiple listing service data in Hampton Roads, Virginia. Finally, the empirical pricing curve suggests the extent of diminishing sensitivity can vary with the loss/gain position of the agent.

INDEX

INDEX

Congratulations to the 2018 Graduate Research Achievement Day Presenters!

Acknowledgements

The Graduate School would like to thank the industry partners that participated in today's Graduate Networking Event.

Also, we extend a big thank you to Alice Jones from Career Development Services. She helped make today's networking event possible.