Room 2216 – Forestry and Wildlife Sciences

- Chieppa, J. (G)
  
  **Title:** Effects of future climate change scenarios on loblolly pine seedlings inoculated with ophiostomatoid fungi.
  
  **Primary Author (and presenter):** Chieppa, Jeff
  
  **Additional Authors:** Chappelka, Arthur; Eckhardt, Lori
  
  **Department:** School of Forestry and Wildlife Sciences
  
  **College/School:** Auburn University
  
  **Description:** Loblolly pine decline (LPD) is associated with premature death of *Pinus taeda*. Two fungi associated with LPD are the native *Leptographium terebrantis* and non-native *Grosmannia huntii*. The current studies were undertaken to determine how altered climate scenarios will affect LPD in the future. Our hypothesis is that exposure to altered precipitation patterns and elevated tropospheric ozone concentrations will reduce vigor of *P. taeda* and exacerbate LPD by increasing susceptibility to *L. terebrantis* and *G. huntii*. Each experiment used four families of *P. taeda*. Two were susceptible while two were more tolerant to LPD associated fungi based on previous resistance screening. Seedlings had five inoculation treatments (wound, no wound, wound+media, *L. terebrantis* and *G. huntii*). The first study (2013) used open-topped chambers and was conducted using three ozone concentrations. Families that were susceptible to LPD associated fungi showed higher incidence ozone damage than tolerant families. The second study (2014) used three simulated rainfall treatments. All irrigation amounts were equal each week but chambers were irrigated three, four and seven days/week. Seedlings that were irrigated three and four days/week were significantly more water stressed than seven day/week seedlings during midday on days with no irrigation. On days with irrigation, three day/week seedlings were significantly more water stressed than four and seven day/week. Our results will help identify which families of loblolly pine will perform best in future climate change scenarios as well as give insight in abiotic and biotic stresses of pine.

- Devkota, P. (G)
  
  **Title:** Variation in tolerance of *Pinus taeda* families to root infesting fungi *Grosmannia huntii* and *Leptographium terebrantis*.
  
  **Primary Author (and presenter):** Devkota, Pratima
  
  **Additional Authors:** Eckhardt, Lori
  
  **Department:** School of Forestry and Wildlife Sciences
  
  **College/School:** Auburn University
  
  **Description:** Pine decline is a serious threat to forest production sustainability in the southern USA and involves complex interaction of various biotic and abiotic factors. The biotic factors associated with this decline include several ophiostomatoid fungi vectored by numerous root-inhabiting bark beetles. The study was conducted to determine the variation in tolerance of several genetically different loblolly pine (*Pinus taeda*) families towards two ophiostomatoid fungi, *Leptographium terebrantis* (native) and *Grosmannia huntii* (non-native). The study was conducted on containerized seedlings in 2013 and 2014 representing 66 loblolly pine families and on bare root seedlings in 2014 representing 4 loblolly pine families. Those seedlings were screened for tolerance using an artificial fungal inoculation method. Various seedling response variables like seedling survival, lesion presence, lesion length and occlusion of vascular tissues were measured twelve weeks after inoculation. Stems exhibited dark brown lesions
and resinous occluded tissues. Within each family, L. terebrantis and G. huntii showed varying response with significant differences from each other. There was family x fungal treatment interaction. This study shows that family differences exist and those specific families may perform better on high risk sites.

- **Essien, C. (G)**  
  **Title:** Effect of thinning regimes on the acoustic velocity of 29 year old loblolly pine stand.  
  **Primary Author (and presenter):** Essien, Charles  
  **Additional Authors:** Cheng George, Via Brain K  
  **Department:** School of Forestry and Wildlife Sciences  
  **College/School:** Auburn University  
  **Description:** The significance of assessing wood quality traits during forest inventory cannot be underestimated due the swift shift of wood supply from old growth to fast growing plantation species. This information help the forester to make informed decision on the type and intensity of management practices to use and also proper allocation of wood to appropriate processing line. Thinning is one of the silvicultural management tools that influence the tree growth and thus affect the quality of the wood produced. In this study, the effect of thinning regimes on acoustic velocity and stiffness of standing tree were studied using nondestructive acoustic technique – Time-of-flight tool. One Hundred trees each randomly selected from non-thinned, light-thinned and heavy-thinned stands were acoustically tested for the velocity and their dynamic stiffness estimated. Acoustic measurements were taken on the north and south aspect of the trees. The diameter at breast heights over the bark was also determined. The results indicated the diameter of the heavy-thinned stand was about 28% and 13% higher than the non-thinned and the light-thinned stands respectively while the light-thinned was 13% higher that the non-thinned stand. Also, the thinned stands had significantly higher acoustic velocity and dynamic stiffness than the non-thinned stand. Furthermore, the light-thinned stand had significantly higher acoustic velocity and stiffness than the heavy-thinned stand. The northern part of the tree had significantly higher velocity and stiffness than the southern part on all the stands studied. Although, thinning operation increased diameter in this loblolly pine stand, it did not reduced the acoustic velocity and stiffness as reported for other species. Therefore thinning operation may be one of the prerequisite management tools and the intensity of thinning operation operations must be stated in wood quality inventory operations in the forest.

**Room 2218 – Biosystems Engineering**

- **Cross, P. (G)**  
  **Title:** Eucalyptus gasification, understanding the formation of “tar.”  
  **Primary Author (and presenter):** Cross, Phillip, J  
  **Additional Authors:** Adhikari, Sushil.  
  **Department:** Biosystems Engineering  
  **College/School:** Samul Ginn College of Engineering, Auburn University  
  **Description:** The potential for large scale industrial gasification in the Southeast is limited by the condensable, product gas contaminants, also known as “tar”. What makes “tar” difficult to deal with is the large distribution of compounds, which include species that cannot be identified by traditional methods. Defined as any organic molecules with a Mw greater than 78 g mol-1, “tar” is a large group of chemicals. The prevention or removal of which is not yet accomplished in an efficient, cost effective manner. A great deal of research has gone into removing “tar” compounds but there is less research about the actual structure of biomass and what effects this has on the “tar” produced through gasification. In previous work we found that older eucalyptus samples produced more “tar” than younger samples. This is believed to be caused by lignin, a component of biomass. Although the actual weight percent of lignin is not significantly different between the samples we believe that the structure of lignin in the older samples produces more “tar” when gasified. Thus the aim of our research is to; Isolate the lignin fraction of the biomass samples using organosolv and enzyme hydrolysis, determine the major functional groups of lignin in the different eucalyptus samples using
Fourier Transform Inferred Spectroscopy (FTIR) and Nuclear Magnetic Resonance (NMR). Gasify the lignin in a controlled atmosphere using a pyro-probe coupled with a “tar” collection system. Then finally, perform FTIR and NMR on the “tar” samples to determine if there is a different product profile depending on the age of the tree sample. This information will allow us to determine if there is a correlation between functional groups present in lignin of different age eucalyptus, and what effect this will have on the product profile of “tar”.

- **Singh, S. (G)**
  - **Title:** Baseflow response to climate variability induced droughts in the Apalachicola-Chattahoochee-Flint river basin.
  - **Primary Author (and presenter):** Singh, Sarmistha
  - **Additional Authors:** Srivastava, Puneet; Abebe, Ash; and Mitra, Subhasis
  - **Department:** Biosystems Engineering
  - **College/School:** Samul Ginn College of Engineering, Auburn University
  - **Description:** Climate variability induced droughts have been the source of the Tri-State Water Wars in the Southeastern United States. One of the major issues related to the conflict is the reduction in baseflow levels in the Flint River during droughts which affects the availability of freshwater resources at the downstream Apalachicola River. Study of large scale climate phenomena and the interactions of interannual with decadal and multidecadal oceanic-atmospheric phenomena can provide valuable information regarding regional climatic conditions such as drought and its impact on water resources. This study was conducted to understand and quantify the impacts of climate variability cycles on baseflow levels in the Flint River. The individual and coupled impacts of the El Niño–Southern Oscillation (ENSO), Pacific Decadal Oscillation (PDO), Atlantic Multidecadal Oscillation (AMO), and North Atlantic Oscillation (NAO) on baseflow were studied and quantified. A novel non-parametric Joint Rank Fit (JRFit) procedure was used to test the interaction between ENSO phase baseflows with PDO, AMO, and NAO phase baseflows. Further, simple-main effect comparisons were also performed using the JRFit model to estimate significant difference between the positive and negative phase baseflows of PDO, AMO, and NAO associated with El Nino or La Nina phases. The results indicate that the phases of ENSO, AMO and NAO significantly affect baseflows in the Flint River. Interaction tests showed that the PDO and AMO phases modulate ENSO phase baseflows. La Nina associated with positive phase of PDO and AMO resulted in greater decrease in baseflow levels of approximately 30% and 35% respectively. However, La Nina associated with negative phase of AMO showed above normal baseflows. The result illustrates the effect of severe droughts on baseflow levels in the Flint River. The results obtained from this study can be used by water managers in issuing severity based water restrictions in the region.

- **Wang, X. (G)**
  - **Title:** Comparison between radio frequency (RF) and traditional heating assisted alkaline pretreatment on four categories of lignocellulosic biomass.
  - **Primary Author (and presenter):** Wang, Xiaofei
  - **Additional Authors:** Wang, Yifen; Taylor, Steve
  - **Department:** Biosystems Engineering
  - **College/School:** Samuel Ginn College of Engineering, Auburn University
  - **Description:** Pretreatment plays an important role in making the cellulose accessible to enzyme hydrolysis and subsequent conversion because of the resistance and recalcitrance of biomass. In this study, radio-frequency (RF) assisted dielectric heating was utilized in the alkaline (NaOH) pretreatment. The substrates ranged from softwood (loblolly pine), hardwood (cottonwood and sweetgum), and herbaceous crops (switchgrass) to agricultural residues (corn stover). Pretreatment was performed at 90°C for both RF and water bath heating for one hour after overnight soaking in NaOH solution (0.2g NaOH/g Biomass). Pretreated materials were characterized by scanning electron microscopy (SEM), Fourier transform infrared spectroscopy (FTIR) and chemistry methods. The glucan hydrolysis yield using RF heating methods for these five feedstocks were 9.9%, 17.0%,
21.7%, 72.6% and 89.6%, while with conventional heating technique the yields were 9.8%, 18.5%, 19.6%, 51.8% and 89.4%. Interestingly, radio frequency heating system did not show a higher glucan yield all the time compared to traditional heating, sometimes similar effect on enzymatic digestibility while sometimes even worse.

Room 2222 – Chemical Engineering

- **Dev, V. (G)**
  
  **Title:** Design of reactants and products with properties dependent on structures of both.
  
  **Primary Author (and presenter):** Dev, Vikrant, A.
  
  **Additional Authors:** Chemmangattuvallappil, Nishanth, G.; Eden, Mario, R.
  
  **Department:** Chemical Engineering
  
  **College/School:** Samuel Ginn College of Engineering, Auburn University
  
  **Description:** In the past, Computer aided molecular design (CAMD) has successfully been performed to design chemicals, e.g. solvents, for a variety of processes including those involving reactions. CAMD generally involves a mathematical program where properties, expressed in terms of molecular building blocks, are maximized/minimized under a variety of constraints. The obtained molecular building blocks from the solution of the program are combined to provide the desired molecules with optimal properties. CAMD methodologies to design reactants and products with optimal properties however are very few. The majority of the contributions are restricted to design of reactants and products when only a single reactant and product can be structurally varied. An attempt to include variation of structures of multiple reactants and products was also restricted in scope. Only the dominant properties of the product molecules could be optimized such that each product molecule was subjected to its respective set of property constraints. In this work, an algorithm has been developed that designs reactants and products such that properties that are functions of structures of reactants and products are optimized. Also, the reactants and products are subjected to their respective set of property constraints. Certain thermodynamic properties of reactions like standard Gibbs free energy change of a reaction can be optimized using the developed algorithm. Linear and nonlinear property-structure relationships based on group contributions and/or topological indices (TIs) have been utilized. They have been treated on a single platform using signature descriptors. Signatures have been used as building blocks to form molecules. Signatures have also been utilized to capture the structural relationships between reactants and products.

- **Haywood, A. (G)**
  
  **Title:** Shear induced assembly of optically anisotropic cellulose nanocrystal films.
  
  **Primary Author (and presenter):** Haywood, Alexander, D.
  
  **Additional Authors:** Ashurst, William, R.; Davis, Virginia, A.
  
  **Department:** Chemical Engineering
  
  **College/School:** Samuel Ginn College of Engineering, Auburn University
  
  **Description:** This work investigates the effect of shear on alignment of cellulose nanocrystals (CNC) in lyotropic liquid crystalline dispersions and the ability to retain alignment in a dried film. CNC films can exhibit a number of interesting optical properties including iridescence, interference colors, selective reflection, and optical anisotropy. However, the microstructure of the film must be precisely controlled to obtain these properties. These films could be used as alternative optical components in high tech devices. Rheology and rheo-optics were used to study the effect of shear from 0.1-100 s-1 on dispersions in each of the four concentration regimes: isotropic, biphasic, liquid crystalline, and gel. CNC films were prepared on glass slides by blade coating. Optical anisotropy in the dispersions and films was investigated qualitatively by cross polarized optical microscopy and quantitatively by intensity and optical contrast (OC) measurements, where 0 indicates fully isotropic and 1 indicates perfectly anisotropic. We found that the initial dispersion microstructure and shear rate were the most important factors affecting film properties. Dispersion optical contrast was highest for all concentration regimes at 100 s-1, with the liquid crystalline dispersion showing the

*G = graduate student presentation*
most anisotropy (OC=0.91). For film fabrication, microstructural relaxation during drying is highly important. As expected, the higher viscosity dispersions had slower relaxation times and were better able to retain shear alignment. The combined effects of shear alignment and relaxation during drying resulted in films with optical contrasts of 0.02, 0.99, and 0.49, for biphasic, liquid crystalline, and gel dispersions, respectively. In this work, we have developed a scalable and cost effective method to fabricate highly aligned, optically anisotropic and transparent CNC films with a variety of possible applications.

- **Casper, W. (G)**
  
  **Title:** A new laser ignition method of energetic materials.
  
  **Primary Author (and presenter):** Walter F. Casper IV
  
  **Additional Authors:** Huijiao denHartog, Rik Blumenthal
  
  **Department:** Chemistry
  
  **College/School:** College of Sciences and Mathematics, Auburn University
  
  **Description:** Recent advances in weapons systems for military use rely upon new technologies that emphasize safety during storage and transport, and effective ignition when needed. Common explosives such as RDX require a less sensitive primer for ignition. This can lead to inconsistencies and safety issues in use. Replacing the insensitive primer is ideal, but one cannot lose the performance and reliability. The use of a laser to selectively irradiate an inert material that could be converted to an energetic ignition source has proven to be another option for these systems. Plasma ignition of explosives has been accomplished previously, and polymers can easily be converted to plasmas. Coupling these techniques and that of laser ablation technology, the safe ignition of RDX has been demonstrated with the use of a polycarbonate (PC) overlay. This experimental design creates a similar chemical and physical environment that is present in electrothermal chemical ignition systems. This model has been investigated on a microscale level to demonstrate the selective irradiation of inert materials that then ignite the underlying energetic materials. With a 266nm, 50mJ Nd:YAG laser pulse, RDX is ignited with PC regardless of the amount of material present in 86% of the cases. Further investigation through optical emission spectroscopy and 3D laser scanning microscopy support the safe and selective ignition of an energetic material through the conversion of an inert polymer to serve as an ignition source. This data supports this model of a new, primerless ignition method.

**Room 2223 – Fisheries**

- **Cai, W. (G)**
  
  **Title:** Effect of Ca\(^{2+}\) on biofilm formation of fish pathogens.
  
  **Primary Author (and presenter):** Cai, Wenlong
  
  **Additional Authors:** Arias, Covadonga; De la Fuente, Leonardo
  
  **Department:** Fisheries
  
  **College/School:** College of Agriculture, Auburn University
  
  **Description:** The genera *Flavobacterium*, *Ewardsiella*, and *Aeromonas* contain important fish pathogens that cause great economic losses in aquaculture practice. Eradication of these pathogens is unrealistic as they are ubiquitous in freshwater environments. Interestingly, many aquatic bacteria are capable of forming biofilm and are more resistant to stressors such as disinfectants. We tested biofilm formation of *F. columnare* in glass flasks with different Ca\(^{2+}\) concentration (0 to 6.5 mM) and found that high concentrations of Ca\(^{2+}\) consistently enhanced biofilm formation. Without the addition of Ca\(^{2+}\), all *F. columnare* cells were planktonic while at 6.5 mM Ca\(^{2+}\) nearly all the cells were in biofilm. To test if the positive effect of Ca\(^{2+}\) in biofilm formation was a general mechanism, we quantified the production of biofilm in other fish pathogens at different Ca\(^{2+}\) concentrations. Our study showed that high Ca\(^{2+}\) concentration significantly promoted biofilm formation in *F. columnare*, *A. hydrophila* and *E. tarda* strain HL 213. On the other hand, *E. ictaluri* did not form much biofilm under any of our experimental conditions. The bacterial attachment to plastic surfaces under fluid conditions was also evaluated by...
using a microfluidic chamber. The microfluidic adhesion assay indicated that *F. columnare* can attach to plastic (polydimethylsiloxane) against higher effluent resistance at enhanced Ca\(^{2+}\) concentration. However, further studies utilizing different culture media and growing conditions are required to determine which factors condition biofilm formation in aquaculture settings.

- **Crovo, J. (G)**
  
  **Title:** A little less noise there: the effect of road traffic on a hearing specialist fish.
  
  **Primary Author (and presenter):** Jenna Crovo
  
  **Additional Authors:** Carol Johnston
  
  **Department:** Fisheries
  
  **College/School:** School of Fisheries, Aquaculture, and Aquatic Sciences, Auburn University
  
  **Description:** Noise pollution from anthropogenic sources is an increasingly problematic challenge faced by many taxa, including fishes. Recent studies confirm that vehicular traffic noise propagates effectively from bridge crossings into surrounding freshwater ecosystems; however, its effect on the stress response and hearing capacities of freshwater fishes has not been examined. The Blacktail Shiner (*Cyprinella venusta*) is a soniferous hearing specialist found throughout the Southeastern United States and was used as a model to investigate the degree to which traffic noise impacts stress and hearing. Fish exposed to an underwater recording of interstate traffic exhibited a significant elevation in the stress hormone, cortisol. Hearing threshold shifts for this species occurred at the frequencies of 300 and 400 Hz, where their hearing is most sensitive. Future work aims to elucidate the relationship between cortisol and hearing threshold integrity.

- **Matuha, M. (G)**
  
  **Title:** Mobile phone use in Ugandan aquaculture: Farmer experiences and aspirations.
  
  **Primary Author (and presenter):** Matuha, Moureen
  
  **Additional Authors:** Molnar Joseph J, Walakira John K, Naigaga Shamim
  
  **Department:** Fisheries
  
  **College/School:** College of Agriculture, Auburn University
  
  **Description:** Aquaculture, being largely non-traditional in Uganda, poses serious challenges mainly regarding lack of information and technical assistance to guide fish farmers. Farmers in Uganda have accumulated enough experience mainly in growing crops and livestock farming on their land, they have little information on raising fish on farms. Mobile phone could have an important role to play in improving aquaculture productivity through technical guidance, extension services, product assembly, coordination and price discovery for small-scale fish farmers. However, little is known regarding the utility of mobile phones in fish farming in Uganda. The objectives of this project were (1) to examine the use of mobile phones as a means of reaching and supporting fish farmers with timely information and technical guidance, (2) to obtain inputs on the content and design of information for improving and expanding existing cell-based system and (3) to explore the challenges faced by Ugandan fish farmers while using mobile phones. Focus group discussions with fish farmers were conducted in five districts of Uganda in the months of May, June, July and August 2014. The main findings reveal that cell phone use is common among fish farmers, but intermediary farmers play an important role in connecting producers to markets and suppliers and other services. Services fish farmers get from their fellow farmers are limited since the government fisheries officers and aquaculturalists are unable to reach all of them. Information regarding Market price, quality seeds, feeding procedures, pond management, fish diseases, breeding, water quality management and predator control are most needed by fish farmers. Our future work will focus on improving the already existing cell-based tilapia module, identification of ten clusters of fish farmers at district level with at least ten fish farmers in each cluster, training of one lead fish farmers identified by fellow farmers in each cluster on how to use the module who would help producers get answers to questions in fish farming and connect farmers to fingerlings, buyers, equipment, and other needs.

\*G = graduate student presentation
Room 2225 – Humanities and Communications

- **Stilwell, M. (G)**
  
  **Title:** She had it coming? Examining the framing of Janay Rice’s response.
  
  **Primary Author (and presenter):** Stilwell, Matthew, A.
  
  **Additional Authors:** n/a
  
  **Department:** Communication
  
  **College/School:** College of Liberal Arts, Auburn University
  
  **Description:** Issues of stereotyping and inequality are not new in today’s media landscape. Further, issues of gender continue to dominate within the realm of sport. Messner (2012) noted the growth of women’s sport coverage in new media may simply be nothing more than a ghettoization of women’s sport, while Daniels and LaVoi (2012) indicated trivialization and sexualization of females within sport continues. An ongoing problem that continues to be spiraling downward in the sports world is the issue of domestic violence. More specifically in the NFL, domestic violence cases have long been ignored and now seem to be the league’s number one off the field issue (Martinez & Riojas, 2014). In light of the recent Ray Rice case, an interesting dynamic to examine is the issue of forcing Janay Rice into the media spotlight while she adamantly defends her husband (Keneally, 2014). Utilizing the theoretical lens of framing, Intimate Partner Violence (IPV) will be examined in mainstream media outlets. Through a mixed method analysis, this study will examine a) what role Janay Rice was assigned by mainstream and sports media outlets and b) how mainstream and sports media outlets framed the comments of Janay Rice after the press conference. While much of sport research focuses specifically on the portrayal of athletes, by expanding the scope to include an analysis that includes primarily a non-athlete, this research hopes to examine the role of sport in the setting a broader social issue. Findings from this study will be used to analyze the framing of IPV within a sport specific context. Both theoretical and social implications will be discussed.

- **Edwards, B.**
  
  **Title:** Video games and the growing social acceptance of rape culture in America.
  
  **Primary Author (and presenter):** Edwards, Bobby, K.
  
  **Additional Authors:** Dr. Silvia Giagnoni
  
  **Department:** Department of Communication & Theater
  
  **College/School:** College of Arts and Science, Auburn University Montgomery
  
  **Description:** Video games have become one of the fastest-growing platforms for American media consumption. With the highly engaging and visual nature of the media, however, negative portrayals of women and violent images can have repercussions: including the promoted social acceptance of rape culture. Media scholars and academics have not yet done much research to address this phenomenon. In my presentation, I will offer an exploratory approach to understanding our knowledge of video games influencing rape culture and some of the concerns that this phenomenon may bring. The issue is important because this media phenomenon is relatively new, and the lack of research done in this field underscores how little we as academics know about the influence that video games have on consumers and how that influence may shape societal outlooks, attitudes, and behaviors towards rape and rape victims in America. The research I undertook was a purely qualitative exploration into previous studies and data. After I found this previous research, I discussed common trends and differences in the findings, and what may have yielded those differences. I also discuss the changing nature of the phenomenon. The results of my research reflect little being done to study the shift in societal attitudes (and the public discourse about rape) due to video games. Ultimately, studies have found positive evidence of violent video games yielding negative rape attitudes, rape culture, and victim blaming. They have also found that this has worsened through prolonged exposure to video games and that this phenomenon has compounded over the last 20 years. My presentation stresses the need for more research to be done in regards to
video games and rape acceptance and it emphasizes the importance of video game developers being held accountable for violent and sexually objectifying content. It also emphasizes the importance of media literacy for consumers of video games.

- **Rice, T.**  
  **Title:** The influence of relationship education on the dating and parent-adolescent relationships.  
  **Primary Author (and presenter):** Rice, TeKisha M  
  **Additional Authors:** Adler-Baeder, Francesca; McGill, Julianne  
  **Department:** Human Development and Family Studies  
  **College/School:** College of Human Sciences, Auburn University  
  **Description:** Dating relationships in adolescence are considered part of normative development and thought to serve as a primary context for learning interpersonal behaviors. Likewise, the parent-child relationship remains a salient influence for many teens. Relationship education (RE), often employed for adults, has become increasingly available for teenagers. However, non-romantic relationships are rarely assessed as a potential outcome domain influenced by RE. Therefore, informed by family systems and life course theoretical perspectives, this study quantitatively examines the influence of relationship education on the dating and parent-child relationship through paired sample t-test, repeated measures analysis of covariance (RMANCOVA), and hierarchical linear regression analyses. Results indicate significant and positive influences on participants' dating and parent-adolescent relationships. Implications include suggestions for RE implementation to maximize program outcomes.

**Room 2227 – Pharmacy and Veterinary Medicine**

- **Dobson, C.**  
  **Title:** Development of peptide-functionalized gold-lipidic nanocomposites for cancer diagnosis and therapy.  
  **Primary Author (and presenter):** Dobson, Connor S.  
  **Additional Authors:** 2David, Allan; 1Panizzi, Peter; 1Arnold, Robert D.  
  **Department:** 1Drug Discovery and Development; 2Chemical Engineering  
  **College/School:** Harrison School of Pharmacy and Samuel Ginn College of Engineering, Auburn University  
  **Description:** Traditional chemotherapeutic cancer treatments such as doxorubicin are poorly-selective cytotoxic agents that are effective at killing cancer cells, but are also toxic to healthy cells. For many, their selectivity is based upon their ability to kill or inhibit the growth of rapidly-dividing cells, leading to undesirable side effects in healthy but fast-dividing cells such as those found in the gastrointestinal tract or bone marrow. Liposomes, a type of nanoparticle drug-carrier, are a well-known and effective strategy for addressing these challenges. However, the clinical use of liposomes has been limited by non-optimal drug exposure profiles, leading to poor availability and thus ineffective treatment. We hypothesized that “nanocomposite” systems consisting of functionalized gold nanoclusters encapsulated within liposomes may be used to improve the efficacy of traditional chemotherapy and permit non-invasive imaging. Here we report the synthesis of peptide-functionalized 2 nm gold clusters capped with glutathione, which are stable in aqueous media, are readily conjugated via simple chemical techniques, and retain characteristic fluorescence and absorbance properties of gold nanoparticles at this size range. We have previously shown that these particles have minimal cytotoxicity, are readily taken up by PC-3 human prostate cancer cells in vitro, and that the nanocomposites have tumor-imaging capabilities in vivo in a human xenograft tumor model in athymic, immunocompromised NCR nude mice. By incorporating hydrophilic poly-(ethylene glycol) chains along with paclitaxel on the gold nanoparticles, this system represents the potential for a targeted, hydrophilic paclitaxel formulation with controlled release and imaging properties for improved cancer therapy and diagnosis.
• **Chandler, M.** (G)
  **Title:** Discovering breast cancer genetic risk factors and determining their impact on disparities – insight from an Alabama cohort.
  **Primary Author (and presenter):** Chandler, Madison R.
  **Additional Authors:** Merner, Nancy
  **Department:** Department of Drug Discovery and Development
  **College/School:** Harrison School of Pharmacy, Auburn University
  **Description:** Alabama is an understudied population for hereditary breast cancer (BC) genetic research that provides an opportunity to explore BC disparities between African Americans (AA) and Caucasians. The AA population, in general, represents a particularly under-privileged population, thus socio-economic factors can explain certain disparities. However, AA women are often diagnosed with a BC sub-type that is less treatable and more aggressive, which hints that biological factors are involved. Furthermore, AA women have a higher incidence rate of BC under the age of 40 compared to Caucasian women. Women diagnosed with BC under 40 years of age represent 5% of all new cases and are mostly seen in hereditary cases. Interestingly, BRCA1/2 mutations (that account for ~20% of hereditary BC) do not explain the higher incidence of young AA BC, and ~65% of all hereditary BCs remain unsolved. Therefore, our laboratory has designed a strategy to identify the genetic risk factors that are contributing to this BC disparity, which includes three specific aims. Aim 1 entails the recruitment of samples into “The Merner DNA bank and Database at Auburn University” (AU IRB protocol #14-335) for the study “The Identification of Human BC Genetic Risk Factors at Auburn University” (AU IRB protocol #14-232; EAMC IRB protocol 14-03-E). Aim 2 involves screening known BC susceptibility genes using a custom designed Agilent Technologies HaloPlex probe panel for targeted capture followed by next-generation sequencing (NGS); and, aim 3 includes identifying individuals/families without known susceptibility gene mutations and carrying out gene discovery efforts through whole exome capture followed by NGS. Currently my research focus is concentrated on the recruitment of affected BC individuals and families, DNA extraction from blood samples, and the gene panel screening for the first recruited samples. Ultimately, this approach will provide superior insight into the array of mutations that contribute towards hereditary AA BC.

• **Davis, R.** (G)
  **Title:** Utilizing mate-pair libraries for the automated completion of microbial genomes.
  **Primary Author (and presenter):** Davis IV, Richard W.
  **Additional Authors:** Mohammad Hossain, Mark R. Liles, Peter Panizzi
  **Department:** Department of Drug Development and Discovery and Department of Biological Sciences
  **College/School:** Auburn University
  **Description:** With the advent of antibiotic resistance in bacterial species, such as *Staphylococcus aureus* and the new “totally drug resistant” distinction in strains such as *Mycobacterium tuberculosis*, we are entering an age which many refer to as the post-antibiotic era. In the wake of this threat, recent developments in next-generation sequencing offer a new hope in describing the total genetic code of bacterial species as a means to determine how this resistance develops and new ways to combat its spread. Although these technologies have significantly lessened the cost and time required to construct these genomes, it seems to lag behind in its ability to automate their completion. For example, of the 4,223 genome projects listed from the Genome Assembly and Annotation report for *S. aureus*, only 65 are currently listed as complete. The intrinsic difficulty in closure of these genomes is the determination of Euler paths during the deconstruction of De Bruijn graphs by genome assembly algorithms. Significant amounts of interspersed or tandem repeats can cause misassemblies due to collapsing or rearrangement of the surrounding elements. We describe the use of a new technology, 25 kilobase mate-pair (MP) libraries, which successfully automate this closure of genomes by providing more thorough information on the length and ordering of these difficult regions. In this presentation,
we compare three library constructions (Illumina® Nextera, Pacific Biosciences® SMRTbell, and Lucigen® NxSeq MP libraries) and contrast their ability to automate the completion of an ancestral *Staphylococcus aureus* genome, named Tager 104, isolated prior to the emergence of methicillin resistance. Information provided will be applied towards its use in prokaryotic and eukaryotic genome construction, as well as providing information to bioinformaticists and programmers about the current state of challenges in genome construction.

**Room 2310 –Veterinary Medicine**

- **Jensen, R. (G)**
  
  **Title:** Viral vectored vaccines to control sexual behavior and reproduction in horses.  
  **Primary Author (and presenter):** Jensen Rochelle L.  
  **Additional Authors:** Johnson Aime K, Baker Henry J, Wilborn Robyn R.  
  **Department:** Clinical Sciences, Theriogenology  
  **College/School:** College of Veterinary Medicine, Auburn University  
  **Abstract:** Uncontrolled expression of sexual behavior can adversely affect pleasure riding and athletic performance of horses. In addition, population control of wild horses requires non-surgical contraceptive methods. Research at Auburn University, College of Veterinary Medicine on development of contraceptive vaccines provides promising results toward a practical and affordable solution to these problems. Gonadotropin releasing hormone (GnRH) is a small peptide with central control of reproduction and sexual behavior in all mammals and both genders. GnRH is produced in the hypothalamus and controls the release of gonadotrophic hormones from the anterior pituitary which in turn regulates fertility and sexual behavior. When combined with immunostimulants, anti-GnRH vaccines produce antibodies that interfere with GnRH function and suppress the entire reproductive system. While some experimental GnRH vaccines demonstrate feasibility of this contraceptive method, they produce inconsistent suppression of gonadal function and sexual behavior, and cause adverse injection site reactions, all of which limit their use in domestic and wild horses. Adenovirus vectored vaccines have been engineered to express GnRH antigens that address the limitations of these vaccines and are safe and effective. These innovative vaccines provide practical and affordable control of equine sexual behavior and reproduction, with special advantages of long term effect, economical mass production and application to field use.

- **Kottwitz, J. (G)**
  
  **Title:** Expression of cyclooxygenase-1 and -2 isozymes in alpaca (*Vicugna pacos*)  
  **Primary Author (and presenter):** Kottwitz, Jack  
  **Additional Authors:** Edmonson, Misty and Boothe, Dawn  
  **Department:** Anatomy, Physiology, Pharmacology  
  **College/School:** College of Veterinary Medicine, Auburn University  
  **Description:** Cyclooxygenase (COX) isoenzymes are key components in the inflammatory cascade. Cyclooxygenase-1 (COX-1) is constitutively produced by the body, and is required for essential physiological functions including intrinsic protective mechanisms of the renal and gastrointestinal system and normal platelet function. The isoenzyme COX-2 is induced in response to injury, trauma, and other stimuli and is involved with inflammatory responses, cardiovascular function, and water homeostasis. The purpose of this study was to determine the circulating concentrations of COX-1 and the inducibility of COX-2 in alpacas as a prelude to understanding differences in non-steroideal anti-Inflammatory drugs (NSAIDs) in this species. These results were compared to horses as a positive control species in which circulating levels of these isoenzymes have already been evaluated. Blood was obtained from 7 healthy adult alpaca and 3 horses. Initial evaluation for thromboxane as an indicator of COX-1 activity showed levels below the detection levels of the assay for alpaca. A second assay, with lower detection thresholds, determined that Alpaca serum had a mean thromboxane level that was 10% of that of the horse (alpaca=$621.47 +/ - 300.90$, 95% CI  

*G = graduate student presentation*
Plasma was evaluated for prostaglandin E2 and its metabolites after induction with lipopolysaccharide as an indication of inducibility of COX-2 isoenzymes. Alpaca and equine plasma had similar results, where the mean in alpaca plasma was 34.10 +/- 9.69, 95% CI [26.87, 41.23] pg/ml. For horses, mean concentrations were 34.05  +/- 6.28, 95% CI [25.39, 42.81] pg/ml. The low COX-1 levels detected in this study imply that a thorough evaluation of NSAID drugs may not be possible in alpacas utilizing current methods. The low background levels of COX-1 may indicate a substantially higher risk of toxicity in alpaca for medications that preferentially inhibit this isoenzyme.

- Shirley, J. (G)
  Title: Experimental infection of calves with *Salmonella enteritidis*: Disease variability and peripheral lymph node contamination.
  Primary Author (and presenter): Shirley, James, F.
  Additional Authors: Kitchens, S.R.; Walz, P.H.; Wright, J.C.; Price, S.B.
  Department: Pathobiology
  College/School: College of Veterinary Medicine, Auburn University
  Description: In 2012, the Centers for Disease Control and Prevention investigated a human outbreak of *Salmonella Enteritidis* (SE) linked to ground beef products from a single supplier. This outbreak was unusual because SE is most closely associated with poultry, where it has been implicated in several human outbreaks associated with ingestion of contaminated eggs. To explain this unusual route of transmission of SE to humans, we hypothesize that SE can cause disease in cattle, where it disseminates from the bovine gut and invades peripheral lymph nodes. Unlike the mesenteric lymph nodes, the peripheral lymph nodes are not removed at slaughter following carcass processing and thus are a potential source of ground beef contamination from infected cattle. To test this hypothesis, three pairs of 5-7 week-old calves were challenged orally with between 5.0 x 10⁹ and 1.3 x 10¹⁰ CFUs of a bovine SE isolate. Following inoculation, daily fecal samples were enumerated for SE and temperatures were measured twice daily. Blood and four peripheral lymph nodes were cultured post-mortem. Oral challenge with SE produced mixed results. Fever spike was noted for all calves for days two or three post inoculation. Although each calf received a high dose of SE, fecal shedding of the organism was variable amongst the calves. Calf T1 shed low amounts of SE (10² - 10³ CFU/g feces); calves C1, C3 and C4 shed moderate amounts of SE (10⁴ - 10⁶ CFU/g feces); and calves C2 and C2 shed high amounts of SE (10⁶ – 10⁸ CFU/g feces). Bacteremia was noted for two amongst the three most severely affected calves and SE was recovered from the peripheral lymph nodes of the same three calves. This work shows that SE causes disease and invades peripheral lymph nodes in calves and therefore is a concern for ground beef contamination. Ongoing research is examining a treatment cocktail of seven bacteriophages to reduce SE disease and prevent peripheral lymph node contamination. The presence of SE in the peripheral lymph nodes of the three most severely affected calves and its presence in the blood of two of these three suggests that SE produces a systemic disease in calves. Considering that the SE used in these studies was originally isolated from a bovine source, future experimental calf infections using a different SE isolate are necessary to determine whether host source of SE affects disease outcome.

Room 2326 – Biological Sciences

- Chen, C. (G)
  Title: The impact of maternal protein intake on offspring organ development in the house mouse (*Mus musculus*)
  Primary Author: Chih-Wei Chen
  Additional Author: Wendy R. Hood
  Department: Biological Sciences
  School: College of Sciences and Mathematics, Auburn University

*G = graduate student presentation*
**Description:** Organ mass is a well-known phenotype used in observing development. Numerous studies note how variables such as diet and maternal effects play a key role in altering development and that it can be recognized through the measurement of organ mass at different developmental stages. However, these studies are mostly done on lab animals under lab settings. The docile nature of these animals cultivated through generations of lab inbreeding as well as their artificial habitat causes a differentiation in response to environmental variables when compared to wild populations. To accurately predict dietary effects on development in the wild, our animals were kept in a semi-natural environment mimicking the climate of wild demes. Our aim was to identify 1) Whether maternal or dietary effect was more influential to development and 2) whether offspring expressing higher levels of development are ones maintaining a similar diet to their mothers (Environmental matching hypothesis) or based on their accumulative diet (silver spoon hypothesis).

We fed first generation mice (F0) a high (H) or low (L) protein diet and then maintained their offspring (F1) on the same diet (HH, LL) or alternate diet (HL, LH) upon weaning (day 28 of age). We then collected organ samples of F1 mice at day 28, 56 and 270 to inspect the dietary and maternal effects on organ mass in each group. Using R software to analyze the organ data (liver, kidney & spleen) we noticed greater organ development in the LH and HH group compared to the LL and HL group. In addition, we observed no differences in the L and H groups. Indicating 1) Individual diet plays a bigger role than maternal effects in organ development and 2) development followed the silver spoon hypothesis rather than the environmental matching hypothesis. Our study accentuates the importance of conducting studies using models that can resemble wild environments, which can provide a more accurate insight on developmental plasticity in wild species.

- **Chivers, J. (G)**
  **Title:** Characterizing pure and hybrid morphology of the species *Anaxyrus americanus*, *Anaxyrus fowleri*, and *Anaxyrus terrestris* in Alabama
  **Primary Author (and presenter):** Chivers, Jacqueline, M  
  **Additional Authors:** Guyer, Craig  
  **Department:** Biological Sciences  
  **College/School:** College of Sciences and Mathematics, Auburn University  
  **Description:** The American toad (*Anaxyrus americanus*), Fowler's toad (*Anaxyrus fowleri*) and the southern toad (*Anaxyrus terrestris*) are known to hybridize. In this study we observed the extent of hybridization among these species using morphological characteristics. We examined 1,041 preserved toads from Auburn University’s Museum of Natural History and collected morphological data including condition of the junction of the interorbital and postorbital crests, size of tibial warts, number of warts per dorsal dark spot, and contact of the postorbital crest with the parotoid gland for all three species. Location coordinates for each specimen were plotted on a map of Alabama to examine geographic range. Using cluster analysis, multidimensional scaling, and discriminate function analysis, the results showed morphology is useful in identifying *Anaxyrus fowleri*. *Anaxyrus americanus* and *A. terrestris* are not as morphologically distinct as gene trees claim. *Anaxyrus fowleri* had a higher frequency of hybridization with *A. terrestris* than with *A. americanus*. *Anaxyrus americanus* specimens exhibited a higher hybridization frequency with *A. terrestris* than with *A. fowleri*. Morphological hybrids of these species occur without geographic limitations. Future research will focus on advertisement calls and genetic analysis of these species.

- **Folt, B. (G)**
  **Title:** Population genetics of the Red Salamander (*Pseudotriton ruber*) with the Recognition of a New Species  
  **Primary Author (and presenter):** Folt, Brian  
  **Additional Authors:** Garrison, Nicole; Guyer, Craig; Bond, Jason.  
  **Department:** Department of Biological Sciences  
  **College/School:** College of Science and Mathematics, Auburn University
Description: The Red Salamander (*Pseudotriton ruber*) is a widely-distributed species of lungless salamander which occupies stream habitats in eastern North America. Color pattern varies across the species’ range and has resulted in the recognition of four subspecies of Red Salamanders: *P. r. ruber* occupies upland habitats above the Fall Line, *P. r. vioscai* occurs in Gulf and Atlantic Coastal Plain habitats, and *P. r. nitidus* and *P. r. schencki* inhabit high elevation areas in the Blue Ridge Mountains. Although these subspecies largely do not overlap in distribution, Mount (1975) suggested that a large area of hybridization exists between *P. r. ruber* and *P. r. vioscai* in central Alabama. In this study, we sequenced three genes from populations of *P. ruber*, used statistical methods to analyze the genetic data, and built an evolutionary tree for the species. Our tree questioned the recognition of the historically-defined subspecies and instead described two major genetic groups of Red Salamanders: an upland population distributed from central Alabama north and east through Appalachia, and a lowland population occurring in the Coastal Plain from southern Georgia west and north to western Kentucky. We propose that the Coastal Plain population represents a distinct and new species, *Pseudotriton vioscai* (Southern Red Salamander). We rejected Mount’s (1975) hypothesis of a hybrid zone in central Alabama. Similar to other Coastal Plain animals, an east-west split in genetic structure coincided with the Apalachicola River basin, suggesting that this region of the Coastal Plain was important in the diversification of Red Salamanders during past periods climatic cooling and glaciation. These results are contrary to a long-standing hypothesis for an Appalachian origin for lungless salamanders and also generate immediate conservation consequences, because *P. vioscai* has a limited distribution in most states within which it occurs.

9:00 – 9:45 a.m.

Room 2216 – Forestry and Wildlife Sciences

- **Majidzadeh, H.** *(G)*
  
  **Title:** Soil carbon dynamics beneath impervious surfaces: an information gap related to Global C Cycle
  
  **Primary Author (and presenter):** Majidzadeh, Hamed
  
  **Additional Authors:** Lockaby, Greame; Governo, Robin
  
  **College/School:** School of Forestry and Wildlife Sciences, Auburn University
  
  **Description:** Climate change is mostly a result of human activities increasing greenhouse gases in the atmosphere. The future increases in levels of greenhouse gases not only depends on how much is released, but also on the amount of carbon absorbed by the Earth’s natural sinks. Soils are the largest terrestrial reservoir of atmospheric carbon. However, urbanization has been shown to impact soil carbon (C) and nitrogen (N). The earth’s total impervious surface (580,000 Km2) is estimated to encompass an area the size of California. Few studies have sampled soil beneath impervious surfaces despite the large area that it covers and substantial effects that it may have on soil biogeochemistry. Therefore, urban soil C and N estimations without considering that beneath impervious surfaces are not complete. In this study possible changes in soil biogeochemistry beneath the crawl spaces of homes in the southern piedmont of Alabama and Georgia were examined. Preliminary data suggests that soil C and N beneath the crawl spaces of homes are 40% lower than adjoining lawns, and that microbial biomass C and N were 38% and 11% lower respectively in the top 10 cm of soil beneath the crawl space in comparison to adjoining lawn. In order to expand these data to other areas, a control study is currently underway. The control study consists of replicated crawl spaces and slabs built on the 5m x 5m plots. Changes in C storage beneath these surfaces will be monitored in a two year period and will be compared to adjoining reference grassland to elucidate the mechanism of changes in soil. The preliminary data from control study suggest that soil C and microbial biomass beneath concrete slabs might be even lower than under crawl spaces.

- **Trautwig, A.** *(G)*
Title: *Imperata cylindrica* Reduces Colonization of Mycorrhizal Fungi on *Pinus taeda* in Commercial Stands  

**Primary Author (and presenter):** Trautwig, Adam, N  
**Additional Authors:** Eckhardt, Lori; Loewenstein, Nancy; Hoeksema, Jason; Carter, Emily  
**Department:** Forestry  
**College/School:** School of Forestry and Wildlife Sciences, Auburn University  
**Description:** *Pinus taeda* comprises over 50 percent of growing stock in commercial forests, totaling over 1 billion seedlings. *Imperata cylindrica*, has been shown to reduce tree vigor in *P. taeda* plantations. This species is known to produce allelopathic exudates that may influence the community dynamics of *P. taeda* symbionts like soil microbes. This interaction has the potential to negatively influence the forest products industry, which has an industrial output of 103 billion dollars annually. Roots colonization by mycorrhizal fungi and soil microbial communities were sampled at an intensively managed site in Greene County, Mississippi, on Westervelt property in *I. cylindrica* invaded and non-invaded plots. It was found that sites in which *Imperata cylindrica* have invaded there were reduced levels of mycorrhizal colonization in the top 40 cm of soil. Abundance of pine fine feeder roots was also measured. In the top 20 cm there was insufficient information to determine abundance but lower in the soil profile (21-40 cm and 41-60 cm) there was sufficient data to discern that there is a disparity in root prevalence in *I. cylindrica* invaded stands. In addition there were higher organic C:N ratios at sites in which *I. cylindrica* was present.

- **Yang, J. (G)**  
  **Title:** Century-scale estimation of global burned area, pyrogenic carbon emissions, and its impacts on terrestrial carbon fluxes  
  **Primary Author (and presenter):** Yang, Jia  
  **Department:** Forestry  
  **College/School:** School of Forestry and Wildlife Science, Auburn University  
  **Description:** Fires consumed large amount of vegetation and soil organic carbon, and significantly influenced ecosystem and climate system. Despite that the global fire regimes in the contemporary period has been widely investigated via satellite observations, studies regarding to century-scale assessment of global fire regimes are still lacking. The knowledge of fire history in the context of multiple environmental changes would give us clues as to how fire regimes will change in future. In this study, we investigated the global burned area, biomass burning and its impact on carbon fluxes from 1901 to 2010 by using a process-based ecosystem model. During the 110 years, global burned area was approximately 442×10^4 km^2 year^-1 and showed a significant downward trend at the rate of -1.28×10^4 km^2 year^-1. Global biomass burning was estimated to be 2.43 ± 0.27 Pg C year^-1. From the early 20th century to the mid-1980s, biomass burning showed a significant declining trend at the rate of -0.0086 Pg C year^-1, but followed by a significant increase trend at the rate of 0.014 Pg C year^-1 from 1984 to 2010. Under the impact of fire activities, global net primary productivity was reduced by 4.14 Pg C year^-1, heterotrophic respiration was reduced by 6 Pg C year^-1, and the size of terrestrial net carbon sink was reduced by 0.57 Pg C year^-1. The current humid regions with large carbon storage should be paid with particular attention on the fire activities. To minimize the forest logging and cropland expansion in these regions could be practical strategies to reduce carbon emissions from global biomass burning in the future.

Room 2218 – Electrical Engineering  
- **Hu, C. (G)**  
  **Title:** Rapid imaging based on complex exponential modelling of signal in magnetic resonance imaging  
  **Primary Author (and presenter):** Chenxi Hu  
  **Additional Authors:** Stanley Reeves  
  **Department:** Electrical and Computer Engineering
College/School: Samuel Ginn College of Engineering, Auburn University

Description: Magnetic resonance imaging (MRI) forms an image by acquiring its Fourier transform. In many applications the image varies during acquisition, such as when R2* decay and off-resonance are present. Conventional imaging samples the spectrum repeatedly, with a small time interval in each decay period so the image appears static. This causes a relatively long scan up to multiple seconds. In our approach, the time variation of the image is modelled explicitly as a complex exponentially decaying image where the initial map is given by the spin density, and the complex decay rate is composed of the real R2* decay rate and the imaginary off-resonance frequency. We then only sample the signal in one decay period and estimate the three parameter maps of the model. Thus, the scan time drops to tens of milliseconds. The reconstruction, however, becomes challenging due to the nonlinearity, ill-conditioning, and large data size. The conventional reconstruction algorithm is nonlinear conjugate gradients (CG). However, CG can be very slow and can often fail to converge. We have developed two improved algorithms. The first is a trust-region (TR) algorithm. It controls the step length in each iteration at a suitable scale so that the local quadratic approximation of the cost function remains valid. This strategy not only makes the algorithm much more stable but also helps it reach the optimal update in each iteration. Our experiments show that TR is much more likely to converge than CG. The second algorithm is an auxiliary variable (AV) method. An auxiliary variable set enables us to split the nonlinear cost function into two functions with special structures that can accelerate the computation. Our extensive simulations show that the AV method generally converges in 3 minutes, compared to TR in 18 minutes, and CG in 30 minutes. Our approach applies to many applications such as functional MRI, detection of cartilage degeneration, neuroimaging, and radiofrequency ablation.

- Lindmark, B. (G)
  Title: Estimation of in-water transmit signals and scene data in sonar applications using semi-blind deconvolution
  Primary Author (and presenter): Lindmark, Brian D
  Department: Electrical & Computer Engineering
  College/School: Samuel Ginn College of Engineering, Auburn University
  Description: A transmitted acoustic signal in the water is not the same as its analytic source. Both hardware limitations and the physical interaction with the water can potentially cause an acoustic signal to degrade from its original description. In many sonar applications, however, the analytic signal is used to process the return information, despite its inaccuracy from the actual in-water signal. Even when a recorded replica is included, it may be inaccurate to the particular circumstances of the data set. This can lead to errors in the processed information. In our method, we use semi-blind deconvolution to simultaneously estimate the scene and the actual in-water signal. We adopt a general model for the target signal that constrains the estimate to reduce artifacts arising from an inaccurate acoustic signal. Then we use this estimate to refine the estimate of the acoustic signal. This leads to estimates on both the acoustic signal and the scene that can both be used in additional processing. We have tested this process using simulation data, using a non-ideal transducer frequency response. Deconvolving the estimated transmit from the return signal resulted in a significant improvement on the signal reconstruction compared to deconvolution with the analytic signal description. This improvement could allow us to better identify and classify targets of interest in sonar applications using any existing hardware and under any water conditions.

- Venkatasubramanian, M. (G)
  Title: A new test vector search algorithm for a single stuck-at fault using probabilistic correlation
  Primary Author (and presenter): Venkatasubramanian, Muralidharan
  Additional Authors: Agrawal, Vishwani D.
  Department: Electrical and Computer Engineering
  College/School: Samuel Ginn College of Engineering, Auburn University

*G = graduate student presentation*
Description: It has been mathematically shown that the testing problem is NP complete. Numerous attempts have been made in creating and designing algorithms to successfully test a digital circuit for all faults in computational linear time. However, due to the complexity of the NP problem, all these attempts start becoming exponential with an increase in circuit size and complexity. Algorithms have been proposed where successful vectors have been used to search for more test vectors with similar properties. However, this leads to a bottleneck when trying to find hard to find stuck-at faults which have only one or two unique tests and their properties may not match other previously successful tests. To tackle this issue, we forayed into the exciting field of quantum computing and how to successfully apply current quantum algorithms in its mathematical form to our problem. Specifically, we looked at Grover's algorithm for database search to figure out how to successfully search for new test vectors in the optimum time. We propose a new probability based algorithm where new test vectors are generated based on the input probability correlation of previously unsuccessful test vectors. By looking at the correlation between the primary inputs for previously generated test vectors, we use the probability information of 1's or 0's at a primary input with respect to other inputs to skew the search in the test vector space. Our findings successfully demonstrate the proof of concept of this new algorithm along with its resilience with weighted random test generators. We have shown test time improvements for a 10 input AND gate, c17 and c432 benchmark circuits. We have also shown improvements when comparing our algorithm with a random test generator and weighted-random test generator. Our end objective is to create a quantum testing algorithm i.e. create a probabilistic algorithm which can run on a quantum computer. We might have not yet achieved the goal, but that is the ultimate direction with which we are undertaking a foray in this research.

Room 2222 – Chemical Engineering

- Kerscher, P. (G)
  Title: Cardiac differentiation of hiPSCs as a tool to identify and study drug-induced congenital heart defects
  Primary Author (and presenter): Kerscher, Petra
  Additional Authors: Lipke, Elizabeth
  Department: Chemical Engineering
  College/School: Samuel Ginn College of Engineering, Auburn University

Description: Drug-induced changes of the developing human heart are unpredictable and difficult to understand due to the limited availability of human heart tissues in vitro. Creating a system that mimics human heart development can provide insights into the physiological, electrical, and mechanical functions at different stages of heart development and more accurately detect drug-induced changes of these parameters. Previous studies primarily focused on developmental changes in small animal models, which are not comparable to human heart development and might result in false information on the influence of potential, new pharmaceuticals on the developing organ. In this study, a conventional 2D monolayer (simplified model) as well as our newly developed 3D developing human engineered cardiac tissue (3D-dhECT) platform for differentiating human induced pluripotent stem cells (hiPSCs) into contracting cardiomyocytes (CMs) were used as model systems for in vitro heart development. Throughout development, thalidomide, a sedative drug launched in 1957 which caused severe birth defects in more than 10,000 children, is introduced at 10 and 70 μM, and thalidomide-induced changes in frequency of contraction, gene expression, and electrophysiological function of these developing heart cells was compared to the control group. In the simplified 2D monolayer differentiation platform, a higher number of cell detachment was observed prior to the initiation of spontaneous contraction (< day 7). Surprisingly, by day 11, thalidomide-treated CMs resulted in stronger contracting monolayers compared to the age-matched control; following day 11, contractility of thalidomide-treated CMs seemed to decrease. In our 3D-dhECTs, thalidomide-treated tissues did not appear as dense as control 3D-dhECTs, which resulted in slower tissue development and
slower frequency of contraction (0.45 ± 0.03 Hz vs. 0.54 ± 0.06 Hz, day 19). In summary, these 2D and 3D differentiation platforms will provide insights into thalidomide-induced changes during heart development on a cell- and tissue-level and enhancing our ability to more efficiently and accurately detect drug-induced defects in the developing human heart.

- **Larsen, J. (G)**
  
  **Title:** Functionalization of nano-polymersomes for delivery through the blood-brain barrier  
  **Primary Author (and presenter):** Larsen, Jessica M  
  **Additional Authors:** Pearce, Elizabeth; Martin, Douglas; Byrne, Mark  
  **Department:** Chemical Engineering  
  **College/School:** Samuel Ginn College of Engineering, Auburn University  
  **Description:** The blood-brain barrier (BBB) serves as the first level of defense for the brain, selectively permitting passage of necessary ions and molecules while preventing transport of greater than 98% of drug molecules. Intravenous treatment of a fatal genetic disease, GM1 gangliosidosis, would require transport of a lysosomal enzyme through the BBB and into the lysosome of neural cells. We are engineering self-assembling polymersomes, which will protect the enzyme through delivery with attachment of multiple targeting moieties. Poly(ethylene glycol)-b-poly(lactic acid) (PEG-b-PLA) copolymers have self-assembled into membrane-bound polymersomes over a period of three hours in water at an average minimum diameter of 216.2 nm ± 12.9 nm. Polymersomes with a diameter of approximately 200 nm have proven to be therapeutically deliverable in *in vitro* BBB studies. In order to attach targeting ligands, N-hydroxysuccinimide (NHS), an amine-reactive linker, is introduced. NHS is activated in aqueous solution, leaving its ester group to allow for amine bond formation, necessitating polymersome formation in other solvents. Formation occurs more rapidly after complete dissolution of PEG-b-PLA at a concentration between 2 and 50 μmol/mL in either dimethyl siloxane (DMSO) or acetone prior to rapid injection in water or an aqueous drug solution. Using dynamic light scattering (DLS) techniques and acetone as a solvent in the injection method, greater than 90% of polymersomes formed were found in the desirable hydrodynamic diameter bin of less than 200 nm. Without employing membrane for separation of polymersomes formed in DMSO, only 4% of were found to have a diameter less than 200 nm, with a 450 nm membrane increasing this percentage to greater than 60%. Transmission electron microscopy was conducted to confirm the presence of spherical vesicle structures. Introduction of NHS groups was confirmed using Fourier Transform-Infrared Spectroscopy. Introduction of NHS group on the surface of polymersomes will allow for attachment of amine-activated apolipoproteins, newly discovered to transcytose through the BBB to the lysosome where treatment is needed. The activity of apolipoproteins and the active site for binding the BBB must remain intact, making the attachment to NHS groups an extremely important step towards brain delivery.

- **Parit, M. (G)**
  
  **Title:** Thermoplastic polymer composites using polyvinylpyrrolidone functionalized single walled carbon nanotubes  
  **Primary Author (and presenter):** Parit, Mahesh B.  
  **Additional Authors:** Davis, Virginia A.  
  **Department:** Chemical Engineering  
  **College/School:** Samuel Ginn College of Engineering, Auburn University  
  **Description:** The objective of this research is to determine if non-covalent functionalization of single-walled nanotubes (SWNT) with polyvinylpyrrolidone (PVP) improves the thermal properties of two model thermoplastic polymer composites: polypropylene (PP) and ethylene vinyl alcohol (EVOH). The addition of SWNT to thermoplastic polymers has the potential to improve their thermal stability, mechanical properties, and flame retardancy. However, achieving these goals requires uniform SWNT dispersion without aggregates and favorable thermodynamic interactions with surrounding polymer matrix. Since pristine SWNT are amphiphobic, covalent functionalization
is often used to modify the SWNT surface chemistry and improve their compatibility with the polymer. However, since covalent functionalization can deteriorate the SWNT’s intrinsic mechanical and electrical properties achieving non-covalent functionalization may enable better properties. Non-covalent functionalization using PVP maintains the pristine structure of SWNT while potentially improving dispersion and enabling higher thermal degradation temperatures. Investigation of both PP, a hydrophobic polymer, and EVOH, a hydrophilic polymer was used to gain insights into the importance of PVP compatibility with the matrix. The composites were produced by extrusion on a Haake Minilab counter rotating twin screw extruder. Thermal properties were measured on a TA Instruments Q50 Thermal Gravimetric Analyzer in both air and inert atmospheres. The effects of SWNT concentration, screw speed, extrusion temperature, and extruder recirculation time on thermal properties are reported and compared to previous results for covalently functionalized SWNTs.

Room 2223 – Economics and Business

- **Song, J.** (G)
  **Title:** Contemporary virtual teams: Managerial challenges and solutions
  **Primary Author (and presenter):** Song, Jiahe
  **Additional Authors:** Byrd, Terry A.
  **Department:** Aviation and Supply Chain Management
  **College/School:** Raymond J. Harbert College of Business, Auburn University
  **Description:** Virtual communication is a preferred working style for remote-team-building with a concern of saving both time and money. A variety of information and communication technologies (ICTs) are available for providing technical support to virtual teams. While companies as a whole accumulated a good deal of experience on executing virtual teams from practice, challenges still exist due to distinct industry or even individual organization circumstances. Using four case studies of companies across Asia and the U.S., this paper aims to reveal the difficulties when managing virtually-connected teams and follows with solutions for team managers and organizational leaders to achieve greater collaboration and higher productivity in virtual team practice. Interview was applied to each firm as the major methodology. The results from the cases suggest that traditional communication tools such as phone and e-mail are still necessary for virtual team members to convey important and formal information. Most importantly, the research reveals that every virtual team should consider adopting ICTs and designing a portfolio to use ICTs based on the specific functions and characteristics of the team.

- **Shi, W.** (G)
  **Title:** Assessing and forecasting financial vulnerability in the united states in a data rich environment
  **Primary Author (and presenter):** Shi, Wen.
  **Additional Authors:** Kim, Hyeongwoo.
  **Department:** Economics
  **College/School:** College of Liberal Arts, Auburn University
  **Description:** We present factor-based models to out-of-sample forecast the financial market vulnerability in the U.S. We employ the method of the principal components for 170 monthly frequency macroeconomic data from October 1991 to November 2014 in order to extract multiple latent factors that summarize common components of the entire data set. Using these factor estimates, we out-of-sample forecast the Cleveland Financial Stress Index, which is one of newly developed measures of financial vulnerability in the U.S. We evaluate the prediction performances of our models using the ratio of root mean square error and the Diebold-Mariano-West statistics. Our major findings are tri-fold. First, our factor-based forecast models improve upon the random walk model and the stationary autoregressive competing models for 1- to 6-month forecast horizons. Second, estimated first common factor, which plays a key role in our forecast exercises, seems to be
more closely related with real activity variables rather than nominal variables. Third, the rolling window scheme with at least 50% split points performed as well as the recursive approach.

- **Sisman, M. (G)**
  
  **Title:** Impacts of the food safety regulations on trade flows: An application to the almonds industry  
  **Primary Author (and Presenter):** Muhammet Yunus Sisman  
  **Department:** Agricultural Economics and Rural Sociology  
  **College/School:** College of Agriculture, Auburn University  
  **Description:** International trade has become less restricted with the reductions in tariffs but has been significantly influenced by the regulatory standards. Food safety regulations become increasingly important as trade instruments, and many developed countries are employing restrictive limits on food safety standards that may prevent imports (WTO, 2013). The domestic sanitary measures stringent than international standards raise question on protectionist exercise of regulations in agricultural trade. The European Union’s (EU) food safety regulations have received great attention during the last decades. One particular item which triggers the concern that EU may violate the Sanitary and Phytosanitary agreements in the early millennium is the harmonization policy on foodstuff contaminants such as aflatoxins that are one of the most common types of food contaminants in cereals, nuts, and fruits. The EU made substantial adjustments on the aflatoxin standards in 2010. The new regulation aligns the current EU aflatoxin maximum residue levels with the Codex for a group of tree nuts including almonds. This study aims to explore the impacts of EU’s aflatoxin regulations on the international almonds trade flows. A major hypothesis to be investigated is whether the food safety standards act as barriers or catalysts in the world tree nut market. The gravity models are estimated almonds during the period of 1995-2012 which includes three stages of EU regulations. The trading partners consist of major exporters of almonds and EU-28 as importers. A number of developed countries which keep their regulation unchanged are included as the control group. The analysis accounts for around 70 percent of the world almond trade. The findings of the study validate the concerns of protectionist use of the food safety regulations which can be considered as an important factor for trading policies for certain crops. Overall, the present study contributes the existing literature in two folds. To my knowledge, no readily available study on the EU’s recent adjustments on aflatoxin harmonization and tree-nuts trade exists. Furthermore, the literature on the economics of agricultural product standards provides inconclusive empirical findings. The mixed empirical findings of food safety standards and the recent adjustments of the EU regulations for rarely studied industries are main driving forces in this research.

Room 2225 – Veterinary Medicine

- **McMaster, M. (G)**
  
  **Title:** *Ex vivo* evaluation of a modified Teno Fix® device repair pattern versus a three-loop pulley for repair of equine flexor tendons.  
  **Primary Author (and presenter):** McMaster, Mattie, A.  
  **Additional Authors:** Hanson, Reid; R, Munsterman; Amelia, S; Weimar, Wendi  
  **Department:** Clinical Sciences  
  **College/School:** Auburn University College of Veterinary Medicine  
  **Description:** Traumatic lacerations of equine flexor tendons are often life-threatening, and current repair techniques are not able to withstand strains associated with immediate weight-bearing and locomotion. The Teno Fix® (TF) repair system is an intratendinous device used in human orthopaedic surgery. The objective of this study was to compare the strength and failure characteristics of the TF to the current clinical standard, the three-loop pulley (3LP), *ex vivo* evaluate the effect of implant pattern and number of TF implants on maximum strength and gap formation. Twenty cadaver superficial digital flexor tendon pairs were randomized and repaired with a 3LP or one of two TF patterns; four staggered TF implants (4TF) or five staggered TF implants
(5TF). Ultimate load to failure and 2mm gap (Newtons), mode, and gap at failure (mm) were obtained using a materials testing system and high speed camera. Statistical analysis was performed using one-way analysis of variance (ANOVA) with post-hoc testing using Tukey-Kramer HSD (significance set at p≤0.05). The 3LP failed at a greater load than the 4TF and 5TF (p<0.001). Load to a 2mm gap and gap at failure were significantly higher for the 3LP than both TF repairs (p<0.001). Mode of failure was suture pull-out/breakage for the 3LP, and anchor pull-out/failure for the TF. Use of a fifth TF implant had no significant impact on the strength (p=0.37). The low ultimate strength suggests that the TF repair patterns used in this study may not be ideal for equine flexor tendon tenorrhaphy.

- Campbell, S.
  
  **Title:** Clock gene expression is altered in adipose tissue during adipogenesis and obesity in Mangalica pigs

  **Primary Author (and presenter):** Campbell, Stephanie, M

  **Additional Authors:** Purvis, Katelyn; Bartosh, Julia; Brandebourg, Terry

  **Department:** Biological Sciences; Animal Sciences

  **College/School:** College of Science and Mathematics; College of Agriculture, Auburn University

- Barr, L.
  
  **Title:** Evaluating potential routes of off-pathway electron transfer in catalase-peroxidase

  **Primary Author (and presenter):** Barr, Lauren E.

  **Additional Authors:** McCurdy, Ethan; Njuma, Olive; Goodwin, Douglas

  **Department:** Chemistry and Biochemistry

  **College/School:** College of Sciences and Mathematics, Auburn University

  **Description:** Any organism in an aerobic environment must degrade hydrogen peroxide (H2O2) to avoid its cytotoxic effects. Catalase-peroxidase (KatG) is unique in that it is capable of utilizing the two principal mechanisms for the decomposition of H2O2 observed in nature, catalase and peroxidase. KatG of Mycobacterium tuberculosis is of particular interest due to its involvement in virulence and antibiotic resistance. Recent investigations of this enzyme have revealed that peroxidatic electron donors can actually stimulate catalase activity, possibly by “rescuing” catalase-

*G = graduate student presentation*
inactive intermediates that accumulate as a result of off-pathway electron transfer, returning the enzyme to active turnover. By using site-directed mutagenesis to produce variant forms of the enzyme, various residues of KatG can be evaluated to determine their role in this misdirected electron transfer. In the variant W438F, a non-oxidizable phenylalanine replaces the oxidizable tryptophan at position 438, blocking any potential electron transfer through that route. The W438F variant displays a threefold increase in catalase activity and a threefold decrease in peroxidase activity as compared to wild-type KatG. Furthermore, by monitoring catalase activity as a function of oxygen production measured via an oxygen-sensitive electrode, electron donors appear to inhibit catalase activity at pH 7, where optimal unassisted catalase activity is typically observed. These results are consistent with the possibility of off-pathway electron transfer through this route, as the phenylalanine substitution would obstruct the route and diminish the need for the peroxidatic rescue event. However, oxygen production data also show that electron donors enhance catalase activity at pH 5, in a similar manner to the wild type. Heme intermediates observed by transient-state kinetic methods for W438F KatG and other variants associated with peroxide-dependent inactivation and rescue have been compared and will be discussed.

Room 2227 – Pharmacy and Veterinary Medicine

- Brannen, A. (G)
  
  **Title:** Segmental 360° bioluminescent imaging using the mouse imaging spinner (MiSpinner) shows potential for accurate monitoring of tumor development.

  **Primary Author (and presenter):** Brannen, Andrew, D.

  **Additional Authors:** Eggart, Matthew; Nahrendorf, Matthias; Arnold, Robert; Panizzi, Peter

  **Department:** Drug Discovery and Development College/School: Harrison School of Pharmacy, Auburn University

  **Description:** *In vivo* molecular imaging is a powerful tool, providing morphological, molecular, and functional information in regards to disease progression for many areas of research, including infectious disease and cancer. Tracking the progression of luciferase-expressing tumor cells over the span of weeks to months by bioluminescence imaging serves as one of the primary means of studying tumor metastasis and therapeutic efficacy. While bioluminescence and fluorescence are immensely useful tools for *in vivo* cancer studies, they have inherent biases that can affect the outcome of imaging trials, especially with standard optical 2D imaging systems. One of the more prominent biases lies in the physical orientation of the signal source relative to the detector. Animal positioning can drastically affect signal intensity, and inconsistent animal placement during longitudinal studies can result in ambiguities in regions of interest by reducing accurate measurement of bioluminescent tumor signal, and ultimately increasing animal usage to reach a measurement of significant difference. We have invented a device to be used in conjunction with top-mounted camera-based imaging systems, allowing researchers to appreciate bioluminescent or fluorescent signal change with respect to subject orientation. Progressive imaging of tumor growth in an NCRNu mouse with PC3-Fluc cells was performed with our device, in conjunction with the IVIS Lumina XRMS system, to turn the imaging subject at specified intervals around a 360° axis. With the resulting data, we are able to determine the optimal orientation of the signal source, produce a pseudo-3D representation of the subject, and propose a novel method of assessing tumor progression. This device can improve consistency and provide an immense amount of new information for optical *in vivo* imaging studies, particularly for longitudinal studies with tumor models.

- Pickering, C.
  
  **Title:** Development of gold-lipidic nanocomposites for cancer theranostic applications

  **Primary Author (and presenter):** Pickering, Christina M(1,2)

  **Additional Authors:** Dobson, Connor S(1,2); Eggert, Matthew W(1); David, Allan E(2); Arnold, Robert D(1)

*G = graduate student presentation 23
Chemotherapy efficacy is limited by toxicity and non-uniform tumor exposure. Liposomal drug carriers are nano-scale, spherical particles with a phospholipid bilayer surrounding an aqueous core. With increased circulation and improved tumor deposition due to the enhanced permeability and retention effect, liposomes increase treatment efficacy and reduce toxicity. However, a lack of understanding regarding tumor growth and metastasis is a challenge for developing treatments. Much current research is devoted to understanding what processes cause tumor behavior. Theranostics, or carriers that combine diagnostic and therapeutic capabilities in one unit, are used to study tumor operation in treatment. We hypothesized that composite systems, encapsulating gold nanoparticles within liposomes, may be used to improve drug delivery and permit non-invasive imaging. We previously designed a novel gold-lipidic nanocomposite to capitalize on the drug delivery capabilities of liposomes and the imaging contrast power of gold nanoparticles. Here we present the formulation of nanocomposites comprised of 2 nm glutathione-capped gold clusters encapsulated within pegylated, long-circulating “stealth” liposomes (Au-LNC). Physical and pharmacodynamic studies were completed using atomic absorption spectroscopy (gold quantification), dynamic light scattering (size distribution), zeta potential (particle stability), and cell metabolic assays (cytotoxicity). The nanocomposites have a high gold encapsulation efficiency, show narrow size distribution centered at 100 nm, exhibit minimal cytotoxicity, and are readily taken up by PC-3 human prostate cancer cells in vitro. These data support our hypothesis that gold-lipidic nanocomposites can be prepared and justify preclinical in vivo studies in murine models of human tumors to improve cancer detection and treatment. On-going research with these systems includes determining the effect of the gold nanoparticles on doxorubicin loading and release.

Napier, I. (G)
Title: Superparamagnetic iron oxide nanoparticles for DNA vaccine delivery systems
Primary Author (and presenter): India Napier1,2
Additional Authors: Tareq Anani3, Allan David3, Tatiana Samoylova2
Department: Scott-Ritchey Research Center1, Department of Pathobiology2, Department of Chemical Engineering3
College/School: College of Veterinary Medicine1,2; College of Engineering3, Auburn University
Description: The addition of polymers or functional groups onto the surfaces of superparamagnetic iron oxide nanoparticles (SPIONs) has the potential to improve particle stability and half-life. However, such surface modifications may affect the performance of SPIONs as injectable DNA vaccine delivery systems. Considering this, objectives were to adsorbed pcDNA 3.1 plasmid DNA (pDNA) onto SPIONs that were aminated (A-SPIONs) or coated with 5K PEG (P-SPIONs), and evaluated their potential application as model gene delivery systems. A-SPION and P-SPION sizes and zeta potentials (ZP) were measured before and after DNA loading using a ZetaSizer particle-sizing instrument. Measurements of A-SPION and P-SPION ZPs post-DNA loading indicated drastic shifts from positive to negative values that were accompanied by an increase in particle sizes. The pDNA loading efficiencies were determined as 93% for A-SPIONs and 85% for P-SPIONs. Also, TEM micrographs of both SPIONs indicated that particle morphology is preserved post pDNA adsorption. Interestingly, A-SPIONs adsorbed with pDNA form irreversible aggregates in a PBS suspension after centrifugation. The formation of aggregates may interfere with release of pDNA from the surface of A-SPIONs, as suggested by the cumulative in vitro pDNA release rate of 1% over a 40-day period. In contrast, over the same time period, 10% of pDNA was released from the P-SPIONs which are capable of reverting back to a homogenous suspension under the same conditions. Importantly, MTT colorimetric assay results indicated that exposure of CHOK1 cells to A-SPIONs or P-SPIONs did not negatively impact viable cell number. In conclusion, characterization of both SPION formulations suggest that the P-SPIONs may be better candidates
as injectable gene delivery systems due to their behavior in suspension. Future studies include in vivo evaluation of A-SPIONs and P-SPIONs adsorbed with DNA-based vaccines.

Room 2310 – Agriculture and Entomology

- Clem, S. (G)
  Title: Can interactions between native and non-native plants in urban landscapes influence herbivore abundance and diversity?
  Primary Author (and presenter): Clem, Carl, S.
  Additional Authors: Held, David, W.
  Department: Entomology and Plant Pathology
  College/School: College of Agriculture, Auburn University
  Description: As urban and suburban regions radically expand throughout the United States, a large variety of non-native plant species both invasive and non-invasive are becoming more prevalent. While invasive plants have proven to be detrimental to native ecosystems, few studies have assessed the impacts of non-native, non-invasive ornamental species. Most non-native plant species produce a smaller abundance and fewer species of herbivores, especially caterpillars, and suburban landscapes are often planted with a mixture of natives and non-natives. This begs the question: can the association between native and non-native plants influence the abundance of herbivorous insects in suburban landscapes? Associational Resistance (AR) and Associational Susceptibility (AS) are widely cited concepts in ecology and are used to better understand the relationship between an herbivore and its host plant in various plant community contexts. This study investigates the roles that AR and AS play in mediating caterpillar abundance on native red maples (Acer rubrum), when either native or non-native neighbor plants are present. In a two year field experiment, we are assessing caterpillar abundance and feeding on native plants when provided neighboring plants that vary in origin (native vs. non-native) and relatedness (congeneric vs. non-congeneric). In addition, we are also monitoring natural enemy abundance and diversity on these plots. Results from year 1 of this study will be presented and discussed.

- Liu, F. (G)
  Title: Human odorant reception in the common bed bug, Cimex lectularius.
  Primary Author (and presenter): Feng Liu
  Additional Authors: Nannan Liu
  Department: Entomology and Plant Pathology
  College/School: College of Agriculture, Auburn University
  Description: Human odorants are considered to be very important cues in the host-seeking process of the blood-feeding insects. For the common bed bug Cimex lectularius, which is a temporary ectoparasite on humans and currently resurgent in the developed countries, the host-seeking behavior is critical for them to survive and reproduce. Olfactory system of the bed bugs plays an important role in detecting the human odorants in the environments. To gain insight into the interaction between the bed bug’s olfactory system and human odorants, we, for the first time, analytically investigated neuronal response of olfactory sensilla to 104 human odorants. The result showed that human odorants of different identity and intensity elicited neuronal response of olfactory sensilla with different firing frequencies and temporal dynamics. Particularly, aldehydes and amines were most distinctively differentiated in the odorant space of the bed bugs. Functionally characterization of bed bug odorant receptors and co-receptor in recognition to human odorants revealed molecular mechanisms involved in the olfactory responses to these human odorants and suggested the importance of aldehyde chemicals in the host-seeking process of bed bug. Taken together, our study on the interaction between the bed bug olfactory system and human odorants not only provide exciting insight into the odor coding mechanisms of bed bugs, but also offer valuable information for developing new reagents (attractants or repellents) for the control bed bugs.

*G = graduate student presentation
• Morawo, T. (G) – Are caterpillars more attractive to parasitoids after feeding on host plants? Effect of diet on the attractiveness of Heliothis virescens to Microplitis croceipes.

Title: Are caterpillars more attractive to parasitoids after feeding on host plants? Effect of diet on the attractiveness of Heliothis virescens to Microplitis croceipes

Primary Author (and presenter): Morawo, Tolulope O.
Additional Authors: Fadamiro, Henry

Department: Entomology
College/School: College of Agriculture, Auburn University

Description: In the plant-host complex, both infested plants and herbivores emit volatile organic compounds (VOCs) that may be used by parasitoids to locate their herbivore hosts. However, it is unclear whether hosts become more attractive to parasitoids at short range after feeding on plants. In order to test this hypothesis and its underlying mechanisms, the endoparasitoid Microplitis croceipes (Hymenoptera: Braconidae) and its larval host, Heliothis virescens (Lepidoptera: Noctuidae), a caterpillar pest of cotton plant was used as a model system. A group of third instar larvae of H. virescens (initially reared on a pinto bean-based diet) was either fed cotton leaves for 24 h (plant-fed) or continuously fed pinto bean-based diet (diet-fed) prior to use in bioassays. When simultaneously presented with equal numbers of plant-fed and diet-fed hosts (5 each), female M. croceipes preferred plant-fed hosts in oviposition choice tests. This preference was not enhanced by prior oviposition experience with plant-fed hosts. Each group (50 larvae) of host was more attractive to parasitoids in Y-tube olfactometer bioassays compared to control. However, in four-choice olfactometer bioassays, parasitoids showed a clear preference for plant-fed hosts compared with diet-fed hosts, highlighting the importance of odor cues in their behavioral responses. On the contrary, parasitoids did not significantly discriminate host groups based on visual cues alone in a modified still-air arena. GC-MS analyses of headspace VOCs emitted by both groups of host larvae indicate profile differences that may offer possible chemical explanation of the parasitoid behavior. The significance of these results to the fitness of both parasitoid and plant is discussed.

Room 2326 – Social Science and Psychology

• Cero, I. (G)

Title: The etiology of suicidal thoughts and the capability to act on them: Insights for prediction and prevention through longitudinal modeling.

Primary Author (and presenter): Cero, Ian, J.
Additional Authors: Zuromski, Kelly L. & Witte, Tracy K.
Department: Clinical Psychology
College/School: College of Liberal Arts, Auburn University

Description: Claiming more than 40,000 lives a year, suicide is now the 2nd leading cause of death in young people, and annual fatalities continue to grow beyond predictions from previous 10-year trends. Thus, improved understanding of the development of suicidal phenomena (e.g., thoughts, plans, attempts) is an urgent priority for quantitative modeling efforts. The most generative framework in this pursuit has been the Interpersonal-Psychological Theory of Suicide (IPTS), which proposes desire for suicide and the capability to enact it arise from distinct causes. While the desire for suicide is proposed to arise from thwarted interpersonal connection and the perception that one is a burden on others, the capability for suicide is thought to be acquired through repeated exposure to frightening death-related experiences, which gradually reduce a person’s natural fear of death and dying. Although this 'distinct causes' account is intuitive, it is inconsistent with other findings on gradual reduction in fear, which show even repeated imagining of a stimulus can create marked reductions in the fear of that stimulus over time. Given desire for suicide typically involves imagining multiple aspects of a potential suicide (e.g., desirability, method), the desire for suicide, itself, may facilitate the acquisition of suicide capability. This investigation sought to examine this possibility by measuring changes in the desire and capability for suicide in a group of 700 university undergraduates over time (6 time points over 15 days). Data collection is still ongoing; we hypothesized that...
increases in suicidal desire would be associated with subsequent increases in capability for suicide, but not the reverse. Discussion will highlight implications for improved suicide assessment and prevention, including the possibility that a person’s overall risk for suicide could increase due to increasing capability for suicide, even if desire remains constant.

- Daniel, T. (G)
  Title: What a twist! Do story spoilers even matter?
  Primary Author (and presenter): Daniel, Thomas, A.
  Additional Authors: Katz, Jeffrey.
  Department: Psychology
  College/School: College of Liberal Arts, Auburn University
  Description: Does knowing the ending to a story ahead of time change the way people about it? Recent research suggests that knowing the ending of a story increases the enjoyment of the narrative rather than decreases it (Leavitt & Christenfeld, 2011). This is contrary to the popular belief that spoilers “spoil” the pleasure of a story. Previous research leaves many questions unanswered: Does this effect extend beyond commonly studied short stories? Do people enjoy a story more if they do not know it is being spoiled for them? In two experiments, we answered these questions.
  Experiment 1 attempted to replicate the prior finding that knowing the ending of a short story increases the overall enjoyment of the tale. Experiment 2 investigated whether visual media (i.e., television episodes) were spoiled when participants were given knowledge of an ironic, dramatic “twist” ending. These results may be surprising, but we will not spoil them here.

- Dunaway, E. (G)
  Title: Combining Pavlovian conditioning paradigms as a strategy for the treatment of conditioned fear
  Primary Author: Elizabeth P. Dunaway
  Additional Authors: Whitney Kimble & Martha Escobar
  Department: Psychology
  School: College of Liberal Arts, Auburn University
  Both extinction (CS-US then CS-noUS) and latent inhibition (CS-noUS then CS-US) result in attenuated fear. However, combining these two treatments (e.g., Leung & Westbrook, 2010) appears to increase rather than decrease fear as compared to either treatment alone. Our laboratory has reported that providing extinction immediately after conditioning (Johnson et al., 2010) or CS preexposure immediately before conditioning (Powell et al., 2013) can increase the fear-reducing effect of these treatments. Two experiments assessed the effects of combining extinction and latent inhibition when either procedure was conducted in short proximity to conditioning. In Experiment 1, extinction occurred either 15-min or 24-h after conditioning, and produced equivalent responding in both delay conditions. In Experiment 2, CS preexposure occurred either 15 min or 24 h prior to conditioning. In this case, immediate preexposure enhanced the effectiveness of extinction and made it resistant to spontaneous recovery. This suggests that immediate latent inhibition may permanently affect the course of subsequently-acquired fear.

10:00 – 10:45 a.m.

Room 2216 – Wildlife Sciences

- Benesh, K.
  Title: Investigation of the correlation between shape variation of species in Phenacobius and their evolutionary relationships.
  Primary Author (and presenter): Benesh, Kasey, C
  Additional Authors: Tan, Milton

*G = graduate student presentation
**Department:** Biological Sciences  
**College/School:** Auburn University  
**Description:** The genus *Phenacobius* contains five species of suckermouth minnows native to the United States. We investigated the correlation between shape variation of species in *Phenacobius* and their evolutionary relationships. We used geometric morphometrics to examine the shape difference between these species. We performed a principle component analysis to see what explained the most variation of shape between the species, and a canonical variate analysis to identify what shape variation contributed to the separation of these groups. We found that body depth explained a majority of the variation between the five species. We then constructed a phylogenetic tree based on genetic sequences obtained from GenBank. We then mapped the phylogeny into shape space to evaluate if the morphological data was an indicator of the evolutionary relationships of these species. We found that, in this case, phylogeny was not a good indicator of shape similarity, and the resultant tree had no phylogenetic signal. Ecological variation between species could explain these shape differences better than phylogeny, however there is little known about the ecological variation between species of *Phenacobius*.

- **Sharma Dangal, S. (G)** –  
  **Title:** Climate and grazing controls on terrestrial net primary productivity in the Mongolian grasslands  
  **Primary Author (and presenter):** Sharma Dangal, Shree Ram  
  **Additional Authors:** Tian, Hanqin; Lu, Chaoqun; Pan, Susan; Yang, Jia  
  **College/School:** School of Forestry and Wildlife Sciences, Auburn University  
  **Description:** The Mongolian Steppe (41.6 – 52.2°N and 87.6 – 119.9°E) is one of the largest remaining grassland ecosystems encompassing a region of considerable ecological importance due to its extreme continental climate. It has experienced several extreme climate events including extreme winters (*dzuds*) and summer drought resulting in reduction of grassland production and widespread mortality of livestock. In addition, privatization of livestock ownership since the 1990s has resulted in dramatic increase in livestock number from 26 million animals in 1990 to about 45 million animals in 2012. In this study, we explore the role of climate change with elevated CO2 at varying grazing intensities along a precipitation gradient to investigate the plant physiological response on aboveground net primary productivity (ANPP) using an ecosystem model, the dynamic land ecosystem model (DLEM). Our results across 6 different sites along a precipitation gradient show that both precipitation and temperature exerts an important control on ANPP explaining 67% and 48% of the variations, respectively. Historical grazing resulted in a net reduction in ANPP across all sites ranging from 2% to 15.4%; however, grazing had a more detrimental effect on grassland ANPP at dry compared to wet end of the precipitation gradient. We also found varying compensatory growth responses to grazing intensity among years where the ability of plants to partially compensate for grazing damage was higher in sites receiving high precipitation. In addition, precipitation use efficiency (PUE) tends to decrease while nitrogen use efficiency (NUE) tends to increase across a gradient of high to low precipitation. However, both PUE and NUE tend to decrease with increasing grazing intensity across all sites. Our results indicate that moisture limitation is an important regulator of grazing compensation, which determines future grassland productivity in Mongolia.

- **Tripp, H. (G)**  
  **Title:** Habitat connectivity modeling as a tool for management of the gopher tortoise (*Gopherus polyphemus*).  
  **Primary Author (and presenter):** Tripp, Helen, E.  
  **Additional Authors:** Gitzen, Robert  
  **Department:** Forestry and Wildlife Sciences  
  **College/School:** School of Forestry and Wildlife Sciences, Auburn University  
  **Description:** Gopher tortoises (*Gopherus polyphemus*) are a keystone species associated with open habitat and sandy soils in the southeastern United States. They excavate unique burrow systems that
support many other native wildlife species. Unfortunately, gopher tortoise populations are in decline, with the species listed as Threatened under the Endangered Species Act in the western portion of its range and petitioned for listing in the remainder of its range. Understanding how tortoise populations and suitable habitat are connected across the broader landscape, as well as in smaller conservation priority areas, is critical to better understand the current status of gopher tortoise populations and for planning future conservation efforts. We are quantifying habitat connectivity for gopher tortoises across a broad portion of their range in Alabama, Mississippi, and Louisiana, as well as at a set of focal public properties within Alabama, using descriptive statistics and methods based on electrical circuit theory. A circuit theoretical approach allows us to quantify the relative ease of movement for tortoises across portions of the landscape, as well as identify areas where movements may be concentrated. Preliminary results indicate that there is wide variation in the spatial configuration and total area of soils appropriate for tortoises across various focal properties in Alabama, indicating that tortoise habitat, and consequently tortoise populations, may be fragmented on certain portions of the landscape. The results from our study will give managers a better understanding of how the species is affected by landscape patterns at a regional scale, and will help managers evaluate potential habitat management strategies at the scale of individual properties. This method could also be applied in the future to other focal areas where conservation of the gopher tortoise is a concern. Our study is an important step towards understanding and ultimately conserving this important species.

Room 2218 – Humanities – History

- **Hicks, D. (G)**
  - **Title:** Unforgettable ostalgie: GDR nostalgia, memory, and German identity in a reunified age.
  - **Primary Author (and presenter):** Hicks, Dana, R.
  - **Department:** Department of History
  - **College/School:** College of Liberal Arts, Auburn University
  - **Description:** With the end of the Cold War, the Fall of the Berlin Wall, and the reunification of the two Germanys at the tail of the twentieth century, a new German identity has been developing, forging a new nation going into the twenty-first century. The people of former East Germany, the German Democratic Republic (GDR), have not forgotten their lives in the communist state. In this present time, they remember fondly the past lifestyle lived in the East, the dignity of labor under the socialist system, and even household goods, the mundane everyday items are significant to recollection. Both former East and West Germans labelled this longing for the former life lived in the GDR: Ostalgie. Considered by many to be a plague upon the new nation, it is often dismissed as positive memory of a negative past. Historians and literary critics have weighed in on Ostalgie, considering it nostalgia for the missed opportunities of socialist idealism and a coping mechanism for adapting to a Germany in a competitive capitalist system. However, in my review of Ostalgie analysis, I find that these historians and critics are inadvertently addressing Ostalgie as a much broader topic than mere nostalgia. I argue that part of Ostalgie is nostalgia; however, this concept is much broader, addressing memory and German identity of all Germans, former East and West. Memories of the East are an intergraded part of a German identity going into this new century.

- **Pratt, L.**
  - **Title:** Sittlichkeit, social democracy, and “Spar-Agnes”: The image of Eugen Richter’s Agnes Müller and its usage as a political tool
  - **Primary Author (and presenter):** Pratt, Laura K.
  - **Department:** History
  - **College/School:** College of Liberal Arts
  - **Description:** As the Reichstag debate on February 7, 1893 ended, Wilhelm Liebknecht (a leading member of the Social Democratic Party [SPD]) addressed the opposition parties: “As you are all now marching under the same flag with “Spar-Agnes” as the virgin of Orleans at the head from the
Oriflamme, golden calf painted— as you move against us, we are rallied under our honest red flag.”

Who was this “Spar-Agnes” identified as leading the march against the SPD? She was a character created by liberal politician, Eugen Richter, in his 1891 work, Sozialdemokratische Zukunftsbilder, a book intended to warn the public of the bleak Social Democratic future. In the book, the “chaste maiden” Agnes Müller suffered at the hands of the new society through sexual harassment in the new factory she was forced to work in and, (most notably), through the loss of her hard-earned 2000 Mark dowry with the dissolution of the banks. While other characters in Richter’s book suffered similar hardships, no other figure was extracted and used as widely in political debate. This paper aims to analyze the economic, social, and political atmosphere in which “Spar-Agnes” emerged to determine why she was used as a political weapon, and, through this, discover what her existence can reveal about the nature of challenges to the SPD and the larger societal perceptions about women in late nineteenth century Germany.

- Vickers, S.
  
  **Title:** A different shade of green: the rise of the Green Party in Ireland, 1981-1992
  
  **Primary Author (and presenter):** Steven A. Vickers Jr.
  
  **Mentor:** Dr. Ralph Kingston
  
  **Department:** History
  
  **College/School:** College of Liberal Arts
  
  **Abstract:** Throughout much of the twentieth century, nationalist ideals and Civil War-era divisions dominated the political landscape of Ireland. In the 1980s, growing discontent within the system led to the establishment of a number of minor political parties, most of which gained little influence. The Green Party was an exception to this and managed to establish itself within a political system which had been monopolized by three parties for decades. This paper analyzes how the Green Party established itself. It argues that after an initial struggle to organize itself, the eventual success of the Green Party was due to its ability to present itself as a viable alternative to the decades-old political system. The party placed itself aside from, rather than within, the normal political spectrum. Other parties, built upon the remnants of a centuries-long struggle for independence, continued to cling to the political squabbles of a generation past; the Greens took a stance outside of the fierce nationalism and divisions, choosing instead to work on creating a practical, sustainable future while still identifying with a strong national Irish identity.

Room 2222 – Chemical Engineering

- Pradhan, S. (G)
  
  **Title:** PEG-fibrinogen hydrogel microspheres support tumorigenic growth of MCF7 breast cancer cells
  
  **Primary Author (and presenter):** Pradhan, Shantanu
  
  **Additional Authors:** Clary, Jacob M.; Seliktar, Dror; Lipke, Elizabeth A.
  
  **Department:** Chemical Engineering
  
  **College/School:** Samuel Ginn College of Engineering, Auburn University
  
  **Description:** Breast cancer has been a leading cause of cancer-related deaths worldwide. The tumor microenvironment of breast cancer is known to play an influential role in the malignant progression of the disease. However, current two-dimensional (2D) monolayer culture and three-dimensional (3D) spheroid models are not able to capture the complexity of the extracellular matrix, making them inaccurate in providing clinically-relevant data. In order to address this challenge, we have developed a novel 3D in vitro model for the long-term culture of cancer cells and subsequent investigation of tumorigenic properties. Briefly, MCF7 breast cancer cells were encapsulated within poly(ethylene glycol)-fibrinogen hydrogel microspheres using an innovative aqueous-oil emulsion technique and maintained in culture for 21 days. The ‘tumor microspheres’ (TM) (diameter=100-300 μm) were larger, with higher sphericity and uniformity compared to cells aggregated as tumor spheroids (TS) using the hanging droplet method (diameter=50-100 μm). Live/Dead imaging revealed the high...
viability and consistent growth of cells within the TM. Scanning electron microscopy and fluorescence staining revealed the 3D morphology and cellular organization within both the TS and TM. Cells within TM showed a loss of polarity and loss of cell-cell contact as compared to those within TS. Thus, cells grown within TM displayed a more disorganized and heterogeneous morphology as compared those within TS, which is reminiscent of the native tumor microenvironment. Overall, the tumor microsphere model provides a more physiologically relevant 3D culture platform for the tumorigenic growth and morphology of cancer cells as compared to the tumor spheroid model. The biochemical and mechanical properties of the PEG-Fb used for fabrication of the microspheres can be modulated to match that of native cancer tissue and the model can be potentially used for the investigation of tumorigenic mechanisms and in drug-testing applications.

- **Roe, D. (G)**
  Title: Use of a nanoscale Fe/Cu/C catalyst and supercritical hexane medium for enhanced Fischer-Tropsch synthesis
  Primary Author (and presenter): Roe, David, P
  Additional Authors: Roberts, Christopher, B
  Department: Chemical Engineering
  College/School: Samuel Ginn College of Engineering, Auburn University
  Description: Fischer-Tropsch Synthesis (FTS) is a surface-catalyzed polymerization reaction which produces hydrocarbons, oxygenates, heat, water, and CO2 from syngas, a mixture of hydrogen and carbon monoxide. As syngas can be produced from biomass gasification, FTS is often an important step in the process of converting biomass to fuels. While FTS produces many of the compounds in liquid transportation fuels, the additional production of light gas, heavy wax, and a large amount of waste heat make the economics of large scale fuel production challenging. This research aimed to improve the FTS reaction in two ways. First, a nanoscale iron-based carbon-supported catalyst was utilized. Nanoscale catalysts have high surface area per mass, which translates to higher FT activity. The carbon support is stable, eliminates some difficulties in reduction often seen with iron nanoparticles on oxidic supports, and is typically thought to increase selectivity to olefins, a potentially desirable product. Secondly, the reaction was conducted in supercritical hexane. A supercritical reaction medium has been shown to improve product selectivity and activity maintenance by alleviating some of the heat and mass transfer challenges of the reaction. The simultaneous use of both the nanoscale catalyst and supercritical fluid reaction media resulted in an active, stable Fischer-Tropsch catalyst with relatively high selectivity towards valuable hydrocarbon and oxygenate products.

- **Saha, P. (G)**
  Title: Optimization of thin films produced from cellulose nanocrystal dispersions.
  Primary Author (and presenter): Saha, Partha.
  Additional Authors: Haywood, Alexander; Ashurst, William R.; Davis, Virginia A.
  Department: Chemical Engineering
  College/School: Samuel Ginn College of Engineering
  Description: The objective of this research is to understand and control the factors affecting crack formation in cellulose nanocrystal (CNC) films. CNC extracted from woody biomass using sulfuric acid hydrolysis were obtained from the US Forest Service’s Cellulose Nanomaterials Pilot Plant and dispersed in water over a range of concentrations. CNC follow lyotropic liquid crystalline phase behavior and form a cholesteric phase when dispersed above a critical concentration. Producing uniform crack free films requires understanding and controlling numerous processing parameters including initial dispersion concentration and microstructure, wet thickness, shear alignment, surface interactions, capillary forces, and drying kinetics. The results supported the hypothesis that evaporation of solvent in a low concentration side of cholesteric regime results in less twisted cholesteric structure mitigating the crack formation. The observations have also led to the
propagation that faster evaporation enables retention of the desired structure in the final film. These results are part of achieving our ultimate goal: making microelectromechanical systems (MEMS) from CNC. The next step is optimizing the fabrication of the films into the following MEMS testing devices: comb drive resonators, mechanical strength testers (MST), residual stress testers (RST) and cantilever beams arrays (CBA). This will enable quantification of the effects of the initial dispersion composition and processing conditions on elastic modulus, elastic strength, residual stress, and surface tension etc.

Room 2223 – Allied Health

- Zheng, C. (G)
  
  **Title:** TrkA in Alzheimer’s disease  
  **Primary Author (and presenter):** Zheng Chen  
  **Additional Authors:** Whitehead Jonathon, Phillips Brooke, Pool Taylor, Rushton Chase, Thangiah Geetha, Gearing Marla, Jeganathan Ramesh B.  
  **Department:** Department of Nutrition, Dietetics and Hotel Management; Department of Chemistry; Department of Pathology and Laboratory Medicine  
  **College/School:** College of Human Sciences, Auburn University; Auburn University at Montgomery; Emory University School of Medicine  
  **Description:** Amyloid β (Aβ) protein is the primary proteinaceous deposit found in the brains of patients with Alzheimer’s disease (AD). Evidence suggests that Aβ plays a central role in the development of AD pathology. Here, we show that Aβ impairs ubiquitination, phosphorylation and association of TrkA from p75NTR in PC12 cells. The ubiquitination and tyrosine phosphorylation of TrkA was also found to be impaired in postmortem human AD hippocampus compared to control. Interestingly the nitrotyrosylation of TrkA was increased in AD hippocampus and this explains why the phosphorylation and ubiquitination of TrkA was impaired. In AD brain the production of matrix metalloproteinase-7 (MMP-7) which cleaves proNGF was reduced, thereby leading to accumulation of proNGF and decreasing the level of active NGF. TrkA signaling events, including Ras/mitogen-activated protein kinase (MAPK) and phosphatidylinositol 3-kinase (PI3K)/Akt pathways, are deactivated with Aβ and in human AD hippocampus. This suggest that Aβ blocks the TrkA ubiquitination and downstream signaling similar to AD hippocampus.

- Arnold, M. (G)
  
  **Title:** Gestational exposure to a high-fat diet and Polyninosinic:Polycytidylic acid in mice: Effects on spatial and visual discrimination  
  **Primary Author (and presenter):** Arnold, Megan, A.  
  **Additional Authors:** Boomhower, Steven, R.; Newland, M., Christopher  
  **Department:** Psychology  
  **College/School:** College of Liberal Arts, Auburn University  
  **Description:** Obesity during pregnancy is associated with learning deficits in humans. The mechanism through which maternal obesity may affect behavioral flexibility in offspring is unclear, but increases in inflammation that result from prenatal high-fat diet exposure may be one possibility. The present experiment assessed the degree to which gestational exposure to a high-fat diet and polyinosinic:polycytidylic acid (poly I:C, a pro-inflammatory drug) affected spatial and visual discrimination in mice. C57BL/6 mice were exposed, in gestation, to three dietary conditions (n=15 male and n=15 female in each) - standard chow, high-fat diet, and high-fat diet + glycan (an anti-inflammatory drug) - and three inflammation conditions (n=10 male and n=10 female in each) - saline, poly I:C, and poly I:C + glycan. As adults, mice were trained on a spatial discrimination procedure followed by a visual discrimination procedure (i.e., an extradimensional shift). In general, mice exposed to poly I:C omitted fewer trials than controls and poly I:C + glycan mice in both procedures and made more errors in the transition from spatial to
visual discrimination. A similar pattern occurred with mice prenatally exposed to a high-fat diet, but only in the visual discrimination task.

- **Boomhower, S. (G)**
  
  **Title:** Adolescent methylmercury exposure impairs the acquisition of impulsive choice in mice.
  
  **Primary Author (and presenter):** Boomhower, Steven, R
  
  **Additional Authors:** Newland, Christopher
  
  **Department:** Psychology
  
  **College/School:** College of Liberal Arts, Auburn University
  
  **Description:** Human gestational exposure to methylmercury (MeHg)—an environmental neurotoxicant that bioaccumulates in fish—is a major public health concern. Though the majority of nervous system development occurs during gestation, the brain continues to mature after birth and throughout the adolescent period. However, the neurobehavioral effects of adolescent MeHg exposure remain virtually unknown. The current experiment was designed to assess the effects of adolescent MeHg exposure on impulsive choice—the preference for small, immediate rewards over large, delayed ones—in a mouse model. Thirty-six male C57Bl/6n mice were exposed to 0, 0.3, and 3.0 ppm MeHg (n=12 in each group) via drinking water during the murine adolescent period, i.e., postnatal days (PND) 21 and 59. As adults, mice were allowed to respond for a droplet of milk delivered immediately and four droplets delivered after a series of delays. Adolescent MeHg exposure significantly impaired the acquisition of impulsive choice relative to controls, but did not affect estimates of reward value. The current study provides support for the notion that adolescence is a vulnerable developmental period in which neurotoxicological insults may have long-lasting effects.

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**Room 2225 – Biological Sciences**

- **Mariita, R. (G)**
  
  **Title:** Metagenomic assessment of an estuarine system reveals high microbial and mobile genetic elements diversity during spring
  
  **Primary Author:** Mariita, Richard M.
  
  **Additional Authors:** Hossain, Mohammad J.; Liles, Mark R.; Moss, Anthony G.
  
  **Department:** Biological Sciences
  
  **School:** College of Science and Mathematics, Auburn University
  
  **Description:** Estuaries are sources of over 80% of the fish harvested in the USA. They are the sources of the vast majority of shell- and finfish larvae for their respective coasts. Estuaries are metals sinks and are fertile habitats for microbial interactions and exchange of mobile genetic elements that can encode antibiotic resistance (AR). Mobile genetic elements contribute to acquisition of AR genes across taxa that drive microbial assemblage structure and evolution. Our study focused on determining the diversity and composition of microbial assemblages and their AR determinants in Mobile Bay, Alabama. DNA was extracted from 0.2µ filters using a modified CTAB method. Bar-coded libraries were constructed using a Nextera DNA Sample Prep Kit and sequenced using the Illumina MiSeq platform. Sequence reads were trimmed for quality, assembled de novo using CLC Genomics Workbench and submitted for annotation to MG-RAST. MG-RAST output was analyzed for taxonomic affiliations via the SILVA SSU rDNA database, functional annotation via SEED and graphically represented via Krona. We observed seasonal trends in the diversity and occurrence of both microbial assemblages and their predicted AR determinants. Except for summer when Cyanobacteria were most abundant, the predominant microbes were Proteobacteria [1000738 reads for Fall (F), Winter (W) and Spring (Sp)]. Daytime data from NASA MODIS-Aqua, MODIS-Terra and SeaWiFS-GAC revealed differences in seasonal surface chlorophyll, thus confirming the seasonal trends. Species richness was as follows: Sp (437); W (406); Su & F (<300). Chemotaxis and motility genes varied similarly: Sp (2728 reads); W (2221); F (900) & Su (698). Virulence, disease & defense gene abundance varied similarly: Sp (9097); W (7715); F (3274); and Su (2641) as did the abundance of phages, transposable elements and plasmids: Sp (10323); W (7535); Su (5052) and F (4918). Co-Zn-Cd resistance genes abundance also varied seasonally: W (1553); Sp (1345); Su (459); F

*G = graduate student presentation*
The study reveals that in the microbial plankton, taxonomic, functional and AR gene diversity is highest during spring, possibly due to expanded riverine input during the rainy season. This study forms a basis for future examination of the link between watershed management, estuarine systems and public health.

- **Wilkins, A.**
  
  **Title:** Zebrafish toxicity screen of novel myeloperoxidase inhibitors
  
  **Primary Author (and presenter):** Wilkins, Andrew, T
  
  **Additional Authors:** Daniel, Jeffrey G., Panizzi, Jennifer R., Ph.D.
  
  **Department:** Anatomy, Physiology, and Pharmacology
  
  **College/School:** College of Veterinary Medicine
  
  **Abstract:** Myeloperoxidase (MPO) catalyzes the breakdown of hydrogen peroxide and the formation of the powerful oxidant hypochlorous acid (HOCL). Neutrophils and monocytes use HOCL, the active component of bleach, to battle infections by triggering directed modifications of proteins and DNA of engulfed pathogens. However, during chronic diseases like rheumatoid arthritis, atherosclerosis, and certain cancers, elevated circulating MPO levels cause collateral damage to the host, thereby fueling the need for safe ways to abrogate these effects. The goal of our research was to conduct *in vivo* safety screening of nine benzoic acid hydrazine (BAH) analogs, recently shown to inhibit MPO *in vitro* by mediating the breakdown of the heme linkages necessary for proper enzyme function. Here, we use the zebrafish to monitor the effects of treatments before, during, and after organ development. As zebrafish have a remarkable degree of genetic similarity to humans, the data generated from this study is likely predictive of potential adverse effects in humans. If any, the primary defects observed after treatment during early development were pericardial edema and pooling of blood cells in the tail region. Our studies found treatment with 300μM of NaN₃, 4-(nitro) BAH, and 4-(trifluoromethyl) BAH caused circulatory abnormalities in all embryos, with these defects appearing less frequently as dosage was lowered. For all other chemicals, fewer than 25% were affected with doses up to 300μM. In our assay for effects on cardiac function, we found circulatory abnormalities only with NaN₃ and 4-(trifluoromethyl) BAH treatments at doses of 80-300μM. Our results suggest that 2-(amino) BAH, 4-(amino) BAH, 3-(dimethylamino) BAH, 4-(fluoro) BAH, BAH, and isoniazid cause little to no developmental or organ toxicity when administered at dosages of 300μM and below, thus making them ideal candidates for further *in vivo* testing of MPO-inhibitory function.

- **Boggio, A.** – Shape evolution in the genus *Luxilus.*
  
  **Title:** Shape evolution in the genus *Luxilus*
  
  **Primary Author (and presenter):** Boggio, Audrey, A
  
  **Additional Authors:** Milton Tan
  
  **Department:** Biological Sciences
  
  **College/School:** College of Science and Mathematics, Auburn University
  
  **Description:** *Luxilus,* commonly know as shiners, is a genus of fish in the family Cyprinidae whose range occurs over Eastern North America. *Luxilus* traditionally has been classified by morphology. *Luxilus* is generalized by a compressed body, terminal and oblique mouth, and a number of scale and fin ray counts. Quantifying characteristics can be tedious; using a modern method of geometric morphometrics we can more thoroughly survey shape differences throughout this genus. Also, although morphological similarity unite these species in a single genus, molecular data suggest *Luxilus* is not monophyletic. Geometric morphometrics presents a recent method to assess shape variation between species and visualize patterns in morphospace. All nine valid species of *Luxilus* were examined. Eighteen landmark data points were digitized on 403 images. A Procrustes superimposition was used to standardize landmarks by rotating, translating, and scaling the coordinates. A principal components analysis was used to find the variables contributing the maximum amount of variation in our shape.
The first three principal components explained 75.5% of total variation, with PC1 explaining 33.05%, PC2 explaining 27.36%, and PC3 explaining 15.06% of the total shape variation. Positive PC1 scores are associated with a deeper body shape, smaller eye, and terminal mouth. Positive PC2 scores are associated with a larger eye and a more superior mouth. A canonical variance analysis was used to show the variation that best separated taxonomic groups. The CVA showed a clustering of seven species, but a separation of L. zonistius and L. coccogenis due to a difference in body depth. The landmark data was compared in light of molecular phylogeny to deduce if shape data has phylogenetic signal. Geometric morphometrics is shown to be an efficient approach to distinguish between closely related fish species.

Room 2227 – Veterinary Medicine / Biomedical Sciences

- **Cuming, R. (G)**
  
  **Title:** In vitro release profiles of voriconazole from a PLGA-PEG-PLGA thermogel and ex vivo equine subconjunctival injection characteristics of the thermogel
  
  **Primary Author (and presenter):** Cuming, Rosemary
  
  **Additional Authors:** Duran, S.; Ravis, W.; Stewart, A.; Wooldridge, A.; Abarca, E.
  
  **Department:** Department of Clinical Sciences
  
  **College/School:** College of Veterinary Medicine, Auburn University
  
  **Description:** Development of a voriconazole-containing thermogel for subconjunctival space (SCS) injection could allow for sustained drug delivery to target tissues and improved success in treating horses with keratomycosis. The purpose of this study was to determine if sustained-release of voriconazole occurs when combined with a thermosensitive Poly(lactic-co-glycolic acid)-b-Poly(ethylene glycol)-b-Poly(lactic-co-glycolic acid) (PLGA-PEG-PLGA) hydrogel in vitro and to characterize SCS thermogel injection in ex vivo equine eyes. Six groups were defined: 1) thermogel, 2) 1mg voriconazole + thermogel, 3) 1mg voriconazole in ethanol + thermogel, 4) 5mg voriconazole + thermogel, 5) 5mg voriconazole in ethanol + thermogel, and 6) 5mg voriconazole. Thermogel samples were maintained at 34.5°C in phosphate buffered saline (PBS). PBS was collected daily for 28 days and voriconazole concentrations determined via high-performance liquid chromatography. Ten normothermic ex vivo horse eyes were injected with 300μl thermogel and evaluated via high-resolution (50MHz) ultrasound. Voriconazole was successfully combined with the thermogel in crystalline form and ethanol solution. Voriconazole release from the thermogel followed first order kinetics with t1/2 ranging from 1.82 (Group 3) to 4.22 days (Group 2). Voriconazole concentrations released exceeded the target MIC (0.5μg/ml) for 28 days in Groups 2 and 4 and 16 days in Groups 3 and 5. Addition of ethanol inconsistently altered voriconazole release. The thermogel was injected through a 30ga needle into the equine bulbar SCS with ease. A well-demarcated, hypoechoic structure formed in the SCS following thermogel injection. Voriconazole is released in a sustained manner from PLGA-PEG-PLGA thermogel in vitro. SCS injections of liquid thermogel are feasible in equine eyes and result in formation of a well-defined gel deposit at body temperature.

- **Eggert, M. (G)**
  
  **Title:** Revealing the effect of sPLA2 Enzymes and PLA2R receptors on the ability of responsive liposome nanoparticles to target prostate cancer within in-vitro and in-vivo models
  
  **Primary Author (and presenter):** Eggert, Matthew W.
  
  **Additional Authors:** Anna M. Burcham1, Nhat D. Quach2, Andrew D. Brannen1, Peter R. Panizzi1, Brian S. Cummings2, and Robert D. Arnold1
  
  **Department:** 1Drug Discovery and Development; 2Pharmaceutical and Biomedical Sciences
  
  **College/School:** 1Harrison School of Pharmacy, Auburn University; 2R.C. Wilson School of Pharmacy, University of Georgia
  
  **Description:** Our development of a secretory phospholipase responsive liposome (SPRL) is being researched as a multi-functional agent to target cancerous tissue, identify site of malignancy, and
effectively release chemotherapeutic drugs. By exploiting intrinsic tumor pathophysiology, these lipid-based nanoparticles are degraded selectively by secretory phospholipase A2 (sPLA2), an enzyme that is over expressed in many tumors and is associated with cancer metastasis and malignancy. We demonstrate that a membrane protein for sPLA2, M-type phospholipase A2 receptor (PLA2R1), can also influence the uptake and drug delivery of SRPL formulations. Additionally, the integration of a near-infrared fluorescent lipid membrane probe into the liposome formulation has improved capability to monitor and quantify uptake in-vitro and has enabled tracking of liposome disposition non-invasively within tumor-bearing mice. When flow cytometry and fluorescence microscopy were applied to evaluate the in-vitro uptake of liposome formulations and the binding/uptake of two fluorescently labelled peptides that are expected to interact with the active site of PLA2R1, in a trio of human prostate cancer cell lines, results showed significant variation between a shRNA PLA2R knock down cell line variant (PC-3-PLA2R-KD) and wild type PC-3 or scrambled shRNA control cells. Importantly, fluorescent signal indicated SPRL uptake was significantly greater (p<0.05) vs. a traditional liposome formulation (SSL) beyond 24hrs. In-vivo imaging also reveals enhanced deposition of SPRL to all tumor sites, whereas SSL only presents abundantly within KD cells. Peptide studies, based on fluorescent intensity, confirmed that a consensus sequence binds markedly to regular PC3 at low concentration and has limited binding to KD cells. Ultimately, the identification and use of a targeting peptide for PLA2R1 may serve to distinguish indolent vs. malignant disease, aid detection of metastatic cancers, and boost targeted drug delivery.

- Gillen, A. (G)
  Title: Aberdeen knot security in large gauge suture.
  Primary Author (and presenter): Gillen, Alex, M1
  Additional Authors: Munsterman, Amelia, S1; Farag, Ramsis2; Hanson, R, Reid1
  Department: 1Department of Clinical Sciences, Auburn University, AL 2Department of Engineering, Samuel Ginn College of Engineering, Auburn University, AL
  College/School: Auburn University, College of Veterinary Medicine
  Description: Ventral midline incisions in the horse carry a high rate of complications. Aberdeen knots reportedly are stronger and smaller than surgeon’s and square knots for ending suture lines, potentially resulting in a decreased incidence of complications, but have not been assessed using large gauge suture. This study investigated the optimum knot configuration using 2USP and 3USP polyglactin 910 and 2USP polydioxanone. We hypothesized that Aberdeen knots in comparison to surgeon’s and square knots would have higher relative knot security (RKS) and knot holding capacity (KHC), would not unravel, and would be smaller. All knots were tested under linear tension on a universal testing machine recording mode of failure and KHC. A digital micrometer measured knot size and a balance measured weight. ANOVA and post hoc testing compared strength between number of throws, suture, suture size, and knot type, and P<0.05 was considered significant. Aberdeen knots had a higher KHC for all suture types and number of throws (P<0.001), and a higher RKS than surgeon’s or square knots. None of the Aberdeen knots unraveled, but a percentage of square and surgeon’s knots with under six throws did. Aberdeen knots had a smaller volume and weight than surgeon’s and square knots with the same RKS. Comparing all knots tested, Aberdeen knots of four throws and one turn using 3USP polyglactin 910 provided the highest RKS and smallest size. The increased strength and decreased size of Aberdeen knots provides evidence supporting in vivo testing in horses.

Room 2310 – Agriculture and Entomology

- Yang, L. (G)
  Title: Orientation and colonization preference of adult Megacopta cribraria (Hemiptera: Plataspidae) to soybean development stages
  Primary Author (and presenter): Yang, Liu
  Additional Authors: Dr. Xingping Hu

*G = graduate student presentation
Department: Entomology and plant pathology  
College/School: College of Agriculture  
Description: Kudzu bugs, *Megacopta cribraria*, a species native to Asia but currently invading U.S. has become a serious pest of soybean crops. Although adults are known to move, in spring, from wild kudzu patches to infest and develop on early planted soybean plants, the nature of the migration, the specific preferred soybean development stages, and the behavior response from males and females require elucidation. Given choices of soybean plants at four representative development stages, adults preferentially (77% on average distributional proportion) settled on soybean plants at early reproductive stages (flowering R1 and pod development R3) than later reproductive stage (after seed development R3) or early vegetative stage (V2). Specifically, the adults demonstrated significant predilection to R1 during the first hour, then the numbers on R3 sustainably increased over time during the 3-day observation. Y-tube olfactometer bioassay not only showed that the behavioral preferences were influenced by volatile chemicals associated with whole soybean plants but also corroborated the results from greenhouse choice experiments. Interestingly, Y-tube bioassay also indicated that females were significantly more responsive to whole plant volatiles, meaning females were more likely to be colony funders on soybean crop. Collectively, the empirical data indicate that soybean plants at early reproductive development stages are the most attractive to kudzu bugs. This finding might be great significance for developing kudzu bug management tactics.

- Zeng, Y. (G)  
  Title: Bacteria induced alteration in the antibacterial defense of the eastern subterranean termite *Reticulitermes flavipes*  
  Primary Author (and presenter): Zeng, Yuan  
  Additional Authors: Hu, XingPing; Suh, Sang-Jin  
  Department: Entomology and Plant Pathology  
  College/School: Agriculture  
  Description: The Eastern subterranean termite, *Reticulitermes flavipes*, faces strong pathogenic pressures as they nest and forage in soil, reflecting its remarkable capacity to control and eliminate pathogens. We recently demonstrated that *R. flavipes* constitutively displays various proteins with antibacterial activity against several Gram-negative and Gram-positive bacteria but not several multidrug resistant pathogens (MDRs). Here, we demonstrate that feeding *R. flavipes* with a sublethal concentration of multidrug resistant pathogen Methicillin-resistant *Staphylococcus aureus* (MRSA) or *Pseudomonas aeruginosa* (PAO1) induces production of antibacterial proteins in the hemolymph that are effective against these MDR pathogens. The SDS-PAGE electrophoresis analysis demonstrated an alteration in the protein profile of termite cell free hemolymph and showed an upregulation of proteins (100-130 kDa) as well as a downregulation of proteins (70-100 kDa) relative to uninfected termites. Our data demonstrate that in addition to the constitutive production of antibacterial proteins, the innate immune response of *R. flavipes* is tailored to respond to the threat posed by specific pathogens.

Room 2326 – Social Science and Psychology  
- Frye, W. (G)  
  Title: The mediating role of weight-based teasing in adolescent African American body appreciation  
  Primary Author (and presenter): Frye, William, S.  
  Additional Authors: Resmini, Alana. R.1; Robinson, Leah, E.2; Gray, Wendy, N.1  
  Department: Psychology1; Kinesiology2  
  College/School: Auburn University1; University of Michigan2  
  Description: Epidemiological research has indicated that almost 32% of youth are overweight or obese. African American youth are particularly at risk, with almost 39% classified as overweight/obese. Being overweight has been associated with body dissatisfaction. Similarly, weight-based teasing (WBT), particularly common in overweight youth, can diminish body image perceptions. While these constructs may be detrimental to how youth view their bodies, some studies

*G = graduate student presentation*
have found that African American ethnicity serves as a protective factor against developing negative body perceptions. Unfortunately, there is a dearth of research examining the relationship of these constructs. To address this gap, the current study examines the association between body fat percentage (BF%), WBT, and body appreciation in a primarily African American sample. Specifically, we examined if WBT was the mechanism that relates BF% to body appreciation. Youth (N = 93, 12-17 years) attending a rural Southeastern school completed forms assessing WBT and body appreciation. BF% was assessed with bioelectrical impedance. Higher BF% was associated with lower body appreciation (r = .29) and higher WBT (r = .30). WBT was associated with lower body appreciation (r = .37). When WBT was entered as a mediator of BF% predicting body appreciation, the relationship between BF% and body appreciation decreased from 3.6% to .89% and was not significant (b = -.10, p = .39). The test of the indirect effect was confirmed via bootstrapping procedures (b = -.0958, p < .05, 95% CI [-.27 - -.01]). WBT plays an underlying role in body appreciation in ethnic minority youth. Understanding this role is valuable given that youth who experience WBT may be more likely to engage in unhealthy weight control behaviors. Since adolescence is a critical time for the development of healthy body image, future research should examine the risk and protective factors of body appreciation in this age group.

  
  **Title:** Testing timing of delivery effect of a cross-cultural training program
  
  **Primary Author (and presenter):** Hou, Ning
  
  **Department:** Psychology Department
  
  **College/School:** College of Liberal Arts, Auburn University
  
  **Description:** The current study examined how timing of delivery impacted the effectiveness of a cross-cultural training program in a quasi-experimental field study, with a sample of first-year international students studying in a US university. The training was delivered to two sections of an English class at different times (Early Group and Delayed Group). We hypothesized the ROPES training would benefit the Delayed Group more on utility perceptions, knowledge retention, coping behaviors, stress and adjustment, and that utility perceptions should mediate the above treatment effects. Results supported the timing of delivery effect on utility perceptions and the mediation role of utility perceptions on adjustment.

- Lee, D. (G)
  
  **Title:** PTSD Symptoms in Response to Stressful vs. Traumatic Events: Differences across Symptom Clusters and Assessment Methods
  
  **Primary Author (and presenter):** Lee, Daniel
  
  **Additional Authors:** Silverstein, Madison; Davis, Margaret; & Weathers, Frank
  
  **Department:** Psychology
  
  **College/School:** College of Liberal Arts
  
  **Description:** Diagnosis of posttraumatic stress disorder (PTSD) requires experiencing a traumatic event as defined by *DSM-5* Criterion A. As such, many stressful life events (e.g., expected death of a loved one, non-life-threatening medical problems) are not considered capable of conferring a PTSD diagnosis and rendering access to associated treatments. This is especially concerning given that growing number of studies have found that individuals exposed to stressful events that do not meet Criterion A report substantial (e.g., Long et al., 2008) or even greater PTSD symptom severity than those exposed to Criterion A events (Gold et al., 2005), suggesting the current definition of Criterion A lacks predictive validity with regard to PTSD symptom development. However, few studies have examined this question using data collected using the most accurate and comprehensive clinician-administered measures. A sample of undergraduates (N = 67) who reported experiencing a stressful life event completed an online survey and a clinician-administered interview about their trauma exposure history and PTSD symptom severity. Participants were classified into two groups: those whose index event met Criterion A (n = 42; 63%) and those whose index event did not meet Criterion A (n = 25; 37%). Groups did not significantly differ on any *DSM-5* PTSD symptom cluster...
or in total PTSD symptom severity on a self-report symptom measure. However, the Criterion A group endorsed significantly higher re-experiencing (RXP), alterations in arousal and reactivity (AAR), and total PTSD severity on the clinician-administered measure. Observed group differences in RXP, AAR, and total PTSD severity on the clinician administered measure suggest that previous findings of no group differences may be due at least in part to an assessment method effect. Likewise, observed group differences support that the DSM-5 Criterion A provides a clinically meaningful distinction with regard to subsequent PTSD symptom development.

11:00 a.m. – 12:00 p.m.

Room 2216 – Architecture and Consumer Design

- **Grant, N. (G)**
  - **Title:** Using BIM to design three sustainable housing prototypes for a community in Thoman, Haiti
  - **Primary Author (and presenter):** Grant, Nougen
  - **Additional Authors:** Walker, Erin and Jacobs, Chelsey
  - **Department:** Building Science
  - **College/School:** Architecture, Design and Construction, Auburn University
  - **Description:** Populations around the globe are mushrooming at an alarming rate which is creating a housing shortage in many developing countries. The country of Haiti is no exception to the rule. The earthquake that the country experienced in 2010 has created even more of a housing crisis. Though the amount of people living in tent cities have fallen precipitously from its peak of 1.5 million in 2010, five years later approximately 80,000 people are still living in tent cities in unsanitary conditions. It is important to note that housing was a challenge even before the earthquake mostly due to the economic condition of the country. It is estimated that 70 percent of the people were living in slums exacerbated by the economic challenge of individuals living on a meager $1.25 per day. The aim of this research is to investigate the benefits, advantages, and risks of different sustainable building prototypes utilizing passive design strategies in a building information environment. The objectives of this research include to develop virtual building prototypes from common and alternative building materials, to do a sustainability analysis of virtual building prototypes with proprietary energy/environment software, and to develop a cost analysis to compare and contrast economic strength and weakness of the different options. The country also faces significant environmental and energy challenges that are hampering their ability to have a sustainable future. Haiti has limited energy sources which has had an immense impact on the environment. The country has little petroleum or hydroelectric resources, and supplies of wood fuel is almost exhausted. Any solution to the country’s housing crisis will need to look at how to use sustainably sourced materials for building.
  - **Key Questions**
    1. Can BIM models be used for sustainability analysis of unconventional building materials?
    2. What are the different software available for performing sustainability analysis?
    3. What is the best sustainability analysis software?
    4. What is the most economical building material for Haiti?
    5. Can passive design strategies be used successfully in Haiti?
    6. Is the use of Rammed Earth building techniques viable for Haiti?
    7. Can the use of steel be utilized to sustainably solve the housing needs in Thoman, Haiti?

- **Matthews, E. (G)**
  - **Title:** Estrangement in rural wilds.
  - **Primary Author (and presenter):** Matthews, Elizabeth G.
  - **Department:** Landscape Architecture

*G = graduate student presentation*
College/School: College of Architecture, Design and Construction, Auburn University
Description: In abandoned rural landscapes, impressions of culture are overtaken by the steadiness of living things. The familiar succumbs to the wild, resulting in physical environments that arouse curiosity because of their uncanny presentation of reality. In these raw encounters with ourselves and nature, we find ourselves experiencing estrangement from both. Estrangement is the perception of mystery resulting from the recognition of otherness. This thesis proposes that design can collaborate with the active and/or latent energies of a site, inviting people to experience the landscape on its own terms. To accomplish this, the designer must make the landscape’s invisible characteristics palpable through simple, underwhelming maneuvers that empower the landscape. We need places that allow for us to strongly connect with non-virtual reality in restorative and transformative ways. People need wild places, and this thesis acknowledges the real wildness that exists in abandoned, human-altered sites. In their book Lost Landscapes, the firm LOLA writes, “People need wilderness in their lives... An ecological perspective of protectionism or quantification does not address our need for wild experiences... Therefore, landscape architecture, like ecology, should be an experimental playground.” Fallow rural sites are fertile grounds for rich, experiential landscapes. This thesis acknowledges progress to date and seeks to further advance the field by exploring design and estrangement in human-altered wilds. This work draws on precedents such as RO&AD Architecten’s Moses Bridge, Richard Haag’s Bloedel Reserve, and West 8’s Swamp Garden as well as inspirations from artists such as Tara Donovan, Andy Goldsworthy, and Edward Burtynsky. Theoretical influences include LOLA Landscape Architects, Paul Roncken, Michel Desvigne, and Julie Bargmann.

- Cutler, K.
  Title: Classroom design and student motivation
  Primary Author (and presenter): Cutler, Kathryn P.
  Department: Consumer and Design Sciences
  College/School: College of Human Sciences, Auburn University
  Description: Numerous studies and polls in the last several years have shown that the United States is falling behind other industrialized nations in terms of the number of students completing school and the quality of the education they are receiving (Program for International Student Assessment, 2014). Speculation varies as to the cause; some blame poor teachers and the lack of talent from which teachers are drawn (Berlatsky, 2014), while others blame inefficient and useless focus on standardized testing, cultural inequalities, and parents for not placing proper emphasis on the importance of education (Gordon, 2013). The focus, however, is rarely on the design of the learning environments themselves – classrooms, of all configurations and forms. In particular, this study will examine the effect of classroom configuration and design on students’ motivation during instruction time. A survey distributed to a group of N=30 students will compare student self-reported motivation levels within two learning environments; one environment recently renovated with attention to collaborative work spaces, and one space where renovation is needed and is set up in a lecture style format. Findings can aid designers and school builders in creating the best learning environments possible to procure the highest level of motivation from students. Taking one variable out of the complex equation that results in a quality education is sure to help pinpoint what exactly needs to happen to bring the United States back to the top of the education rankings.

- Braun, A. (G)
  Title: The influence of design complexity on perceived quality: The moderating role of price and brand familiarity
  Primary Author (and presenter): Alina Maria Braun, AB
  Additional Authors: Chattaraman, Veena, VC
  Department: CADS
  College/School: College of Human Sciences, Auburn University
Description: This study aims to investigate the influence of three important product factors – brand, price, and design on consumers’ perceived product quality and purchase intention. A 2 (price: low vs. high) x 2 (brand familiarity: low vs. high) x 2 (product design: complex vs. simple) mixed factorial experiment design with price and brand familiarity as the between-subjects factors and product design as the within-subjects factor was employed with 431 participants to test the interaction effects of a product’s design, price, and brand familiarity on perceived apparel product quality and purchase intention by applying two different models: the Model of Consumer Responses to Product Form and the Model of the Dimensions of Clothing Product Quality. Results obtained from repeated measures ANOVA demonstrate that brand and design complexity assert significant effects on perceived quality. Specifically, for unfamiliar brands, complex designs are perceived as higher quality than simple designs, which is not the case for familiar brands. Further, higher perception of quality leads to a higher purchase intention. Price asserts no significant effects on perceived quality within this combinatorial model. Brand managers of less familiar brands will benefit from understanding the role of a product’s design complexity in increasing consumers’ perceived quality and, thereby, purchase intentions. This study combines quality and aesthetics research to further test important research questions on perceived product quality, which were studied in the late 1980s. Since then, there has been a gap in quality research related to the aesthetics-quality relationship. The present study is the first to clearly define and evaluate the combinatorial effects of a product’s design (based on overarching design principles, such as complexity), brand and price on quality perceptions.

Room 2218 – Creative Scholarship

- Michaelson, D. (G)
  Title: A submerged perspective: A smocking approach to fabric manipulation
  Primary Author (and presenter): Michaelson, Dawn M.
  Department: Department of Consumer and Design Sciences
  College: College of Human Sciences
  Description: Have you ever imagined what it must look like to gaze at the shore while underwater? Would the sun’s rays play with your vision while the ocean moved your body? This strapless hi-lo dress was designed to expose you to this perspective – an underwater illusion – of color, texture and movement. This affect was achieved by manipulating a vibrant patterned chiffon with a smocking pleater that ran specifically spaced running threads through the length of the fabric. The threads were tightened for fabric manipulation then draped directly onto a dress form. The dress is made up of seven different sections - each manipulated section has a different direction and/or depth of fold - with the lower section cascading to form the fishtail hemline. These individual sections were thread marked, underlined, tacked, smocked, beaded, and then the gathering threads removed for final construction. These varied techniques were necessary to enhance the multiple colors/patterns of the fabric while creating movement for the viewer’s eye. The front bodice sections continue to drape beyond the bodice, crisscrossing at the neckline and cascade down the back of the dress. Dress was exhibited March 8, 2014 to October 31, 2014 at Lacis Museum of Lace and Textiles, Berkeley, CA, “Smocking Manipulation and Beyond” by invitation. Oral presentation would consist of inspiration, brief history of smocking, fabric manipulation steps for visual effects, and various images of dress. Dress can also be displayed on dress form during presentation.

- Hanna, L. (G)
  Title: Writing down the ghosts: A collection of original poems
  Primary Author (and presenter): Hanna, Laura, N.
  Department: English
  College/School: School of Liberal Arts, Auburn University
  Medium: Poetry
  Description: The original pieces in this poetry collection, entitled “Writing Down the Ghosts: A Collection of Original Poems,” initially were written for two graduate-level poetry classes I
took with Professor Kuipers in fall 2013 and spring 2015. The final revisions were completed on February 2, 2015. What does it mean to mourn? To grieve? To live after having lost a love one? The speaker in each of these poems is attempting to deal with such loss or its possibility. The first poem, “The Glass of Water,” opens the collection with the speaker's attempt to cope with her loved one's suicide. However, not all of the poems are about a death that has already occurred. For example, “Critical Care” is about an in-home nurse who is taking care of a dying elderly woman. As has been illustrated, while some of the poems are written from disparate points of view, there are other poems in this collection that are part of a series, meaning that they are all in the uniform voice of the same speaker. These poems are titled: “Day 3,” “Day 9,” and “Day 37.” I titled the poems this way in order to indicate how many days after the speaker's loved one has died and to provide a time sequence through which to show the different stages of grief that the speaker is experiencing. Illustrated in each of the poems in this collection is the use of poetic craft with imagery and metaphors in order to help more acutely illustrate through language the ideas being conveyed and to deepen the emotional impact of the poems. Such imagery is particularly evident in the final poem. This poem, “January Snow,” ends the collection with a resolution—the speaker finally is able to live with the loss of a loved one.

- **Smith, L.**
  **Title:** Antebellum & artillery ancestry.
  **Primary Author (and presenter):** Smith, Lindsey, M.
  **Additional Authors:** N/A
  **Department:** Consumer and Design Sciences
  **College/School:** College of Human Sciences, Auburn University
  **Description:** I began this design process with the desire to create something that would inspire the viewer to reflect on his or her own roots— to see something different each time they look at it and feel a stronger sense of nostalgia the longer they gaze. I was very much inspired by my family. On my mother’s side, my grandmother and great-grandmother offered romantic beauty in the brooches and jewelry that they passed down to my mother. As we sifted through the heirlooms, my mother had specific memories tied to each piece that caused me to revel in the feminine elegance of my family history on her side. Juxtaposing that elegance, I was inspired by my grandfather on my father’s side. The roots on his side run deep into the country life of Alabama. My grandfather was a veteran who lived a simple life on the Smith-family farm in a homemade cul-de-sac of sorts—small country homes placed on the land that housed my grandfather’s parents, brother, and my uncle. My design blends my heritage with the combination of antique jewelry and brooches with corroded and weathered shotgun shells attached to a corset by hand sewing and couching. The bottom of the design is made up of two parts: a linen ruffled skirt, and a separate layer made up of an antique linen tablecloth (more than one hundred years old) constructed with hand-sewn bustles. For design cohesion, I tea-stained all of the linen used in this design to give the stark white color a more antique look. In order to create enough structural support to manage the weight of the jewelry and miscellaneous items that attach to the corset bodice of the design, I use a corseting coutil fabric with interfacing and boning, and I sew vertical lines every eighth of an inch on all corset panels.

Room 2222 – Human Development and Family Studies / Consumer and Design Sciences

- **Sabey, A. (G)**
  **Title:** Me before you or you before me? Relational predictors of compassionate love in older couples
  **Primary Author (and presenter):** Sabey, Allen, K.
  **Additional Authors:** Rauer, Amy
  **Department:** Human Development and Family Studies
  **College/School:** College of Human Sciences
  **Description:** Compassionate love can be defined as a love that is centered on the good of the other and research has shown that it is an important characteristic of healthy marital relationships,
particularly in older adulthood (Sabey, Rauer & Haselschwerdt, under revision). However, we know little concerning changes in compassionate love over time or the individual and relational factors that promote or hinder the experience of compassionate love within couples (Collins et al., 2014; Fehr, Harasymchuk, & Sprecher, 2014). Thus, to explore if compassionate love changes over time and if there are certain individual or relational variables that are related to both concurrent and future compassionate love, the current study examined self and spouse-reported compassionate love over approximately 16 months with a sample of 54 primarily European-American, well-educated, married older couples (MH age = 72, MW age = 70, M marital duration = 42 years). Couples participated in a compassionate love task and a problem-solving task at Time 1 and completed a questionnaire at both Time 1 and Time 2. The variables included in the analyses were health (doctor-diagnosed diseases), attachment avoidance, marital equity satisfaction, observed sensitivity, and observed conflict. Results indicated small but significant declines in compassionate love for both spouses. Further, hierarchical regression analyses revealed that both spouses appeared to contribute in unique and consistent ways to the overall experience of compassionate love. Couples reported greater compassionate love when wives were less avoidant, more sensitive, and more satisfied with marital equity and when husbands were less conflictual and more sensitive. Notably, health was unrelated to compassionate love and wives’ attachment avoidance was the most consistent predictor across all three domains of compassionate love (i.e., self-report at Time 1, spouse-report at Time 1, and changes in compassionate love) for both husbands and wives. Thus, compassionate love may unrelated to the specific needs of the other and more about being aware and feeling safe in a relationship as this may help spouses focus on each other and trust that their efforts will be well-received and appreciated.

Saini, E. (G)
Title: Associations between perceived daily discrimination and sleep among couples: Mental health risk as mediators
Primary Author (and presenter): Saini, Ekjyot, K.
Additional Authors: El-Sheikh, Mona
Department: Human Development and Family Studies
College/School: College of Human Sciences, Auburn University
Description: A growing literature has documented associations between experiences of perceived discrimination and many physical and mental health problems. Sleep is a bioregulatory process involved in multiple domains of functioning and is key to maintaining health. Thus, identifying predictors of sleep problems is warranted. Advancing the scarce pertinent literature, the main objective of this study is to examine relations between perceived discrimination and adults’ sleep. Further, given that discrimination may contribute to feelings of depression or anxiety, we examined these as potential mechanisms that may explain the discrimination-sleep link. A sample of 151 couples participated (M age = 36.2men, 34.2female years; ~24% African- and the rest mostly European-American; 66% lived near or below the poverty line). Partners reported on their own experiences of perceived daily discrimination, subjective sleep problems, depression, and anxiety. Objective assessments of sleep duration and quality were derived with actigraphs worn for seven consecutive nights. Preliminary analyses indicate that adults reported experiencing discrimination predominantly because of their ethnicity, physical appearance, and poverty. Preliminary path analyses support direct effects between perceived discrimination and some sleep parameters. Further, illustrating potential mechanisms of effects, depression and anxiety mediated the relationship between discrimination and some sleep parameters. Specifically, discrimination was associated with greater mental health problems, which in turn was linked with worse sleep quality. These findings are novel and suggest that mental health status may explain the association between discrimination and sleep problems among both men and women. Results highlight the importance of examining multiple domains of functioning towards better explication of sleep regulation in adults.
**Su, S. (G)**

**Title:** Social anxiety in early adolescence: Links with peer rejection and victimization and parental social coaching.

**Primary Author (and presenter):** Shu Su

**Additional Authors:** Gregory S. Pettit, Stephen Erath

**Department:** Human Development and Family Studies

**College/School:** College of Human Science, Auburn University

**Description:** Parenting and peer relationships play vital roles in children’s psychological development. Problematic peer relationships, such as peer rejection and victimization, have been found to be related to psychological distress, including social anxiety (SA), which is heightened during early adolescence. Parental social coaching (e.g., behavioral advice, cognitive framing), on the other hand, might help young adolescents develop more confidence in their social relationships. To our knowledge, the combined impact of peer problems and parental coaching on SA has not previously been examined. The present study examined independent and interactive associations between peer relationship difficulties and parental social coaching and young adolescents’ SA. Early adolescents (N = 80; Mage = 11.9 years; 45% females; 57% ethnic minority) and a parent (mostly mothers) participated in this study, which included a lab protocol designed to simulate common peer evaluation experiences. Adolescents were asked to lead a 3-minute conversation with a research assistant, while ostensibly being evaluated by three (fictitious) peer judges via Skype (conversation task). Adolescents then talked with their parent for three minutes about what to do in case they were not chosen by the peer judges as one of the best performers in the conversation activity (coaching task). Parents’ cognitive framing and prosocial behavioural advice were reliably coded. Peer victimization and peer rejection were reliably measured via parent report. Adolescent SA was measured through global self-report and context-specific report during the peer evaluation protocol. Regression analyses showing that global SA was associated with victimization, and the context-specific SA was independently predicted by higher levels of rejection and lower levels of framing and advice. Two significant interactions emerged: cognitive framing moderated associations linking peer victimization and rejection and context-specific SA. These findings suggest that (1) generalized and context-specific indexes of SA may have distinct correlates, (2) poor coaching and peer problems cumulatively predict context-specific SA, and (3) good coaching may offset some of the risks associated with problematic peer relations in young adolescents’ SA.

**McCann, A. (G)**

**Title:** A clothing journal study: Decision-making factors in clothing choice.

**Primary Author (and presenter):** McCann, Abbi-Storm

**Additional Authors:** Duffeyy, Melanie

**Department:** Consumer and Design Science

**College/School:** College of Human Sciences, Auburn University

**Description:** This mixed methods study will address how social environments affect clothing choice in millennial college aged sorority women at Auburn University. Millennials are an important demographic to study because of their unique placement in the consumer market place, being a large, young generation with extreme social media and internet presence (Bapna, 2013; Tayler & Gao, 2014). The primary purpose of this study is to identify what specific factors affect decision-making as it pertains to clothing choice. Adapted nutrition diaries in the form of clothing journals will be used to discover daily clothing choice by tracking participants (N=X) clothing choices over a one-week period. Follow up interviews, in the form of focus groups, will explore decision-making factors for daily clothing choices. Both methods will test the theory of Social Identity Theory (SIT), which predicts that the social groups will influence positively and negatively the clothing choices for the women members. SIT aims to define how a social group defines a person and how this group will produce a unique set of characteristics for each social group (Hogg & Terry, 2000). Expected findings may reveal the presence of set dress norms conformed to by sorority membership. It is also anticipated that physical environment and destination will be a prominent decision-making factor in
clothing choice. Findings from this study will further develop SIT and make a direct application to clothing, a facet of expression not yet explored in relation to this theory. The large millennial generation, including sorority women, has caused recent shifts in consumer markets giving them the ability to act as a primary consumer within the economy. Ultimately, the potential findings for this study can provide specific information on how the sorority women target market makes decisions when it comes to clothing.

Room 2223 – Chemistry and Biochemistry

- **Dmytrejchuk, A. (G)**
  - **Title:** Synthetically modified nucleic acids for antisense-based therapies.
  - **Primary Author (and presenter):** Dmytrejchuk Ana M
  - **Additional Authors:** Merner, Bradley
  - **Department:** Chemistry and Biochemistry
  - **College/School:** College of Sciences and Mathematics, Auburn University
  - **Description:** The incorporation of synthetic, tricyclic nucleic acid (TriNA) modifications into antisense oligonucleotides (ASOs) has demonstrated that they provide increased thermal stability relative to DNA and RNA, as well as leading nucleic acid modifications, such as locked nucleic acid (LNA). One of the major obstacles facing the development of TriNAs into viable ASO candidates is a weakness in chemical synthesis. This talk will focus on the development of new synthetic strategies that employ nucleosides as starting materials for the rapid construction of the tricyclic frameworks of TriNAs. Using a commercially available nucleoside we have developed short synthetic approach to a bicyclo[6.2.1]undecane nucleoside intermediate, which takes advantage of regio- and chemoselective reactions. This intermediate will serve as molecular scaffold from which multiple TriNA analogues can be prepared.

- **Ghebreamlak, S.**
  - **Title:** The Iron Sulfur cluster and conserved amino acids of IspH, an isoprenoid pathway enzyme.
  - **Primary Author (and presenter):** Ghebreamlak Selamawit M
  - **Additional Authors:** Xiao Xiao, Duin Evert
  - **Department:** Chemistry and Biochemistry
  - **College/School:** College of Sciences and Mathematics, Auburn University
  - **Description:** Isoprenoids are large biomolecules, such as carotenoids, vitamins, cholesterol that are essential for the survival of an organism. Most eubacteria and protozoan parasites use 1-deoxy-D-xylulose 5-phosphate (DOXP) pathway for the synthesis of isoprenoid building blocks, Isopentenyl diphosphate and Dimethylallyl diphosphate. E-4-Hydroxy-3-methylbut-2-ethyl diphosphate reductase (IspH) catalyzes the conversion of E-4-hydroxy-3- methylbut-2-ethyl diphosphate (HMBPP) in to the precursors. Photometric assays and EPR-spectroscopy-based-kinetics studies were used to probe the active site 4Fe-4S cluster and the conserved amino acid residues H124 and E126 of wild type and mutant IspH. The IspH variant with H124F has negligible activity whereas the E126Q mutant has no activity. Rapid Freeze quenching of the wild type IspH showed two signals with different g values. A transient intermediate with EPR g values 2.176, 2.008 and 2.000. This signal denoted as FeSI is proposed to be an intermediate where the cluster is a [4Fe-4S]3+ based species and directly binds the hydroxyl of the HMBPP. A second signal with g values 2.082, 2.006 and 1.991 that represents cluster-product species, FeSII. A product-like signal with g-values 2.079, 2.004 and 1.989 appears for the H124F variant. The E126Q mutant shows a species with g values 2.117, 2.003 and 1.964 which is different than the FeS cluster bound to substrate or product. The kinetic and spectroscopic analyses suggest that the activities of the H124 participates in correct orientation of the HMBPP and the E126 residue is involved in stabilizing the HMBPP C4-OH and dehydroxylation. The DOXP pathway is absent in humans hence the enzymes of the pathway can be specifically targeted, making this an attractive pathway in the search for novel drugs. It is important to investigate and characterize the transient intermediates formed and the role of the conserved
amino acids in the active site so as to have an in-depth understanding of the IspH reaction mechanism.

- **Meudom, R. (G)**
  
  **Title:** Synthesis of strained, functionalized 1,2 and 1,4-arene-bridged macrocycles: New tools for a bottom-up chemical synthesis of carbon nanotubes.
  
  **Primary Author (and presenter):** Meudom,Rolande
  
  **Additional Authors:** Mitra, K. Nirmal; Gorden, D. John; Merner, L. Bradley
  
  **Department:** Chemistry and Biochemistry
  
  **College/School:** Science and Mathematics
  
  **Description:** Singled-walled carbon nanotubes (SWCNTs), a cylindrical shaped allotrope of carbon, are interesting carbon-based materials with exceptional electronic and optical properties. Armchair CNTs are particularly interesting for applications to materials and nanoscale science. The preparation of structurally uniform CNTs remains a great challenge for chemical science, and in this regard synthetic chemists have accepted this challenge. The past seven years has witnessed a surge in synthetic activity for the development of starting materials and chemical tools that will facilitate a bottom-up chemical synthesis of CNTs. [n]Cycloparaphenylenes (CPPs), macrocyclic carbon nanohoops, have been prepared and the notion of using these systems as templates for CNT synthesis has been put forward. However, one of the current limitations facing the implementation of CPPs as precursors to CNTs is the virtual absence of direct functionalization reactions of CPPs. Our group has developed a new macrocyclic-based approach to CPPs and CPP fragments that enables late-stage functionalization of these hydrocarbon materials. This presentation will discuss our approach, the synthesis of a series of arene-bridged macrocycles (CPP fragments), and the conversion of these macrocycles into higher order nanostructures.

**Room 2225 – Computer Science and Industrial Engineering**

- **Derhami, S. (G)**
  
  **Title:** Optimizing space utilization in block stacking warehouses through the design to operation processes.
  
  **Primary Author (and presenter):** Derhami, Shahab
  
  **Additional Authors:** Smith, Jeffrey; Gue, Kevin.
  
  **Department:** Industrial and Systems Engineering
  
  **College/School:** Samuel Ginn College of Engineering, Auburn University
  
  **Description:** A block stacking storage system is a unit load storage system in which pallets of stock keeping units (SKUs) are stacked on top of one another and stored in lanes on the warehouse floor. The major operating policy widely used in this type of storage system is termed shared storage in which lanes are not dedicated to any SKU and empty lanes are available to all SKUs. This characteristic makes this policy a space-efficient operating policy; nevertheless, to avoid blockage and relocation of pallets, a lane is dedicated to a SKU once the first pallet position of the lane is occupied by that SKU. This restriction leads to waste some storage spaces in a lane when it is being filled or depleted as there will be some unoccupied pallet positions in the lane that are available just to the pallets of the SKU that has been assigned to the lane and are not available to the other SKUs. There is another type of waste of space that is incurred to the system by the aisle spaces. Aisles are required to have access to the lanes but their devoted spaces are not used directly for the storage, so they are considered as a waste of storage space. Warehouse designers have to minimize these two types of wastes in order to enhance the space utilization in the warehouse. Although this type of storage system is widely used in manufacturing facilities, determining the optimal lane depth that maximizes space utilization under finite production rate constraints has not been adequately addressed in the literature and is an open problem. In this research, we propose mathematical models to obtain the optimal lane depth for a single and multiple SKUs where the pallet production rate is finite. We then develop a mixed
integer programming model to design the most space efficient layout for a block stacking warehouse. The performance of the proposed models are evaluated by a simulation module.

- **Avery, H. (G)**
  
  **Title:** Sentiment analysis solutions for insurance business decision support.
  
  **Primary Author (and presenter):** Avery, Heather, Ann
  
  **Additional Authors:** Narayanan, N.H.
  
  **Department:** Computer Science and Software Engineering
  
  **College/School:** Samuel Ginn College of Engineering, Auburn University
  
  **Description:** As the amount of data proliferates, businesses are faced with a plethora of decision support opportunities and often times lack a prescribed set of techniques to speed up or even handle analysis opportunities. Areas with the biggest increases in information variety and volume include: customer information, operations, and sales/marketing. From an industry perspective, the largest opportunity for leveraging data relates to sentiment analysis and brand reputation. With the advent of social media, opportunities to monitor sentiment have become abundant. Tracking sentiment is important as brand reputation is one of the key drivers of customer acquisition and retention. Our research aims to provide a framework for analyzing social sentiment of insurance consumers with appropriate machine learning approaches for business decision support. We report on experiments comparing the accuracy of string matching and a machine learning technique in classifying the sentiment of tweets about the insurance industry as positive or negative. Results show that both techniques achieved a high accuracy in predicting sentiment but have different strengths and limitations.

- **Ozden, S. (G)**
  
  **Title:** Optimizing non-traditional designs for order picking warehouses.
  
  **Primary Author (and presenter):** Ozden, Sabahattin G.
  
  **Additional Authors:** Gue, Kevin R. and Smith, Alice E.
  
  **Department:** Industrial and Systems Engineering
  
  **College/School:** Samuel Ginn College of Engineering, Auburn University
  
  **Description:** For more than 50 years facilities that are the backbone of supply chain still look like much the same (rows of straight, parallel picking aisles with perpendicular cross aisle). The proposed research offers an approach that reduces the costs of most costly operation in a warehouse – order picking. Order picking operation requires workers to visit multiple locations per tour. Due to shipment size decrease, labor costs associated with filling customer orders has increased. We estimated $13.1 B was spent in 2011 on workers associated with order picking in United States. We already have seen the improvements in unit-load warehouses (where you only pick or put away a single item per tour) by applying non-traditional designs, however these particular designs (Flying V and Fishbone) do not perform in order picking operations where you have to perform multiple picks per tour. In order picking, travel takes more than 50% of time of picking and it is a non-value adding activity. We believe that the average travel distance within order picking operations can be reduced with other non-traditional designs. We are developing a tool which currently has capabilities of creating non-traditional warehouse designs, allocating items according to different storage policies, and optimally solving the picking tours by using parallel computing paradigm. When we are done with the development, we will be able to know which designs performs better under which storage policies, and if there exists any non-traditional design that can lower the average travel distance of picking tours over traditional warehouses. Any decrease in average travel distance can save hundreds of thousands of dollar per year for warehouses or hundreds of million dollars in United States. Our research is sponsored by National Science Foundation.
• Teran-Somohano, A. (G)
  Title: Exploring the relationship between function and form in facility layout problems.
  Primary Author (and presenter): Teran-Somohano, Alejandro
  Additional Authors: Smith, Alice E., Murray, Chase C.
  Department: Industrial and Systems Engineering
  College/School: Samuel Ginn College of Engineering, Auburn University
  Description: The Facility Layout Problem has a longstanding history in Industrial Engineering. However, advances in the field have come to a halt in the last few decades, as the problem has devolved into a purely academic exercise for benchmarking optimization algorithms. Overly constraining restrictions have made the problem more manageable but, at the same time, rendered it unrealistic. Finding ways of solving the problem became the focus, at the expense of what is most essential to it, namely, the relationship between function and form. In this presentation, we describe a study that aims at re-establishing that link. We formulate the facility layout problem in one of its most simple forms—the quadratic assignment problem (QAP)—and explore how the operational characteristics of the different departments relate to the spatial characteristics of their optimal locations, as well as to the facility’s shape. The study consists of two distinct parts. The first part shows that facility shape matters. We prove that changing the shape of a facility can produce better solutions to the QAP. The second part maps the operational traits of the departments, as measured by number of flows and flow volumes, to the spatial characteristics of the facility, as measured by global and local depth, to discover the underlying forces that give shape to an optimal arrangement. Our study brings many interesting results into the light. When unconstrained, form is an emergent property of the operational interactions between departments. It emerges from a very simple rule: place interacting departments close together, with those with the higher flow volumes closest. By constraining the shape, we introduce an element of noise to the placement of departments, which can entirely disrupt their placement preference leading to worsening objective values. In addition, we found that the local and global relationships between departments manifest themselves spatially, and that these can have a significant impact on a facility’s shape. We also discuss how these findings can open whole new avenues of research in facility layout design, and how they can help not only engineers, but also architects, in designing and building better facilities.

Room 2227 – Materials / Polymer Engineering

• Chanysheva, A. (G)
  Title: Electrochemical sensing system for detection of tricresyl phosphate in aqueous solution and air.
  Primary Author (and presenter): Chanysheva, Alina, N.
  Additional Authors: Arugula, Mary, A.; Simonian, Aleksandr, L.
  Department: Materials Engineering
  College/School: Samuel Ginn College of Engineering, Auburn University
  Description: The analysis of the air quality in commercial airliners suggests that there is a risk of cabin air contamination with tricresyl phosphate (TCP), which is an anti-wear additive in jet engine oils. TCP is an organophosphate that inhibits vital enzymes, such as acetylcholine esterase, and carboxylesterases, and induces an organophosphorous-induced delayed neuropathy (OPIDN). A development of a portable TCP sensing device would require employing electrochemical methods, as other techniques such as chromatography have a number of limitations. Due to the fact that TCP is not electroactive, and also gas samples of TCP are not readily available, electrochemical sensing is accomplished via detecting the products of TCP hydrolysis, cresols. A challenging part of the amperometric detection of such phenolic compounds as cresols is fouling of the working glassy carbon electrode, this can be resolved by electrode modification with poly(3,4-ethenedioxythiophene)-poly(styrenesulphonate) (PEDOT:PSS). Electrochemical detection allows to scale the chemical analysis down to the usage of microfabricated systems, allowing high sensitivity, compatibility, along with low cost.
Sheng, Z. (G)

Title: Influence of current density and boron content on the microstructure and magnetostrictive property of Fe-Co-B thin films

Primary Author (and presenter): Sheng, Zhizhi

Additional Authors: Zhang, Kewei; Cheng, Z.-Y.

Department: Materials Engineering

College/School: Samuel Ginn College of Engineering

Description: Magnetostrictive materials with soft magnetic property have been widely used in sensors, resonators, actuators and transducers. For high frequency biosensor application, the miniaturization of the device is necessary. Commercial soft magnetic amorphous materials have been used for biosensors, however, there is still a challenge to make them into micro or even nano scale for higher frequency application. Thus, it is necessary to find new materials which could be fabricated into micro or nano scale directly with suitable structure, property, and novel sensor behavior. In this research, Fe-Co-B alloys have been proven to be good candidates. Fe-Co-B thin films were fabricated by electrochemical deposition. The influence of current density and Boron content on the microstructure, morphology, magnetostrictive and magnetic properties were investigated. The films prepared at 0.5 mA/cm² showed Co₂₃B₆ nanocrystalline structure, while those deposited at 1~ 4 mA/cm² showed FeCo nanocrystalline structure. The films deposited under 1 mA/cm² and 2 mA/cm² for 9 hr exhibited a good trade off between the structure, morphology and resonance behavior. To study the effect of Boron content, Fe₅₅Co₁₆Bₓ (x=0~29) and Fe₅₅Co₂₄Bₓ (x=0~29) thin films were prepared. Most of Fe₅₅Co₁₆Bₓ thin films showed FeCo(211) structure, while all of Fe₅₅Co₂₄Bₓ thin films showed FeCo(110) structure. Fe₅₅Co₁₆Bₓ thin films displayed semi-spherical nodules, while Fe₅₅Co₂₄Bₓ thin films showed circular nodules on the film surface. Fe₅₅Co₁₆Bₓ thin films exhibited best resonance behavior with Boron concentration of 17 at.% and 20 at.% when deposited at 1 mA/cm² for 10 hr. Fe₅₅Co₂₄B₁₅, Fe₅₅Co₂₄B₁₇, and Fe₅₅Co₂₄B₂₀ exhibited better resonance behavior than other compositions when prepared at 3 mA/cm² for 2.70 hr.

Wang, H. (G) – Reaction mechanism of CMAS on lanthanide zirconia thermal barrier coatings.

Shen, Y. (G) – Buckling analysis of open-architecture composite structures.

Room 2310 – Chemistry and Physics

Mitra, N. (G) – A non-cross-coupling approach to strained arene-bridged macrocycles.

Njuma, O. (G) – Potential participation of the proximal tryptophan and arginine switch in catalase-peroxidase inactivation.

Tutson, C. (G) – Magnetic poly(vinyl)alcohol beads Functionalized with a water soluble salen 2-quinoxalinol ligand.

Özden, B. (G) – Investigation of electrically active defects distribution in AlGaN/GaN high electron mobility transistor devices grown on Si wafers via depth-resolved ultra-violet spectroscopic photo current-voltage measurements

Room 2326 – Human Science and Education

Marsh, S. (G) – Same race, nice place: A content analysis of race of interviewer effect in the 2013 NBA draft.

Kaeppler, A. (G) – Physiological and coping responses in socially anxious children.

McElwain, A. (G) – Dating experience as a moderator of youth-focused relationship education outcomes.

Lunch and Afternoon Poster Session
Student Center Ballrooms
11:30 a.m. – 1:00 p.m.

Oral Research Presentations – Afternoon Session
Student Center Meeting Rooms

1:00 – 1:45 p.m.

Room 2216 – Biological Sciences
- Tempero, M. (G) – The effect of ascorbic acid on the antibody response in Rhinella marina.
- Warren, M. (G) – Using 16S rRNA sequencing to examine dietary protein effects on the rat microbiome.
- Price, J. – Ecological models with U-shaped density dependent dispersal.

Room 2218 – Aerospace and Biomedical Engineering
- Appleget, C. – Development and optimization of the first fully nano-fibrillated cellulose aircraft.
- Roberts, W. – Depth estimation with a plenoptic camera.
- Beauchamp, D. – Simulation and phantom study of wall shear stress in arteriovenous grafts.

Room 2222 – Chemical Engineering
- Whitener, R. (G) – Avidity-driven targeting of a novel biohybrid nanoscale carrier engineered for high therapeutic payload and extended release of anticancer drugs to treat small cell lung cancer.
- Sloan, A. – Carbon nanotube dispersion in a biocompatible medium.

Room 2223 – Biomedical Sciences
- Westbrook, B. – Developing a model system for antigen-induced maturation of dendritic cells reaching through the intestinal epithelium.
- McCray, M. – Elucidating the development of the bactericidal capabilities of GM-CSF derived dendritic cells.
- Hightaian, A. – Engineering a silicone hydrogel contact lens to treat glaucoma.

Room 2225 – Humanities – English & History
- Soderstrom, D. (G) – Feminist responses to trauma and symbolic violence in Edwidge Danticat’s The Farming of Bones and Julia Alvarez’s In the Time of the Butterflies.
- DePace, K. – A novel look at Confederate women: Perspectives from Augusta Jane Evan’s Macaria.
- Hathcock, D. – Forgotten heroes: socialist women and youth in the Austrian Civil War.

Room 2227 – Pharmacy and Veterinary Medicine
- Kollhoff, A. – Production of a tuberculosis shikimate kinase variant for inhibitor analysis by mechanistically targeted intrinsic protein fluorescence.
- Narayanan, N. – Expedient approaches to bicyclic nucleosides: Precursors to nucleic acid modifications for antisense technology.

*G = graduate student presentation
• **Coleridge, M.** (G) – *An in vitro* study assessing the effect of biologic media on the biomechanical properties of surgeon’s, square, and Aberdeen knots.

**Room 2310 – Social Science and Communications**

• **Dukes, A.** (G) – Community land trusts as a means of preventing gentrification while creating perpetual and resilient communities: A meta-analysis.
• **Rains, S.** – Identifying successful community development practices in Ecuador.
• **Chastain, L.** – Access to care in the Spanish universal healthcare system—Gynecology and cardiology appointments and hospitalizations in the Canary Islands.

**Room 2326 – Social Science and Psychology**

• **Paneerselvam, B.** (G) – Retrieval blocking supports the testing effect with all-of-the-above questions on a multiple-choice test.
• **Williams, C.** (G) – Media reporting on suicide: Evaluating the effects of including preventative resources and psychoeducational information on suicide risk, attitudes, knowledge, and help-seeking behaviors.
• **Zuromski, K.** (G) – Temporal variation in fearlessness about death: Implications for risk of suicidal behavior.

**2:00 – 2:45 p.m.**

**Room 2216 – Pharmacy and Veterinary Medicine**

• **Gross, A.** (G) – Dual selected phage ligands for tumor targeted nanomedicines.
• **Hespel, A.** (G) – Applications for 3D printers in veterinary medicine.
• **Huang, J.** (G) – *In vivo* imaging of myeloperoxidase in prostate cancer.

**Room 2218 – Biological Sciences and Plants**

• **Tan, M.** (G) – Building the all Cypriniformes tree of life.
• **Liu, L.** – Identification of calcium-binding proteins in the *Xylella fastidiosa* proteome.
• **Hall, N.** (G) – Sequencing and characterization of Del/Tekay chromoviruses in the wildflower *Marshallia obovate*.

**Room 2222 – Chemistry and Chemical Engineering**

• **Pearce, E.** – Controlled release of model molecules from polymersomes.
• **Tilton, S.** – Multi-photon manufacturing of electrical systems.
• **Nelson, J.** – Synthesis of 2-quinoxaline salen derivatives for catalysis.

**Room 2223 – Biomedical Sciences**

• **Ghavam, S.** – Elucidating the role of PA1489 operon in regulating *trans-translation* in *Pseudomonas aeruginosa*.
• **McCandless, A.** – Effects of metronomic topotecan on prostate cancer metabolism.
• **Farmer, T.** – Exploring a new cascade reaction, a key step in the synthesis of a polyol.

**Room 2225 – Humanities – Women’s Studies**

• **Clark, L.** (G) – The plastic image: Why Katy Perry is so successful.
• **Martin, R.** – The gender gap in the criminal penalty of transportation.

*G = graduate student presentation*
*Armstead, S.* – Feminized battlegrounds: Internationalisms at the 1975 United Nations’ World Conferences for International Women’s Year in Mexico City.

**Room 2227 – Agriculture and Poultry Science**
- *Qiao, M.* (G) – Toxicity assessment of fruit body extract from *Clitocybe nuda.*
- *Ren, T.* (G) – Antimicrobial activity of N-halamine coated materials in broiler chicken house.
- *McCafferty, K.* – Effects of intermittent wheat inclusion on broiler performance, gastrointestinal tract health, and footpad dermatitis during a 46 d production period.

**Room 2310 – Miscellaneous Humanities**
- *Bradley, B.* – Death becomes him: Images of Thomas Becket’s martyrdom.
- *Pollock, M.* – From Dahrar to Déorwine: Examining Tolkien’s interpretation of sound symbolism.

**Room 2326 – Allied Health**
- *Irwin, J.* (G) – Team player: The role of balance in development of fundamental motor skills – a pilot study.
- *Luo, Y.* (G) – Genome-wide transcriptome analysis of liver and adipose tissue in a western diet-induced model of NAFLD.
- *Rege, S.* (G) – Resveratrol protects against β-amyloid-induced neurotoxicity.

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3:00 – 3:45 p.m.

**Room 2216 – Biomedical Sciences and Veterinary Medicine**
- *Bottenhorn, K.* – Connectivity of the human hypothalamus using ultra-high field, high-resolution imaging at 7T.
- *Young, T.* – Novel selective PPARg agonists prevent amyloid-beta formation and improve cognitive deficits.

**Room 2218 – Humanities – Art**
- *Dunn, C.* – If this is not a pipe, then what was Magritte’s point?

**Room 2225 – Social Sciences**
- *Burton, T.* – Determining ancient diet by the use of an element analyser on excavated human bones.
- *Keel, S.* – The effects of the implementation of the Help America Vote Act on election administration and voter confidence.

**Room 2227 – Architecture and Design**
- *Walker, J.* – A dialogue between sound and space.

*G = graduate student presentation*
• Wright, G. – Pre-fabricated ranger stations.
• Hall, J. – Accessibility and architecture: Where’s the disconnect?

Room 2310 – Mechanical Engineering
• Ramenzan Pour, B. (G) – Prediction of light reflectance by pigment/binder coatings.
• Roy, C. (G) – Performance of low melt alloys as high conductive thermal interface materials for efficient heat transfer.
• Saha, S. (G) – The pressure to cause complete contact for a perfectly elastic axisymmetric sinusoidal surface under loading.

Room 2326 – Education and Human Development and Family Studies
• McKey, T. (G) – Green ribbon school award winners: Analysis of the first three years.
• Towns, L. (G) – Optimizing the use of internet-based education to capitalize on fundamental principles of learning.
• Goodman, R. (G) – Childhood predictors of developmentally limited versus persistent clinical-level antisocial behavior in adolescence through young adulthood.

Afternoon Poster Session
11:30 a.m. – 1:00 p.m.
Student Center Ballroom

Civil Engineering
1. Majid, R. (G) – An investigation into the effectiveness of dynamic merge control in work zones in Alabama.
2. Wang, J. (G) – A comparison of the Green Arrow and Green Ball for reducing wrong-way incidents at interchange terminals.

Industrial/Systems Engineering
4. Derhami, S. (G) – Mathematical optimization for medical diagnosis.
5. Kardel, K. (G) – Preliminary development of 3D printed custom substrata for benthic algal biofilms.
6. Sakinc, E. (G) – Manufacturing cost estimation in the presence of numeric and categorical design attributes.

Mechanical Engineering
7. Chen, Chienchih (G) – Improved meshing strategy for finite element modeling of pbga thermal cycling.
8. Gao, L. (G) – Two-phase flow in wavy microchannel for cooling high power electronics.

Polymer Engineering
9. Li, M. (G) – Alginate functionalized beads for auxin release into water.

*G = graduate student presentation
Biochemistry
10. **Diaz-Tinoco, M.** (G) – Computational studies in borane clusters.
11. **Fuanta, R.** (G) – Site-directed incorporation of intrinsic fluorescence in shikimate kinase to evaluate catalysis and inhibition.
12. **Gamble, B.** – PGC1α-Frataxin signaling: A therapeutic potential to combat heart failure.

Biosystems/Biosystems Engineering
14. **Kaur, M.** (G) – Application of surface roughness engineering principles to optimize benthic algae biofilm colonization and biomass characteristics.
15. **Kulkarni, A.** (G) – Gasification of torrefied pine in a bench scale bubbling fluidized bed gasifier.
16. **Mahadevan, R.** (G) – *In situ* catalytic pyrolysis of biomass to produce upgraded biofuels.
17. **McDonald, M.** (G) – Optimization study of novolac resins utilizing fast pyrolysis bio-oil characteristics.
18. **Richard, S.** (G) – Polycyclic aromatic hydrocarbons and their bioavailability associated with biochar.
19. **Sadhwani, N.** (G) – Chemistry and kinetics of biomass gasification using carbon dioxide.
20. **Shakya, R.** (G) – Hydrothermal liquefaction of algae for bio-oil production.
22. **McCarty, S.** – Differential gene expression in *Xylella fastidiosa* under increased calcium conditions.
23. **Thomas, P.** – Selection and molecular characterization of stable sulfate reducing bacteria for bioremediation of metals and metalloids.

Mathematics/Physics
25. **Coger, C.** – Atomistic Studies of graphene/MoS2 multilayer heterostructures.
26. **Michael, P.** – Characterization of graphene/ion interactions using first principles calculations.

Agriculture/Plants
27. **Miller, T.** – Identifying the mechanism of resistance to ALS-inhibiting herbicides in spotted spurge (*Euphorbia maculata*).
28. **Acquah, G.** (G) – Screening *Pinus taeda* (loblolly pine) families for physical and mechanical properties using infrared spectroscopy.
29. **Celikbag, Y.** (G) – Pyrolysis oil substituted epoxy resin: Improved ratio optimization and cross-link efficiency.

Agriculture/Soils
30. **Yang, R.** (G) – Evaluation of methods for soil calcium for peanut production in Coastal Plain soils.
31. **Zhou, J.** (G) – Identification and heterologous expression of Type I polyketide synthase pathways from a large-insert soil metagenomic library.

Entomology

*G = graduate student presentation*
32. **Adesanya, A.** (G) – Geranium intoxication and consequence on detoxification enzymes activities in a polyphagous scrub, *Papillia japonica* Newman.
33. **Disi, J.** (G) – Cis-jasmon induces tomato, *Solanum lycopersicon* defense and affects oviposition preferences of beet armyworm, *Spodoptera exigua*.
34. **Feng, X.** (G) – Identification of multiple mutations on the voltage-gated sodium channel gene of insecticide-resistant house flies, *Musca domestica*.
35. **Ye, Z.** (G) – Olfactory responses of southern house mosquito, *Culex quinquefasciatus*, to human odorants.
36. **Cole, A.** (G) – A survey for *Sirex noctilio* and native wood wasps in Alabama.

**Poultry Science**
37. **Frazier, A.** (G) – Effect of two *Bacillus* subtilis strains on production and *Salmonella* colonization in male broilers.

**Clinical Psychology**
38. **Shen, A.** (G) – A novel event analysis for early detection of methylmercury toxicity and nimodipine neuroprotection.
39. **Silverstein, M.** (G) – Examining the factor structure of the Posttraumatic Growth Inventory.
40. **Leach, S.** – Sex differences in rumination and depressive symptoms.
41. **Mayhall, L.** – Mild traumatic brain injury and hypoarousal in a military population based on the military affective pictures system.
42. **Daly, T.** – The relationship between excessive alcohol use and sexual risk taking in college-aged males.

**Social Science/Psychology**
44. **Nuhu, N.** (G) – An evaluation of token economies following functional communication training to increase compliance.
46. **Harrell, S.** (G) – The new neuroscience and consequentialism: Implications for the practice of law.
47. **Rowland, A.** – Effort and decision making.
49. **Corbitt-Hall, D.** – An investigation of college students’ interpretations of and responses to suicidal content in Facebook status updates.
51. **Irons, A.** – We versus me: Language style matching in older married couples’ relationship narratives.

**Education**
52. **Lin, X.** (G) – Motivational differences between international and American adult learners entering graduate school.
53. **Sanders, H.** – A study of preservice teachers’ beliefs about grammar.

*G = graduate student presentation*
Consumer Design
54. Michaelson, D. (G) – Appraising recreational scuba diver’s wetsuit needs.

Human Development and Family Studies
55. Morrison, S. (G) – Parenting status as a modifier of couple and relationship education: Do transitioning parent’s need more help?

Hospitality Management

Humanities/Design/Architecture
59. Ferguson, L. (G) – Minstrel music and superannuated slaves: Symbols for the peculiar institution.
60. Barr, S. – A new kind of ranger station.
61. Bryant, R. – In between: Addressing the problem of an aging school infrastructure.
62. Perry, R. – Prototype for the National Park Service’s ranger stations.

Mentor Recognition Reception
Provost Timothy Boosinger
5:00 – 6:15 p.m.
Student Center Ballroom

Evening Poster Session
6:30 – 8:00 p.m.
Student Center Ballroom

Chemistry
1. Henderson, L. – Photoisomerization of (EZ) 2,4-Nonadiene.

*G = graduate student presentation
4. Hardy, E. (G) – Novel di-tert-butylsalphenazine ligand for uranium sensing.
5. West, M. (G) – Metal extractions using a solid supported quinoxalinol base salen ligand.

Biosciences/Marine Science
6. Crisp, E. – Effects of visual and chemical signaling by conspecifics on anemonefish behavior.
8. O'Reilly, E. (G) – Giants under pressure: Demography of giant sea anemones Bartolomea annulata in the Florida Keys.

Fisheries
10. Thongda, W. (G) – Differentially transcriptomic profiles in gills of channel catfish (Ictalurus punctatus) fry in response to new attenuated vaccine and highly virulent Flavobacterium columnare.
12. Willimon, E. – Columnaris disease is caused by two different bacterial species: Flavobacterium columnare and Flavobacterium bernardetti, novem nudum.

Biosciences
15. Neufeldt, M. – Assessing candidates for mitochondrial copper transport from fruit flies and zebrafish.
16. Thurlow, C. (G) – An attenuated Aeromonas hydrophila mutant as a vaccine candidate for motile Aeromonas septicemia in channel catfish (Ictalurus punctatus).
17. Williams, M. (G) – The effect of Bacillus spp. probiotics on aquaculture microbiomes and growth performance in Ictalurus punctatus (channel catfish).

Geosciences
23. Ahmed, N. (G) – Is climate change to blame for groundwater arsenic contamination in Bangladesh?

*G = graduate student presentation
Wildlife Sciences
27. Garland, L. – Food habits of black bears in urban versus rural Alabama.

Nutrition
29. Mann, E. – Effects on satiety from carbohydrate beverages.
30. Odom, S. – What’s on your plate: A look at school lunch programs from around the world.
32. Ding, M. (G) – Is food-insecure children’s exposure to secondhand smoke more likely to be misclassified?
33. Kothari, V. (G) – AICAR negatively regulate high glucose induced hepatic Fetuin-A expression by AMPK-p38MAPK pathway.

Nursing/Healthcare
34. Thomas, K. – Disparities in health care: Rural Ecuadorian women’s’ health and the impact of foreign-run aid clinics.
35. Brown, E. (G) – Sleep well, feel well.

Communication Disorders
36. Smith, A. (G) – Laryngeal skeletal muscle bioenergetics: What we know, what we don’t, and why do we care?
37. Tingle, D. (G) – Diagnosis muddled: When the puzzle pieces don’t fit.

Kinesiology

Biomedical Sciences
40. Lee, W. – Nicotinic Receptor-α7 interacts with Integrin-linked Kinase modulating synaptic plasticity and memory.
42. Bartlett, A. – Analyzing the catalytic role of a conserved active site residue in cysteine dioxygenase.
43. Nasrin, S. (G) – Prevention of Staphylococcus aureus skin infection with a probiotic Bacillus strain.
44. AlAsmari, A. (G) – HIF-1a-Frataxin signaling pathway and cardioprotection during ischemia-reperfusion injury.
45. Barger, P. (G) – Differential production and secretion of potentially toxigenic ECPs from an epidemic strain of Aeromonas hydrophila.
46. Foshee, L. (G) – Variability of an epidemic strain of Aeromonas hydrophila and its mutants to phagocytic and complement-mediated killing.
47. Mouli, S. (G) – The critical role of frataxin in doxorubicin cardiotoxicity.

*G = graduate student presentation
48. Shrader, S. (G) – Elucidating the mechanisms underlying Duchenne Muscular Dystrophy cardiomyopathy.

Veterinary Medicine

49. Ayers, J. (G) – Validation and genetic profiling of canine mammary tumors.
50. Kitchens, S. (G) – A one-year study of factors associated with environmental Salmonella prevalence in a multi-species animal facility.
51. Liu, X. (G) – In vitro selection of resistance to pradofloxacin and ciprofloxacin in canine uropathogenic Escherichia coli isolates.
52. Platten, P. – Validation of canine TRAIL in canine tumor cells.
53. Nie, B. (G) – Assessment of function of sPLA2 and its Receptor PLA2R and quantification of intracellular uptake and degradation of SPRL by LC-MS/MS.
54. Visser, M. (G) – Pharmacokinetics and pharmacodynamics of 0.01% and 0.001% itraconazole baths in Panamanian golden frogs (Atelopus zeteki) for the treatment of amphibian chytridiomycosis (Batrachochytrium dendrobatidis).

Pharmacy

55. Sajib, A. (G) – Multilevel targeting and systemic administration of adenoviral vectors to malignant cells of lymphocyte origin.
56. Wittayanukorn, S. (G) – Cardiotoxicity in tyrosine kinase inhibitors: A study of the FDA Adverse Event Reporting System (FAERS).
58. Yooket, P. (G) – Regulation of thiamine transporter SLC19A3 by HIF1α: A possible potential therapeutic in congestive heart failure.
60. Price, R. – Production of polymer-coated silica nanoparticles for therapeutic drug delivery.

Aerospace Engineering

62. Costello, R. – Integration of a turbine optimizer into a turbojet model.
63. Bolan, J. (G) – Enhanced imaging in obscured environments via 3D deconvolution and a plenoptic camera.
64. Thorn, C. (G) – Optimization of a turboramjet hot section with an interstage turbine burner.

Chemical Engineering

68. Kelly, A. (G) – Detection of lipid-coated silica nanocomposites.
69. Noor, M. (G) – Comparison of covalent and non-covalent lysozyme functionalized single-walled carbon nanotubes.

*G = graduate student presentation
70. **Tian, Y. (G)** – Endothelial progenitor cell encapsulation in poly(ethylene glycol)-fibrinogen hydrogels for blood vessel repair.

**Software Engineering**
71. **Nolen, J.** – Blind pedestrian iphone interface for an integrated navigation system.

**Electrical Engineering**

**Materials Engineering**
73. **Watson, Z.** – Acoustics of materials: Saddles of guitars.
74. **Zhang, Y. (G)** – Layer-by-layer assembled enzyme cascade for catalyzing oxidation of sucrose for biofuel cells.

*G = graduate student presentation*