

Poster and Exhibit Abstracts

(In alphabetical order by author)

Marcelo Araya-Salas & Alejandro Rico-Guevara; Biology, NMSU

Bills as daggers? A test for sexually dimorphic weapons in a lekking hummingbird

Secondary sexual traits often play a role in differential reproductive success. Some traits are used as ornaments to attract mates, while others have a key role in direct physical contests for mates. We describe an undocumented secondary sexual trait in a lekking hummingbird species, the Long-billed Hermit (*Phaethornis longirostris*). The trait is a dagger-like structure of the bill tip, that we hypothesize functions as a sexually dimorphic weapon. Examining 5 leks during three consecutive years, and employing morphological analyses, performance experiments, and territory mapping, we show evidence to support this hypothesis. We found that 1) adult male bill tips were longer and pointier than their counterparts in females and juvenile males, 2) juvenile males acquired dagger-like tips during their transition to adulthood, 3) variation in bill tip morphology reflected puncture capability, and 4) males with larger and pointier bill tips were more successful in achieving lek territory tenure. This study provides the first evidence of sexually dimorphic weapons in hummingbirds and suggests a role of sexual selection on the evolution of overall bill morphology in this group.

Kenza Arraki; Astronomy, NMSU

Comparing the properties of satellite and isolated dwarf galaxies

The LCDM cosmological model has been very successful at reproducing the large-scale structure of the universe. However, for sub-LMC galaxies, the concordance model overpredicts both the number of satellite and field galaxies. We have conducted analysis of state-of-the-art, high-resolution hydrodynamical simulations of galaxy formation. These simulations include relevant physical models for star formation and stellar feedback including stellar winds, supernovae feedback, and radiation pressure. We have examined the differences between satellite and isolated dwarf populations around a MW-like galaxy. By understanding how the evolution of isolated and satellite galaxies differ we can shed light on the role of baryons in the overabundance problem.

Antonio R. Arrendondo, Enrico Pontelli, & David DuBois; Computer Science, NMSU

An Ontology for Ambient Intelligent Wireless Sensor Networks

Ambient Intelligence is a term that describes an environment that is responsive to the presence of people. It's a paradigm that builds upon pervasive computing, ubiquitous computing, context awareness, and human-centric computer interaction. Wireless Sensor Networks have evolved into the ideal platform for ubiquitous computing. The operation of an Ambient Intelligent application hinges on the its ability to represent and exchange information. Therefore, an ontology for Ambient Intelligent Wireless Sensor Networks is needed. The ontology will provide the appropriate terminology and classification for a general Ambient Intelligent Wireless Sensor Network. This will establish a general classification and common behavior, that can be extended to specific use cases. One use case in particular, a Dust Monitoring Network, is given to illustrate the hierarchy and extensibility of the Ambient Intelligent Wireless Sensor Network. The ontology has been designed to address the following key areas in Ambient Intelligence, wireless hardware devices, personalized needs and environmental responses.

Derek Wayne Barchenger, Li Jiang, & Paul W. Bosland; Plant & Environmental Science, NMSU

Autopathic Effect of Capsaicin (8-methyl-N-vanillyl-6-nonenamide) on Capsicum annuum L. Seed Germination

Recently, a new class of chile peppers (*Capsicum* spp.), that rate more than 1,000,000 Scoville heat units have become very popular, in the vernacular these are called "super-hots". However, it has been observed that germination of super hot chile pepper seed is slower and reduced, compared to other chile peppers with lower heat levels. Germination is

study also assessed demographics, Body Mass Index, and perceived health (BRFSS, CDC, 2012). ANALYSES. We conducted bivariate correlations between Body Image Assessment and all other assessments. RESULTS. Findings suggest that this college sample had an accurate perception of their body image with heavier individuals rating heavier contour drawings. Body contour ratings correlated positively with weight/shape concerns, dieting practices, and sedentary lifestyle and correlated negatively with healthy eating practices (e.g., eating breakfast, number of snacks), engagement in vigorous physical activity, and physical health self-rankings. In general, women demonstrated stronger relationships between body contour self-ratings and behavioral practices and body perceptions. Although college students are properly assessing their weight status, this study finds the heavier an individual is the less likely he/she is to engage in healthy lifestyle practices.

Kathryn Stroud; Sociology, NMSU
Sexuality Norms for Non-Normative Genders

The current research will explore how people of non-normative gender roles negotiate between sexuality identities. As past research has shown, individuals who identify as transsexual, transgender or genderless often have difficulties fitting into the constraints of gender-specific sexuality labels, such as heterosexual, homosexual or bisexual. The research will be compiled by conducting multiple interviews with people of non-normative gender roles. While the research is still in-process, we hypothesize that the framework to be used will be labelling theory. Individuals of non-normative gender roles are already stigmatized by not identifying within the gender binary, and therefore might feel more compelled to identify within the sexuality labels, while feeling the need to qualify certain aspects of these gendered sexualities.

Brendan P. Sullivan; Industrial Engineering, NMSU
An Iterative Approach to New Product Development

This paper describes an approach for optimization of manufacturing systems and facility planning by incorporating the use of analytical comparative techniques. The scope of this project emphasizes the optimization of facility design through the utilization of practical and theoretical processes in the an iterative engineering approach from prototype to advanced full-scale product manufacturing. The project objective is to minimize the cost of manufacturing processes through an optimized facility design, while successfully satisfying established constraints. Through the utilization of the analytic hierarchy process (AHP), the design and adoption of established constraints enables adjustment for qualitative and quantitative considerations in both the manufacturing process and facility design. Through the AHP process, the identified constraints ensure that the final design works through a concurrent process in order to achieve optimal physical design and integrity specifications. This approach demonstrates the ability of a numerical hierarchical technique to increase efficiency and performance of the manufacturing system through multiple levels of development.

Ali Vaziri-Gohar & Kevin D. Houston; Molecular Biology, NMSU
Tamoxifen-induced IGFBP-1 expression requires GPER and is dysregulated in chemoresistant breast cancer cells

The membrane-bound G protein-coupled estrogen receptor (GPER) mediates rapid signaling events induced by 17β -estradiol (E2) to modulate tissues. In addition to E2, the active metabolite of the selective estrogen receptor modulator tamoxifen activates GPER. Tamoxifen is the most frequently prescribed hormonal treatment for women presenting with estrogen receptor-? (ER?)-positive breast cancer. ER?-positive breast cancers often express GPER; however, the function of GPER during tamoxifen treatment and the development of tamoxifen resistance, a common occurrence in treated patients is not clearly defined. Recent studies have suggested a role for GPER in the development of tamoxifen resistance in breast cancer cells; however the molecular mechanisms of GPER-dependent tamoxifen action remain poorly understood. The insulin-like growth factor-1 (IGF-1) signaling axis increases proliferation of breast cancer cells and is often altered during the development of tamoxifen resistance. To identify putative GPER-dependent mechanisms of tamoxifen action, transcription of IGF-binding protein-1 (IGFBP-1), a known inhibitor of IGF-1, was measured in breast cancer cells after treatment with tamoxifen or the GPER-specific agonist G-1. IGFBP-1 transcription was elevated after tamoxifen treatment and resulted in decreased IGF-1-dependent cell