

Poster and Exhibit Abstracts

(In alphabetical order by author)

Marcelo Araya Salas; Biology, New Mexico State University

Identifying Stopover Hotspots and Their Conservation Status for Nearctic Migratory Land Birds in Costa Rica

The declining of Neartic-Neotropical migratory bird populations has been related to the degradation of the different habitats along migration routes. However, the role of habitat loss at the stopover sites remains unclear due to the poor understanding of their habitat preferences during migration. Therefore, identifying stopover sites and their conservation status becomes a critical step for evaluating the importance of this habitat loss and generating efficient migratory bird conservation policies. In this work we used amateur birder sightings from the eBird database to identify through potential distribution models, the historical and current distribution of stopover hotspots for Nearctic migratory land birds in Costa Rica. We used 1502 sightings of migrant birds from 35 species -7 families- made at 311 different localities, 17 of them were threatened species. The observed and predicted species number showed a correlation of 0.67 ($p=0.02$). The area of current hotspots has shrunk 38% compared to their historical range. Roughly half of the current hotspots (51.3%) are located outside the protected areas of Costa Rica and near to highly populated or most agricultural-intensive regions in the country. This indicates that non-protected areas of current hotspots are likely to become degraded unless effective policies are implemented in the short term. Most migrant can be found in second growth forest and low-disturbed areas. Thus further management strategies must promote low-level of alteration to protect the remaining hotspots in the country.

Irisa Arney; Anthropology, New Mexico State University

The Utility of Postcranial Elements in Diagnosing Southern African Microfauna

Micromammals are informative environmental indicators due to their ecological specificity, sensitivity to environmental change, and small habitat ranges. As such, small mammal assemblages are often useful in paleoenvironmental reconstructions, particularly in cave localities which frequently preserve large samples. While species composition and relative abundance of these fossil assemblages are needed to reliably reconstruct paleoenvironments, lower-level taxonomic identification using mandibles, maxilla and teeth can be ambiguous due to overlapping morphologies. Data from postcranial elements is often overlooked as a source of apomorphies. In order to test the value of micromammal postcrania in identifying taxa from a Pleistocene fossil assemblage from northwestern Botswana, a qualitative and quantitative examination of 14 known modern species trapped at the Koanaka Hills locality of Ngamiland Province was undertaken. Results from this analysis indicate that the femur displays genus-specific morphological features. While individual features tend to overlap between genera, the suite of these characteristics allowed confident diagnosis of the genera examined. A principal components analysis displayed separation between micromammal genera. An examination of the fossil small mammal femora (early to middle Pleistocene in age) collected from the Koanaka South Bone Cave locality yielded distinctions consistent with the morphology of the modern taxa, indicating that the postcranial elements may allow for more confident micromammal identification. Many of the taxa studied in this analysis are widespread in southern Africa and are known to occur at many fossil localities in the region.

Kenza Arraki; Astronomy, New Mexico State University

Variable High Velocity Winds from Broad Absorption Line Quasars

We study broad absorption line quasars (BALQSOs) because these objects, in particular, probe the high velocity gas ejected by luminous accreting black holes. The variability timescales of BALs can help constrain the size, location, and dynamics of the emitting and absorbing gas near the supermassive black hole. We have obtained multi-epoch spectroscopy of seventeen BALQSOs from the Sloan Digital Sky Survey (SDSS) using the Fred Lawrence Whipple Observatory's 1.5m telescope's FAST Spectrograph. These objects were first identified as BALQSOs in SDSS, observed with Chandra, and then with FAST at 1, 3, 9, 27, and 81 day timescales. Additional observations are acquired for 1 and 2 year cadences. We also obtain a set of non-BAL quasar spectra of similar redshift and luminosity as controls. We identify significant variability and assess its magnitude and frequency in the observed spectra of our BALQSOs and determine which constraints our investigations can put on the outflows impacting the BAL region.

Deepak Basyal; Mathematics, New Mexico State University

How the Concept of Zero Has Changed During the Last 300 Years

Zero's journey from placeholder or cypher to cardinality of the empty set and from Indian sunya to modern zero, together with its current uses and misuses, makes a fascinating story. In this poster I will show some modern misconceptions that school children hold about zero. I will also outline the historical development of zero during the last three hundred years as seen in early American mathematics textbooks (e.g. Cocker (1678), Ward (1719), Dilworth (1825), and many other authors). Finally I will describe some modern uses of zero that have been developed during the last one hundred years within the framework of contemporary mathematics. The poster will be illustrated with excerpts from original historical sources and will provide selected bibliographic references.

Zachary Brooks; Second Language Acquisition and Teaching, University of Arizona

Is Media Literacy Active or Passive?

The ability to read and write, i.e. literacy, was once considered a trade secret by the professional scribes who depended on it for job security. The ability to read and write is still the most commonly understood notion of literacy, but technological developments require that the definition of literacy be expanded and modified. While a modern set of professional scribes ensure their job security by guarding trade secrets, a generation of people raised on electronic and visual media could benefit from more than a passive understanding of media. If literacy is composed of the "passive" ability to read and the "active" ability to write, then any definition of "literacy," including media literacy, would be comprised of active and passive components. Yet, definitions of media literacy are generally limited to the development of passive skills. It would be akin to saying that "literacy" equals only reading comprehension. But why would people write if no one could read? In order to examine the relationship between literacy and media literacy and how each is understood, the discussion below has been divided into four parts. First, definitions of literacy are examined. Next, definitions of literacy to definitions of media literacy are compared. Third, the results of a study in which participants self-report on their understanding of "literacy" and "media literacy" are shared. Finally, implications of the survey results are discussed. These results point to the need for further research in order to examine the differences in how literacy and media literacy are understood and ultimately taught.

Malynda Chizek; Astronomy, New Mexico State University

Mapping the Methane on Mars: Observational Season Comparison

The announcement of recent detections of Martian methane resulted in many questions, including "how is it being destroyed so quickly?" The expected destruction mechanism, photochemistry, has a lifetime of ~ 350 Earth years in the Martian atmosphere, which is about 600 times longer than the 0.6 Earth year lifetime estimated from the observations. No mechanism has yet been identified to answer this question. The sparse number of methane detections provide little constraint on the destruction mechanism. In order to understand the sources and sinks of the gas, we need a broader dataset with more spatial and temporal coverage. I will use a statistical clustering technique developed by Fonti & Marzo (2010) to investigate the already existing dataset from Mars Global Surveyor Thermal Emission Spectrometer to derive methane abundances at seasons analogous to the observations of Mumma et al. (2009). I will derive methane abundance maps like those of Fonti and Marzo (2010) at the observed seasons of Mumma et al. (2009), and I will compare the latitudinal abundance distributions from these maps with abundance distributions reported by Mumma et al. (2009). This will be the first comparison of two different sets of detections of Martian methane at the same seasonal dates. These detections are also made in two different methane bands (TES at 7.8 microns, Mumma et al. (2009) at 3.3 microns).

Melissa A. Currie; Landscape Architecture, Texas Tech

The Role of Women in Shaping our Built and Natural Environments

Women have contributed to our built and natural environments in many important ways. This influence is seen in the buildings, landscapes, urban forms, and natural environment that make up our world. In nature, one is often reminded of the female's home-building role, searching far and wide for just the right materials and location to create suitable habitation for her family; a home she will valiantly defend. In the US, women have played a pivotal role in the making of our collective habitat - both built and natural. If not for the foresight, perseverance, and dedication of strong and determined women, many of our most precious national treasures would have been lost forever, or perhaps never even created. Women have shaped our world, working with diligent commitment, even though often unseen and unrecognized, to create our buildings, city forms, towns, gardens, or memorials. Many times she has been the

voice of reason or alarm, a vanguard for community. Her purple strand of influence is woven throughout our collective memory to fashion history's fabric into a pattern that would be profoundly less sonorous without it. Acknowledging this influence is an essential component to the relating of a complete history of our nation, adding depth and meaning to our national heritage. This research highlights important contributions of American women such as Ann Pamela Cunningham, Lady Bird Johnson, Rachel Carson, Jane Jacobs, Martha Schwartz, and Elizabeth Plater-Zybek in the fields of historic preservation, architecture, landscape architecture, urban design, and social commentary.

Lisa Drake, Immo A. Hansen; Biology, New Mexico State University
*The Aquaporin Gene Family in the Yellow Fever Mosquito, *Aedes aegypti**

The mosquito, *Aedes aegypti*, is the principal vector of the Dengue and yellow fever viruses due to its dependence on vertebrate blood for egg development. During feeding, an adult female can take up more than its own body weight in blood. It is essential for mosquitoes to possess an efficient excretion system to shed excess water and ions and retain nutrients from the blood. After a blood meal females excrete large amounts of urine through their excretion system, the Malpighian tubules (MT). Diuresis starts within seconds after the mosquito starts feeding. Aquaporins (AQPs) are a family of membrane transporters that regulate the flow of water, glycerol and other small molecules across cellular membranes in both prokaryotic and eukaryotic cells. Our aim was to identify aquaporins that function as water channels, mediating transcellular water transport in MTs of adult female *Ae. aegypti*. We surveyed genome databases and identified six putative AQPs in the genome of *Ae. aegypti*. Phylogenetic analysis showed that five of the six *Ae. aegypti* AQPs have high similarity to known water-transporting AQPs of vertebrates. Using microarray, reverse transcription and real time PCR analysis we found that all six AQPs are expressed in distinct patterns in mosquito tissues/body parts. Four of the AQPs are expressed in the MTs of *Ae. aegypti*. RNAi-mediated knockdown of the MT-expressed AQPs resulted in significantly reduced diuresis. Our results demonstrate the importance of these AQPs for mosquito diuresis after blood ingestion and highlight their potential as targets for the development of novel vector control strategies.

Robert Edmonds; Astronomy, New Mexico State University
Examining Buoyancy Waves in the Martian Atmosphere with Mars Climate Sounder

Internal buoyancy ('gravity') waves can potentially play a significant role in the dynamics of the Martian atmosphere (Barnes, 1990). Small wave disturbances created at the surface (i.e. topographically) or at low altitudes (ex. convection) can propagate vertically under the appropriate thermodynamic conditions. To conserve energy, the amplitude of small waves can grow substantially in response to decreasing densities at higher altitudes. Gravity waves in the upper atmosphere have been analyzed from atmospheric densities derived from aerobraking Martian spacecraft (Creasey et al., 2006b & Fritts et al., 2006). Potentially large wave amplitudes aloft can result in wave saturation and wave breaking (Lindzen, 1981). The breaking waves deposit momentum, potentially altering the winds at that breaking level substantially. Creasey et al. (2006a) investigated the amplitudes of Martian atmospheric gravity waves by attempting to determine their manifested temperature perturbations as derived from Mars Global Surveyor (MGS) radio occultation measurements. Their results showed little correlation between topographic variance and gravitational wave energy. Motivated by this result, we are interested in how wave energies derived from Mars Climate Sounder (MCS) limb radiance measurements compare to the MGS Radio Science (RS) results. The MCS data used in this work is made publicly available through NASA's Planetary Data System's Atmospheres Node.

Daniel Estrada; Geography, New Mexico State University
Mode Choice: Travel Patterns Associated with Commuter Rail in the Paso Del Norte Region

Historically, the most frequently used method to address traffic congestion was to increase the capacity of a road to handle a decrease in the level of service. This practice has had the benefit of 1) maintaining our roads while they are altered by adding an extra lane, 2) opening up an extra lane to High Occupancy Vehicle use and/or, 3) adding a toll lane. The three options increase the number of lanes available for traffic thus allowing for greater traffic flow in a given corridor and alleviating current problems with level of service. Yet, this does not solve the issue of the increasing number of vehicles on the roadway, but prolongs the situation where the new capacity will eventually reach its maximum again. Transit has not been fully utilized to assist with alleviating traffic congestion on regional roadways in the Western United States and in particular in the Paso Del Norte region between El Paso, Texas and Las Cruces, NM. Similar to other urban areas, the Paso del Norte region is considering a commuter rail as an alternative mode of transportation. The concept of a commuter rail has the potential to lower traffic congestion and lower carbon emissions thereby improving air quality. Using a multinomial logit regression model to provide a

forecast of ridership will assist in ascertaining the shift of person trips from the Interstate 10 corridor between El Paso, Texas and Las Cruces, NM. The model will investigate if commuter rail will decrease the total vehicle miles traveled by moving people from their single use vehicles to rail passengers thus allowing for increased pedestrian and bicycle use between home, station and work.

Amy Franzen; Anthropology, New Mexico State University

The Women's Intercultural Center: A Feminist Grassroots Organization in the U.S.-Mexico Border Region

This research explores how women manage to achieve their own personal goals by being a part of a feminist grassroots organization. It focuses on two areas that the Women's Intercultural Center in Anthony, New Mexico has in their programming-economic independence and political power. My research objectives are to examine how women gain economic independence by being involved in a women's organization. My second research objective is to construct a picture of some women's immigration experiences in this community and examine how becoming a U.S. citizen through the citizenship program has benefited them. My final objective is to gather migration stories for a story banking project that my research site can use to disseminate information about themselves and their US citizenship program. This research benefits current and future members of the Women's Intercultural Center by giving them data that they can present to potential members, community members, local and regional politicians, and to their current and potential donors that shows how they are accomplishing their goals. This research might also be applied by the Women's Intercultural Center to gauge possible new directions they might take up in their pursuit of empowering women and ensure that they stay connected with the issues and needs of women in the Anthony community. In a larger context, this research focuses on issues in the U.S.-Mexico border region and might provide some insight into such problems as immigration and job security.

Daniel Gambacorta; Psychology, New Mexico State University

The Context of Emotion: How Sex, Ethnicity and Culture Affect Emotion Perception

Previous research has found that perceptions of facial displays of emotion are dependent upon the context in which these faces appear (Avezier, et al., 2008; Masuda, et al., 2008). However, this research has suggested that context is a relatively domain-general variable that affects observer's perceptions of emotion displays equally regardless of the gender and ethnicity of the displayer. In contrast, several lines of evolutionary thought suggest that gender and ethnicity could play an important role in emotion perception (Becker, et al., 2007; Maner, et al., 2005). In the current study, participants were presented with a series of pictures depicting groups of people and were asked to rate the emotions of a target individual in the center of the picture. This target individual (as well as the background individuals) varied in terms of sex (male, female), ethnicity (Caucasian, Asian) and facial expression displayed (angry, happy or neutral). In three samples of participants from Singapore, the Netherlands and the US we explored several evolutionary hypotheses concerning biases in the perceptions of facial displays of emotions that vary as a function of gender and in-group/out-group status. Results show that contrary to prior findings (Masuda, et al., 2008), emotion perception in Westerners was affected by the context in which the face appeared. Additionally, as per Error Management Theory (Haselton & Buss, 2000), happy females appeared happier when surrounded by other happy females.

Jessica Gant; Biology, New Mexico State University

A Fusidic Acid Inducible Operon (fai123) of Staphylococcus aureus

Background: *Staphylococcus aureus* clinical resistance to the steroid-like antibiotic fusidic acid is due to the acquisition of the fusidic acid resistance gene *far1*, or due to mutations in the gene (*fusA*) producing the target of fusidic acid, elongation factor G. We have recently identified a fusidic acid inducible operon (*fai123*) that encodes for putative antimicrobial efflux pumps and an operon regulator. We now report on the altered regulation of this operon in a *fusA*-mediated fusidic acid-resistant *S. aureus* strain and the effects of antimicrobials and the fusidic acid mimic cortisone on *fai123* induction. Methods: SH1000 and its isogenic fusidic acid-resistant mutant SH1000-1 (*fusA* mutant) were utilized for these studies. A *S. aureus*-*Escherichia coli* shuttle vector pCL52.2 was utilized for cloning a *fai1* amplicon into *S. aureus* strain RN4220. Real-time PCR using an icycler iQTM real-time PCR detection System (Bio-Rad, Hercules, CA) with *fai1*-, *fai2*- and *fai3*-specific primers and iQ SYBR Green Supermix (Bio-Rad, Hercules, CA) was used to determine the transcriptional response of *fai123* to possible antimicrobials (0.25 X minimum inhibitory concentrations [MICs]). Results: Strain SH1000-1 demonstrated increased expression of the *fai123* operon compared to SH1000. In strain SH1000; fusidic acid, erythromycin, ciprofloxacin, and nalidixic acid all induced the *fai123* operon. In strain SH1000-1; fusidic acid, erythromycin and nalidixic acid also induced the

fail23 operon. In addition, the steroid cortisone also significantly induced the fail23 operon in both strains. The introduction of pCL52.2::fail into strain RN4220 led to an increase in both the fusidic acid and nalidixic acid MICs, compared to RN4220 containing pCL52.2 alone. Conclusions: The fail23 operon appears to be up-regulated in a fusidic acid-resistant strain compared to its susceptible parent. fail23 also appears to be induced by antimicrobials targeting processes not inhibited by fusidic acid, and the fusidic acid mimic cortisone.

R. Danielle Garcia; Women's Studies/ Art, New Mexico State University

Constructing Gender and Discrimination: Traditional Roles and Stereotypes Portrayed in Advertising and Media

Traditional roles and stereotypes portrayed in advertising and media. Many innovations in media technology have been credited for expanding the views and notions of society. Advertising for example, is a billion dollar industry that derives success from the public's daily consumption of their messages, even more so now since advertising is able to take many forms and is no longer only limited to print ads. One can now question if whether the flood of these images and messages still remains beneficial or whether they have potentially become more harmful to society. Using the language of simulation, images and signs are treated as if history, culture, gender, ethnic identity exist only in systems of representation. Because of this notion, the power of sign systems came under/ and still needs to come under intense study. The focus of this poster will be to show how the construction of gender and discrimination is repeatedly perpetuated through the traditional roles and stereotypes portrayed in the media and more specifically in advertising. It will do this by juxtaposing images from that past and present that demonstrate the construction of gender and discrimination through traditional roles and stereotypes in advertising and the media.

William Graves, Igor Dolgov, Jeremy Schwark, Daniel Hor; Psychology, New Mexico State University

What Can Video Games Do for You!? A Glimpse at Their Benefits to Visual Attentional Abilities

Bavelier & colleagues find that video game playing experience has a beneficial impact on people's visual attentional abilities, measured by their performance in various cognitive paradigms. We sought to replicate Green & Bavelier (2003) by testing video game playing experience was beneficial in an individual's performance on flanker, enumeration, and attentional blink paradigms. The paradigms were believed to contain aspects of video game environments that video-game players would have viewed fairly frequently. We had two groups: video-game players, those who had 20 or more hours of video game play in a month, and non-players, those who had little video game play. We did not find any evidence for any attentional advantages for video-game players in the tasks which were representations of Green & Bavelier's design. However, our results showed that video game playing experience assisted the video-game players in the parallel processing condition of the flanker task.

Gretchen Gurtler, Bill Mueller; Museum Science, Texas Tech

Fauna Report of Taxa Collected From the Post Quarry of Garza County, TX

Research conducted by the Museum of Texas Tech University (MoTTU) has resulted in the recovery of an abundance of vertebrate fossils from the Dockum Group in the southern portion of Garza County, Texas. From 1980 to 1984, an extensive number of specimens were collected from a site named the Post Quarry by Dr. Sankar Chatterjee and his research team. These specimens offer a glimpse of the biota living in northwestern Texas during the Late Triassic (Carnian) 220 million years ago. Chatterjee described this site as consisting of thick red mudstones representing a floodplain deposit. The abundance of the disassociated bones of numerous species suggests that a catastrophic event, such as a flash flood, may have occurred. This event was most likely followed by another flood, which disarticulated the bones, orienting them with the current and burying them in a distinct 30cm-thick layer. The original research resulted in the discovery of several new taxa including two Paracrocodylamorphs named Postosuchus and Shuvosaurus. It was initially thought that the material collected from the Post Quarry included two individual specimens of Postosuchus and six individual specimens of Shuvosaurus. Recently, an extensive study of the Post Quarry material was conducted. The recent faunal analysis has changed the population dynamics and known fauna of the Post Quarry. The detailed analysis has doubled the population of Postosuchus and more than tripled the number of Shuvosaurus individuals, changing the predator/prey ratio for the fauna.

Robert Guth, Graciela A. Unguez; Biology, New Mexico State University

Got Calcium? - Role of Calcium Signaling in the Electrical Activity-dependent Plasticity of Myogenic Cells in Electric Fish

Skeletal muscle fibers in vertebrate animals exhibit remarkable adaptability even in adults. This plasticity is particularly well illustrated in studies that revealed the ability of skeletal muscle to change its physiological characteristics in response to changes in mechanical, hormonal, or electrical stimuli. An extreme case of electrical activity-dependent plasticity occurs in the electric fish *Sternopygus macrurus* whereby a subset of differentiated skeletal muscle fibers transform into the non-contractile, current-producing cells (electrocytes) of the electric organ (EO). Although the conversion and maintenance of electrocytes require neural activity, the underlying molecular mechanisms are currently unknown. However, work in mammalian species has identified calcium signaling pathways as key mediators of the electrical activity-induced effects on phenotype. We have thus started to investigate the hypothesis that electrical activity regulates expression of skeletal muscle genes in *S. macrurus* muscle and EO tissues via calcium signaling pathways. Toward this end, we are removing all electrical activity to skeletal muscle and EO tissues in order to test the effects of inactivity on the tissue phenotype by 1) quantifying changes in transcript abundance of skeletal muscle genes and 2) detecting the presence and quantifying the abundance of known calcium signaling proteins. Preliminary data show that calcium signaling components are expressed in both skeletal muscle and EO tissues of *S. macrurus* and that changes in electrical activity affect muscle gene expression after as few as 4 days of electrical silencing.

Ryan T. Hamilton; Astronomy, New Mexico State University

K-band Observations of Sub-Gap Cataclysmic Variables

We present K-band spectroscopy of short period, “sub-gap” cataclysmic variable (CV) systems obtained using ISAAC on the VLT. We show the infrared spectra (IR) for nine systems below the 2-3 hour period gap: V2051 Oph, V436 Cen, EX Hya, VW Hyi, Z Cha, WX Hyi, V893 Sco, RZ Leo, and TY PsA. We are able to clearly detect the secondary star in all but WX Hyi, V893 Sco, and TY PsA. We present the first direct detection of the secondary stars of V2051 Oph, 436 Cen, and determine new spectral classifications for EX Hya, VW Hyi, Z Cha, and RZ Leo. We find that the CO band strengths of all but Z Cha appear normal for their spectral types, in contrast to their longer period cousins above the period gap. This brings the total number of CVs with moderate resolution (R = 2000) IR spectroscopy to forty-eight systems: six pre-CVs, thirty-one non-magnetic systems, and eleven magnetic or partially magnetic systems. We discuss the trends seen in the IR abundance patterns thus far, and highlight a potential link between anomalous abundances seen in the IR with the C IV/N V anomaly seen in the ultraviolet. We present a compilation of all systems with sufficient resolution IR observations to assess the CO band strengths, and, by proxy, obtain an estimate on the C abundance on the secondary star.

J. Ryan Harbert; School of Art, Texas Tech

The Medicinal Landscape

Since the turn of the millennium there have been increasing trends in both sustainable practices and homeopathic remedies. As a landscape architect in training and steward of the environment, my research is based on the true meaning of Going Green, living with the land. Although not every individual is blessed with an abundance of agricultural property, the very framework of suburban sprawl provides an ample palette for the propagation and cultivation of beneficial and nourishing plant material. In addition to this horticultural research, I plan to incorporate my findings into a residential landscape plan. Applied to a typical suburban lot (1/8 acre) in West Texas, this research and design project is a modern application of historical and culturally significant native planting material. I will be highlighting the healing and ceremonial practices of the Chicano and Native American Peoples of the Southwestern United States and the applicability of these practices in the contemporary suburban garden. I believe the integration and portrayal of the historical, local environment and regional, cultural customs of indigenous peoples in regard to modern garden design are an invaluable asset and added dimension to the landscape architectural field as well as to the families who benefit from the inherent advantages of the native garden.

Kristen Hestir; Geography, New Mexico State University

Remote Sensing Assessment of Land Cover Change in the Mesilla Valley, New Mexico, 1985-2009

The Southwest is experiencing some of the highest rates of urbanization in the U.S. The Mesilla Valley of Doña Ana County, New Mexico is a prime example. Urban expansion in this area is transforming desert ecosystems into urban ecosystems at a rapid pace. It is unclear, however, which parts of the landscape are at the greatest risk of

being transformed and what effects urbanization will have on desert ecosystem structure and function. In order to understand these impacts, we must first have spatially explicit and continuous land cover information for the area. Remote sensing can provide such information. Using classification algorithms, land cover types can be differentiated based on their unique spectral characteristics. There are, however, some challenges in classifying land cover in arid regions. The spectral responses of bright desert soils are often confused with spectral responses of impermeable surfaces, for example. The objectives of this project are to: (1) evaluate the suitability of a series of land cover classification approaches of Landsat TM imagery of the arid Mesilla Valley; (2) use the most accurate of these approaches for mapping current (2009) and historical (1985, 1990, 1995, 2001, 2005) land cover in the study area; and (3) apply post-classification comparison change detection to assess the magnitudes and directions of land cover changes in the study area during the last twenty-five years. In our poster, we present the results of this work and discuss its importance for developing land change scenario models, our next goal.

Daniel Hor; Psychology, New Mexico State University
Optimizing Toolbar Placement for Response Speed in a Graphical User Interface

Toolbars in computer graphical user interfaces are usually placed at the top of the program window. Yet, our studies showed that people did not always respond fastest when toolbars were placed at the top. In some situations, they responded fastest when toolbars were placed on the left or right side, despite the four sides being of equal distance from the center of the screen. Moreover, responses were consistently slowest when toolbars were placed at the bottom. We also found that participants performed significantly slower when presented with multiple toolbars and when toolbar position was unpredictable.

Gayle Hunt, Kasha Geels; Psychology, New Mexico State University
Analyzing Sub-Optimal Human-Automation Performance Across Multiple Sessions

Objective: The purpose of the current study was to analyze the interaction between operator strategy and consistency over time. Background: Sub-optimal human-automation performance is a phenomenon whereby combining human operators with diagnostic aids results in performance that is less than desirable. Rice, Trafimow and Hunt (in press) used Potential Performance Theory (PPT) to show that strategies account for little of the variance in sub-optimal performance, and that most of the decrements are due to operators inconsistently using these strategies. The current study looks at these issues across multiple sessions. Method: 20 participants spent four sessions searching for enemy helicopters in aerial images of Baghdad; the task was augmented by a 70% reliable diagnostic aid that provided recommendations during each trial. Results: Consistency accounted for improvement in observed scores early on, despite no gains to strategy, while improvements in strategy accounted for increased observed performance in the later sessions, despite no gains to consistency. Individual data were also analyzed separately, showing various reasons for improvement across time. Conclusion: Both consistency and strategy play important roles in observed performance during human-automation interaction. Application: This study points to a topic that designers and users of automated systems should carefully consider.

Marieke Jackson; Health Sciences, New Mexico State University
Relationships Between Risky Health Behaviors and Behavioral Motivational Systems in Hispanic College Students

The Behavioral Inhibition System (BIS) and Behavioral Activation System (BAS); Carver and White, 1994) have been used to predict behavioral tendencies. Previous studies have shown a strong relationship between the BAS subscales and risky behaviors (Voight et al, 2009; Franken and Muris, 2005). Based on this past research, it was proposed that the BIS/BAS subscales would also predict engagement in risky among Hispanic college students. METHODS . Participants were 355 Hispanic college students attending the University of Texas at El Paso. Students completed measures of substance use (alcohol, marijuana), crimes committed, sexual sensation seeking and victimization, stress, physical activity, height, weight, and motivational tendencies prior to their participation in an alcohol risk-reduction program. A standard multiple regression was performed between individual risk behaviors as the dependent variable and BIS/BAS scales as the independent variable. RESULTS. Illegal risk behaviors including underage drinking, marijuana use, and self-reported crime were all predicted by sensation seeking tendencies (all p values < .01). BMI and physical activity were predicted by punishment (p values < .05 for physical activity) and reward sensitivity (all p values < .05). Risky sexual behaviors and sexual victimization were predicted by drive, sensation seeking, and punishment tendencies (all p values < .01). Finally, punishment sensitivity predicted stress ratings (p value <.01). Not surprisingly, sensation seeking was strongly associated with illegal risk behaviors as well as sexual sensation

seeking. The BIS/BAS subscales predicted similar risky behaviors among Hispanic students when compared to other studies.

Palak Jain; EE, New Mexico State University
Island Identification in Customer-Driven Microgrids

Given a distribution system with an agent at each bus, working in collaboration, the agents have to identify viable islands prior to the disturbance using a decentralized, multi-agent architecture, i. e., The Islanding Problem. The agents also have to solve The Capacity Discovery Problem, a sub part of islanding problem. The objective is to identify if a completely decentralized architecture with only neighbor-neighbor communication of agents discover how to island a feeder when utility is lost.

Cynthia Killough, Laura Thompson, Gin Morgan; Psychology, New Mexico State University
Do Auditory and Visual Information Influence Infants Movement to Music?

Humans are often exposed to music beginning at birth (or even before birth), yet the study of the development of musical abilities during infancy has only recently gained momentum. The goals of the present study were to determine whether young infants (ages 4 to 7 months) spontaneously moved rhythmically in the presence of music, and whether the presence of visual information in addition to music would increase or decrease infants movement. While nearly all infants moved in the presence of music, very few infants demonstrated rhythmic movement. Results revealed that when visual information was present, and particularly when infants appeared to show focused attention toward the visual information, infants moved less than when only auditory information was present. The latter result is in agreement with most studies of sensory dominance in adults, in which visual stimuli are dominant over auditory stimuli.

Qi Lu; Mechanical & Aerospace Engineering, New Mexico State University
A Momentum-based Approach for Identifying the Inertia Property of a Human Body

The body segment parameters (BSP) of a human body are critical information for modeling, simulating, and understanding human dynamics. The determination of BSPs of human bodies has received increasing attention in biomechanics, sport science, ergonomics, rehabilitation and other fields. This paper presents a momentum-based identification algorithm for dynamically estimating the BSPs of a human body. The human body is modeled as a multibody dynamical system, and the momentum equation of the system can be derived by applying the principle of impulse and momentum. It is possible to formulate the momentum equations corresponding to a set of experiment tests into a linear regression form with respect to the unknown BSPs, which then can be solved using the least square method or other methods. The momentum-based algorithm requires inputting position, velocity, and external force data only. Since acceleration and all the internal force data is not needed, the algorithm is less demanding on measurements and is also less sensitive to measurement errors. As a result, it is practically more appealing than the algorithms depending on the equations of motion. The paper presents the momentum-based inertia identification algorithm along with a simulation study of the algorithm using a simplified trunk-leg model representing a main portion of a human body.

Daniel Marquis; Electrical and Computer Engineering, New Mexico State University
AMI Evaluation for Rural Electric Coop with Fixed Power Price and High 480V Three-phase Penetration, Including Meter Failure Rate Impact

Results of an AMI evaluation for Rural Electric Coop with a fixed power price and a high 480V 3-phase penetration is summarized, major costs are explored, and a general sensitivity analysis is presented. Analyzed data was gathered in summer 2007, but major factors are still applicable today.

Jacqueline McCleary; Astronomy, New Mexico State University
The Bulge, Disk and Halo Components of Disk Galaxies: Kinematic vs. Photometric Decompositions

We have analyzed surface brightness maps for disk galaxies formed in recent GASOLINE hydrodynamical cosmological simulations. To better understand stellar mass distributions, we directly compared classic photometric decomposition techniques, based on light profiles, with a kinematic decomposition based on particle positions and velocities.

These galaxies exhibit masses, structural parameters, and colors typical of early type spirals, and so are excellent proxies for observed spiral galaxies. Surface brightness profiles were generated to model the light distributions in SDSS, HST ACS, and Spitzer IRAC bands. These images are based on local star formation histories and include a detailed treatment of light reprocessing by dust based on the 3D distribution of stars, gas and metals. Photometric bulge/disk decompositions and estimates of disk scale lengths were performed using the GALFIT modelling tool. Kinematic decompositions were made directly from simulation outputs and use the ratio of each stellar particles angular momentum to the momentum of the co-rotating circular orbit, as well as particle binding energy, to assign it to either bulge, pseudo-bulge, disk or halo components. We find that the photometrically identified bulge often consists of a combination of a kinematically identified non-rotating, spherical, classic bulge made of old stars plus inner disk stars, and a rotating, attenuated pseudo-bulge. This suggests that many photometric decompositions of disk galaxies may overestimate bulge stellar mass, and thus systematically underestimate the importance of the disk component at redshifts $z > 0.5$.

Rodrigo Rau Mora; Sociology, New Mexico State University

A New Exploitation of Undocumented Immigrants

The Thirteenth Amendment of the United States Constitution, Section 1. Neither slavery nor involuntary servitude, except as a punishment for crime whereof the party shall have been duly convicted, shall exist within the United States, or any place subject to their jurisdiction. Section 2. Congress shall have power to enforce this article by appropriate legislation. This is the basis that began the privatization of prisons, the thirteenth Amendment. Remember the term "except as punishment" for the story that is about to unravel. It dives into the world of corruption, greed, prejudice, and apathy. The slave trade of people in the United States sanctioned by the government and traded on Wall Street as a commodity for the rich and affluent of this country. The abolition of slavery is alive and happening today. With slaves that are in the "involuntary servitude" of strangers on a daily basis, slaves that have been silenced by the elite, white establishment of America. Freedom has a perspective in our history. It is the current perspective, which, will be discussed in this presentation.

Kristin M. Morehead, Sean G. Dolan; Anthropology, New Mexico State University

Projectile Points at Kipp Ruin, Locus 4

For six weeks in the summer of 2010 the NMSU Anthropology department conducted an archaeological excavation at Kipp Ruin just outside of Deming, NM. During this excavation in a section designated as Locus 4, 29 projectile points were found. This poster will give a brief discussion on the significance, uses, and manufacture of projectile points. The last section of this poster attempts to identify what types of points were found at Kipp Ruin Locus 4 and estimate what time period and building phase they came from.

Susan Tinker Morrison, Alice Jones, Bryan McCuller; SpEd/CD, New Mexico State University

Standing in the Shadows: A Synthesis of Why Students with LD Hate School

Students with learning disabilities (LD) have myriad reasons to hate school because they typically encounter academic and social difficulties. This session will address these negative factors and present instructional strategies related to technology integration which has shown to promote positive academic and affective domain outcomes among students with LD.

Ashwin Naidu; School of Natural Resources and the Environment, University of Arizona

Wildlife Forensic Genetics: A Synthesis For DNA Detectives To Fight Wildlife Crime

An ever-increasing demand for wildlife parts in international wildlife trade, now a multi-billion dollar business, necessitates stringent enforcement of wildlife protection laws. Additionally, the need to curb worldwide illegal wildlife trafficking calls for the use of best available scientific resources to provide reliable evidence on wildlife crime cases. Wildlife forensic genetics, one of the available resources, is becoming increasingly popular for providing evidence during wildlife crime investigations, primarily because of its strong scientific basis. In the last two decades, genetic techniques have been invaluable in determining a myriad of aspects in wildlife biology, including but not limited to the identification and classification of species, populations, individuals, sex, mating systems, parentage, relatedness, kinship, population size, population structure, migration, diet and disease. This information, in the scope of wildlife forensics, has been used as unfailing evidence for the prosecution or defense of wildlife crime cases, and has significantly aided the enforcement of national and international wildlife protection laws. I will present

important genetic techniques in wildlife forensics and give reason for their efficacy, utility, and reliability. I will also explain genetic techniques that are currently popular among the scientific community and are peer-reviewed for use in wildlife management applications. With this project, I hope to generate people's interest in novel scientific applications for wildlife conservation in general, and the use of forensic genetic practices in fighting wildlife crime in particular.

Xuan V. Nguyen; Counseling and Educational Psychology, New Mexico State University

The Implications of Acculturation and Gender on Ethnic Identity in International Students

The researcher explored the conceptualization of John W. Berry's Acculturation Model (1980). The researcher discussed the four modes of acculturation proposed by Berry (1980): intergration, assimilation, segregation/separation, and marginalization. Ethnic identity has been studied as a component of acculturation (Berry, Phinney, Sam & Vedder, 2006). Acculturation is a variable that has been suggested to influence ethnic identity. The investigation of ethnic identity was explored using the Multigroup Ethnic Identity Measure (MEIM; Phinney, 1992). The researcher hypothesized that integrated individuals significantly value belongingness as a characteristic of ethnic identity more than individuals in other modes of acculturation. Furthermore, different findings exist on gender and ethnic identity. Females score higher on ethnic identity than males (Chae, 2000). No significant differences on ethnic identity between males and females (Phinney, 1992). Additionally, the researcher hypothesized that females value belongingness significantly more so than males. The results suggested no significant differences on both hypotheses.

Brenda Nieto; Biology, New Mexico State University

Woody Plant Encroachment and Soil Organic Carbon Pools: Exploring the Role of Rhizodeposition

Soil organic carbon (SOC) plays a significant role in the global C cycle, accounting for more C than terrestrial biomass and atmospheric pools combined. Arid and semi arid ecosystems over the past 150 years have seen grasslands replaced by shrubs due to woody plant encroachment. Woody plant encroachment impacts on SOC have been hard to define, but evidence suggests vegetation changes alter root distributions and may subsequently effect SOC distribution and stability. One large unknown is the effect of woody plant encroachment on root exudates (organic compounds passively released by the root) in the rhizosphere. To investigate the role of SOC and root exudates in different vegetation communities, root exudates will be measured using a new method designed for field collection. We will use intact root systems of shrubs (*Larrea tridentata* and *Prosopis glandulosa*) and C4 grasses (*Bouteloua eriopoda* and *Sporobolus wrightii*) representative of Chihuahuan Desert vegetation for root exudate collection in the field. Our objectives are to investigate previously unknown shrub and grass root exudates to identify mechanisms of woody plant encroachment that influence SOC pools. We hypothesize that root exudates significantly contribute to the composition of SOC pools in drylands because unknown amounts of C return to the soil by rhizodeposition and stimulate belowground microbial activity. The results of this study will provide an understanding of root exudates and their role in SOC as they relate to woody plant encroachment.

Ashley O'Hearn; Psychology, New Mexico State University

How Salience of Feminine Pronouns Contribute to Readers' Perceptions of Written Language

Using masculine pronouns, such as "he" or "man" to refer to both women and men has been prohibited by a number of professional organizations (e.g., American Psychology Association, American Medical Association, Modern Language Association). Instead of using generic masculine pronouns, some authors alternate between singular-masculine and singular-feminine pronouns, such as using "he" in one paragraph and "she" in the subsequent paragraph. Presumably, if masculine and feminine pronouns are used with the same frequency, the text will be perceived as nonsexist. On the contrary, results indicated that readers overestimated the frequency of feminine pronouns (indicating a feminine bias) when this method was utilized. This pattern of results may be due to the greater salience of feminine pronouns.

Alma D. Pacheco; Geography, New Mexico State University

Analyzing Forest Fragmentation in Private and Public Forestland in Massachusetts (USA) between 1990 and 2009

Forest loss and fragmentation reduce the quality of ecosystem services and are thus of major concern for ecologists, conservationists, landowners, and many others. In the northeastern United States, private land ownership is a major driver of these forest changes. However, this relationship has not been sufficiently documented in a spatially and temporally explicit fashion. Moreover, there is little information about rates and patterns of forest change, which

policy- and decision-makers need to make sensible decisions about forestland management. The purpose of this study is to address these issues by quantifying the rates and patterns of forest change from 1990 to 2009 for protected private forests, protected public forests, and all forests in Massachusetts. We quantified magnitudes and transitions of change by applying post-classification change mapping techniques to remote sensing-derived, multi-temporal land cover maps. We assessed spatio-temporal changes in the patterns of forestlands by examining changes in forest core, edge, and loop as identified through Morphological Spatial Pattern Analysis. Our results show that rates of forest loss have been much greater in private than in public forests. Our results further demonstrate that patterns of forest fragmentation have been highly variable across space, through time, and depending on land ownership.

Javitt Higmar Padilla-Franco, Balwinder Singh; Electrical and Computer Engineering, New Mexico State University

Scalable Technologies for Resource, Energy, and Environment Management & Sustainability (STREEMS)

Sustainability can undoubtedly be achieved in any aspect of our daily life, if appropriate natural and ambient resources could provide the minimum energy required to perform a diversity of tasks. In this context, scalable technologies play a key role in contributing to sustainability, beginning from an individual's perception of what sustainability means at the smallest level, spanning the perceptions of sustainability experienced by larger bodies of the human society. How does one show where sustainability exists? Any novel technology holds potential to contribute to some form of sustainability in a system comprising coupled subsystems that experience impact. By impact we mean changes in the constituents of economic and environmental systems that have a persistent effect on human society. As such quality-of-life, a metric in sustainable systems, must indicate positive change. Heat generated by wood-burning has sustainable attributes as long as there is wood to burn. Deforestation and other negligent land-use patterns have reduced wood-burning and has made society reach out to cleaner, more reliable, and more sustainable and easily operable energy harvesting technologies. Hence the solution towards sustainability is through the use of environmentally benign approaches to harvest energy from natural, renewable, and ambient energy sources. A vast array of technologies is therefore needed to achieve sustainability. STREEMS is a strategy towards building sustainable systems. The Poster/Paper presents several graduate student projects from an energy harvesting course initiated in Fall 2010 illustrating how unique academic programs lead to highly innovative and revolutionary technologies by concept-driven ideas having physics-based solutions.

Prafulla D. Patil; Chemical Engineering, New Mexico State University

Optimization of Direct Conversion of Wet Algae to Biodiesel Under Supercritical Methanol Conditions

This study demonstrated a one-step process for direct liquefaction and conversion of wet algal biomass containing about 80% of water to biodiesel under supercritical methanol conditions. This one-step process enables simultaneous extraction and transesterification of wet algal biomass. The process conditions are milder than those required for pyrolysis and prevent the formation of by-products. In the proposed process, fatty acid methyl esters (FAMES) can be produced from polar phospholipids, free fatty acids, and triglycerides. A response surface methodology (RSM) was used to analyze the influence of the three process variables, namely, the wet algae to methanol (wt./vol.) ratio, the reaction temperature, and the reaction time, on the FAMES conversion. Algal biodiesel samples were analyzed by ATR-FTIR and GCMS. Based on the experimental analysis and RSM study, optimal conditions for this process are reported as: wet algae to methanol (wt./vol.) ratio of around 1:9, reaction temperature and time of about 255 C, and 25 min respectively. This single-step process can potentially be an energy efficient and economical route for algal biodiesel production.

Maria T. Patterson; Astronomy, New Mexico State University

The HALOGAS Project: HI Observations Of NGC 5055

We present deep neutral hydrogen observations of the nearby spiral galaxy NGC 5055 as part of the Westerbork Hydrogen Accretion in Local GALaxieS (HALOGAS) survey currently being performed with the Westerbork Synthesis Radio Telescope (WSRT). The HALOGAS survey aims to investigate cold gas accretion in a sample of 22 neutrally-selected nearby spiral galaxies with 120 hours of integrated observation time for each target. The data are sensitive enough to study faint neutral hydrogen in the galaxy outskirts and to search for halogas and possible accreting gas clouds. The galaxy NGC 5055 is a moderately-inclined SABc galaxy in the sample with a large pronounced warp of the extended gaseous disk and a declining rotation curve outside of the optical radius. We present an analysis of the new HI observations of this galaxy based on a tilted ring analysis and on more detailed modeling and visualization

of the 3-D HI distribution and kinematics. We also discuss the relation between star formation in the faint outer disk spiral arms by comparison of the HI with GALEX and other star formation tracers.

Tiffanie Phillips, Mina Alinejad; Criminal Justice, New Mexico State University
Discovering Intelligence and Security Career Opportunities (DISCO)

This project is one component of the National Security Preparedness Project (NSPP), performed under the Department of Energy (DOE), National Nuclear Security Administration (NNSA) grant under the direction of the Arrowhead Center at New Mexico State University. The purpose of DISCO is the development of a marketing project to stimulate awareness and interest in careers in national security technologies among middle and high school students. DISCO built on workforce development research previously conducted in the NSPP and emphasized the fact that careers utilizing majors in all fields are possible. The DISCO project was composed of four parts: 1) Review of previous research to determine workforce needs at NNSA. Research to determine best practices for marketing efforts aimed at middle and high school students. 2) Focus groups to gain feedback from middle and high school students regarding current interest in national security technology and STEM focused careers and interest in pursuing education following high school. 3) Marketing theme created using the information gained in previous activities. Marketing materials developed: Youtube videos, informational DVDs, brochures, promotional give away items. 4) Pilot tests conducted for all marketing materials at grade levels 6 - 12. Changes made to the marketing materials based on feedback received during pilot testing. When in final format, all materials will be given to the New Mexico Public Education Department for distribution to all New Mexico 6 - 12 graders beginning in fall, 2011.

Lejla Porobic; Industrial Engineering, New Mexico State University
Knowledge Management and Absorptive Capacity as the Catalysts of Successful Manufacturing Information Technology Integration

Research on organizational knowledge, its management and learning processes is burgeoning, and yet our understanding of the key elements and relevant interrelationships is still ambiguous. Studies to date have focused attention, individually, on the nature of knowledge, its attributes, and the capability of absorptive capacity, but there is a need to understand the internal interactions between the two constructs. In this research, we focus on the influence of knowledge management and absorptive capacity, as facilitators, on the successful manufacturing information technology integration, and how they relate to each other in this effort. We analyze their similarities and differences and posit that an appropriate balance between these capabilities is a necessity. Finally, we point to directions for the future research.

Davie P. Price, Wayne Van Voorhies, Immo A. Hansen; Molecular Biology, New Mexico State University
*Metabolomic and Transcriptional Differences in High vs Low Nutrient *Aedes aegypti**

When raised under high population density, many holometabolous insects emerge smaller and with less nutrient reserves than those raised under low population density. Under "field" conditions large, high-nutrient mosquitoes occur less frequently than small, low-nutrient mosquitoes. Such mosquitoes do not have enough nutrient stores to successfully complete egg production from a single blood meal and therefore need a second blood meal in order to produce eggs. This raises their vectorial capacity. This study focuses on the molecular differences between high- and low-nutrient mosquitoes and on the regulation of nutrient accumulation in the fat body. We performed transcriptome sequencing and metabolomics analysis of mosquito fat body tissue and compared the metabolic rate of individual low- and high nutrient mosquitoes. The results of this study will further our understanding of the molecular basis of mosquito nutrient metabolism during development and pave the way for creation of transgenic lines with altered nutrient accumulation.

Matt Rambert; Psychology, New Mexico State University
Word Encoding: Is Naturalistic Attention Better than Forced Attention?

Two experiments were conducted to investigate the effects of presentations on word encoding. Experiment 1 examined the influence of dynamic presentations of words as compared to a static display. Experiment 2 examined three types of dynamic presentations, two of which were naturalistic writing and one of which was not a non-naturalistic presentation. Both of these studies provide evidence that a natural dynamic presentation will increase memory encoding and retrieval. This shows that encoding and retrieval is not only based on increased attention but on the

nature of the presentation. This gives support to the schema representation we have for encoding and remembering words on a general scale. Specific words may be encoded and remembered better if there is a greater level of processing.

German Reyes; Industrial Engineering, New Mexico State University

The Need to Improve the Current Transit System on NMSU Campus

Transportation is central in any development process. Transportation is an integral part of any community striving to meet their daily needs in a limited time. New Mexico State University (NMSU), like any developing community while trying to meet their transportation needs use larger buses than system demanded capacity in the hope of future expanded demand. This results in increase in operational cost of running the larger buses as benchmarked against the actual capacity demanded. The cost of operation of the Roadrunner Transit can greatly be reduced by using better efficient and small capacity buses to a minimum without sacrificing the same quality of services rendered on campus. A linear programming model has been developed to evaluate other possible alternatives to the current system. In addition, a sensitivity analysis will let us know how some variables could be changed without modifying optimal decision. Furthermore, the alternative of using or converting the buses to run on an alternate fuel such as biodiesel is being considered. By looking at a cost benefit analysis, we will be able to determine the overall impact to the NMSU campus.

Laura Reyes; Anthropology, New Mexico State University

Reconstruction of Australopithecus Afarensis Sexual Dispersal Demonstrates that Males Were More Closely Related than Females at the "First Family" Site (A.L. 333, Hadar, Ethiopia)

Australopithecine social organization reconstructions are based on sexual dimorphism levels: high body mass and canine size dimorphism reflect high male-male competition and polygyny, while low body mass and canine size dimorphism denote low male-male competition and monogamy. Australopithecus afarensis is paradoxical, exhibiting high body mass dimorphism, yet low canine size dimorphism. Previous literature focuses on male-male competition, neglecting other traits relevant to social organization. This study reconstructs A. afarensis sexual dispersal by establishing relatedness within each sex. Mandibular molars from site A.L. 333 were sexed and rated for dental traits in two models. In Model 1, molars smaller than the mean were female, while molars larger than the mean were male. Model 2 involved random assignment assuming gorilla-like sexual dimorphism. Dental trait ratings indicated intrasexual relatedness levels in A.L. 333 molars compared to all Hadar molars. In Model 1, A.L. 333 female variation was 91% that of all Hadar females, while male variation was 42% that of all Hadar males. In Model 2, A.L. 333 female variation was 67% that of all Hadar females, while male variation was 54% that of all Hadar males. Both models indicate that A.L. 333 males were more closely related than females. A. afarensis likely practiced a sexual dispersal pattern with considerable female transfer and moderate male transfer. A. afarensis individuals of both sexes appear to have relocated at sexual maturity, much like modern humans in foraging societies. Hence, A. afarensis social organization may have formed the evolutionary beginnings of modern human society.

Roxanna Reyna; EPPWS, New Mexico State University

Detection and Localization of Undifilum oxytropis Fungi in Locoweed Tissues

Grazing locoweed Oxytropis and Astragalus by livestock can cause the toxicosis known as locoism. Locoweeds contain the indolizidine alkaloid, swainsonine, which is the principal agent responsible for inducing locoism in animals. Previous research showed the presence in locoweed of an endophyte fungus, Undifilum oxytropis which can induce toxicity to animals without the plant presence, and it has not been observed causing disease to the plants. Histological techniques for light or electron microscopy have been used to study endophytes. Immunogold labeling uses gold particles as markers for indirect labeling of specific sites.

Jessica Richardson; Psychology, New Mexico State University

The Effects of Temporal Distance on Affective and Cognitive Contributions to Health-Related Behavioral Intention Formation

The purpose of this study was to determine whether shifts in the contribution of cognition and affect to behavioral intention formation occur over time. Construal Level Theory (CLT) predicts that as temporal distance increases, the way in which individuals' understand circumstances changes. Specifically, increases in temporal distance result in a shift from low-level construal in the near future to higher-level construal in the more distant future. Affect

is commonly considered a lower-level construal due to its concrete, specific nature (e.g. the taste of the chocolate cake), whereas cognition is commonly considered a higher-level construal due to its more abstract, global nature (e.g. caloric content). Participants were asked to evaluate 32 behaviors on an attitude formation dimension (cognition and affect) and a behavioral intention formation dimension. The timeframe of the attitude formation dimension and the behavioral intention formation dimension were varied between current and future timeframes creating four different conditions (current-current, future-future, current-future, future-current). Correlations between affect and behavioral intention formation and cognition and behavioral intention formation were calculated in order to determine the contribution of each factor to behavioral intention formation separately in the different timeframes. Results did not support the hypothesis that a shift from a reliance on affect to a reliance on cognition would occur as temporal distance increased. Between and within-participant analyses revealed a decrease in the contribution of cognition to behavioral intention formation when forming attitudes in the future condition. No shifts in the contribution of cognition and affect to behavioral intention formation occurred when the behavioral intention timeframe was varied. There were also no significant influences of being a current/future thinker on the contribution of affect and cognition to behavioral intention formation over time.

Stacy D. Rodriguez, David P. Price, Alexander Tchourbanov, Immo A. Hansen; Biology, New Mexico State University

Use of Microsatellites to Test the Reproductive Fitness of Mosquito Males Raised Under Different Nutritional Regimens

sterile Insect Technique is a method of insect extermination in lieu of pesticides. Large amounts of sterile males are released into the environment and copulate with females. Females do not become fertilized and die without reproducing - hence insect populations are reduced to the level of extinction. Mosquito nutrition during the larval phase determines the size of adult mosquitoes. Using NCBI BLAST as well as SHRIMP software algorithms we identified a large number of microsatellites in the genome of the yellow fever mosquito *Aedes aegypti*. Primers were determined using Primer Blast. We tested 49 primer pairs via genomic PCR in order to identify microsatellites that can be used to distinguish between several mosquito laboratory strains. We identified seven informative microsatellites that enable us to distinguish the four lab strains that are part of this study: ROCK, UGAL, Las Cruces, and Waco. The results of this study allow us to perform paternity tests for mosquitoes in order to gain insight into mosquito male parental fitness through crossing experiments.

Eric Rodriguez, Randy Rankin; Industrial Engineering, New Mexico State University

Systems Engineering Approach to Disaster Evacuation Modeling and Simulation

Disaster modeling and simulation is an immense and complex challenge. Organizations such as the National Weather Service, the Natural Hazards Research and Applications Information Center, and Federal Management Emergency Administration have developed models to predict the occurrence of a cataclysmic event. The Department of Homeland Security and the National Infrastructure Simulation and Analysis Center have developed models of the United States infrastructure, and others including the Department of Defense have studied human behavior to predict how a population will react to a given catastrophe. The added complication of how to determine the best government response to a disaster makes a solution set too large to resolve within any single modeling space. Due to this complexity, trying to solve a problem of this magnitude forces one to consider a process based solution. The established Systems Engineering methodology used to solve complex problems appears to be the best approach to develop a simulation for this multifaceted problem. The benefit of simulating a disaster is to evaluate changes caused by the event without the cost or risk of performing a real exercise. Simulation provides data on how the system operates and responds to changes. "What-if" analysis can provide effects on system performance. Simulation results are presented graphically illustrating the flow of people, equipment, or other entities through the system allowing the analyst to see the "big picture" results. The purpose of this study is to present the architecture of a systems engineering approach to develop a Disaster Evacuation Modeling and Simulation.

Joshua Sandry; Psychology, New Mexico State University

A Comparison of Multiple Adaptive Mechanisms with the Survival Advantage in a Free Recall Task

Researchers investigating memory from a functional perspective found that processing or encoding words in terms of their relevancy to a survival situation led to more words being recalled than if the words had been processed any other way (Nairne, 2010; Nairne, Thompson, & Pandeirada, 2007). The current study was based on evolutionary psychology theorizing that the mind comprises many different adaptive mechanisms, and each mechanism contributes

to the organism's fitness. We tested the hypothesis that processing in terms of adaptive mechanisms will also lead to strong encoding, similar to survival processing. Participants rated random words for relevancy to survival and different adaptive situations. The findings revealed that participants recalled more words when the words were processed for survival. Even when alternative scenarios were generated from specific evolutionary theorizing, survival processing was resilient and remained the best form of encoding; survival processing is an especially powerful encoding strategy.

James Schaeffer; Psychology, New Mexico State University
Speed of Sight

Our study assessed the time course of visual masking. Two pictures were displayed in rapid succession, followed by a question about whether or not a target picture was present. Participants responded to this question by pressing keys labeled "yes" or "no" on a keyboard. Accuracy was measured while varying expectancy (cue vs. no cue) and interstimulus intervals. Our results showed lower accuracy for non-expectancy vs. expectancy trials as well as for shorter vs. longer interstimulus intervals.

Marco Schiavon; Plant and Environmental Sciences, New Mexico State University
Subsurface capillary Irrigation to Establish Festuca Arundinacea (Schreb.) in an Arid Environment

Subsurface drip irrigation, commonly used to conserve water in turfgrasses, has been shown to irrigate more uniformly and efficiently than sprinkler systems. However, establishment of turfgrass can be delayed when drip irrigated. Recently, a new subsurface irrigation technology called KISSS (Kapillary Irrigation Subsurface System) has been developed to distribute water more evenly throughout the rootzone. A geo-textile layer encloses the drip line to prevent loss of water due to downward movement. Information is lacking on the feasibility of using this technology to establish and maintain turfgrasses. Research was conducted at New Mexico State University in Las Cruces, NM, from fall 2009 to summer 2010 to determine if KISSS irrigated *Festuca arundinacea* (Schreb.), cv. Justice established differently than sprinkler irrigated plots when potable (500 ppm) and saline (1600 ppm) irrigation water was applied. The study was carried out on a sandy skeletal mixed thermic Typic Torriorthent, a sandy entisol typical of arid regions. Plots were seeded on September 28, 2009. Seventy days after seeding (December 7, 2009) KISSS irrigated plots with potable water exhibited highest coverage, followed by plots sprinkler irrigated with saline water. In spring 2010 (210 days after seeding) all treatments reached approximately 30% coverage with no differences among treatments. In August 2010 (10 months after seeding), potable and saline irrigated plots reached coverages of 88% and 82% respectively. There were no differences in establishment between irrigation systems. Results indicate that irrigation systems do not affect establishment with either potable or saline water.

Jeremy Schwark; Psychology, New Mexico State University
Personality in Affective Computing: Neuroticism as a Predictor

Affective computing is the domain of designing systems that recognize, interpret, and influence human emotions. The current study looked at using personality measures to predict how much an individual can be influenced by a positive, affective computing paradigm. The results showed that personality measures could predict changes in 9 of the 13 state affect scales defined by the PANAS-X, of which neuroticism was a predictor in 7. The authors conclude that neuroticism plays a large role in the potential impact of affective computing paradigms and individual differences should be considered in future affective computing research and design.

Charlene Shroulote; Government, New Mexico State University
Political Feminism: Examining the Representation of Clinton and Palin in the 2008 Election

Utilizing feminist and traditional gender role theories this research poster examines the roles of Hillary Clinton and Sarah Palin during the 2008 Presidential elections in particular as female candidates in a historically male environment. And while both women definitely defy the traditional roles of womanhood they are not equally painted in the same manner. I begin with a brief history of the women and their political careers. Followed by an examination of how both Clinton and Palin represented themselves as candidates in the election. Next, I explore the media's role in the election and how they were characterized by not only the press but by various political and church groups. An analysis of these issues concludes the presentation.

Frank Sullivan; Industrial Engineering, New Mexico State University

Red Chili Drying Process Improvements Using Discrete-event Simulation

The Biad Chili Company processes both green and red chili seasonally each year. This project will address the red chili drying process at the Biad plant located 6060 South HWY 478, Mesilla Park, NM. This processing plant will process approximately 77,000 pounds of red chili per day during the season. There are four stages in the red chili drying process: 1) Preparation for drying, 2) Drying, 3) Grinding, 4) Packaging and shipping. The Biad Chili Company would like to increase their production capacity and efficiency. The purpose of this project is to use discrete event simulation to model the process so that management can better understand the dynamics of the current system. Once we have an understanding of the current system, we can experiment with system and process changes to increase capacity and throughput while decreasing the time that the chili is in the plant. ARENA simulations software will be used to model and simulate the system. Data will be collected using time studies and observations. This data will then be statistically analyzed to determine the best fit for distribution.

David Teal; Astronomy, New Mexico State University

Martian Middle-Latitude Atmospheric Stationary Waves as Manifested in MRO MCS Retrieved Temperature Data

Large scale waves in the Martian atmosphere can play a significant role in the meridional transport of climatically important gases and aerosols. Banfield et al. (2003) examined forced waves in the Martian atmosphere in MGS TES nadir temperature data from 6.1 to 0.18 mbar. In September 2006, Mars Reconnaissance Orbiter's Mars Climate Sounder instrument began its limb sounding campaign, measuring atmospheric pressure, temperature, and gaseous/aerosol opacities from 12.1 to 0.0001 mbar at a similar (~ 0.5 scale height) vertical resolution as TES. Using the extended pressures probed by MCS, Lee et al. (2009) have examined the thermal tide components of the forced waves in the MCS temperature data, but not the stationary wave components. Our project analyzes MCS data that is publicly available through NASA's Planetary Data System's Atmospheres Node and currently contains more than 1.5 Martian years worth of retrievals. Our work focuses on the magnitude, longitudinal phase, and vertical propagation of the stationary wave components manifested in the MCS temperature data. Model results will be used to minimize aliased wave signatures. Our results agree with those of Lee et al. (2009) and extend Banfield et al. (2003)'s analysis with the larger pressure range provided by MCS.

Adam Underwood, Melissa Guynn; Psychology, New Mexico State University

Manipulating Expectation of Context at Intention Formation: Evidence of Task and Lure Interference in Unexpected Context

The current study seeks to determine whether expectation of context can be manipulated without explicit instruction or implication during a prospective memory task. Additionally, the study seeks to determine whether task and lure interference, along with good prospective memory, can occur during an unexpected context. To achieve this, the prospective memory cues (fruit words), while occurring in each task, were more highly associated with one ongoing task (fruit/vegetable categorization) than the other (tree/shrub categorization). Results indicate expectation of context can be manipulated without explicit instruction or implication; and furthermore, task and lure interference was observed in the unexpected context.

Cat Wu; Astronomy, New Mexico State University

Kinematics of Ionized Gas in Edge-on HALOGAS Galaxies

Extra-planar gas generally shows a decrease in rotational velocity with increasing height above the disk. It can originate from disk-halo cycling driven by star formation in the disk or from infalling gas clouds. Studies at optical and radio wavelengths suggest that a combination of the two is the most likely scenario. Our goal is to measure velocity gradients of the ionized gas in a large number of halos, which can then be used as a constraint for models of the origin of halo gas. Because we are observing in optical, our measurements are likely not affected by warps which generally occur further out in radial distance. Our targets are drawn from a well-defined sample and are also a subset of the HALOGAS survey, which is investigating cold gas accretion in spiral galaxies with deep WSRT observations. We restrict our targets to edge-on galaxies, and our data provide an optical complement to HALOGAS data. We perform our observations using a multi-slit spectroscopic setup on the ARC 3.5m telescope. Arranging the slits parallel to the minor axis allows us to measure velocities of H-alpha emitting gas as a function of height above the plane in 11 radial distance bins in a single exposure. Our field of view is $3.75' \times 4'$, and our total exposure time

for a typical field is 6-8 hours. We present our ionized halo gas velocities for two nearby, edge-on galaxies and show a comparison with HI data.

Miguel Angel Zuniga; Marketing, New Mexico State University

Effectively Targeting in Diverse Consumer Markets

The purpose of this study is to analyze how marketers have altered their advertising campaigns by using culturally relevant content in magazine advertising to target the Hispanic population. Stereotypes have been an important aspect of the advertisers' efforts to target the Hispanic population. Therefore, it is important to also investigate the Hispanic stereotypes and the portrayal of Hispanics in Hispanic oriented advertisements. As the Hispanic population expands so does their economic impact and importance to advertisers. Examining whether marketers are modifying their advertising campaigns to reflect Hispanic heritage as an effort to relate and influence them with greater effectiveness was important for this study. Stevenson and Swayne (1999) indicate that the use of a member of a minority group in an ad increases the effectiveness of ads. Efforts by marketers to relate to Hispanics are demonstrated by the increased use of Hispanic cues. Aspects of the portrayal of Hispanics have been analyzed including the prominence of Hispanic portrayals and the types of settings and relationships in which Hispanics are portrayed. Advertisers are believed to be making a greater effort than ever to accommodate to the Hispanic culture in their ads as an effort to increase the persuasiveness and effectiveness of their ads. Preliminary results of this study show that advertisers are relying more on using a greater proportion of Hispanic models and collectivism factors (ex. Family, social, etc.) in ads directed toward Hispanics.