

Poster and Exhibit Abstracts

(In alphabetical order by author)

Rachelle M. Bassen; Biology, NMSU

Staining for Myelination with Luxol Fast Blue and Neutral Red

Hearing loss, vestibular disorders and damaged eyesight can be the result of axonal degeneration (*Int Jour Ped Otrlaryn*, 61:1-15; *Inst Ophthalm*, 7:109-125). Improper functioning of the myelin sheath may be responsible for this degeneration, due to its role in conducting chemical and electrical neural signaling. Investigation of myelin degeneration requires understanding of normal myelinogenesis during development. Anatomical characterizations are typically the first step in formulating mechanistic understanding with new model systems. Luxol Fast Blue has often been paired with various counterstains as a way to stain myelin sheaths, including the Kluver-Barrera method with Cresyl Violet (*J Neuropath Exp Neurol*, 12: 400-403). The acidic Luxol stain binds to the phospholipids of the myelin sheath, whereas Cresyl Violet stains Nissl bodies. However, some recent protocols have utilized Neutral Red as a replacement to Cresyl Violet as a Nissl body counterstain due to its greater contrast to the blue stain (*Stain Technl*, 37: 13-16). Using *Xenopus laevis* larvae as a model, we prepared a new method for Luxol Fast Blue myelin stain with Neutral Red counterstain. Results revealed substantial differentiation of tissue, with red Nissl bodies and dark blue myelin. This method will be used for histological staining to detect the earliest stage of myelination of the VIIIth acoustic-vestibular nerve in *Xenopus*, which has not yet been determined. Supported by NIH (R25NS080685, P20RR016480).

Erin Brown-Meeks & Erica Davis; Anthropology, NMSU

Another example of a chimp-like black-handed spider monkey (Ateles geoffroyi) "raid" observed at La Milpa, Belize

Stealthy chimpanzee-like raids by male black handed spider monkeys (*Ateles geoffroyi*) into neighboring territory were first documented in 2006 in the Yucatan Peninsula of Mexico. Raiding groups of males traveled on the ground apparently searching for individuals to attack. They traveled in single file with tails held erect. More recently, hostile events leading to a takeover by neighboring male spider monkeys were documented in NW Costa Rica. Hostile raids in Mexico were linked to male-male philopatry with males remaining in their natal groups, but genetic identification of relatedness of takeover males in Costa Rica revealed they were not as closely related as previously believed.

We report here another example of spider monkey male gang aggression toward individuals of a neighboring group. On March 27th, 2013, during our third brief field trip to La Milpa in North West Belize we witnessed and video recorded spider monkey males traveling arboreally in single file with tails erect. They attacked an adult female and her young offspring. Approximately one minute into the attack another individual arrived at the scene from the opposite direction in which the attackers entered, leading to an escalation of hostilities. Five attacking individuals were photographed leaving the scene in single file and displaying. Since this incident, guides at La Milpa observed two other hostile attacks and one monkey with a bite wound on his shoulder. Attacking monkeys never traveled on the ground. Our observations indicate that hostile attacks by neighboring males may be a normal part of this species' behavior.

Kristin Lea Corl & Angel Pena; Anthropology, NMSU

Ritual or War: Burning in the Jornada Mogollon

What is the significance of room burning within El Paso Phase (A.D. 1300-1450) Mogollon pueblos of Southwest New Mexico? Are these events the results of violence, ritual abandonment of rooms, accidental fires or other processes? This poster explores these questions through a case study of Cottonwood Spring Pueblo (LA 175) one of the largest villages in the region. We have identified at least two temporally distinct burning events at the site. This pueblo also straddles a cultural boundary between the Jornada and Mimbres branches of the Mogollon and possesses relatively high frequencies of Salado polychrome ceramics. To contextualize Cottonwood's burning we will compare it to other

pueblos in the region considering their sizes, locations, ceramic assemblages, dates of occupation and numbers of burning episodes.

Kyle DeGrave, Jason Jackiewicz, & Matthias Rempel; Astronomy, NMSU

Validating Time-Distance Helioseismology With Realistic Quiet Sun Simulations

Linear inversions of two $\sim 100 \times 100 \times 20$ Megameter (Mm) realistic magnetohydrodynamic quiet-Sun simulations are carried out using time-distance helioseismology to recover vector flows in the upper layers of each domain. These inversions were performed using several filtering schemes including ridge, phase-speed, and a combination of ridge+phase-speed filtering with the ultimate goal of assessing the capabilities of our current helioseismic methods. We find that horizontal flow maps recovered from our inversions correlate strongly with those of the simulations down to a depth of ~ 3 Mm, with correlation values dropping rapidly thereafter. In several cases, the magnitudes of the inverted flows severely underestimate those of the simulations, possibly suggesting nonlinearity of the forward problem. We find that inversions for vertical flows depend strongly on filtering method, with phase-speed filtering giving the best results. In general, however, these inversions are unable to accurately recover the vertical flow structure present in the simulations due to the low-amplitudes of these flows coupled with high levels of noise.

Adam Dettmer; Water Science and Management, NMSU

Determination of optimal coordination complex for facilitated transport enabled - in-situ chemical oxidation of 1,4-dioxane in groundwater

1,4-Dioxane is an ether that is commonly used as a stabilizer for many chlorinated solvents (i.e. trichloroethylene and 1,1,1-trichloroethane), and therefore is likely to be present at sites impacted by chlorinated solvent spills. Its properties such as infinite water solubility, low volatilization, and negligible adsorption allow it to form expansive contaminant plumes as large as, or larger than, those associated with chlorinated solvents. These plumes represent a substantial liability due to their potential for adverse health effects (anthropogenic and ecologic) and high remediation costs. Extensive research is underway to develop advanced *in situ* chemical oxidation (ISCO) as applicable technology for 1,4-dioxane-contaminated groundwater, by enhancing the solubility, transportability, and longevity of oxidants. Theoretically, co-injecting oxidants and a chemical “delivery agent”, or complexing agent that will supplement the transportability and stability of the oxidant can accomplish this. The objective of this particular investigation is to determine the most effective oxidant(s)-delivery agent complex, based on the stability of the complex and the ability of the delivery agent to enhance the oxidant solubility.

This research will serve as a fundamental part of a project that will develop a novel, cost-effective, *in-situ* treatment alternative for 1,4-dioxane-contaminated source zones and groundwater plumes and it will contribute to our understanding of the processes controlling the complexation of oxidants. This technology has the potential to completely replace the existing, and more costly, *ex-situ* method for treating 1,4-dioxane-contaminated groundwater and thus, support the management of Department of Defense sites experiencing problems with groundwater contamination.

Carollan Ehn; Mathematical Sciences, NMSU

The Hasse-Weil Theorem and Applications to Elliptic Curve Cryptography

Cryptography is the theory and practice of sending messages so that only the sender and intended recipient can read them. Today cryptography is used in sending information over the internet and computer networks, with the aim of avoiding interception or interference in these transactions. There are cryptosystems which embed messages in collections of points known as elliptic curves. The security of these cryptosystems is often based on the difficulty of solving the “discrete logarithm problem.” There are attacks on the discrete logarithm problem which require knowing information about the number of points on an elliptic curve. In this thesis, we study the Hasse-Weil Theorem, which gives a bound on the number of points on an elliptic curve. This theorem can be used to determine if a cryptosystem is resistant to an attack on the discrete logarithm problem.

Diane Feuliet; Astronomy, NMSU
Ages of Nearby Giants with APOGEE

The SDSS-III Apache Point Observatory Galactic Evolution Experiment (APOGEE) is a high resolution ($R \sim 23,000$) near-IR (H-band) spectroscopic survey of 100,000 Milky Way stars designed to chemically trace the formation and evolution of Galactic stellar populations. In addition to the primary survey, the APOGEE spectrograph has been fitted with 10 fibers from the robotically controlled NMSU 1 m telescope to maximize the use of this instrument when not on sky with the Sloan 2.5 m telescope. This allows for single object observations with this high resolution NIR spectrograph. Using this new capability provided by the 1 m, we are conducting a survey of bright stars ($H \leq 8$) with accurate Hipparcos parallax measurements ($\mu_{err} \leq 10\%$), which are not accessible to the main APOGEE survey. These data can be reduced and analyzed in the same way as main survey data, resulting in detailed chemical information for hundreds of nearby stars. The atmospheric parameters combined with the Hipparcos distances allow for age estimates of these stars. We present initial age estimates from isochrone matching to Padova isochrones, and an age-metallicity relation for the current sample.

Erek H. Fuchs & James Witcher; Civil Engineering, Water Science and Management, NMSU
Central Palomas Basin Aquifer Investigation

New Mexico experiences periodic and severe drought of decadal length. Farmers in the Hatch-Rincon Valley along the Rio Grande in southern New Mexico are especially impacted by the current severe and sustained drought because of the unique geology of the immediate area that does not allow significant augmentation of water for irrigation from pumping groundwater. Groundwater that is readily accessible is currently deteriorating in quality as salinity is increasing in the shallow Rio Grande alluvium aquifer. The economy in the Hatch-Rincon Valley is highly dependent on irrigated agriculture in the immediate area.

In response to this apparent crisis, interests in the Hatch-Rincon Valley have been investigating the potential of a groundwater drought reserve. Earlier studies suggested, but did not investigate in detail the possibility of a significant resource, the Central Palomas Basin Aquifer (CPBA). A preliminary geologic cross-section model has been developed by Dr. John Hawley. Surface resistivity and EM geophysical surveys and water chemistry analysis are in progress by David Hyndman and James Witcher to define the CPBA, a buried and confined fluvial channel predating the Rio Grande. Investigation is designed to define and characterize this aquifer as an emergency supply during extreme drought by applying existing water rights of the water users in the Hatch-Rincon Valley. Much work is yet to be performed to fully quantify the aquifer but it may represent an important undeveloped shallow potable groundwater system in New Mexico.

Andrea Gallegos; Physics, NMSU

Lg Attenuation in the Central and Eastern United States as Revealed by the EarthScope Transportable Array

Lg waveforms recorded by EarthScope's Transportable Array (TA) were used to determine interstation crustal attenuation in the central and eastern United States (CEUS). Attenuation was calculated based on Lg spectral amplitudes filtered at a narrow band from 0.5 to 1.5 Hz. The two-station and reverse two-station techniques were used to invert the spectral amplitudes for Q. 39 events occurring from 2010 to 2012 and ranging from magnitude 3 to magnitude 6 were used in this study. 39,258 and 4,627 interstation Q values were determined using the two-station and reverse two-station techniques respectively. The results show northeast trending high Q regions (low attenuation) ranging from eastern New Mexico to Wisconsin. Regions of low Q (high attenuation) are seen along the Minnesota-Wisconsin border, the Gulf Coastal Plain (GCP), along the South Dakota-Nebraska border, and along the Oklahoma-Texas border. A positive correlation between heat flow, sediment thickness, recent tectonic activity, fluids, and low Q was observed. Areas with low heat flow, thin sediment cover, no recent tectonic activity, and a lack of fluids were observed to have consistently high Q. These new models use a greater amount of data and attain more coverage than previous studies and better constrain attenuation. The attenuation maps generated are highly detailed. This increase in detail can improve high frequency ground motion predictions of future large earthquakes for more accurate hazard assessment and improve overall understanding of the structure and assemblage of the CEUS.

Robert Gueth; Biology, NMSU

Temperature effects on the electric discharge and gene expression in the electric organ of Eigenmannia virescens

Environmental factors affect protein composition and behavioral outputs of motor systems. For instance, ambient water temperature alters the physiological and contractile properties of skeletal muscle of teleosts (Watabe 2002). The weakly electric gymnotiform fish *Eigenmannia virescens* possesses a highly specialized electromotor system that evolved from skeletal muscle and generates an electrical discharge (EOD) used for communication and navigation. Unlike muscle, this electric organ (EO) tissue does not contract and is activated continuously by distinct electromotoneurons at frequencies between 250-600Hz (Assad 1998). Previous studies showed that the EOD frequency in *E. virescens* is affected by changes in water temperature (Enger 1968; Boudinot 1970). However, these studies examined the duration of this effect for only short durations of time of less than 20 minutes. This work will expand these data by characterizing the effect of water temperature on *E. virescens* EOD and EO gene expression over at least 2 weeks. To date, we have developed a wireless multi-sensor framework capable of monitoring EODs (under review, IEEE BioCAS 2013) and are expanding this system to continuously record water temperature. This will allow long-term, continuous EOD recordings from fish kept at different water temperatures (25° vs 30°C; n=5 each). Following stabilization of EOD frequencies at 2 weeks, EO tissue will be harvested and analyzed for changes in gene expression. These data will expand our current understanding of long-term effects of ambient temperature on EO activity, and furthermore help elucidate the role of temperature in regulation of gene expression in electromotor systems.

Mohammad A. Haque; Electrical & Computer Engineering , NMSU

Item Implementation of low quiescent current low-dropout (LDO) regulator using Split Length Compensation technique with Enhanced Transient Recovery

This paper presents a three-stage Low-Dropout Voltage Regulator~(LDO) with a class-AB output stage using the Split “Length Compensation~(SLC) technique. In this technique a transistor M of length L is split into two series transistors, M_a and M_b , of length L_1 and L_2 , where $L_1 + L_2 = L$. The input V_{in} and output voltage V_{out} are 2~V and 1.5~ V, respectively. The load current range is 0 to 50~mA. Due to the class-AB output stage, the LDO shows a low average load transient recovery time of 14 μ s using a low quiescent current (I_Q) of only 4.3 μ A. The dropout voltage V_{DO} achieved is 124~mV. The design is compared with state-of-the-art LDO designs and achieves comparable results.

Michael Hayden; Astronomy, NMSU

Chemical Cartography with APOGEE: Large-scale Mean Metallicity Maps of the Milky Way Disk

We present Galactic mean metallicity maps derived from the first year of the SDSS-III APOGEE experiment. Mean abundances in different zones of Galactocentric radius ($0 < R < 15$ kpc) at a range of heights above the plane ($0 < |z| < 3$ kpc), are derived from a sample of nearly 20,000 stars with unprecedented coverage, including stars in the Galactic mid-plane at large distances. We also split the sample into subsamples of stars with low and high-[alpha/M] abundance ratios. We assess possible biases in deriving the mean abundances, and find they are likely to be small except in the inner regions of the Galaxy. A negative radial gradient exists over much of the Galaxy; however, the gradient appears to flatten for $R < 6$ kpc, in particular near the Galactic mid-plane and for low-[alpha/M] stars. At $R > 6$ kpc, the gradient flattens as one moves off of the plane, and is flatter at all heights for high-[alpha/M] stars than for low-[alpha/M] stars. Alternatively, these gradients can be described as vertical gradients that flatten at larger Galactocentric radius; these vertical gradients are similar for both low and high-[alpha/M] populations. Stars with higher [alpha/M] appear to have a flatter radial gradient than stars with lower [alpha/M]. This could suggest that the metallicity gradient has grown steeper with time or, alternatively, that gradients are washed out over time by migration of stars.

Gizelle Hurtado & Dr. Karen Mabry; Biology, NMSU

Impact of urbanization on kangaroo rat abundance in Las Cruces, NM

Urban development can fragment and degrade remnant habitat. These alterations in habitat can have profound impacts on wildlife populations that are isolated by development. Urban populations can also be exposed to novel urban pressures and stimuli that may impact their ecology. I investigated the influence of urbanization on populations of Merriam's kangaroo rat (*Dipodomys merriami*). I hypothesized that urban development would affect the number of kangaroo rats in urban areas as compared to non-urban (wild land) areas. I live trapped 10 sites in Las Cruces, NM: 5 urban and 5 non-urban, from May to November 2013. There was no difference in kangaroo rat abundance between urban and non-urban sites, indicating that kangaroo rats are able to survive and reproduce in urban areas.

Laura Ana James; Counseling & Education Psychology, NMSU

Exploring the psychological impact of the Mexican Drug War in the border Mexican community

This qualitative study explores the experiences of Mexican immigrants in relation to the exposure to violence in Mexico prior immigration to the U.S. Eight participants were interviewed and the data was analyzed using a Descriptive Phenomenological approach. Two main themes that emerged from the data analysis are presented in this study which describes the participant's experiences, including the lack of trust in the police reported by four participants, and the impact that the exposure to violence had in their mental health. All participants reported being exposed directly and indirectly to violent events before immigration.

Yufeng Jiang, Liu Fang, Hongmei Luo, & Yunfeng Lu; Chemical Engineering, NMSU

Titanium oxide nanocrystal on carbon 3D-Scaffold for electrochemical energy storage

Effective energy conversion and storage are required for better use of energy due to the inevitable depletion of fossil fuels. Energy storage technology is the key factor in harvesting kinetic energy. In the past decades, there has been an ever-increasing demand for environmental friendly, high performance energy storage systems. Titanium oxide has been extensively investigated as electrode candidate for electrochemical energy storage, such as lithium ion battery. However, the poor conductivity of titanium oxide has limited its application. Carbon black, graphene, and carbon nanotubes (CNTs) are common supplements to electrode materials in order to increase their conductivity.

Three-dimensional (3D) carbon scaffold was made to be an additive to titanium oxide to improve its conductivity. It was made by CNTs (one dimensional) and graphene oxide (two dimensional). Titanium oxide was prepared by two-phase hydrothermal method, when the scaffold was introduced to titanium oxide, the specific capacity was 170 mAh/g at 0.3C and it is very close to the theoretical capacity of titanium oxide (175 mAh/g) and performed good cyclic data.

Manasi Jogalekar; Molecular Biology, NMSU

A three-dimensional culture system for breast cancer cell line HCC70

Tissue and organ failure are major health problems in the United States. Tissue engineering is a tool that can assist with identifying treatments for tissue and organ disorders, such as breast cancer, a disease that comprises about a fifth of all cancers in women. Three-dimensional cultures of breast cancer cell lines may be more similar to native cancer tissue in terms of morphology and gene expression, as compared to typical monolayer cell cultures. This pilot study was carried out with the goal of establishing a three-dimensional breast cancer cell culture system, and comparing its morphology with that of breast cancer cells grown in monolayer. To this end, the breast cancer cell line HCC70 was cultured in 3D matrix GeltrexTM (Invitrogen, 12760-021) and with conventional monolayer culture methods. Fluorescent probes were used to stain the cytoskeleton (Alexa Fluor[®] 488; F-actin) and the cell nucleus (Hoechst 33342; DNA) and images were captured using an epifluorescence microscope (Nikon TE2000). We noted that as expected, cells in monolayer culture appeared flat, adhered to the stiff plastic surface, and spread horizontally. In contrast, HCC70 cells maintained in GeltrexTM grew in multiple layers within a complex microenvironment, in close association with neighboring cells. Future studies will continue to evaluate the 3D culture system by assessing mitochondrial function with fluorescent probes, and cell ultrastructure with transmission electron microscopy. This research is supported by NIH P20RR016480.

Dusan Jolovic, Aleksandar Stevanovic, & Cameron Kergaye; Civil Engineering, NMSU

A Review of Traffic Management Center Practices for Contemporary Technological and Service Improvements

Traffic Management Centers require dedicated management and staff with specialized skills and training. They rely on advanced technologies and require operating and capital funding. Investments in new technologies and services should allow agencies to proactively manage and control traffic to optimize performance of a surface transportation system. The Utah Department of Transportation has commissioned a study to identify potential technological and service improvements for its TMC. The goal was to synthesize the current state of practice on applying innovative and advanced procedures, applications, and tools in TMC operations. This paper presents a summary of a broad web-based survey of transportation agencies and field visits to TMC agencies whose practices were recognized as most interesting for UDOT. The survey contained 22 questions which were developed for UDOT's need to investigate improvement areas in its own operations. After reviewing responses from 54 agencies, a technical advisory team selected TMC candidates to interview during field visits. Two tours were organized: "Eastern", touring TMCs in Minnesota, Pennsylvania, Ohio, and Virginia; and "Western" visiting TMCs in California and Missouri. This report summarizes the best practices from these field visits and provides a comprehensive list of highlights from all visited TMCs.

**Christianne Jane Jones, Dr. Linda Spencer, Genevieve Munoz & Stephanie Morales;
Communication Disorders, NMSU**

Spelling as a Window of Phonological Development in Children with Diverse Learning Backgrounds

Understanding how sound representations develop in typically developing children, struggling readers and in students who are English Language learners and those with hearing loss is important, because each group varies with experience in the amount of consistent exposure to English within their ambient language in the early years of their lives. Information learned in this study will help us to ascertain strengths, and weaknesses within the learning strategies of these groups for the development of interventions that exploit strong areas, and build upon weak areas.

Seda Karayazi Ozsayin; Special Education, NMSU

Teachers Attitudes towards Inclusion in Different Countries: a review of the literature

Inclusion is a term which means to educate all individuals, to the least restrictive environment, in the mainstream schools. Inclusive education is a first and foremost reform strategy which aims to include students with different abilities in regular schools. Successful of inclusive education in the schools or classrooms depends on teachers' attitudes and beliefs about inclusion and individuals with disabilities. This present study will provide a review of the literature on teachers' attitudes, beliefs, and cultural values towards inclusion in different countries. Results will reveal differences between teachers' attitudes towards inclusive education in the world.

Randa Keeley; SPED/CD, NMSU

Co-Teaching Model Preferences for Students and Teachers

This study is associated with the experimental and quasi-experimental group research.

Student perceptions of co-teaching models are integral to improving inclusive practices for students with disabilities. This study measured student perceptions of the effectiveness of the five co-teaching models in the inclusion classroom based on pre-established categories related to co-teaching (i.e., teacher authority, classroom management, student learning, behavior, etc.). This study has aided in refining evidence-based inclusive practices in the classroom in order to improve instruction in co-taught classrooms.

Despite the available research on the benefits and effectiveness of co-teaching as an instructional strategy/method, there is no research available regarding teacher and student preferences for each of the five co-teaching models (Murawski & Swanson, 2001; Weiss, 2004). In order to implement the models most effective for the students being served, we need to know what students and teachers perceive as most effective from a learner and teacher perspective and why.

This session will include the results of a survey study that measured student perceptions of the five co-teaching models. The results from the study indicated that differences existed with regard to student perceptions of the five co-teaching models. Recommendations for effective co-teaching will be offered following the session.

Naima Ansar Khan; Water Science and Management, NMSU

Combined natural attenuation processes in vadose zone for produced water in oil & gas operations

Produced wastewater (i.e., oil and gas) have significant environmental impact through releases or through applications that support various beneficial uses. The potential risks of soil and groundwater contamination associated with produced water are due to the high concentrations of petroleum hydrocarbons (some of them are carcinogenic) and salts (deteriorate irrigation or drinking water quality and also have an adverse impact on plant growth). Different methods like GC-MS, GC-FID, GC-TOF-MS - can be used to analyze the volatile and semi-volatile characteristics of produced water for There are significant natural attenuation processes inherent in both vadose zone and groundwater contaminant transport that serve to diminish concentrations or retain contaminants within porous media. Extensive research is underway to assess produced water contaminant transport and attenuation processes (adsorption, volatilization, diffusion/dispersion, biodegradation) and rates acting in soil and groundwater to mitigate potential groundwater contamination. Particularly the quantification of attenuation rates from each individual processes can be used to predict the coupled/overall contaminant attenuation in soil. Comparing attenuation rates between individual and combined natural attenuation processes will be one of the methods for this research. Moreover it will possible to evaluate the success of this process by comparing 1st order kinetics for individual and combined application of natural attenuation processes.

Mayra Lovas, Mario Gutierrez Casale, & Janeth Sanchez; Public Health Sciences, NMSU

Using Cancer 101 to increase cancer knowledge among public library staff in Southern New Mexico.

Background: Cancer 101 has been utilized as an effective educational tool to increase cancer knowledge among community members and to train health educators with accurate cancer information. Providing effective training for other professionals who serve as points of cancer information dissemination is vital. Past research suggests that public libraries are a source of health information for many individuals of low socioeconomic status. This study assessed the Cancer 101 curriculum as an effective training educational tool among public library staff.

Methods: Three public libraries in Southern New Mexico agreed to participate in Cancer 101 train-the-trainer sessions. The curriculum is comprised of ten modules each containing a pre- and posttest with five items. Participants were asked to complete a pre-test before each module and a posttest immediately after. Paired-samples T-tests were performed to examine changes in knowledge gained between pre and posttest.

Results: A total of 27 public library staff participated in the trainings, with 81% being female. Overall, participants demonstrated a significant increase in cancer knowledge for nine of the ten modules (all p values < .05). Participants did not exhibit increased knowledge on the role of genes in cancer most likely due to insufficient information in the training materials

Conclusions: Past research has shown that Cancer 101 is an effective tool for increasing cancer knowledge among communities and health educators. Results from this study suggest that Cancer 101 is an effective train-the-trainer tool among potential health information resources, such as public library staff.

Candyce Luna & Alma Gross; Public Health Sciences, NMSU

Pediatric Pesticide Exposure: Proximity of Selected Elementary Schools to Agricultural Crops in Doña Ana County, New Mexico

Background: Children experience a higher risk of pesticide exposure because their organs are still developing during critical periods where exposure to toxins can be permanently altering to their biological systems. Children living near agriculture have statistically significantly higher pesticide exposure. Agriculture is an important part of New

Mexico (NM) history and continues to be a significant part of the state's economy. In NM, there is a lack of pesticide monitoring and pesticide application records are unavailable. Methods: For this report, indirect methods to estimate pesticide application were necessary because records in NM are not available. Data mapping was used to estimate the amounts of pesticides used in Doña Ana County based on the crop acreage, and the most common used chemical pesticide agents used for a particular crop. Pediatric pesticide exposure locations were identified by targeting and mapping public elementary schools and measuring the proximity to local agricultural crops. Results: Children living in Doña Ana are at an increased risk of pesticide exposure as a result of potential pesticide drift from nearby agricultural farmland due to lack of sufficient environmental protections in place, such as adequate buffer zones. Conclusion: Issues identified included the lack of transparency present in the community's monitoring and reporting of pesticide applications and exposures. An accessible pesticide surveillance system would provide the necessary data to identify potential environmental health risks. More urgent is the need for a community wide assessment, to better understand the environmental health impact present in Doña Ana related to pesticide exposure.

Eribel Lupercio, Azucena Mayorga, & Teresa Román; Communication Disorders, NMSU
Somos Bilingües: The Need for Specialized Training Through the Eyes of Bilingual Graduate Clinicians

Few Speech Language Pathologists have specialized training to assess children for language difference versus a language learning disorder. Thus specialized training in working with the bilingual population becomes crucial for future clinicians. Four graduate students share their experiences in attaining specialized training in working with this fast-growing and dynamic population.

Laura Mayorga; Astronomy, NMSU
Disentangling the Planetary and Stellar Components of Transit Light Curves

The difficulty in confirming Kepler planet candidates from the ground drives the creation of more sophisticated transit light curve analyses. These analyses attempt to isolate planetary effects on the light curve and determine important planet properties such as size, mass, albedo, and temperature. The out-of-transit planetary signals can be dominated by seemingly minor stellar effects such as star spots which are not accounted for in the Kepler data pipeline. Fast rotating host stars can cause undulations in the light curve and become entangled with planetary phase effects. We compare two methods to remove these stellar effects. In the first method, we model the stellar star spot signal. The second method requires the filtering out the stellar rotation signal indicated by star spots through Fourier decomposition. We present preliminary results on the effectiveness of these two methods.

Sarah Ann McCormick, Kayla Hurd & Elizabeth Arnold; Anthropology, NMSU
An ethnoarchaeological examination of the utility of tool preparation methods for the production and use of bone and antler needles.

Previous ethnoarchaeological research evaluated the ease and expedience of various preparation techniques of bone and antler for tool manufacture. Using both fresh and dry bone, specimens were soaked, frozen and boiled as preparation methods prior to fashioning into a variety of needles. Control samples were selected and exposed to no additional processing. The same was repeated for antler in both fresh and dry condition. No preparation method yielded a clear choice for ease of manufacture as it was possible to create usable tools in a timely manner in all cases. However, boiling and/or soaking as a means of preparation does not enhance (and may impede) manufacture of bone and antler tools. The new research presented here examines questions of use and utility of the artifacts produced. How well would each tool hold up to use over time? Which material would need or tolerate reshaping? Each bone and antler needle produced in the first phase of research has been utilized for leather working and single needle knitting (naalbinding). Both qualitative and quantitative measures are used to evaluate and test the utility and durability of the tools. Size and shape of the needles were significant factors on duration of use (until breakage).

Amanda R. Miller; Social Work, NMSU

Strengths of the Homeless Population in a Rural Southwest Community

Homelessness is not a new phenomenon and is social issue that has been heavily researched since the 1980s. Homeless individuals are one of the most vulnerable populations in the United States and homelessness is highly stigmatized. One theme that has often not been associated with homelessness is the individual's strengths. This study seeks to address this lacuna by exploring the importance of viewing the strengths within the homeless population. Qualitative methodology using grounded theory was utilized to examine the stories of ten homeless individuals in order to examine the strengths they possess and how their strengths are assets for their current living condition. The researcher did ten semi-structured interviews with homeless individuals to hear their personal stories. The findings indicate that the homeless individuals to some extent struggled to see their personal strengths, but throughout the interview process identified several strengths without recognition. The homeless individuals interviewed are resilient and resourceful. A specific strength that was identified was the strong social support networks that they possess. The research findings strongly indicate the need and viability of social work practice recognizing the homeless' strengths and empower them to utilize them in their everyday life.

Alireza Moghimi; Industrial Engineering, NMSU

An observational before-after study of the of City of Las Cruces camera enforcement program

The goal of this research is to assess the impact of the red-light and speeding camera enforcement program on traffic safety. The City of Las Cruces, New Mexico introduced the program in March 2009, to improve traffic safety by reducing traffic violations, and consequently traffic accidents at signalized intersections. Initially, there were eight cameras in four different intersections. However, three of them were shut off in May 2010. The current research also includes crash data from six control intersections for comparison study which is a necessary requirement in conducting a proper evaluation of the camera enforcement program. This research includes about 1,700 crash records collected from ten signalized intersections in the city between March 2006 and February 2012. Empirical Bayes method was used to perform before-after analysis. The Empirical Bayes analysis uses the crash data from the control intersections along with ones from the camera intersections to predict the number of crashes in the absence of the camera enforcement program. Since the Empirical Bayes method can increase the precision of estimation even for limited data, and more importantly, it corrects for the regression to the mean bias; the corresponding results are more accurate than other traditional before-after analyses. The results show that two of four camera intersections experienced an overall positive impact as a result of the camera enforcement program. The current research also includes a total of 38,169 red-light violation records collected between March 2009 and February 2012, and about 12,400 speeding violation records collected from five camera sites in the city between May 2010 and April 2012, for the violation data analysis.

Cesar Eber Montelongo; Biology, NMSU

Bioinformatics analysis and gene expression studies of Complement-like factors in Biomphalaria glabrata

The complement system is an important component of vertebrate and invertebrate immunity. The complement pathways and its factors have been involved in key immune responses such as pathogen opsonization, tissue inflammation, recruitment of immune cells and direct cell lysis. The snail *Biomphalaria glabrata* serves as an intermediary host for the blood fluke *Schistosoma mansoni*, and although *B. glabrata* is essential in the transmission cycle for the human disease Schistosomiasis, immunological interactions between the snail host and parasite are still not fully understood. Here we focus in identifying and characterizing complement-like factors in the snail vector, *Biomphalaria glabrata*, using the newly published genome provided by the Snail Genome Consortium. We have identified multiple sequences in the *Biomphalaria* genome that code for potential transcripts containing complement-related domains such as the complement control protein domain, C1q domain, and the alpha-2-macroglobulin family signature. Furthermore, using this preliminary information, we have begun sequencing a C3-like sequence in the resistant strain of *B. glabrata*, BS90. Our immediate goal is to compare the expression of this C3-like sequence between *S. mansoni* uninfected and infected strains of BS90, in order to test whether this factor is up-regulated during the snail is exposure to the parasite. Future directions include using bioinformatics tools to further annotate the genomic sequences of the snail complement candidates, computer modeling and phylogeny analysis of the proteins, and mRNA expression and regulation analysis using RNAseq.

Stephanie Morales, Genevieve Munoz, & Christianne Jones; Communication Disorders, NMSU
Spelling development in four populations: Hard of hearing, ELL, struggling readers and typically developing third grade students

This study has the aim to investigate the different routes children use to develop their awareness of individual sounds in their environment and how this awareness impacts their spelling and reading. Phonologic (sound) representations are intrinsic to reading, writing and spelling in children and this project will elucidate on the spelling skills of three groups of third graders who are 1) typically developing English speakers, 2) English Language Learners (ELLs) 3) students with hearing loss. Participants will include 30 children from the following demographic groups: typically developing 3rd graders within the Las Cruces Public Schools, typically developing 3rd graders in the ELL program in the Las Cruces Public Schools, 30 children in 3rd grade whom are teacher-identified as struggling readers and 3rd grade children with hearing loss from within schools within the region.

Genevieve Munoz, Dr. Linda Spencer, Dr. Deborah Rhein, Christianne Jones, & Stephanie Morales; Communication Disorders, NMSU
Spelling as a Window of Phonological Development in Children With Diverse Learning Backgrounds

Phonological knowledge has been defined as an important skill for learning to read, write and spell in hearing children, thus information about how children develop phonological representations is intrinsic to advancing the three fields. Infants who have hearing are sensitive to more sound contrasts than are adults, but if certain sounds are not used within their ambient language they lose the ability to make those sound distinctions (Best, 1994). Understanding how these sound representations develop in typically developing children, struggling readers and children who are English Language Learners (ELLs) and those with hearing loss is important, because each group varies with experience in the amount of consistent exposure to English within their ambient language in the early years of their lives. Information learned in this study will help us to ascertain strengths, and weaknesses within the learning strategies of these groups for the development of interventions that exploit strong areas, and build upon weak areas.

Nikole Nielsen; Astronomy, NMSU
Characterizing the MgII Circumgalactic Medium Using MAGIICAT Galaxies

We probe the circumgalactic medium within 200 kpc of 180 galaxies using MgII absorption lines in the spectra of background quasars. We determined the colors, luminosities, and halo masses for all galaxies and have obtained the detailed CGM gas kinematics from high-resolution quasar spectra for ~40 of the galaxies. We find that the covering fraction of MgII gas depends strongly on galaxy properties such that higher luminosity galaxies have larger covering fractions at every impact parameter and for all MgII absorption thresholds. In contradiction to theoretical predictions that cold-mode accretion shuts off for halo masses $\log(M_h/M_{sun}) > 12$, we find no evidence for a drop-off in the gas covering fraction as a function of halo mass up to $\log(M_h/M_{sun}) = 13.8$, indicating that the MgII absorbing CGM in high mass halos is sustained by other means, possibly outflows. Lastly, the gas cloud-cloud velocity correlation function (velocity dispersion probability distribution normalized to galaxy circular velocity) reveals enhanced velocity spreads in bluer, higher redshift, and lower luminosity galaxies. Interestingly, lower mass halos have a highly pronounced larger velocity dispersion than higher mass galaxies, indicating that gas is more kinematically “active” in lower mass galaxies. Our results provide a clear picture of how the evolution of galaxies is strongly connected to CGM properties and place strong constraints on currently accepted theoretical ideas on galaxy evolution.

Winona J Patterson; Anthropology, NMSU
Captivating, Sacred Place at Tank Mesa Village in Montezuma Canyon, Utah

Tank Mesa Village, an archaeological site located in southeast Utah, shows at least three occupational events during the late Basketmaker III/early Pueblo I, Pueblo II, and Pueblo III periods. Unlike many of ancestral Pueblo sites in the Four-Corners area, settlement patterns at Tank Mesa Village display multiple occupations that are uninterrupted. The earliest occupation occurred around A.D. 600, and a hiatus took place for at least one generation; ancestral Pueblo people returned and constructed two different villages around mid-1100’s and around 1200. On the basis of

recent reconnaissance and mapping of the site, we argue that the Tank Mesa Village site was a captivating, sacred place for ancestral Pueblo people for several generations. Our argument is not only supported by the evidence of uninterrupted, multiple occupations of the site but also by the existence of a nearby, elaborate rock art panel as well as potential water shrines.

Javier Perez-Ramirez; Electrical & Computer Engineering, NMSU

Anchor-cum-Relay Nodes for Localizing a Mobile Source and Relaying Source Signals

The problem of selecting anchor-cum-relay (ACR) nodes for the dual purpose of tracking a mobile source as well as serving as relays for the source signal is considered. The proposed approach uses particle filters (PFs) with node selection based on the received signal-to-noise ratio (SNR) along with a localization constraint derived through the Fisher information matrix (FIM). The detail steps of implementation are given. A posterior Cramer-Rao lower bound approach is also explored to exploit information from previous node selections. Numerical results demonstrate that the proposed FIM-SNR approach achieves more than 16 dB in average source localization mean-squared error (MSE) over nearest node (NN) selection, while performing very close to FIMbased optimal localization. At the same time, the proposed FIMSNR provides a received SNR nearly identical to NN selection but outperforming FIM-based selection's SNR by more than 5.5 dB.

Kelsey E. Quinn; Animal and Range Science, NMSU

CXCL12 Expression Increases in Sheep Uterine and Fetal Tissues during Early Gestation

Improving livestock fertility is paramount for sustainability of food supplies. It is evident that without proper cellular communication between fetal and maternal tissues, pregnancy complications arise. Chemokines may be fundamental factors in regulating implantation and placental development. The C-X-C chemokine receptor 4 (CXCR4) is up regulated in endometrium during implantation and has only one recognized ligand, (C-X-C motif) ligand 12 (CXCL12). We have recently shown increased CXCL12 and CXCR4 protein expression in ovine fetal membranes (FM) and uterine caruncle (CAR) tissue during the timeframe of fetal attachment and placental development. However, the specific localization of CXCL12 and CXCR4 in FM and CAR tissues during early gestation has not been evaluated. We hypothesized that CXCL12/CXCR4 expression would increase in uterine tissues and FM as early pregnancy progresses. To test this hypothesis, uterine tissues with FM intact were collected on days 14, 16, 18, 20, 22, 24, 26, 28 and 30 of gestation and used for immunofluorescent detection of CXCL12 and CXCR4 proteins. Greater CXCL12 protein immunoreactivity was observed in FM compared to luminal epithelium on days 16-30. The increase of CXCL12 in FM suggests that CXCL12 promotes communication at the fetal-maternal interface. Because CXCL12 supports proper invasiveness and improves cell proliferation in human trophoblast cells, it is probable that it has similar functions in sheep. To our knowledge, this is the first report characterizing localization of CXCL12 in uterine and fetal tissue of sheep during early gestation, thus providing new insights into the importance of this chemokine during early gestation.

Gholamali Rahnavard; Computer Science, NMSU

Applying Big Data Approaches for Experimental Biological Data Mining: A Case Study

Biologists produce many expensive experimental data these days to test their hypotheses. Each experiment may contain some data that is not needed for the current hypothesis, but could be used to extract some interesting knowledge in the research area of the hypothesis. Depending on the labs, the order of the data and the storage mechanism could vary. If we collect and store this massive data, we could be able to apply Big Data analysis techniques and discover valuable knowledge beyond the data. In this talk I present a case study that illustrates how bioinformatics techniques could help to analyze experimental biological data. I used the BLT mice model experiments as a case study here which shows how we can apply multivariate analysis methods to the experiment data as a Big Data technique.

Jamey L. Rislin, Dr. Ivelisse Torres-Fernandez; Dr. Ralph James Crabbe; Desa Daniel; & Jessica Jackson; Counseling & Educational Psychology, NMSU

The Invisibility Syndrome: Understanding Black Men's Experiences with Contextual-Cultural Discontinuity

Individuals are born with a specific set of social identities that predispose them to certain levels of power and privilege in society (Harro, 2000). Individuals are often socialized to engage their social identities in the codified and stereotyped way that society condones (Franklin, 1999). Traditionally, African-American men have often been perceived as pillars of strength in the African-American community and have been revered as men that are immune to psychological and physical weathering (Head, 2004). Simultaneously, African-American/Black men struggle to define themselves amidst racialized and gendered messages that indicate that they are unintelligent, incapable of caring for their families, lazy, irresponsible, aggressive and hypersexual (Akbar, 1996, Beckley, 2008; Ferber, 2007; Hall, 2001; Landrum-Brown, 1990). In essence, African-American/Black men negotiate chronic challenges of prejudice and discrimination often associated with their social identity (Stevens & Englar-Carlson, 2010).

Franklin (1999) notes that Black men experience The Invisibility Syndrome, a preponderance of negative racialized-gendered experiences that occur when Black men engage in (1) culturally dissimilar/culturally disaffirming environments and (2) situations and interpersonal interactions that leave them contemplating how their choices, mobility and rights have been restricted or have been impacted by their racial and gender identity. These chronic challenges can manifest in a number of ways (e.g physical ailments/cognitive stress/psychological weathering/mental health problems/reduced work/school performance and medical issues) that impact one's sense of self and ability to negotiate environments. The current study is a qualitative study that seeks to understand the phenomenological experiences of Black males and their experience with The Invisibility Syndrome.

Aaron Rosenthal, Andrew Garcia, Marcus Wolschlager & Alejandro Castro Jr.; Electrical & Computer Engineering, NMSU

NMSU Power Generating Capacity: Vision and Roadmap for 2050

New Mexico State University's power generating capacity must increase to meet the energy demands of campus facilities by the year 2050. In its current configuration, NMSU's co-generation plant can only supply around 40% of the present campus load. The remainder of the demand is provided by the El Paso Electric Company, primarily from the Tortugas substation. With the student population on the rise and the price of electrical energy increasing due to political climates, inflation, and growing scarcity of resources, NMSU faces a classic challenge seen in the utility industry: current power generation is being utilized at its economic maximum and is being rapidly outpaced by growing demand. This poster explores potential solutions that would help NMSU keep up with growing demands.

At a minimum, if present power generating capacity is maintained, all campus facilities must employ alternate means to generate power in order to contribute towards meeting increased growth in campus energy requirements. New building construction must integrate energy harvesting capabilities to harness energy from air exhaust systems, utilize available space on rooftops for solar energy, and explore other innovative ideas in energy storage and generation toward developing sustainable environments. The goal is to create environments that are self-sufficient in their energy requirements. The integration of such novel energy harvesting technologies will transform NMSU's campus into a true microgrid configuration.

Teresa Ross; Astronomy, NMSU

Metallicity Distribution Functions of 4 Local Group Dwarf Galaxies

Metallicity, age, and mass are fundamental characteristics of a stellar population. Metallicity distribution functions (MDFs) along with chemical evolution models, contain information on the history of enrichment, inflow, and outflow within the galaxy. MDFs for Leo I, Leo II, IC 1613, and Phoenix dwarf galaxies were derived from photometry from the Wide Field Camera 3 (WFC3) instrument aboard the Hubble Space Telescope (HST). While the metallicity accuracy (~ 0.2 dex) in our study is lower than spectroscopic measurements we can reach fainter magnitudes and measure every star in the field, producing an order of magnitude more stellar metallicities than previous studies. We fit the MDFs of four Local Group dwarf galaxies to analytical chemical evolution models to quantify the affect of gas flows and star formation within the galaxies.

Claudia Salaña; Education, UTEP

Art as a Tool of Communication of Meanings in Children with Disabilities

This proposal is focused on the study of art as a voice to children with disabilities that promotes inclusivity and diversity through the recognition of their space in society. The diverse research shows the importance of continued exploration in child-learning and social environment. In that sense, the meta-analysis of the research explores the relation between art as a semiotic tool and social environment signs, which are immersed in child interaction. This study reveals that the environment plays an important role in the expression of meanings. The relationships that are established through the different places help to shape the sense of identity and autonomy of children with disabilities.

Liliana Salazar; Department of Public Health Sciences, NMSU

Colonia Residents' Perceptions of Water Quality in Dona Ana, NM and El Paso, TX

Colonias are unincorporated settlements along the U.S.-Mexico border which emerged without the services normally provided by local government. Consequently, water lines do not reach all *colonia* residents; even when they do, many residents live in substandard housing not meeting county building codes and, therefore, not qualifying for hook up to public water. Alternative water sources for these households include water wells and hauled water stored in tanks. This study examined *colonia* residents' perceptions & concerns regarding water quality in their home. Methods. *Promotoras* recruited participants who relied exclusively on hauled or well water. Participants. Forty-seven *colonia* residents participated across five focus groups, two in El Paso, TX and three in Dona Ana, NM. Instrumentation. A survey assessed demographics, water source characteristics, and access to potable water. Focus group questions assessed residents' perceived water quality, concerns for domestic use, current water treatment practices, and preferred filtration systems. Procedure. Participants completed consent forms and a survey, then participated in a one hour focus group discussion. Analyses. A thematic analysis was conducted on the focus group responses using two independent coders. Results. Although water quality, concerns, and treatment practices were reported by both El Paso and Dona Ana *colonia* residents, the former referred to hauled water stored in large water tanks, while the latter referred to well water. Overall, impoverished *colonia* residents spend a great deal of their income purchasing additional drinking water, filter and appliance/pump replacements. They also revealed a need for health education on water safety and proper water treatment procedures.

Bahar Sayoldin; Computer Science, NMSU

Applying Data Mining and Bioinformatics Techniques to Analysis Capsicum Species Transcriptome

Chile peppers such as *Capsicum* spp. are an important agricultural and economic crop that have a wide variety of uses especially in food and medical purposes. Identifying genetic variations that differentiate pepper species is very important. The genetic variation of chile peppers affects the pungency and pigmentation, and are products of unique bioactive classes of compounds such as capsaicinoids (heat), and carotenoids (color and pro-vitamins) are easily recognized. The goal of this work is to identify transcript in two major species of cultivated *Capsicum*, *C. chinense* and *C. annuum* transcriptome data sets to identify unique expressions by comparing transcript expression patterns and using bioinformatics and data mining tools for annotating the transcript profile of these two species.

Harmandeep Sharma; Plant & Environmental Sciences, NMSU

Partial root zone drying helps conserve water while maintaining chile growth and yield

Growth and yield of chile crop depends upon amount and timing of irrigation. Chile is an important specialty crop of arid New Mexico. Surface water availability is limited in the state and there is need to practice water saving irrigation strategies like partial root zone drying (PRD). The objective of this study was to test suitability of drip irrigated PRD techniques for water conservation while maintaining growth, and yield of greenhouse chile (NuMex Joe Parker; *Capsicum annuum*) for two consecutive growing seasons. Three treatments include: (i) Control where water applied at surface using standard operating procedure, (ii) PRDv where water is applied at 100% of control at 20 cm depth, and (iii) PRDc where water is applied at 70% of the control in alternate root compartments at fortnight interval during first year. Deep percolation was measured throughout the growing season. In the second

year, to reduce water loss to deep percolation, less water was applied in the control and PRDv than first season, but same amount in PRDc. Plant physiological parameters such as photosynthetic rate, stomatal conductance, leaf temperature, stem water potential, plant height, and root length density were measured throughout the season. Crop yield and yield components such as no. of pods/plant, pod length, pod width etc were also evaluated. The water balance was conducted from known irrigation amounts, volumetric water content measured using TDR sensors and hydra probes, evapotranspiration and deep percolation. Evaporative demand inside greenhouse was estimated using measured meteorological data including net radiation, air temperature, wind speed, and relative humidity. Results from first year showed that water usage can be decreased by up to 30% while maintaining total fruit yield. Results indicated that PRD methods can be adopted as water saving methods for chile crop in arid environments.

Sukhbir Singh, Sangu Angadi, Sultan Begna & Kulbhushan Grover; Plant & Environmental Sciences, NMSU

Water use depths across root zone of spring safflower in the Southern High Plains

A field experiment was conducted during 2012 and 2013 seasons at Clovis, NM to assess seasonal patterns of water extraction of two diverse spring safflower cultivars under different irrigation levels with or without refilled profile moisture. Half of experimental blocks were pre-irrigated with 160 mm of water to refill the empty profile from previous crop of corn (PI), while the other half remained depleted (NPI). Of five irrigation levels used in the trial, three levels I1 (75 mm), I3 (225 mm), and I5 (375 mm) were used for the assessment of seasonal patterns of water extraction. During the first observation period from 17 to 50 days after planting (DAP), the extraction depth and amount varied by both pre-irrigation and irrigation levels. Water extraction increased by 40 to 77% in PI over NPI at I1 and I3 irrigation levels. However, further increasing irrigation level to I5 decreased reliance on soil moisture, especially under NPI. During this period almost all of water extraction was from the top 0.9 m depth. The next 35 days period (50 to 85 DAP) saw steep increase in water extraction from almost all depths to 1.5 m. Water extraction during this period from PI blocks was 36 to 59 % higher over NPI including I5. About 25 to 60% of that increased extraction was from 0.9 to 1.5 m depth, the lower per cent being in I5 treatments. Although the total extractions during the period were higher in PI compared to NPI, fraction of water extracted below or above 0.9 m remained the same. The water extraction during the final 34 days (85 to 119 DAP) saw steep decline in water extraction and the major fraction of extraction was coming from below 0.9 m depth. Second year results will be added to the poster.

Swati Somuri; Public Health Sciences, NMSU

Weight Management Practices in College Students and Their Underlying Eating Motives

A meta-analysis by Vella-Zarb & Elgar (2009) found an average weight gain of five pounds in freshmen college students attributed to dietary practices, reduced physical activity, psychological stress, and alcohol consumption. With increasing overweight and obesity trends in the young adult population, this study examined weight management practices (WMP) among college students and their underlying motivational tendencies. Gender and ethnic differences were also examined. METHODS. Participants included 681 students attending New Mexico State University. MEASUREMENT. The WMP online survey (Shamaley, 2011; 36 items) included nine subscales assessing different WMP for weight control or loss. The Eating Motives Inventory (EMI; 37 items) consisted of three Behavioral Inhibition (BIS) and four Behavioral Activation (BAS) subscales. ANALYSES. We conducted multivariate analysis of variance using gender and ethnicity as the independent variables and WMP as the dependent variables. We also conducted bivariate correlations between the EMI and WMP subscales. RESULTS. Almost half of this college sample was overweight or obese. Gender differences were identified in regards to WMP. Men engaged in greater exercise and protein supplementation whereas females engaged in greater use of diet aides and caloric restriction. With regard to eating motives, both BAS and BIS motives were related to unhealthy WMP (laxative and vomiting). A single BAS subscale, Sensation Seeking positively related to recommended WMP (caloric restriction and healthy eating).

Ian Sturdevant & Dr. Kwong Ng; Electrical & Computer Engineering, NMSU

Preconditioning and Ionic Current Modeling for Element Free Simulation of Cardiac Propagation

Accurate numerical simulations of electric field propagation in detailed cardiac models using conventional numerical methods such as the finite element method require a mesh consisting of elements connecting a set of nodes. Generation

of such a mesh for a complex geometry is usually both computationally and labor intensive. The Element Free Galerkin (EFG) method has shown promise in simulating such complicated geometries. It eliminates the need for mesh generation by using two sets of nodes, a set of evaluation nodes at which field values will be calculated and another set of integration nodes to enforce the weak integral form of the governing equation. This is accomplished by describing interaction between nearby nodes via a shape function with finite support associated with each evaluation node. However, the nonlinear ionic current required for simulating cardiac propagation is both spatially and temporally dependent. As such, direct integration of the current model would require it to be repeated at each time step, making the integration computationally prohibitive. This work studies three techniques for representing the current as an expansion in terms of the shape functions with time-dependent expansion coefficients or weights. This turns the current integration into an integration of the shape functions, which only needs to be performed once. The choice of matrix solver and preconditioner is also considered, in an effort to find the optimal combination for efficient simulation of cardiac propagation using EFG.

Richard Raymond Torres; Education, UTEP

'Conquering' the World: Differing Discourses in Global English

This poster will examine the differing theories concerning the spread of Global English. There will be an examination of David Crystal's neutrality theory as contrasted with Robert Phillipson's theory of linguistic imperialism. The poster will utilize color and easy to follow concepts that will illicit discussion.

Addison Warner; Anthropology, NMSU

Exploring Chultun Functionalities: An Experimental Assessment of Food Storage in Chultuns at Uaxactun, Guatemala

Research was focused on replicating particular principles of Dennis Puleston's food storage experiment in chultuns at Uaxactun, Guatemala. Investigations were conducted during the 2013 Uaxactun-SAHI field season under the supervision of the Slovak Archaeological and Historical Institute (SAHI). The experiment was conducted over 47 days, with observation made every 3-4 days depending on the climate and rain. Food observations were made by weighing, photographing, and detailed recording of decomposition conditions. The eight varieties of foods utilized were macal, camote, cacao, yucca, dried corn, smoked corn, black beans, and red beans from Belize. Results showed great preservation of the camote and macal following the experiment. The yucca and both types of beans decomposed completely with a high presence of fungus and mold. Whereas the other foods of cacao, dried corn, and smoked corn all presented varying levels of preservation, though a percentage of each food was still edible following the experiment. For future experiments the environmental conditions should be closely monitored including the humidity index due to their influence on the overall preservations. Alterations should be made to the types of foods used and measurement of the water content of each food would be vital to understanding their preservation abilities.

Lea Wise-Surguy; Art, NMSU

Untitled (Agar Box)

In the realm of today's eco arts, Lea Wise-Surguy is exploring the relationship between ourselves and our environment. In Wise-Surguy's piece *Untitled (Agar Box)*, a life-sized, rectangular Petri dish was built and inoculated by the artist's touch of her full-frontal body. The bacterium that grows large enough to be seen by the naked eye simultaneously resembles both micro- and macro- landscapes as peaks and valleys and planes of differing colors emerge. There the bacterium grow and change with time, and are both a real and symbolic form of life started by human remains. Definitions of self, life, body, and death are blurred and in contemplating the ecology that grows there, it symbolizes environments and ecologies and asks questions about sustainability and the inter-connected relationships of any system.

Cat Wu; Astronomy, NMSU
How to Analyze a Spiral Galaxy

Spiral galaxies can exhibit many types of phenomena, such as thin disks, thick disks, outflows, flares, warps, and lagging halos. Sometimes they show all of these and sometimes they are simply a quiescent disk, but most of the time they show various combinations of these. I will explain what each of these phenomena is, describe how astronomers use galaxy modeling to determine which of these characteristics are present in their observed galaxies, and explain what implications this might have for a particular galaxy's evolution.

Jacob Vander Vliet; Astronomy, NMSU
Structure and Evolution of a Dwarf Galaxy's Circumgalactic Medium

The halo structure of dwarf galaxies are predicted to be unique when compared to larger galaxies. We test this prediction by examining mock quasar spectra of the circumgalactic medium (CGM) of three simulated dwarf galaxies to determine the properties of their halos at redshift zero, and the CGM of a single galaxy as it experiences a star formation burst. All three galaxies have the same initial conditions but are simulated with different feedback mechanisms. We measure the absorption lines of several commonly observed ions including HI, MgII, CIV, and OVI and compare the covering fraction and equivalent width distribution for all simulations.

Yuliana Zaikman; Psychology, NMSU
Ambivalent Sexism and the Sexual Double Standard

The sexual double standard is the notion that that men and women are evaluated differently for identical sexual behavior. The goal of the present study was to investigate the relationship between sexism (prejudice against individuals based on their sex) and the sexual double standard. There are two types of sexism: hostile (negative prejudice) and benevolent (positive prejudice). We hypothesized that participants high on hostile or benevolent sexism would exhibit the sexual double standard to a greater degree relative to participants low on either types of sexism. Participants completed the Ambivalent Sexism Inventory (ASI) and the Ambivalence Towards Men Inventory (AMI) and then evaluated a target individual who reported having 0, 1 or 12 sexual partners. Results show that female participants' sexist attitudes were related to more positive evaluations of sexually active men than women, whereas male participants' attitudes were related to more positive evaluations of sexually active women than men.