Talk and Performance Abstracts

(In alphabetical order by author)

Mariam Abdelmalak; Curriculum & Instruction, NMSU
Building Online Learning Communities Using Web 2.0 Technologies

In this paper I describe how I use Web 2.0 technologies to facilitate the development of a community of learners among graduate distant students and how students responded to the use of Web 2.0 tools and to what extent these tools assisted in developing a community of learners. Twitter, Skype, Google Documents, Blog, and Wiki were intentionally used in order to build online learning communities among students. An anonymous survey was used. The students indicated that using Google Documents, Twitter, Wiki, and blog gave them a sense of a learning community while using Skype did not give them a sense of a learning community. Google Documents and Wiki had the most impact on students' sense of a learning community in the course.

Lekha N. Adhikari & Dr. Matthias Burkardt; Physics, NMSU
Quark Angular Momentum Distribution in the Transverse Plane

Several possibilities to relate the t-dependence of generalized parton distributions (GPDs) to the distribution of angular momentum in the transverse plane are discussed. None of them turns out to correctly describe the orbital angular momentum distribution that one would identify for a longitudinally polarized target.

Amani Al-Ghraibah; Electrical & Computer Engineering, NMSU
Feature Selection in a Cross-Validated Classication Framework as Applied to Spatial Features of Solar Magnetogram Images

Solar flares release stored magnetic energy in the form of radiation and can have significant detrimental effects on earth including damage to technological infrastructure. Recent work has considered methods to predict future flare activity on the basis of quantitative measures of the solar magnetic field. Feature selection methods can provide insight into the measures which have the largest discriminatory potential and can provide a means to streamline real-time processing of solar data. Since solar flares are relatively rare events, however, datasets for such predictive analysis are inherently unbalanced which causes a bias in the classification. Cross validation with randomly subsampled balanced datasets can mitigate classifier biases for unbalanced datasets, but it is unclear how to implement and interpret feature selection in such a framework. This paper proposes a method to determine an appropriate feature subset with cross validation classification based o n a histogram analysis of selected features. We show that the feature subsets resulting from this analysis yield better classification accuracies across a large unbalanced dataset unseen in the feature selection and classifier training.

Armando Altamirano; Curriculum & Instruction, NMSU
Common Practices of Law: From Slavery to Immigration Policies

The purpose of this paper is to explore the historical judicial treatment granted to undocumented immigrants [UI] and its effect on legislature and the treatment of UI. Using the theoretical lens of Critical Race Theory [CRT] I seek to uncover how racist practices have served as the foundations of many polices that relate to the judicial treatment of UI. I will present information, narratives, and general data to compare and contrast the actual immigrations laws with some of the policies and decreets constructed during the Colonization of the Americas that dealt with slavery and noncitizens. This analysis employs a CRT perspective that carefully analyzes the intersectionalities between UI and racism, power, and race as a beginning framework that describes how today, immigration policies fail to protect UI and allow the use of inhumane punishment against them, people whose only crime is the lack citizenship.

Joshua W. Amburgey; Physics, NMSU
Raman Spectroscopy in Oscillating Large Electric Field Gradients

Raman spectroscopy has become a staple technique used to probe a wide variety systems. Since very few molecules contribute to Raman scattering, the scattering intensity is weak. Discussed here is a proposed method for enhancing the Raman signal using oscillating large electric field gradients.

Kenza Arraki; Astronomy, NMSU
The tidal disruption of satellite galaxies

Information about the survival of Milky Way satellites is important for interpreting indirect dark matter detection results and for testing of the cosmological model at the smallest scales. However, even after extreme tidal stripping the complete disruption of a satellite galaxy is difficult to achieve. We investigate the survival of dwarf galaxies orbiting a Milky Way sized host using numerical simulations. The tidal evolution of our simulated satellites is extreme, with evidence of large amounts of mass loss, reductions in circular velocity, and evolution of density profiles. The steep inner slope of the NFW profile results in a compact region that is difficult to destroy even in the most extreme orbits. Using the ratio of the satellites tidal to scale radius and number of completed orbits, we create a predictive model of their evolution. This model is a powerful tool to estimate mass loss, maximum circular velocity reduction, and density profile at all times for any orbiting satellite.

Dawn M. Bates; Counseling & Educational Psychology, NMSU
Prejudice and Discrimination in Graduate School: A Discussion

My dissertation topic is rooted in my own experiences as a feminist, bisexual White woman in a graduate program. As I reviewed the literature, I began with women, trying to find research that suggested that women still were experiencing sexism while in their graduate programs. This proved somewhat difficult and I was surprised to find that there was not as much recent evidence as I had anticipated. I began to explore other "differences", including race, ethnicity, international students, age, class, and motherhood. While I found some evidence of prejudice and discrimination within some studies (for example, Beoku-Betts, 2004; González, 2007), it was generally buried in the research, hidden in the measures the researchers gave, and not discussed at length in the articles. I found this interesting because my experiences and so many stories from other graduate students did not support these minor mentions and brief discussions of discrimination in academia. When I turned to look for lesbian, gay, bisexual, and transgendered students experiences in graduate school, I found two older dissertations that discussed gay and lesbians students experiences.

I found this distressing. I wanted to know women graduate students' stories and I believe there is a need within the literature to directly address and share narratives about graduate students' experiences with prejudice and discrimination. I would like to gather graduate students for a discussion about the prejudice and discrimination that they experienced in graduate school. Having this discussion allows us to support each other and network.

Alejandro E. Bernal; Agricultural Economics & Agricultural Business, NMSU
Evolution of retail food markets and Supplemental Nutrition Assistance Program

The primary objective of this study is to examine the impact of changing Supplemental Nutrition Assistance Program (SNAP) participation rate and benefit levels on local access to retail food outlets overtime. An econometric model that accounts for spatial correlation is used to analyze the data. The preliminary results show that the relationship between the SNAP participation rate and retail food business is negative particularly in rural areas.

Carmen C. Boje & Dr. Edward Pines; Industrial Engineering, NMSU
A Survey-Interview to analyze the Electronic Health Records Systems in United States of America

Electronic Health Record (EHR) practices affect patient care cost and organizational efficiency. This research applies industrial engineering methods and statistics to create an EHR system assessment tool to collect data, evaluate the EHR system quality level, analyze EHR system problems, and compare different EHR systems.

EHR system quality is determined by the following factors: EHR acceptance and learning time, current EHR system stage, efficiency, and cost. EHR acceptance factors like adequate training, perceived usage qualities, perceived usefulness, tech support qualities are investigated and compounded in a total acceptance level. These items are rated on a five-point scale. Results are categorized by type of practice (private or public), specialties, geographic areas, and EHR stage levels.

Understanding the needs and attitudes of the medical staff would help organizations to facilitate the EHR smooth implementation. The findings can be useful to EHR developers in designing products to accommodate multiple clinical specialties and user skill levels.

Reiterative applications of the analytical tools developed by this research could serve to optimize the quality of Information Technology used for the health care services in the US.

Ramaninder Brar; Physics, NMSU
Effect of dissolved gases on the formation of surfactant free emulsions

The stabilization of hydrophobic colloids, such as oil droplets, in water has attracted scientist for a long time for a variety of scientific, pharmaceutical and industrial applications. In medicine today, many anti-cancer agents, as well as other drugs, are hydrophobic and cannot dissolve in water. There is a pharmacological interest in providing a delivery mechanism for these highly hydrophobic drugs through the bloodstream. A typical methodology would be to introduce a surfactant which would serve to bind the hydrophobic molecule to the aqueous environment but surfactants can be toxic and can cause side-effects that would decrease the quality of life for the patient. Because of the need for the surfactant to be non-toxic this avenue proves problematic and many highly hydrophobic drugs which could prove effective are not useable. The work of Pashley and coworkers has demonstrated that hydrophobic materials can form emulsions with water if all of the dissolved gasses have been removed. However, very little is known about the structure and stability of these emulsions or even to what extent they form. We have demonstrated the formation of a stable emulsion of Silicone Oil in degassed water alone. The emulsion droplets were on the order of 50 nm in diameter and stable over a period of 8 hour. We have also studied the change in turbidity of oil droplets in water with time. Our present work involves the effect of degassing on the density of water and formation of stabilized surfactant free emulsions in a homologous series from pentane through decane. The emulsions structure and thermodynamic stability can then be characterized using small angle x-ray scattering.

Federico Campeotto; Computer Science, NMSU
Explore the use of GPUs in constraint solving

This paper presents an experimental study aimed at assessing the feasibility of parallelizing constraint propagation– with particular focus on arc-consistency using Graphical Processing Units (GPUs). GPUs support a form of data parallelism that appears to be suitable to the type of processing required to cycle through constraints and domain values during consistency checking and propagation. The paper illustrates an implementation of a constraint solver capable of hybrid propagations (i.e., alternating CPU and GPU), and demonstrates the potential for competitiveness against sequential implementations.

Melissa Cast; Management, NMSU

Domains as Sources of Acculturative Stress in International Students: An Ethnographic Perspective

International students are an important asset in higher education institutions as they bring financial growth and cultural diversity. However, international students face unique challenges produced by acculturative stress during their acculturation process. This stress leads to negative symptoms which in turn affect students physiological, mental health, and social environments. Current studies have identified such symptoms mostly in a quantitative manner, but usually fail to address the emic aspect of such symptoms, their origins, and related frequency or occurrence. Therefore, this paper presents an ethnographic study conducted at a large land grant institution in the Southwestern United States. The paper contributes to the literature by addressing existing gaps in three main ways. First, it provides an insight as to different domains and emerging themes to examine who and how symptoms of acculturative stressed are produced. Second, it gives an insight as to the frequency and occurrence of such symptoms. Finally, this paper provides the proper resulting implications for higher education institutions and administrators.

Hayley Cotter; English, NMSU

From Fragmentation to Wholeness: The Dwarfs of Spensers Faerie Queene

Unas Dwarf, introduced in Book I of Spensers Faerie Queene (FQ), has long defied a satisfactory allegorical interpretation. The other main characters of the book – Redcrosse, Una, Archimago, Duessa – invite more straightforward, obvious readings, but the Dwarf has either been overlooked entirely, explained in overly simplistic terms, or dismissed as a mere agent that propels Spensers plot. Clearly, the approach to the Dwarfs interpretation has been fraught with problems. The first is that critics have chosen to look at Unas Dwarf independent of the other dwarfs that inhabit subsequent books: Florimells Dwarf (Books III and V), Paeanas Dwarf (Book IV) and Brianas Dwarf (Book VI). The second is that critics have been too quick to provide the dwarfs with a prosaic explanation that fails to capture both the subtleties of the characters and the intricacies of the plot. Looking at existing criticism surrounding Unas Dwarf, and then analyzing the roles of the poems remaining dwarfs will support my thesis, namely that Spensers dwarfs should not be viewed as separate entities; instead, they exist only as alter egos of the Ladies they serve, and that they are no longer mentioned after they fulfill their duty serves as evidence of their reintegration with their respective Lady. This explanation of the dwarfs both accounts for their abrupt disappearance from the text and grants them the psychological attention they and their ladies deserve.

Ryan E. Cruz; Marketing, NMSU

Advertising differences in male aesthetic among non-Caucasian actors across three magazine genres

Advertisements guide and influence consumer preferences, behaviors, and gender role affiliations. The actors, products, messages, and embedded social roles within advert parameters introduce, normalize, reinforce, and replicate behavior through the availability of print and digital media. Although it may be argued that consumers are free agents in information consumption, advertisements are large determinants in the decision-making processes leading to the consumption and presentation of aesthetic.

This research investigates advertisement actor aesthetic to decipher not only what exists in advertisements, but also why it exists and how it modifies across target audience mediums. To prepare for this work, a review of advertising, marketing, and gender theories is presented followed by empirical literature and methodologies on content analysis inspiring the creation of an assessment tool used to survey and investigate male actor aesthetic within a sample of 710 advertisements selected from three issues of nine magazines printed in 2010.

Desa K. Daniel & Dr. Ivelisse Torres-Fernandez; Counseling Psychology and Education, NMSU

A Phenomenological Study of the Invisibility Syndrome among African Americans

According to Franklin (1999) the invisibility syndrome is comprised of social confusion due to mixed messages regarding African American males legitimacy as accepted members of mainstream society. This qualitative research aims to uncover possible themes associated with African American College students experiences at their perspective universities.

Laura Davidson-Salguero & Dr. Igor Sevostianov; Department of Mechanical & Aerospace Engineering, NMSU
Microstructure and Elastic Properties of Cortical Bone

This presentation focuses on the connection between microstructure and the elastic properties of cortical bone. We obtain an analytical, closed form model to represent this relationship. This topic has attracted the attention of researchers in biomechanics for more than half a century. At present, the microstructure of cortical bone is largely established. It consists of hydroxyapatite interlaced with collagen fibrils in a dense matrix, interrupted by a series of cavities and channels; Haversian canals, Volkmans canals, osteocyte lacunae, and canaliculi. It is extremely important to understand the real contribution of many different elements of the microstructure to the overall properties of cortical bone because it is an evolving material. The microstructure depends on many factors and changes significantly with age. Due to mathematical complexity, the microstructure-property relationships are usually oversimplified in existing literature. In most cases the authors either neglect the actual anisotropy of the mineralized tissue or they fail to consider the full set of cavities and channels established as existing in normal cortical bone. In our study, we account for both of these factors. The proposed approach, in particular, allows the estimation of the effects of aging (decrease in osteocyte lacunae concentration, change in shape and size of Haversian canals, etc.) on the mechanical performance of cortical bone- foremost of which is a decrease in stiffness that may lead to increased risk of fracture. The obtained results are in good agreement with published experimental data.

Bishnu H. Dhakal, Rajesh K. Patti, & James W. Herndon; Chemistry & Biochemistry, NMSU
Generation and Reactivity of Isobenzofurans from Carbene Complex Acetylene Coupling

Fischer carbine complexes are useful precursor for the various synthetic transformations. Many examples of polycyclic aromatic ring systems involve the coupling of carbene complexes with enyne carbonyl systems to form an isobenzofuran followed by a third component. The reaction between chromium carbene complexes with enynecarbonyl derivatives has been carried out to afford different derivatives of alkylidenephthalans. Coupling of these substrates are unique in that decomposition of the isobenzofuran to an alkylidenepthalan is too fast for coupling with a third component. This unique facile net [1-7]hydride shift will be the focus of the talk.

Kefaya Diab; English, NMSU
Contested Representations of Reality in Waltz with Bashir & Children of Shatila: The Agenda Setting Theory as Analytical Framework for Looking at Documentaries

When I first watched Waltz with Bashir and Children of Shatila documentaries I were caught in a deep thought; both documentaries evolved around the massacre of Sabra and Shatila in Lebanon in 1982. Yet, the two films provided contested representations of reality regarding what happened there, driven by two different political agendas. To me as an Arab, I already believed in one version of the story. However, thinking about the Western audiences that would see these films, it occurred to me: which version are they more likely to believe? How do they judge which tale is more accurate? And are they aware of the agendas behind these representations put forth by these films? According to Stuart Hall (1997), reality doesnt exist until somebody represents it to audiences. The implication is that deception is accessible to those who have the power to tell their stories about the historical world. In this paper, I apply the Agenda Setting Theory (McCombs & Shaw, 1972) to both these documentaries to show how these films used rhetorical strategies to persuade their audiences to believe their representation of reality. In doing so I analyze: (1) the filmmakers choice of story topic, archive and characters during the pre- production stage, (2) the audio- visual techniques of representing the characters during the production stage, and (3) the professional and the mass audience evaluation during the post- production stage.

Rebecca Dutton; Social Work, NMSU
An Exploratory Mixed-Methods Study of the Impact of Formal Education on Moral Development in Post-Conflict Liberia

The purpose of this study is to explore the effect of formal education on moral development in young adults in post-conflict Liberia. Since education has been identified as having a key role in moral development in numerous

cross-cultural studies, it is important to understand the role of education in moral development in Liberia as education had been disrupted for many students during the civil conflict. 102 participants were interviewed using a modified version of the Determining Issues Test. Each participant decided the best course of action in three scenarios and explained why they thought this was the best choice and what issues were important in their determination. The study determined that numerous factors including gender, location, past experiences during the civil conflict and community connections influenced the level of moral development an individual had attained.

Ronny Forney; Geography, NMSU
The Effects of Diurnal Patterns on the Spatial Distribution of Female Desert Bighorn Sheep (Ovis canadensis mexicana)

This project explores variation in the distribution patterns of desert bighorn between day and night, specifically whether there are variations in elevation, slope, and aspect of desert bighorn locations. The data used in this study are of 6 adult female desert bighorn captured from the Cabeza Prieta mountains, Arizona in 2002. Female locations are mapped in ArcGIS raster layers, allowing for inferences of spatial patterns and prediction of female desert bighorn locations. I generate a Minimum Convex Polygon around all female point locations to estimate home range size and determine movement. Data points within this polygon are considered areas of use and are compared with an equal number of random points to indicate areas of availability and to determine habitat. To model the surface of the mountain range, I obtain 10 m, 1/3 arc second elevation data, which is overlaid with point locations. In addition, the elevation data is used to create a slope map using percent slope as the output, as well as an aspect map using preferred azimuth categorizations as the output. Whether surfaces are convex (curving outward) or concave (curving inward) are also considered. To determine if there is a significant statistical difference in the means in the six samples of each of the three dependent variables, given two independent variables, MANOVA is applied using SPSS. It is predicted that variation exists in female desert bighorns use of slope, aspect, and elevation between night and day, and between samples (females) in the population.

Mark Franzak; Curriculum & Instruction, NMSU
Exploring the intersections of mathematics and race – What are teachers' beliefs, how did they originate, and what are the implications?

The body of research in teacher-held beliefs in mathematics education is wide and varied, however, the aspect of teacher-held beliefs about race is almost non-existent, and existing research often perpetuates deficit models (Martin, 2009). The base of research on teachers' beliefs of mathematics explores teachers' views of mathematics in comparison to their views of teaching and of learning mathematics, often rooted in Ernests (1989) model, in which mathematics is categorized as dynamic, static, or utilitarian. These explorations have focused on the relationship between teachers' beliefs and their development of constructivist classrooms (Beswick, 2007), student improvement on assessments (Watson & De Geest, 2005), instructional practice (Thompson, 1984), inquiry-based instruction (Wilkins, 2008), etc. However, this body of scholarly work has not addressed mathematics teachers' beliefs about race.

Through qualitative research, I will explore teachers' beliefs about race, mathematics, and teaching and learning mathematics. Participants will be white teachers in the Las Cruces Public Schools teaching classes with Latina/o students. Utilizing Nespor's (1987) concept of episodic development of beliefs, I will identify specific events and experiences that are the seeds of the beliefs teachers act upon in their practice. I will also explore teachers' construction of their own race (McIntyre, 1997) as well as the race of their students (Martin, 2010; Sleeter, 2004) as essential components in creating a complete tapestry of the nature of the interactions of teachers' beliefs about mathematics and teaching and learning mathematics. I expect this research will inform the extant gap of research in race in mathematics education.

Adriana Goenaga Ruiz de Zuazu; Curriculum & Instruction, NMSU
Critical Literacy in the Classroom through Literacy Circles

In the form of culturally and linguistically diverse books, I present a study about teaching through critical literacy in an elementary classroom of a school in the Southwest of the United States. This study is based in the consideration

of texts as social constructs, never neutral; thus, both teacher and students, when exposed to a text, are to bring their perspective and opinion to deconstruct what they read to give sense and meaning to the world (Vasquez, 2012). In the process of teaching through critical literacy in the classroom, I present the use of literacy circles, which will be presented as a continuation of read-alouds and as an alternative to work texts in discussion groups. The main characteristics of the literacy circles will be addressed in the presentation. They are put into practice as a way to address current social issues through critical literacy. In a further reflection, it is necessary that teachers select books that represent the diversity of the cultures and backgrounds of their students, and that they create opportunities to have open discussions following the critical literacy perspective.

Laura Goodman; Animal & Range Science, NMSU
Effects of Applying Picloram and Aminopyralid with 2,4-D on White Locoweed in Northern New Mexico

Locoweed toxicity in livestock is generally prevented by precluding access of animals to infested ranges during early spring and fall and/or by controlling locoweed populations through herbicide application. Picloram is effective in controlling locoweed; however, aminopyralid may be a superior product because of its efficacy at lower application rates, lower off-target movement, and its 'Reduced Risk' classification. White locoweed (Oxytropis sericea), non-target grass, and non-target forb response to picloram+2,4-D (P+D; applied at 64 fl oz product/a) and aminopyralid+2,4-D (A+D; applied at 24 fl oz product/a) were investigated at three locations in northern NM. Three randomly selected 200m2 plots at each site were either not treated (control) or sprayed with P+D or A+D in June 2009. Both herbicides were similarly effective in reducing locoweed density, plant size, and biomass 15 MAT (months after treatment) compared to untreated rangeland. Locoweed canop y cover was not different in P+D and untreated plots 15 MAT (P=0.06) but was reduced in A+D plots (P¡0.01). A+D treatments had lower non-target forb canopy cover than their P+D counterparts 15 MAT (P=0.03). Grass biomass remained similar within treatments over time for control (P=0.86), A+D (P=0.67) and P+D (P=0.57) plots, and was similar across treatments 15 MAT (control: 85.8g/m2, A+D: 94.6g/m2, and P+D: 93.0g/m2). Grass canopy cover increased in both herbicide plots (A+D: P¡0.05 and P+D: P¡0.05) relative to control plots 15 MAT.. Overall, both herbicides appeared to affect locoweed and non-target grasses similarly although A+D was less selective, killing a higher proportion of non-target forbs.

Candace Gray; Astronomy, NMSU
Venus' oxygen green line emission: an auroral process?

Venus' oxygen green line at 5577 is a highly variable feature on the Venusian night side, with intensities ranging from stronger than terrestrial green line to non-detectable. We find that green line emission is correlated with large solar events such as solar flares, coronal mass ejections (CMEs), and solar wind streams (SWS). We propose that electron precipitation from CMEs and SWS is the main process responsible for green line emission and we suggest that electrons are penetrating deeper in the atmosphere and with higher density than previously believed or modeled. To test this hypothesis, we compare electron density profiles on the Venusian night side, obtained by the Venus Radio Science Experiment on Venus Express, before and after solar flares and CMEs.

The process for emission is still unknown, but they suggest two possibilities. First, increased levels of EUV photons from flares may increase photodissocation of dayside molecules, which are then transported to the nightside, to a large enough level where green line emission becomes detectable. Second, electron precipitation from solar flares and CMEs may have a high enough energy and density to penetrate deep in atmosphere (<150km) in order to produce green line emission without producing oxygen red lines 6300, 6364, and 7600 Å. Gray detected the green line immediately after a CME impact on April 22, 2012 but was not able to detect the feature after two separate solar flare events not associated with a CME.

We propose that electron precipitation is the main process responsible for green line emission and suggest that electrons are penetrating deeper in the atmosphere and with higher density than previously believed or modeled. To test this hypothesis, we compare electron density profiles on the Venusian nightside, obtained by the Venus Radio Science Experiment on Venus Express, before and after solar flares and CMEs. Here we present the result of these comparisons. This research is funded by NASA's Earth and Space Science Fellowship, NNX12AM70H.

Karina Yazmin Gutierrez-Jurado; Water Science & Management, NMSU
Farm water budgets for semiarid irrigated floodplains of northern New Mexico: characterizing the surface water-groundwater interactions.

With the recent projections for water scarcity, water balances have become an indispensable water management tool. In irrigated floodplains, deep percolation from irrigation can represent one of the main aquifer recharge sources. A better understanding of surface water and groundwater interactions in irrigated valleys is needed for properly assessing the water balances in these systems and estimating potential aquifer recharge. We conducted a study to quantify the parameters and calculate the water budgets in three flood irrigated hay fields with relatively low, intermediate and, high water availability in northern New Mexico. We monitored different hydrologic parameters including total amount of water applied, change in soil moisture, drainage below the effective root zone, and shallow water level fluctuations in response to irrigation. Evapotranspiration was calculated from weather station data collected in-situ using the Samani-Hargreaves. Previous studies in the region have estimated deep percolation as a residual parameter of the water balance equation. In this study, we used both, the water balance method and actual measurements of deep percolation using passive lysimeters. Preliminary analyses for the three fields show a relatively rapid movement of water through the upper 50 cm of the vadose zone and a quick response of the shallow aquifer under flood irrigation. Further results from this study will provide a better understanding of surface water-groundwater interactions in flood irrigated valleys in northern New Mexico.

Sten Hasselquist; Astronomy, NMSU
Kinematical and Chemical Gradients Within the Sagittarius dSph Galaxy

The Sagittarius (Sgr) dwarf spheroidal (dSph) galaxy is presently merging with the Milky Way and is thus a prototype for substructures that participate in the hierarchical build-up of our galaxy. Using highly precise radial velocities from 328 stars observed by the Apache Point Galactic Evolution Experiment (APOGEE) of Sloan Digital Sky Survey III, we have verified with strong significance the existence of a dynamical cold point in the center of the satellite (Majewski et al. 2013, ApJL, in press). Stellar parameters and abundances derived from the APOGEE pipeline have shown evidence for a metallicity gradient that suggests that this cold point may be related to differences in the distributions and dynamics of multiple stellar populations within the Sgr dSph. In this study we further explore the stellar populations and kinematics of the Sgr dSph by expanding our sample to include ∼40 recently acquired APOGEE targets, as well as 408 additional members from R 15,000 spectroscopic observations obtained with the Hydra spectrograph on the Blanco 4m at Cerro Tololo Inter-American Observatory (see Frinchaboy et al. 2012, ApJ, 756, 74). This expanded data set provides us with 4 times greater radial coverage (out to ∼6 kpc from the center) for a more comprehensive investigation of the dynamics and stellar populations of this relatively large satellite of the Milky Way Galaxy.

Robert M. Hastings; Education, NMSU
The Crisis in STEM: Menace, Myth - or Both?

This paper, submitted in a graduate education class, explores a widely perceived crisis in Science, Technology, Engineering and Mathematics in the USA. Is there truly a shortage of competent scientists, mathematicians and engineers? If so, then what is causing it? If not, then why does this perception exist? As a separate issue, is there a crisis in the education of primary and secondary students in STEM subjects? If so, then how may this be ameliorated? A solution to such problems in STEM education is proposed by the author.

Hector L. Hernandez; Agricultural Economics & Agricultural Business, NMSU
A Household Model of Food Security in Tanzania

Tanzania is a sub-Saharan African country considered a Least Developed Country by the United Nations. The World Bank estimates that about 33% of the population lives below the poverty line (in 2007), Gross National Income per capita is estimated at $570 US dollars (in 2012), and life expectancy is about 60 years at birth (in 2011). It is no wonder that a portion of Tanzanias population suffers from food insecurity. According to the World Food Program (2013), about 29% of households were highly food energy deficient. The main thrust of the present research is to

expand on the research of food security in Tanzania. Using Living Standards Measurement Survey (LSMS) data reported in Tanzanias National Panel Surveys (NPS) from 2008 and 2010, this study analyzes measures of food security using an economic model of a farm household. The results are expected to contribute not only to a better understanding of food security, but also to broaden the scope of the literature for Tanzania and Sub-Saharan Africa.

Rebekah L. Horn; Molecular Biology, NMSU
Identifying drivers of local adaptation in an ephemeral pond crustacean (Notostraca: Triops*)*

Conditions that drive local adaptation in a species include reduced gene flow, a heterogeneous landscape and selection towards genes specifically adapted to the habitat. To further study and understand the factors that can lead to local adaptation, controlled lab experiments were performed using the tadpole shrimp (*Triops newberryi*) as a model organism. Previous research has indicated that *T. newberryi* is highly genetically structured across small spatial scales and can occur in playa lakes with varying water chemical values. It is unknown, however, if specific genes in *Triops* are adapted to a native habitat. To test this, lab experiments were developed to hatch *T. newberryi* cysts in water where they natively occur and in non-native water. Hatched individuals were then preserved for differential gene expression analysis. Results indicate *T. newberryi* has a higher hatch rate in its own pond water and reduced hatch rate in a novel environment. From the hatched *T. newberryi*, greater than 24Mbp of the transcriptome was sequenced resulting in over 10,000 predicted peptides. Differential expression analysis of *T. newberryi* hatched under native and non-native water conditions identified only four transcripts with a significant difference in expression. These results indicate that naupliar *T. newberryi* does not exhibit stress responses to non-native water; suggesting early life history stages do not determine an individuals success in a non-native environment. Despite satisfying some conditions of local adaptation, gene expression analysis of *T. newberryi* suggests either a generalist life history and/or that maternal effects are important.

Ping Hou; Computer Science, NMSU
Revisiting Risk-Sensitive MDPs: New Algorithms and Results

A core problem in artificial intelligence is how an autonomous agent can make decisions autonomously, and our research focuses on exploring novel mechanisms and methods of decision making under uncertainty. The decision making problem is formalized as a mathematical model called Markov Decision Process (MDP). MDPs have many application areas, such as Mars rovers planning their daily schedule of activities (Mausam et al., 2005), planning of military operations (Aberdeen et al., 2004), robocup soccer (Stone et al., 2005), an agent playing blackjack (Popyack, 2009), a set of elevators operating in synchronization (Crites and Barto, 1995), and intervention of cellular processes (Bryce and Kim, 2007). While MDPs have been shown to be effective models for planning under uncertainty, the objective to minimize the expected cumulative cost is inappropriate for high-stake planning problems. As such, Yu, Lin, and Yan (1998) introduced the Risk-Sensitive MDP model, where the objective is to find a policy that maximizes the probability that the cumulative cost is within some user-defined cost threshold. In this paper, we revisit this problem and introduce new algorithms that are based on classical techniques, such as depth-first search and dynamic programming, and a recently introduced technique called Topological Value Iteration. We demonstrate the applicability of our approach on randomly generated MDPs as well as domains from the ICAPS 2011 International Probabilistic Planning Competition (IPPC).

Racheal Jones; Water Science & Management, NMSU
Estimating available saline water resources in aquifers of New Mexico using GIS

It is currently believed that there are roughly 15-billion acre-feet of saline groundwater available in New Mexico aquifers, an estimate first published in 1962 by the New Mexico Office of the State Engineer. This estimate is based on 50-year old, reconnaissance-level investigations although it is still a widely-published statistic. This research seeks to answer the question of whether or not 15-billion acre-feet of available saline water resources is a reasonable estimation for New Mexico. This research collected, synthesized, and analyzed existing well data housed by municipal, state, and federal agencies. Well data were also collected from non-governmental agencies, regional and site specific reports. Methods used to answer the "15-billion acre-feet" question include mapping and analyzing synthesized well

data in ArcGIS 10.2. Surface and subsurface geology data were used in conjunction with well data to determine where saline groundwater exists and to estimat e the thicknesses of the saline water-bearing zones. The goal of this research is to provide updated information regarding the total quantity of saline groundwater available in New Mexico and to provide a starting point for water managers at all levels to assess the viability of their saline groundwater supplies.

Elizabeth S. Klimek; Astronomy, NMSU
The Causal Connection Between Inflows, Outflows, and Disk Star Formation in ART Simulations

The CGM is a component of galaxies that hosts a wide variety of physical processes, including accretion, outflows, tidal stripping, and condensation. Understanding the detailed relationship between the processes in this region and the processes in the central disk is integral to developing a complete picture of how galaxies form and evolve. We use high resolution cosmological simuluations to study the cause and effect relationship between disk star formation and the flow of gas through the circum-galactic medium (CGM) of the high redshift progenitors of Milky Way mass galaxies. Using a time series of snapshots between $2.0_i z_i 4.0$, we show how star formation events in the disk launch high velocity (hundreds of km/s), hot ($T_i 10^6$K) material radially outward. This outflowing material does not significantly impede the ability of cool, accreting material to advance toward the central disk. Smooth radial accretion is dominated by warm-hot ($10^5_i T_i 10^6$ K) gas at all radii (up to 2 virial radii) throughout our redshift range. Infalling small galaxies can be identified and tracked using the radial mass flux of stars and dark matter. This allows an estimate of the amount of stars and mass accreted due to merging events.

V. Bleu Knight & Elba E. Serrano; Biology, NMSU
Profiling the Normal Human Astrocyte Transcriptome with Next Generation Sequencing

The tailoring of therapeutic treatments to individuals is facilitated through affordable, complete genome sequencing technologies such as Next Generation Sequencing (NGS). In this study, we exploited NGS in order to acquire a comprehensive view of gene expression among Normal Human Astrocyte cultures. Experiments were undertaken with the goal of characterizing genes essential for glial function. Cells from two anonymous donors were cultured simultaneously in replicate environments. RNA was extracted from the second passage of cells and analyzed for quality control on an Agilent Bioanalyzer. RNA with RIN ≥ 8.9 was shipped to the MIT BioMicro Center, where Illumina Tru-Seq protocols were used to purify poly-A and reverse transcribe RNA to cDNA. The cDNA was prepared for sequencing on the SPRI-works system using BioMicro Center adapters and PCR primers. The multiplexed samples were then sequenced twice with an Illumina HiSEQ 2000. The resulting sequences were mapped to the human genome (UCSC build hg 19; Genome Reference Consortium GRCh37) with the TopHat pipeline software on the Broad Institute public server. CuffDiff software was used to evaluate differential expression and to quantify the fragments per kilobase of transcript per million mapped reads (FPKM). Analysis after log2 transformation revealed that approximately 3000 genes were differentially expressed between the two donors with a fold change greater than 2. The differential expression profile was analyzed in detail using the Database for Annotation, Visualization and Integrated Discovery (DAVID) v6.7. As part of functional characterization of the NHA transcriptome, we conducted an in-depth analysis of genes for ion channels as well as genes that are typically used to classify astrocytes. The results establish putative therapeutic targets in NHA and provide a basis for evaluating NHA cells after exposure to different environmental conditions. The outcomes of our transcriptomic analysis provide a rich resource for further investigations of ion channel function, signaling pathways, and gene networks in human glia. Supported by NIH (P50GM068762).

Phanidhar Kukutla, Jinjin Jiang, Dong Pei, Wanqin Yu, & Dr. Jiannong Xu; Biology, NMSU
The Impact of Gut Bacteria on the mosquito Anopheles gambiae *Fecundity and Immunity against malaria* Plasmodium berghei

The symbiotic bacteria in the mosquito gut affects mosquito fecundity and immunity. In a complex microbial assemblage different members may contribute to different host life traits. We hypothesized that certain bacteria enhances mosquito immunity while other bacteria benefits host fecundity. Mosquitoes were fed on sugar meal containing different gut bacterial isolates to construct a desired gut community with dominance of introduced bacteria. Bacteria fed mosquitoes were then infected with rodent malaria *P. berghei*. The mosquito gut was dissected and examined

for infection. The number of oocysts on the gut was taken as a measure of the anti-malaria immunity. Mosquitoes with fewer parasites had stronger immunity than those with more parasites. Fecundity was measured by counting the number of eggs in the ovaries.

Oral ingestion can establish a gut bacterial community that is dominated by the introduced bacteria. These mosquitoes were used to evaluate bacterial contributions to the immunity and fecundity when infected with malaria *P. berghei*. Introduction of *Enterobacter*, *Elizabethkingia* or *Leucobacter* significantly reduced oocyst load, suggesting these bacteria enhance mosquito anti-malaria immunity. Intriguingly, *Leucobacter* had the strongest effect, the infection rate dropped from 85% in control to 36% in treated group, and the average parasite number decreased from 153/gut in control to 21/gut in treated group. Furthermore, mosquitoes with *Leucobacter* had greatly reduced fecundity in comparison with other bacteria fed mosquitoes. In contrast, *E. anophelis* provided mosquito with a better reproductive outcome than other bacteria. In general, mosquitoes displayed significant tradeoffs between infection/immunity and egg production/fecundity.

These results demonstrate that *Leucobacter*, *Enterobacter* and *Elizabethkingia* effectively enhance mosquito immunity. *Leucobacter* appears to be an ideal symbiont that boosts anti-malaria immunity while reducing fecundity. In sum, different host traits could benefit from different symbionts in associated gut microbial community.

Jessica P. Lail; Psychology NMSU
He said, she said: Engendering blame through personalization biases in news reports of sexual assault

Terministic screens are rhetorical devices deployed by authors to direct the audience toward a specific connotation. Newswriters frequently use terministic screens to position the subjects of a news report either closer to the audience in terms of humanization, or farther away in terms of dehumanization. When reporting sexual assaults, these rhetorical devices may affect the audience's perception of the article's actors depending on the level of humanization allocated to either the victim or the perpetrator. This study intends to analyze the relationship between the deployment of subject positionality and terministic screens as they relate to the attribution of blame in news articles reporting a rape.

Tiep Le; Computer Science, NMSU
Logic Programming for DCOP

Distributed Constraint Optimization Problems (DCOPs) has been used to model various multi-agent coordination and resource allocation problems. This field has matured considerably over the past decade. However, existing DCOP algorithms have focused almost exclusively on imperative programming techniques, in which it teaches computers how to solve the problem step by step. In general, imperative programming techniques consider various inputs the same to each other; they dont allow reasoning for each specific input problem. Without reasoning, those techniques must propagate all of possible solutions, and then pick an optimal correct one as answer. However, there are a lot ones among possible solutions propagated which can be reasoned not to be correct. Observing that, my research explores a new direction, which is to develop algorithms that use declarative programming, specifically logic programming, techniques. Applying logic programming could improve DCOP solvers in terms of scalability and performance due to its ability of reasoning about the problem.

Wenyan Li; Chemical Engineering, NMSU
Fluorescence decay measurements using flow cytometry

Standard laser-based flow cytometers are instruments that enable the characterization of cells by measuring light excitable molecules. Fluorescence and light scatter are typical cytometric measurements widely used, for example, to track subcellular events, and discriminate among native proteins, cell receptors, enzymes, nucleic acids, or gene engineered fluorescence proteins. Spectral differences in the light intensity that is emitted from each cell will help discriminate among different cellular phenomena; however fluorescent colors overlap significantly enough to limit certain flow cytometry assays. In this contribution, we present a new time-resolved cytometry approach to efficiently, sensitively and accurately measure the fluorescent lifetime. The lifetime is a parameter, independent of intensity

that will add to the information content of a cytometer without being disturbed by spectral overlap issues. To accomplish this, we continuously "dither" a laser across a flowing streams of cells so as to interact with each cell multiple times. This methodology results in fluorescence measurements that contain the fluorescence lifetime decay profiles. We present measurements to prove this approach where a fluorescence protein and several fluorophores with different lifetime values ranging from approximately 3 to 25 ns were examined. Fluorescence decay analysis of these measurements positively correlate with fluorescence lifetimes. This was possible by observing long fluorescence lifetimes (e.g. ≥ 10 ns), deciphered by having a long tail and short fluorescence lifetimes by observing the short tail. This cellular analysis technique enables the statistical measure of single fluorescence decays, but also multi exponential fluorescence decays in a high-throughput manner. Our ongoing research is evaluating the capabilities of this new type of flow cytometer using Frster Resonance Energy Transfer (FRET) applications and fluorophore localization scenarios in cells to gain more quantitative information about intracellular events.

Stella M. Lucero; Education Management & Development , NMSU
Leadership Change and Reform

This presentation is about the roles of leadership change agents and how political forces play a key role in dictating reforms. Educational reform involves changes in policy, as well as structure to ensure the practices to restructure public schooling or is accomplishing it in a systematic method. Lastly, I will discuss the history of the pendulum of change.

Thushara W. Madanayake; Chemistry & Biochemistry, NMSU
CYP2S1 depletion alters mTOR signaling in Beas2B cells; orchestrating cell size

Cytochrome P450 2S1 (CYP2S1) expression is elevated in several epithelial derived cancers including squamous cell carcinoma. Although the expression pattern of CYP2S1 suggests an important physiological function, it is still considered as an orphan enzyme with unknown endogenous substrate. To deorphanize the CYP2S1, expression was depleted in human BEAS-2B cells, using RNA-interference targeting the 3UTR (759) and exon 3 (984) of the CYP2S1 gene, and compared with a non-targeting shRNA control (SCRAM). Transcriptomic analysis was performed on CYP2S1 depleted (759) and scrambled control (SCRAM) BEAS-2B cells using RNA-sequencing (RNA-seq). Pathway analysis of differentially expressed genes, using the Database for Annotation, Visualization, and Integrated Discovery (DAVID) analysis, revealed pathways consistent with previously published endogenous substrates and phenotypes. Additionally, analysis also revealed significant changes within mTOR signaling in response to CYP2S1 depletion. mTOR signaling is involved in regulating cell growth. Consistent with changes in cell growth, both CYP2S1 depleted cell lines, 759 & 984, exhibited an approximate 10% increase in cell diameter and 50% increase in cell volume. Western analysis of the mTOR signaling pathway reveal posttranslational changes consistent with increased cell size in CYP2S1 depleted cells (759 & 984) compared with control (SCRAM). CYP2S1 depleted cells specifically exhibit increased phosphorylation of mTOR, and its downstream target S6 kinase. These data suggest that alterations in CYP2S1 expression, and presumably CYP2S1-mediated endogenous metabolism, influence cell size through regulation of mTOR signaling. We are currently pursuing the mechanistic link between CYP2S1-mediated metabolism of endogenous substrates and mTOR signaling.

Giselle Del Carmen Martinez Negrette; Curriculum & Instruction, NMSU
Balanced Dual Language Education in Linguistically Unbalanced Dual Language Classrooms

Dual Language Instruction represents a learning system where minority and majority language speakers learn two languages simultaneously and appreciate their differences. This pedagogical approach supports cultural, social, and academic understandings that connect students through mutual support and respect. Successful dual language settings require very specific conditions that foster linguistic and socio-cultural development; but what can be done when bilingual educators are faced with a classroom population which does not fit the mold of the "perfect" dual language classroom? How can bilingual teachers provide a balanced dual language education in linguistically unbalanced dual language classrooms? This is the focus of this Teacher Action Research mini-project. Using Teacher Action research, I conducted a retrospective reflection of my own practice as a bilingual teacher in a linguistically unbalanced 3rd grade bilingual class in a public school, in Las Cruces, NM. Through the use of Action Research,

I was able to consider the motives guiding my actions, the circumstances surrounding these actions, the impact that my actions had on the students, and how they effected me and my teaching practices. During my reflection, I critically considered my assumptions as a bilingual educator and worked on identifying expectations or ideas that might had been affecting my classroom interactions. I focused on this type of reflection aiming to discover new ways to refine my practices and help my bilingual students impartially.

Nigel Mathes; Astronomy, NMSU
A Detailed Spatial Study of HI and OVI Absorbing Gas Around Galaxies

We present a sample of 14 galaxies imaged by HST with high resolution spectra covering HI and OVI absorption. Galaxies lie within 300 kpc of the quasar line of sight over the redshift range $0.1 < z < 0.7$. We find that HI absorption exists in excess of logN(HI) = 14 out to impact parameters 300 kpc, with OVI detected out to 260 kpc. In our small sample, we find that higher than average column densities of hydrogen (logN(HI) ¿ 15) are located within the galaxy virial radius. HI absorbers with enhanced column densities are aligned within 10 degrees of the projected galaxy major and minor axes. The OVI column density distribution is consistent with being flat at all distances and orientations. The kinematics inside and outside the virial radius are distinct, with only 10% of clouds located within the virial radius having velocities exceeding the halo escape speed compared to 45% outside the virial radius. We also find 70% of clouds have velocities greater than the escape velocity around lower mass halos compared to 10% around higher mass halos. From these data, we infer that lower mass galaxies appear to preferentially pollute the IGM by expelling their gas. Conversely, higher mass halos seem to retain the majority of their outflowing gas which, through recycling, should replenish their ISM with chemically enriched gas. Thus, the different kinematics of CGM clouds for lower and higher mass galaxies may be responsible for the observed mass-metallicity relationship in galaxies.

Jean McKeever; Astronomy, NMSU
Studying the internal structure of stars through asteroseismology

Asteroseismology is an important tool in stellar astrophysics. It provides a unique insight into the interior of stars that would otherwise be unobservable. My research is focused on the structure and evolution of red giant stars. Through careful extraction and analysis of the oscillations on the star's surface I can derive mass and raidus estimates. Additionally, the information contained in the oscillation frequencies allows me to further describe the star's physical structure and evolutionary state. I present here my initial work on extracting the oscillation frequencies.

Greggory T. McPherson; Physics, NMSU
The construction and implementation of a small angle light scattering instrument as a structural probe of micron-scale pore systems in solids

Small angle light scattering (SALS) has been well developed as a tool for studying the microstructure of polymers, as well as probing features of biomolecules and other macromolecules in solution, but applications to inhomogeneous solids and solid-liquid phase systems is less well established. A SALS instrument was designed and built at Oak Ridge National Laboratory to study pore and grain structures in rock samples from many geological formations over length scales on the order of one to several hundred microns. Here will be discussed the design of the instrument, some challenges inherent in using visible light scattering in highly attenuating and often optically inhomogeneous media, and some initial results.

Maria Dolores Molina; Communication Studies, NMSU
Venir sin temores, a exponer la cultura: Preliminary Study of the Factors Impacting Culture Shock Among some Ecuadorian Sojourners in the U.S.

This study reports the findings of research conducted on factors impacting the acculturation process among a group of Ecuadorian students participating in a teacher training program. Thirteen participants were interviewed and a thematic analysis was done using Kim and Ruben's (1988) Stress Adaptation Growth Model as a guide. Participants

identified some key factors that impacted their adaptation as use of humor, expectations and nonverbal behavior among others. This study is an initial report of findings, although the project continues. Future analysis will include an interpretive analysis of the acculturation process.

Yvonne Moreno; Special Education, NMSU
Transition: Barriers, best practices, and teacher assumptions on disability

All individuals regardless of their exceptionalities must have a right to the self-actualization of their goals and aspirations. However, according to the literature, many individuals with disabilities experience poor post-school outcomes. Successful transition is the key to helping individuals set and achieve their post-secondary goals and live independent, productive lives. In order to achieve this, we must identify the barriers that hinder the transition process of individuals and address them through the implementation of best practices. In addition it is important to identify the role that teacher assumptions on disability have on the implementation of transition best practices in schools and on shaping the post-school outcomes for individuals with disabilities.

Balakesavaraju Nadikatla; Electrical & Computer Engineering, NMSU
Fully Integrated Switched Capacitor Buck Converter using Capacitive Banks for High Efficiency over a wide range of Load currents

A circuit and method for providing high efficiency over wide range of load currents is implemented in this paper. The design is fully integrated switched capacitor buck converter implemented with digitally modulating the bucket capacitor by selecting appropriate number of capacitive banks to the output terminal during a clock cycle. A pair of non-overlapping fixed frequency clocks is provided to the Switched capacitor when the respective bank is selected. This converter is designed in 0.5 um technology converting from 3.3V to 1.5V with load range of 5mA to 100uA (6 bit). This design can achieve maximum efficiency of 70% and could maintain around 50% at lower load currents. Implemented better layout techniques to accommodate both bucket and tank capacitor on chip.

Mauren G. Navarro; Curriculum & Instruction, NMSU
Globalized capitalism, neoliberalism and its effects on the living condition of the worlds population

There are many elements involved in globalization, and every element is fundamental as part of the perfect puzzle that comprises this process in which the imperialistic ambitions of nations corporations, organizations, and the like and their desire, indeed need, to impose themselves on various geographic areas to obtain their goals (Dasgupta, S. & Kiely, R., 2006, pg. 239). Today we wonder how human beings have allowed extreme inequality between them and how we have permitted so much injustice. Dasgupta, S. & Kiely,R. (2006) point out that "the idea of globalization is a future world with a single economy based on the capitalist market principles. The system of hierarchy is based on inequalities between the rich and poor nations" (pg. 241). To understand the process in which some obtain more benefits than others it is important to understand globalization, neoliberalism and capitalism from the beginning of their creation. What is globalization?; The effects of globalization (positive and negative); How globalization affects human beings creating different inequalities, based on the construction of new strategies (capitalism and neoliberalism); About identity; Economy; migration/women / negative effects; The role of mass media; The curriculum construction fulfill which needs?

Tara Devi Newar, Rodolfo Tello-Aburto & William A. Maio; Chemistry & Biochemistry, NMSU
The First Total Synthesis of (–)-Palmyrolide A

Nature produces a large variety of natural products, among which some possess potent biological activity. Palmyrolide A was recently isolated from an assemblage of cyanobacteria and was found to display relatively potent sodium channel blocking activity without any cytotoxicity. A full account of our synthetic work towards the first total synthesis of the neuroactive marine macrolide (–)-palmyrolide A will be presented. Our first generation approach aimed to unlock the absolute stereochemistry of the macrocycle via the synthesis of four diastereomers of palmyrolide A aldehyde, a known degradation product, and all four possible stereocombinations of the macrocycle. These studies confirmed the

absolute stereochemistry of palmyrolide A and subsequent work led to the first protecting group free total synthesis of natural (–)-palmyrolide A.

Ramona Isabel Ojeda; Languages and Linguistics, NMSU
Aurora

Aurora is a short novel story, presented in the form of many short stories. It is a fictional novel for a thesis that takes place in two different cities; a small city located in the South of México and a small town called Aserradero. Aurora takes place during the end of XX century and the beginning of the XXI century. Aurora narrates the life of Aurora Imperial and of many of the people that surrounded her during her living days. Many of the short stories represent many moments of her life, many of them full of joy but others full of hope, fantasy, wonder, love, and heartache. Aurora is the story of a little girl who was born in a humble house, whos mother had to give her out in adoption because she was just a little girl herself. Auroras childhood and teenage years are full of violence and marks her in deep ways, she has to learn to survive these traumatic events in her life and explore the many ways in life to make something better of herself as a person and in life.

Romina A. Pacheco; Curriculum & Instruction, NMSU
Participatory Action Research as Pedagogy of Expansion

Framed by a Participatory Action Research (PAR) paradigm, this presentation will explore the possibilities of engaging college students in what Cannella (2008) calls a pedagogy of expansion. That is, engaging in a process that gives everyone involved (including those designated as teachers) the opportunity to experience an "expanded notion of learning, expanded engagement of identities, expanded idea of educational goals" (p. 190). This pedagogy of expansion intentionally positions everyone participating as a learner and a teacher. In other words, an "effort is made to dislodge the hierarchy of which knowledge is worth more than the others (p. 190); as such, teachers learn from students as much (or even more) as students learn from teachers. Thus, PAR, as pedagogy of expansion, deliberately disrupts power dynamics of conventional models of learning and teaching" (p. 190) that bring light to the educational process and facilitates the re/visioning of democratic classrooms. For the purpose of this presentation, a pedagogy of expansion refers to not only an expansion from institutional constrains, but also for everyone involved to experience an alternative model of teaching and learning that reflects horizontal relationships and encourages social action and transformation. Overall, this presentation will discuss how PAR offers an alternative for teachers and students not only to see themselves reflected in the curriculum, but also as contributors to local, national, and global movements towards equity and social change.

Cecilia Palacio-Ribón; Curriculum & Instruction, NMSU
Spanish for Spanish Speakers: differences between Spanish Native Speakers and Spanish Heritage Speakers

Since the 1980s, programs for Spanish speakers have received wide recognition. This is basically because of the increasing size of Hispanic community in the US who is interested in developing their already acquired Spanish skills. As a result, there are many programs offering Spanish classes for Spanish speakers across the nation in high schools, community colleges and universities. However, within the materials that are considered useful for Spanish Native Speakers and Spanish Heritage Speakers, there are important differences that affect their process of learning or improvement of their Spanish proficiency. This research is focused on obtaining a clearer identification of those differences in order to form a foundation to create new didactic materials specifically for each group's needs.

Mariá de los Ángeles Pereira Jiménez; Languages and Linguistics, NMSU
Gastón Baquero: visión de América Latina en sus ensayos

La obra ensayística del poeta cubano Gastón Baquero (La Habana, 1914Madrid, 1997) ha sido muy poco estudiada por la crítica, a pesar de su extensión y variedad temática. Aunque algunos de sus ensayos han sido incluidos en diversas antologías, son pocos los autores que han incursionado de manera sistemática en este aspecto de su obra. No obstante, en sus ensayos literarios, fiel a la mejor tradición ensayística, Baquero nos ofrece una visión abarcadora,

erudita y muy personal de América Latina. Sus reflexiones sobre la literatura en general y la obra de algunos escritores latinoamericanos en particular reflejan un saber humanista que ayuda a conformar una imagen integral del continente.

Brittany N. Porter; Anthropology, NMSU
My Land is the Southwest: A Nomination to the National Register of the Peter and Henriette Wyeth Hurd home and studios

The National Historic Preservation Act (NHPA) is important in preserving New Mexicos past. This paper demonstrates how the NHPA is used to list properties on the National Register of Historic Places through the example of the nomination of the Peter and Henriette Wyeth Hurd home and studios in southern New Mexico. The paper focuses on the historical significance of Peter Hurd and his wife Henriette Wyeth Hurd, southern New Mexico-based artists who contributed to the development of realist art in the region and nationally. Therefore, their home and studios should be recognized as an important part of New Mexico history.

Mohammad A. Qayum; Electrical & Computer Engineering, NMSU
Transactional Memory as synchronization solution for Scalable Parallel

Synchronization of parallel applications like large graphs is very complex. Two major synchronization policies are used in most the architectures are- coarse grain which sequentializes program execution and fine grain which is notoriously complex. Transactional memory (TM) attempts to mitigate complexity in programming and also, provides concurrency. Parallel graph algorithms are mostly based on irregular data structures. In a large graph it is very unlikely that multiple threads will try to access the same vertex at the same time. TM benefits when there is low number of conflicts among the transactions. And, if enough number of transactions exists, they can run concurrently too. Some research results with graph benchmarks like SSCA-2 using Software based TM shows some improvements. Currently at the Advanced Computer Architecture and Performance Simulation (ACAPS) lab at NMSU , we are working with graph benchmarks to use hardware TM (HTM) support implemented in Intel Haswell architecture, analyzing performance of different TM policies and believe that HTM will perform better than STM used in previous researches. And also, we are looking for optimal hardware solutions- instructions, micro-architectures for existing HTM or, Software TM (STM) implementation problems.

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.

Roshani Rajbanshi; Curriculum & Instruction, NMSU
Why Afterschool?

Afterschool programs have been given a great consideration as it has become a part of childrens life in American culture. In the past 15 years, there has been growth in afterschool programs. Every afterschool program has a specific focus such as hands-on, project-based and inquiry-based learning, promoting arts and crafts, physical fitness, or nutrition and life skills. The two afterschool programs namely SEMAA and AmeriCorp that were studied here had two potentially important differences. The purpose of this study was to examine if afterschool program is helping children have structured activity with adult supervision. In addition to that, the purpose of the study was to

examine motives of two afterschool programs in a school setting. For this study, a school in Las Cruces was selected which had diverse students. Noam (2003) states, afterschool acts as a bridge trying to connect the academic but without serving as a school and providing family space but w ithout being family. Thus, afterschool programs that we observed performed both activities. Finding also showed that the distribution of socioeconomic status within the programs was very different and influenced the enrollment of students in these afterschool programs. In conclusion, we can say that it filled the gap between school and family. For SEMAA the purpose of filling the gap was to increase students knowledge and interest in STEM activities and AmeriCorp had the purpose of providing a safe environment for children.

Daniel Ramirez Gordillo; Biology, NMSU
Do hearing loss and Alzheimers disease share common genetic mechanisms?

Hearing loss and Alzheimers disease affect more than 43 million Americans and the number of affected individuals is expected to increase drastically due to the aging population. Here we present outcomes of efforts to identify candidate genes that may be implicated in the onset of hearing loss and Alzheimer's disease, disorders that recent literature suggest may be correlated (Lin et al, Arch Neurol. 68:214-20, 2011). To this end we implemented an informatics strategy and mined open access databases to identify genes linking hearing loss and Alzheimers. The Online Mendelian Inheritance in Man (OMIM) database was queried resulting in a list of 267 hearing loss genes and a list of 266 Alzheimers genes. Comparative analysis of the gene lists resulted in the identification of 7 genes that are common to hearing loss and Alzheimers. We further analyzed the gene lists using STRING protein prediction program. Results showed that 67% of the Alzheimers genes have at least one protein in common to a hearing loss pathway protein identified using the STRING program. In contrast, 44% of the hearing loss genes have at least one protein in common with an Alzheimers pathway protein identified by the STRING program. We have successfully identified candidate genes that may link both diseases. Outcomes are being used to validate a Xenopus model for investigations of human hereditary inner ear disorders and Alzheimer's disease. Research supported by NIH (P50GM068762; R25GM061222)

Nishath Rajiv Ranasinghe; Physics, NMSU
Lg attenuation in Northeast China Using NECESS Array Data

The 127 station Northeast China Extended Seismic Array (NECESSArray) stations provides unprecedented seismic data in Northeast China, allowing us to resolve lateral variations of Lg Q greater than or equal to 2.0°. We gathered more than six thousand Lg path-amplitudes from more than hundred crustal earthquakes for the period of 1995 to 2013. Using the reverse two-station/event method, we obtained a two-dimensional tomographic image of Lg Q with its values ranging from about 50 to 1500. A high degree of detail in the lateral variation of Lg attenuation is revealed in our tomographic image than previous studies in the area. We also observe strong frequency dependent in attenuation. Low attenuation regions are found in the Great Xingan, Lesser Xingan and Songen-Zhangguangcai Ranges. Islands of low attenuation appear to be associated with granitic batholiths in the Great Xing'an Range. Attenuation is high in the Songliao, Sanjiang, Erlian Basins and Bohai Basins. The highest attenuation is found in the vicinity of the Changbaishan, Wudalianchi volcanic field, and Quaternary volcanic regions, the southern Songliao Basin, west of Erlian Basin, Bohai Basin and the Sanjiang Basin. Highly attenuating regions correlate well with regions of high heat flow and volcanism, suggesting intrinsic attenuation as the main cause of low crustal Q. Low Q regions also occur within basins with thick, unconsolidated sediments.

Meredith Rawls; Astronomy, NMSU
A Tale of Two Red Giants: Testing Asteroseismic Scaling Relations with KIC 9246715

We present a thorough characterization of the double red-giant eclipsing binary KIC 9246715. Because one of the two stars shows clear pulsations, this system is an ideal empirical test of asteroseismic scaling relations. We combine Kepler light curves and ground-based radial velocity curves for both stars to derive a best-fit orbital solution for the system, which includes masses and radii. We then compare results from this well-established technique to those from asteroseismology. The red giant asteroseismic scaling laws are a promising way to characterize these stars quickly, and are not limited to binary systems with extensive radial velocity data. Interestingly, the two red giants in this

binary system are very similar physically, yet only one shows detectable pulsations. We comment on the possible implications of this, and discuss how our results can help inform ensemble asteroseismology.

Marilupe Rodriguez; Curriculum & Instruction, NMSU
Understanding the Meaning of Students' Mathematical Motivation

This phenomenological study explores, through in-depth interviews, the experiences, motivations and reflections of calculus students emphasizing how their mathematical experiences influence their motivation to continue studying mathematics.

Manuel Rodriguez Ramos; Languages and Linguistics, NMSU
Historia, cultura y pensamiento universal según la visión iconoclasta de Gastón Baquero

Un acercamiento al diálogo que el poeta cubano Gastón Baquero (La Habana, 1914Madrid, 1997) establece con Europa, Hispanoamérica y África en una parte significativa de su obra, en donde la cultura más refinada dialoga con el sueño, la fantasía, la magia verbal y la plenitud sensorial. Una relación construida desde la inteligencia, sin perder por ello el sentido del humor que siempre caracterizó a su autor. Un diálogo, en fin, donde Baquero asume con audaz desenfado su condición cubana y caribeña: una visión muy personal del mundo y sus connotaciones, cercana también al realismo mágico.

Andres S. Rosan, Dr. Patricia MacGregor Mendoza, Dr. Gabriela Moreno, & Audra Westphal; Language and Linguistics, NMSU
Table Discussion: Principles for the development of a new Spanish leveling exam for NMSU students: Diagnosis based on the first data collection

Currently the NMSU placement exam is not effective for students to indicate their corresponding classes according to their knowledge of Spanish. Nor is useful to differentiate heritage students from second language ones. This is because of the constructs that are most frequently measured are: Listening, Reading Comprehension, Speaking, Writing, Grammar and Vocabulary, the only ones that are included in the examination of NMSU are the last two and are decontextualized. Thus, very little can be known about the productive and receptive skills of examinees. During the first half of 2013, we conducted a testing of reading comprehension items for second language learners and heritage were in order to establish its reliability and validity. These items are composed of questions that students must answer for after reading a text, thus to assess their reading comprehension directly and indirectly to assess other constructs such as vocabulary and grammar. So has been no attempts to find alternative ways to assess the level of students, therefore, this is the first formal attempt Languages Department toward the formation of a new placement test. From 730 potential participants who were taking Spanish classes during the spring semester at NMSU, both online and in NMSU, 252 participated, 80% in the university and 19% online. In an academic leveling range of courses, between 111 and 313 classes, 18% correspond to 111 students, 30% of level 112, 7% of 113 courses for heritage students, 12% students from 211 classes, 9% from 212 classes, 10% 213 students and from 7% from 214 classes, both for heritage students, and 2% of level 313. Currently this study is in a second stage test based on changes implemented from the results obtained in the first stage.

Rachael Ryan; Biology, NMSU
Cryptic species of Checkerspot Butterfly reveals evolutionary diversification as a result of climate change in the American Southwest: Euphydryas anicia cloudcrofti.

The Sacramento Mountain Checkerspot Butterfly (*Euphydryas anicia cloudcrofti* Ferris and Holland) is a rare, endemic butterfly from the Sacramento Mountains, New Mexico. This butterfly was once thought to be among the southernmost populations of *Euphydryas anicia* (*Lepidoptera*: *Nymphalidae*: Tribe *Melitaeini*). However, this cryptic checkerspot butterfly species reveals considerable genetic distinction from its parent species, a result of geographic isolation and historic climate changes in the American Southwest since the end of the Holocene era. In this study, a phylogenetic analysis was undertaken in order to resolve the status of the Sacramento Mountains Checkerspot

Butterfly using the genes 16S and COI. The results of both a Maximum Likelihood and Maximum Parsimony analysis indicate that *Euphydryas anicia cloudcrofti* should be recognized as a new species and the *Euphydryas* phylogeny should be revised.

Karla A. Salazar; Biology, NMSU
Transcriptome of the Southern dumpling squid Euprymna tasmanica white body and its possible role in hematopoiesis

The squid *Euprymna tasmanica* forms a symbiosis with the bacteria *Vibrio fischeri* in a specialized tissue called light organ. Once *V. fischeri* colonizes the light organ, a series of morphological and physiological changes occur. One of the major host responses to symbiosis is the recruitment and circulation of immune cells, hemocytes, to the light organ. The white body is thought to be the blood-forming tissue in cephalopods. The purpose of this study is to investigate the role of the white body in the symbiotic relationship with *V. fischeri*. Therefore, we seek to identify genes that are expressed in the white body using a transcriptomic approach. White body tissues from adults *E. tasmanica* colonized with *V. fischeri* and from antibiotic-treated squids were used for comparative transcriptome analysis. 454 sequencing and analysis produced a total of 13,446 assembled contigs, out of which 2,740 had a BLAST hit. Preliminary gene ontology analysis revealed that the majority of these genes are implicated in metabolism and cellular processes involved in protein binding and enzymatic activity. Furthermore, some of the immune genes identified in the transcriptome were pattern recognition proteins, lectins, and thioester containing proteins, which have been previously reported in squid hemocytes. The identification of genes involved in hematopoiesis and immunity, as well as knowing their gene expression, can lead to a better understanding of the function of white body and its role in this symbiosis.

Mohammed Sawalhah & Andres F. Cibils; Animal and Range Science, NMSU
Animal-driven rotational grazing patterns in a seasonally grazed New Mexico rangeland pasture

GPS data collected over four years on 52 young cross-bred cows grazing a 146 ha pasture were used to determine whether cattle establish patch scale rotational patterns within pastures. Cow positions at 5-min intervals were recorded with GPS collars during 25 d in late winter/early spring. Estimated per capita forage allowance (PCFA) was 347, 438, 1104 and 1884 kg of herbage per cow in 2004, 2005, 2006, and 2007 respectively. Cumulative winter/early spring precipitation (CPPT) was low in 2004 and 2006 (35 and 30 mm, respectively) and high in 2005 and 2007 (119 and 112 mm, respectively). Structured Query Language (SQL) codes developed specifically for this study were used to a) select GPS points associated with movement velocities ranging between 1 and 20 m/min (assumed grazing locations); b) overlay location data on a pasture map subdivided into 30x30m pixels; and c) calculate percent grazed pixels (% GP), pixel residence time (RT), revisit rate (RR), and return interval (RI) for each animal. On average, cows grazed 315.9% of all available pixels (% GP) for 21$\pm$3.7 min (RT), revisited grazed pixels 1.6$\pm$0.18 times (RR), and returned to previously grazed pixels after 52 days (RI). As PCFA increased, % GP decreased (r= -0.42, P0.01) and pixel re-visits occurred at longer time intervals (r= 0.73; P<0.01). Pixel RT and RR were not associated with PCFA; however RT decreased (r= -0.46; P<0.01) and RR increased (r=0.6, P<0.01) significantly with increasing CPPT.

Collin Scarince; Psychology, NMSU
Further Recall of Wins over Losses in Gambling

The purpose of this study is to investigate why people recall wins more easily than losses after gambling. The investigation will be based on a social psychology theory that essentially states unexpected events are recalled more easily and frequently than expected events.

This effect has primarily been used with how people evaluate each other. For example, a person is described as generally nice but occasionally lies to a coworker, the lying (inconsistent) behavior will be more easily recalled than behaviors constant with the trait of being nice.

In the proposed study, this concept will be applied to a gambling situation. Participants will play a card game online. They will either be told the card game is difficult to win or easy to win. Based on the above theory, when participants are told the game is easy, they will most likely remember times they lost the game, because it is not expected in an easy game. Conversely, and more importantly, when participants are told the game is difficult to win, they will be more likely to remember times they won.

If people go into a game of chance supposing they will lose, based on this theory, they will be more likely to recall wins over losses and feel like the overall experience was pleasant, even if they lose more times than they win. Identifying this fallacy may lead to ways to intervene with problem gambling by correcting the fallacy.

Bahar Sayoldin; Dept, NMSU
Applying Data Mining and Bioinformatics Techniques to Analysis Capsicum Species Transcriptome

Chile peppers such as Capsicum app. 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 cartenoids (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.

Sam Schonfeld; Astronomy, NMSU
The Sources of F10.7 Emission

The solar radio flux at a wavelength of 10.7 cm, F10.7, serves as a proxy for the Sun's ionizing flux striking the Earth and is a heavily used index for space weather studies. In principal both the coronal sources of ionizing flux and strong coronal magnetic fields contribute to F10.7 via different emission mechanisms. Recently the Expanded Very Large Array (EVLA) has added the capability to make high-spatial-resolution images of the Sun at 10.7 cm. In this work we compare a trial F10.7 image from the EVLA with the radio emission predicted to be present from EUV images of the Sun acquired by the AIA telescope on the Solar Dynamics Observatory at 6 wavelengths covering the coronal temperature range. Photospheric magnetograms are used to identify likely regions of strong coronal magnetic field, and the the circular polarization measured by the EVLA is used as a tracer of gyroresonance contributions to F10.7. We discuss the conversion of the EUV data to bremsstrahlung radio fluxes via the construction of differential emission measure images, and analyze the relative contributions of the different sources of F10.7 flux.

Dan Short & Dr. Michael De Antonio; Physics, NMSU
Narrow line width tunable DIAL LIDAR detector

We will describe a field testable prototype DIAL LIDAR detector employing the use of a narrow line width Acousto-Optic Tunable Filter (AOTF) on the receiver of a DIAL-LIDAR system. Methane gas absorbs electromagnetic radiation in the near and mid-IR at several points around 1.6 and 3.5 microns and can be used in making high sensitivity measurements of atmospheric methane. Because methane is the main constituent of natural gas, this allows for the detection of escaping natural gas from leaks in buried natural gas pipelines if sufficient reflected power from the radiation source reaches the detector. On a typical DIAL LIDAR, there is a significant amount of background noise from ambient sources at the online and offline wavelengths. The addition of an AOTF to the receiver will result in a decreased line width to approximately 45 nm at the mid-IR range. The AOTF is also tunable allowing for the inclusion of several other chemical species that would otherwise be outside of the region of detection. AOTFs are also solid state resulting in better durability and decreases the potential to malfunction during periods of high vibrations. Due to the increase of SNR, a detector cooled by a multi stage TEC was used. The system was comprised of a tunable laser source. The laboratory receiver system is comprised of an AOTF, HgCdTe detector, a pair of mid-IR polarizers, and an adjustable iris.

Nafiul A. Siddique; Electrical & Computer Engineering, NMSU
Local Memory Store - A multi purpose memory replacing on-chip cache

Most applications exhibit temporal and spatial locality in data access patterns in memory. However, there are classes of applications, such as those that are graph-based, that are characterized by irregular access patterns resulting in little locality. For these applications, memory latency can be significantly reduced by storing an applications working set in a smaller but much faster on-chip memory than cache. Cache performs very well in decreasing average memory access latency for applications that exhibit locality, but even still a high penalty is paid through the energy requirements to move data on -off chip and to support the complex coherency mechanisms required for multi-core systems.

To support applications that exhibit poor locality, a number of processor architectures provide explicit access to on-chip memory in the form of software controlled scratch-pad memory (SPM). SPM is a fast on-chip memory mapped into a predefined address space of the processor memory. Because scratchpad does not update memory, coherence is not a problem and it is easy to share data in multi-core systems. But predicting an appropriate address range for scratchpad and implementing an efficient allocation technique are still significant research questions.

We propose a memory that replaces the data cache with a hardware controlled memory (Local Memory Store (LMStr)) that stores different sizes of blocks according to the application needs and can simultaneously be partitioned into and used as scratchpad and/or cache memory. The architecture of our memory comprises a directory, a mapping table, and a memory component. During creation, each process allocates a fixed entry table to store the exact position of the data blocks, which can be of varying size, to be stored in scratchpad memory. The LMStr is shared by all processes in the same CPU to ensure data sharing between multiple processes in multiple cores. We have introduced a weighted based static searching strategy that predicts the block references that should be stored in scratchpad space.

Mia Angelica Sosa-Provencio; Curriculum & Instruction, NMSU
Imagining Ourselves in Childrens Literature: Power Dynamics and Epistemologies amid the Pages and in the Classroom

This critical literary analysis aims to investigate depictions of schooling within childrens literature including underlying messages present within the literary text, artistic images, character depiction, themes, and the positioning of these within the greater narrative and within the physical pages of each book. Texts are critically analyzed regarding the ways in which knowledge is defined as well as how teacher/student power dynamics are depicted. The analysis of the works in this study is perhaps helpful to the larger conversation of critical literacy pedagogy because of the high circulation of these titles as award winners, bestsellers, and enduring traditional favorites. In choosing titles with high visibility in the childrens book market, I aim to increase our critical awareness and enrich the conversation regarding the formation of a collective social construction of ourselves, the world we live in, the purposes of schooling, and the particular roles assigned therein. I analyze these titles through a lens of critical pedagogy which aims to illuminate the often hidden and seemingly depoliticized representations of reality and versions of truth that may shape and perpetuate current inequitable power dynamics and the societal stratifications that are manifest within the walls of schooling and beyond.

Karen R. Trujillo; English, NMSU
Emotional Expressions of a Tri-State Border Community through an Oldies Radio Show

At the heart of my presentation titled, "Emotional Expressions of a Tri-State Border Community through an Oldies Radio Show," is an analysis of a Sunday call-in radio show featuring music described as El Paso style oldies. In my analysis, I am interested in the ways in which callers use requests and dedications of songs as a means of emotional expression. This presentation examines The Sunday Jukebox as a site for gathering of a discourse community at which a diverse group of listeners in the tri-state border communities of Texas, Chihuahua and New Mexico express private emotions in a public space. I first contend that the callers and listeners of The Sunday Jukebox strengthen their sense of belonging by sharing sentiments that are not typically shared during day-to-day functions. I examine

the extent to which the discourse community expresses emotion in this public space and posit that the callers are expressing private emotions in this public space becaus e the shows platform calls for such behaviors. In this presentation, the gift of music serves other intimate functions, such as reinforcing the discourse community between the callers and listeners, as an enactment of nostalgia, in commemoration of events. I am interested in the ways in which local discourse communities create spaces for the liberation of emotional expression and in the ways in which the local discourse community commemorates birth, life, and death through narrative created between disc jockey and caller.

Sebastian Trujillo; Astronomy, NMSU
Formation of galaxies in a dark universe

Advances in observational cosmology have resulted in a measurement with unprecedented precision of the initial conditions for the formation of galaxies. Several lines of evidence suggest that most of the matter in the universe is in the form a dark component which does not interact with light but governs the formation of structures in the universe through gravity. However, the problem of galaxy formation is extremely complex, involving an enormous range of scales and many physical processes including gravity, radiation, gas dynamics and atomic physics. I will describe a few recent models we have used to better understand where and how galaxies form and the role of ordinary matter in the process, all in the context of our current cosmological paradigm.

Kyle Uckert; Astronomy, NMSU
A Comparative Study of in Situ Biosignature Detection Spectroscopy Techniques on Planetary Surfaces

We demonstrate the biosignature detection capabilities of several classes of instruments, including a compact laser desorption/ionization time-of-flight mass spectrometer, an acousto-optic tunable filter IR point spectrometer, a laser-induced breakdown spectrometer, and a scanning electron microscope. We collected biotic and abiotic calcite, gypsum, and manganese oxide samples from Fort Stanton Cave to identify the presence of biomarkers with each instrument class. We find evidence of biologic activity in these samples including the presence of organic molecules, macroscopic and microscopic morphological features consistent with fossilized mircobes, and the presence of trace elements consistent with the biotic precipitation of minerals. The identification of extant or extinct microbial life is best supported by a suite of biosignatures, rather than a single observation. We demonstrate the unique biosignature detection results of each instrument class and discuss the importance of developing an instrument suite for future landed astrobiology missions on other planetary surfaces.

Nicholas Ule; Astronomy, NMSU
Investigation Into Differential Rotation on Kepler Targets

It has been long understood that the Sun is a differentially rotation star. This was first observed by tracking sunspots as they transited across the Sun's surface, with equatorial spots traveling faster than spots at higher latitudes. With the near micro-mag precision of Kepler it is possible to measure this same phenomenon on other stars. Understanding how differential rotation changes with respect to spectral class will offer new insight into the magnetic field generation for main sequence stars.

We have developed a spot model which can determine the differential rotation of spotted stars. From our Guest Observer program we have 150 stars which show signs of spot activity. These targets typically have over 10 quarters of data so it will be possible to determine the relative amount of differential rotation over a range of latitudes. This presentation will serve to demonstrate the early findings of this project.

Anurag Veerabathini & Dr. Paul M. Furth; Electrical & Computer Engineering, NMSU
A High-Efficiency, Ultra-Low-Ripple Fully-Integrated Switched Capacitor Buck Converter Employing
Time-Interleaving and Pulse-Frequency Modulation Techniques

This paper presents a fully-integrated switched capacitor buck converter implemented in the ON-Semi 0.5-um technology, that converts a 3.3 V DC voltage to 1.5 V. while driving up to a 5-mA current load. A symmetric charge-discharge topology for capacitors is devised for low ripple. Ultra-low output ripple is achieved through time-interleaving. It is observed that a ripple of 87 mV on a baseline design can be reduced to 6 mV by implementing 8-phase time-interleaving with a symmetric topology. To achieve high efficiencies at lower loads, a burst-mode phase-frequency modulation (PFM) technique is implemented. A multi-layer layout technique is used for bucket capacitor to reduce the effect of parasitic capacitances, thereby increasing the efficiency of the circuit. To integrate more capacitance in less area on-chip, the tank capacitor is implemented as a MOSCAP.

Iliana Guadalupe Villegas; Anthropology, NMSU
An Ethnographic Perspective of Human Trafficking and Human Rights in Guatemala

This paper is based on preliminary analysis of ethnographic data concerning the legal and reintegration process underage female victims of human trafficking who reside at a Non-government Organization (NGO) shelter in urban Guatemala go through. Guatemala, an emigrant and migrant transitory country in which demography, ecology, economics, and politics along with a long civil war, have contributed to high poverty. Both migration and poverty influence populations' vulnerability to modern day slavery. These issues frame the ethnographic data, which consists of interviews and participant observation with the NGO staff members of the shelter and the human trafficking task force from the local human rights procurement. The analysis focuses on the different relationships victims undergo in order to reintegrate back to society.

Baoyu Wang; Psychology, NMSU
Agency and the Mechanism of Cultural Influence

Researches in cultural psychology in the past decades implies the idea that agency mediates the relationship between culture and human minds both theoretically and empirically. However, lacking particular operationalization of agency causes the researches of the mediating process in this direction to stay on the theoretical level. Based on the assumption that agency mediates cultural influence, I propose a mediating model in which agency mediates the relationship between social-economic status/mobility and cultural consequences in terms of cognitive styles and self-construe. Agentic Behavioral Tendency Scale and Control Belief Scale were constructed, in Study 1, to be used as the measurement of agency and test the model proposed in Study 2. Two newly designed measurement satisfied basic requirements of psychometric standard according to the results in study 1. The results in Study 2 supported the theoretically assumed model I proposed. Specifically, the statistical analysis showed that a. self-capacity belief partially mediates the relationship between Subjective School Status and internal control tendency/self-construe. b. independent agency partially mediates the relationship between mobility and internal control. c. the relationship between birthplace and attribution styles was mediated by family capacity belief marginally and partially. The unexpected results during the study were analyzed.

Wenjie Wang; Curriculum & Instruction, Education, NMSU
Becoming a Better You: A Further Development of Ten Commandments for Motivating Second Language Learners

The question of what motivation is, where it comes from and how it works in language learning have been studied widely. Ten commandments for motivating language learners were proposed originally by Dr. Dörnyei and Dr. Csizér in 1998, which includes, set a personal example with your own behavior; create a pleasant, relaxed atmosphere in the classroom; present the tasks properly; develop a good relationship with the learners; increase the learner's linguistic self-confidence; make the language classes interesting; promote learner autonomy; personalize the learning process; increase the learners' goal-orientedness and familiarize learners with the target language culture. However, when language learning entered in an information age after sixteen years, with the rapid development of digital technology, new media and the wealth of big data, the Ten Commandments for second language learning needs to

be updated. With this background, a case study of teacher action research is conducted. In this research paper, the researcher presents a literature review of theories of motivation in language learning; and then shows the process of data collecting and analyzing; further, the researcher discusses specific strategies to utilize Ten Commandments in modern second language learning classroom.

Nancy Wasser; Curriculum & Instruction, Education, NMSU
Using Counternarratives of Social Justice to Promote Literacy and Prevent Bullying in Schools

This presentation treats using personal counternarratives as texts with preservice elementary (K-8) teachers as a means to employ narratives for literacy instruction while addressing social justice concerns in the school community and classroom. Preservice teachers write their own narratives recounting experiences of social injustices they witnessed or were made targets of, particularly in school settings. They then apply these authentic texts as examples and models for children to write their own bullying stories, later rewriting them as narratives of transformation, including spoken, written, and performed texts. These transformative texts provide a vehicle for change by helping children move from a position of victimization to one of converting bystanders into allies, and victims into empowered actors. By standing in solidarity with the bullying target, it becomes possible to change bullying behavior through conscious transformative narrative action.

Erandi Apsara Wijerathna & Dr. Boris Kiefer; Physics, NMSU
Effect of Point Defects and Microstructure on Mechanical Hardness Estimates of η-Ta_2N_3

One of the largest challenges in materials science is the design of functional materials through experimentation and/or theory. An example is the synthesis of stable hard and superhard materials. In this presentation we will discuss η-Ta_2N_3 as a test case. This material has recently been synthesized at high pressures and temperatures. Commensurate experiments on the recovered sample suggest that this material could be harder than TiN the industrial material of choice for hard thin-film coatings. However, the synthesized η-Ta_2N_3 sample showed a high porosity and contained point defects rendering the back extrapolation of material properties to a dense sample with zero porosity challenging. In this presentation we will discuss results of our recent parameter-free first-principles computations. In agreement with previous computations we find that η-Ta_2N_3 is only mechanically stable in the presence of point defects. We extend previous research to include cation as well as anion defects and their effect of elastic properties and crystal structure. The combination of our results with recent hardness models suggests an up to 40% lower hardness for dense η-Ta_2N_3 making it significantly softer than TiN. An even lower estimate is obtained by using experimental elastic parameters. We will review several possibilities including microstructural models that may resolve this discrepancy and advance our ability to use the synergy of experiment and theory to design functional materials more reliably.

Lihua Zhang; Curriculum & Instruction, NMSU
Lecturing or Coaching? –Towards an Alternative Approach for EFL teaching in China

Since China adopted the open door policy in 1978, English as a global language for international trade and communication has undergone a period of unprecedented popularity and prosperity in China. However, with English being included as one of the three major compulsory courses in public school curriculum, plus the status of English as a foreign language that one has to labor to learn, it soon becomes the school subject that concerned most by teachers, students, and parents. Very soon, the unique status of English in school curriculum triggered the market sensitivity of people with a business mind. They saw English teaching as something similar to an industrial factory which is free of chimneys. When English learning is closely connected with market and profit, it soon lost its focus in teaching and learning. Gradually, English teaching becomes something as time consuming, energy sapping; too many tests, too little learning, whereas English learning brings the learners more frustration, less enjoyment. Even though up-to-date measures has been proposed to put English teaching back to its right track, the focus of the discussion as presented on China's public forums is still on the peripheral topics such as how many points should be ascribed to English in national entrance examination or should English be eliminated from school curriculum or not, etc. This paper starts from problem posing of current English teaching and learning in China to the analysis of possible caused for such problems. Four possible factors have been identified as the propelling forces to the malpractice of English teaching and learning. After that, the author appealed for changes to be made in this field because "in a time such as the

present when change is so rapid, when so many things are changing from day today, it is imperative that we be able to judge which trends move us in the direction of the goals we want, and which others interfere with the achievement of these goals" (John Dewey, 1919, p. 185).

The author then proposed coaching as an alternative way to traditional, lecturing style English teaching. Such an alternative approach moves the focus of English teaching from knowledge transmission to skills development, which is supposed to be the goal of English teaching and learning in China. The rationale for coaching is justified and a picture of coaching in real classroom practice is envisioned. Finally, the author provided the "how-to"s for implementing the coaching approach of English teaching in Chinas public schools.