Talk and Performance Abstracts

(In alphabetical order by author)

Mariam Abdelmalak; Curriculum and Instruction, NMSU

HyFlex Course Design: Exploring Students Meanings of the Learning Experience

This paper explores the meanings graduate students constructed from their learning experience with the HyFlex course design. The results revealed that the participating students perceived the opportunity of having a choice to attend face-to-face or online sessions as the instructor accommodating and flexibility to meet students different needs. They recognized the importance of flexibility in adult education as a way to motivate adult learners to do better work. The participating students perceived the opportunity of allowing students to choose their mode of participation whether face-to-face or online as the instructor attempt to differentiate instruction to meet students needs and their learning styles. Additionally, they saw the traditional delivery of courses where students have to attend face to face in every class as the school and the instructor control. They perceived the opportunity of having a choice to attend face-to-face or online as an opportunity for students to take control over their learning. This studys findings suggest that graduate students need flexible instruction with meaningful choices, so they can coordinate work and family responsibilities with a challenging course schedule. Universities and colleges should offer students any time, any place learning opportunities that meet diverse needs. This requires that instructors of adult learners value providing participation choices to students more than they value forcing everyone into the best way of learning a set of content.

Lekha N. Adhikari & Dr. Matthias Burkardt; Physics, NMSU

Distribution of Angular Momentum in the Transverse Plane

Fourier transforms of GPDs describe the distribution of partons in the transverse plane. The 2nd moment of GPDs has been identified by X.Ji with the angular momentum (orbital plus spin) carried by the quarks - a fundamental result that is being widely utilized in the spin decomposition of a longitudinally polarized nucleon. However, I will demonstrate that, despite the above results, the Fourier transform of the 2nd moment of GPDs does not describe the distribution of angular momentum in the transverse plane for a longitudinally polarized target.

Valeria Aguirre-Holguin; Mathematics, NMSU

New Information on Abraham Lincoln's Arithmetic Copybook

The earliest existing manuscript of our 16th President, Abraham Lincoln (1809-1865), is his copybook– a notebook in which he worked out arithmetic problems at a young age. While studies of the extant pages of this valuable manuscript have been done, still there seems to be some disagreement among researchers about the provenance of its content. Apparently Lincoln copied pieces from a number of different arithmetic textbooks of his time. However, exactly which textbooks Lincoln had access to, and copied from, is not definitely known. The presenter is doing an extensive analysis of the copybook and what is already known about it. Description of the types of arithmetic problems that Lincoln worked on, as well as interesting matches with several textbooks of Lincolns day, will be presented along with supporting evidence from original sources.

Michael S. Alarid & Erin Easley; English, NMSU

Peeling Back the Layers

This project is an analysis and reappropriation of the beauty aesthetic through representation of depictions of the body in a series of paintings (Judgement of Paris, Cranach; Tarquinus and Lucretia, Rubens; Young Woman Playing with a Dog, Fragonard; The Death of Hyacinthus, Broc) as a foundation from which the politics and intersections of gender and the idealized 'self' may be interrogated and subverted in an attempt to uncover a hidden 'collective self' - a 'self' with which a diverse multitude may identify and recognize - Lacan's jouissance. Though the boundaries the

temporal and specific period aesthetic impose may be finite, our analysis will show that any 'self' may be represented and serve as catalyst for intimate self-reflection. We strive to reveal and analyze the genealogy of the discourse of beauty and aesthetics. The dominant discourse of idealized beauty tends to ignore the spectre of anything less than idealized, an other - the referent to which the ideal defers. Thus, it is our aim to move the referent from a haunting presence to the foreground - unmasking the Real. Conventionally, in our cultural milieu, a referent is necessary to assert validity. In order to promote or establish an ideology or belief as 'valid,' there must be a 'truth' - a referent to establish 'validity' of said ideology. Thus, we have the lure of the referent - the constant search for, and necessity of, a locus to which we can compare and contrast our embodied experiences; the business of being. Through our analysis of the representation of bodies in these pieces, we aim to challenge and resist established idealizations of a monolithic beauty aesthetic. It is our intention that, following several workshops, conferences, peer review, and revisions, this project will realize itself culminate in a live/performed tableaux vivant that moves through each analyzed and reconceptualized piece/painting. Further, it is our hope that this performance will reshape itself through several yearly iterations that will consider and analyze different pieces of art, through varying artistic and historic periods, utilizing this framework as its foundation. As Della Pollack states, "the last resort of high modernism is now the debris of walls previously keeping work from play, art from politics, high from low culture, speech from writing, aesthetic from commodity discourses. Out of the resulting inky spillage, out of what we have come to call "textuality" or the sense that all discourse is encompassed within a multilayered, reflexive/reproductive "text," rise questions trembling with imperatives for performance: What words remain to the body made at once abject by history and abstract by textuality? How then can we speak? What is or might be the purview of the writing/performing subject?" We, then, seek to break down the dividing walls between work, play, art, and politics, and construct new meaning new knowledge from the resulting spillage.

Waleed Alkohlani; Electrical & Computer Engineering, NMSU

Application-dependent workload characterization

Workload characterization is important for both users, designers, and those specifying future machine acquisitions. If the characterization method is carefully crafted to be comprehensive and consistent across platforms, it can be used to specify characteristics and components that comprise an optimal micro-architecture for the workload or application. This work presents an efficient characterization methodology based on inherent application characteristics that enables performance prediction in the context of architecture resources in addition to understanding application performance and similarity.

Amneh Ibrahim Al-Rawashdeh; Educational Management and Development, NMSU

muslimat junior faculty: a hermeneutic phenomenological study of navigating the tenure process in research universities

Higher education institutions carry multiple responsibilities for developing and valuing the recruitment and retention of minority and women faculty more than ever. Throughout the last 25 years, muslimat faculty have been given the opportunity to work at public universities. However they have to go through the tenure process, and once they go through the tenure process they hit a wall of challenge that is impacted by the objectification by Westerners and assumptions are made about their feminist stance. Thus this study utilizes a hermeneutic phenomenological study to understand how muslimat junior faculty navigate the tenure process in research universities. This study will uncover the complicated subjectivity and intersectionality for muslimat facultys scholarly knowledge and understanding of themselves within higher education context The insights gained from this research may have implications in adding to the scholarly knowledge of how muslimat faculty contribute to the professoriate in higher education. It will also help administrators and policymakers create more supportive environments for muslimat faculty in higher education

Armando Altamirano; Curriculum and Instruction, NMSU

Democracy in the Borderland; Empowering the Voice of the Mestizo

Social Justice Education is an area that studies the impact of dominant ideologies over minoritized groups. Social Justice also reveals the necessity for educators and researchers to become involved in social change by challenging academic inequities existent in the classroom (Apple, 2009; Sensoy & DiAngelo, 2012; Adams, Bell & Griffin,

2008). Multicultural educators Bill Bigelow (2006) and Wayne Au (2009) have stated that to challenge the existent inequalities in the classrooms students need to be empowered in order to become successful individuals both in their personal lives and academia. Living close to the border region Mexican Americans face different struggles and necessities conditioned by the local culture and the proximity with Mexico (Au, 2009; Bigelow, 2006). I will introduce the term of mestizo to better identify the personal experiences that Mexican American students encounter in schooling and how social justice can build upon this definition to empower these multicultural students. Finally, by understanding the duality of the mestizo and its implications, we will be able to bring a better understanding of their realities and present a better academic experience that can lead them to personal transformation and action (Anzaldua, 1999; Delgadillo 2011).

Joshua Amburgey; Physics, NMSU

ionic liquids as a versatile radiation shield

Shielding for high energy electromagnetic radiation in space is difficult because of the limitations imposed by weight and volume constraints. This is complicated by the fact that high energy charged particle shielding produces secondary Bremsstrahlung radiation, which are highly intense polychromatic x-rays. The best materials for shielding this type of radiation are materials possessing a high concentration of electrons. Such materials tend to be heavy or voluminous and are hence not suitable for space flight, as both weight and volume are at a premium. This challenge requires the engineering of new materials that can: safely absorb a wide spectrum of radiation, be relatively lightweight, and take up as little volume as possible. One such material may be found in the class of liquids known as room temperature ionic liquids. As an example, consider the small ionic liquid 1-methyl-3-pentyl Imidazolium Bromide which effectively absorbs Bremsstrahlung x-rays. Preliminary data showed a mere 1mm thick sample of this ionic liquid reduced the intensity of a Bremsstrahlung x-ray beam by one order of magnitude. This is impressive, considering that this was a white x-ray beam that consisted of a broad spectrum of energies, and even more impressive when one considers that a similar reduction was seen in a 5mm thick steel plate. A more detailed analysis showed that the ionic liquid substantially reduced the transmitted white x-ray beam across a broad energy range.

Kenza Arraki; Astronomy, NMSU

Effects of baryon removal on the structure of dwarf spheroidal galaxies

Dwarf spheroidal galaxies (dSphs) are extremely gas poor, dark matter-dominated galaxies, which make them ideal to test the predictions of the Cold Dark Matter (CDM) model. We argue that the removal of a small baryonic component from the central regions of forming dSphs may substantially reduce their central dark matter density. Thus it may play an important role in alleviating one of the problems of the CDM model related with the structure of relatively massive satellite galaxies of the Milky Way. To do this, we perform controlled, numerical simulations, which mimic the effects of baryons. We find that the combination of (i) the lower baryon fraction in dSphs compared to the cosmic mean and (ii) the concentration of baryons in the inner part of the Milky Way halo can go a long way towards explaining the observed circular velocity profiles of dSphs. The removal of baryons in the central 200-500 pc lowers the dark matter density by a factor of $(1 - f_b)^4 \approx 0.5$, where f_b is the cosmological fraction of baryons. In addition, the enhanced baryonic mass in the central regions of the parent galaxy generates tidal forces that substantially alter the circular velocity profiles for satellites that come as close as 50 kpc. We show that these two effects are strong enough to bring the observed structure of dSphs into agreement with the predictions of the subhalos in CDM simulations, regardless of the details of the baryonic processes.

Marcia Bardwell, Maria Molina, Sara Sewlyn, & Caroline Zamora; Communication, NMSU

Designing Applied Communication Activities for Communication Studies

This panel introduces new and revised activities that illustrate applied communication activities along with the choices and consequences involved in designing communication activities. Each activity will specifically address courses in Group Communication, Human Communication, Intercultural Communication, Interpersonal Communication, Journalism, Organizational Communication, and Political Communication.

Alejandro Bernal; Agricultural Economics, NMSU

Wind as Renewable Energy Option for Rural Southwest

Renewable resources such as wind can provide sustainable options for generating power in rural areas, particularly in New Mexico. Most communities in New Mexico are classified as areas with high potential for wind as well as solar energy production. Therefore, the primary objective of this study is to develop cost estimates for producing wind energy using available data for the price of turbines, other installation and maintenance costs, and historical wind speed data for rural communities in New Mexico. Actual wind speed and power generation data from existing wind energy systems will be used to compare and contrast the estimated results for sample communities. A secondary objective of this study is to use wind turbine installation data from New York and California to evaluate the likelihood of adopting renewable energy system by a typical rural farm in New Mexico. This analysis will be based on secondary data from various sources and will include information on current electricity rates, wind and solar energy potential for the location, and daily energy demand of the farm.

Briana Bianco; Anthropology, NMSU

Beekeeping Practices in Modern and Ancient Yucatan: Going from the Known to the Unknown

According to historic documents and some scarce archaeological data, apiculture with the stingless bee, Melipona beecheii, was significant in the diet, economy, tribute, medicine, and ritual practices of pre-Columbian Mesoamerica. Current practices with stingless bees give us a frame of reference for interpreting archaeological data. This paper focuses on the ethnoarchaeological studies carried out in Yucatn, Mexico, as well as FTIR, nitrogen, and pH analysis of soil performed in order to identify possible chemical signatures for the production of honey and wax in the past. My research has made inferences about what we can expect to find archaeologically and ways to identify beekeeping in the archaeological record. This research is combined with the examination of how beekeeping practices have changed over the years due to internal and external forces, like the introduction of other species of bees, the Spanish conquest, and globalization. The importance of this research is emphasized by the disappearance of traditional beekeeping practices and current traditional ecological knowledge, the disappearance of the variety of plants necessary to produce honey, and the disappearance of the bees themselves.

Luke Asher Blecha; Psychology, NMSU

The Unheard Unhearing: Most Men Are Created Equal.

In the United States, 13% of the population have hearing problems, or are completely deaf (Gallaudet University 2005). The cost for those born in the year 2000 alone is estimated to be in excess of $2.1 billion dollars, and this does not include the costs of Interpreters or hospital visits (CDC 2012). Hearing is not considered a necessity for continued function and therefore assistive hearing-devices are not covered. Medicaid covers the very cheapest hearing aid on the market (one per lifetime), but it was not effective for my particular hearing loss. I needed a hearing aid that amplified the tones I did not hear, and only those tones. Hearing aids cost approximately $2000.00 and single mothers/student taking out loans just to survive will not be able to afford the hearing aids needed. I was fortunate in that, 1) I have a good ear, and 2) that over eighteen years of not having any help hearing, I learned to lip-read. However, this is a very rare talent and it is onl y possible for a person to physically see about 30% of spoken language, at best (The rest is contextually based guess work). In this issue a counter argument is indeed made to not ensure persons who have hearing loss. Insurance companies would lose some of their profit margin and they simply do not cover hearing loss. Insurance is a business (and according to the United States, a business is a person), lawmakers are ever hesitant to increase their financial burden.

Carmen Boje; Engineering Technology and Surveying Engineering, NMSU

Electronic Health Records (EHR) Systems, Quality Comparison and Analysis

Electronic Health Record (EHR) practices affect patient care cost and organizational efficiency. The research applies Industrial Engineering tools to collect data and analyze the current EMR Systems used in the United States of America. A method of comparing different EMR systems is developed and used for finding the best EMR system with the highest qualities and lowest price. This will help to improve existing EHR solutions like the one that is developed recently in Las Cruces by SiliconMesa Corporation in the Arrowhead Research Park at New Mexico State

University. The improved EHR model can be used in the future for underfunded US medical centers (especially in the south-western US) and would enable a better communication between computer systems and indirectly between patients and Physicians/Physician Assistants/Registered Nurses and other medical personnel. The research should optimize the quality of Information Technology used for the health care services in the US and respond to important questions about EHR software reliability, usability, maintainability, transferability, overall satisfaction with EMR software and EMR software support, EHR Cost and Cost/Benefits.

April Bond; Sociology, NMSU

Betwixt and Between: A Critical Discourse Analysis of Discursive Constructions of Native American Identity in U.S. Daily Newspaper Articles on the Cobell Indian Trust Case, 1996-2011.

This study examines the discursive construction of Native American identity within the context of the Cobell Indian Trust Case. Taking a corpus linguistics approach to critical discourse analysis, a specialized corpus was compiled of US newspaper articles from 1996-2011. Using Tribal Critical Race Theory the data was analyzed qualitatively and quantitatively to uncover thematic representations of racial and legal/political discursive strategies. The analyses point to racialized predication strategies which seek to undermine the legal/political nature of Native American identity. The paper concludes by critically addressing the ramifications of racialized discourse and its effect on Native American self-determination and sovereignty. With this understanding, an alternative discourse from Native Americans can more effectively work to reassert itself in mainstream media and reestablish their legal/political identity.

Ramaninder Brar; Physics, NMSU

Sterilize Aedes Aegypti Mosquitoes using X-rays of different wavelengths

Sterile Insect Technique (SIT) has been successfully used to eradicate dipteran insect populations in the past. While different sterilization methods have been used ranging from chemo-sterilization to genetically modified male-sterile mosquito strains it is sterilization with ionizing radiation which is the method of choice for effective sterilization of male insects for most species. The lack of gentle sterilization methods and other problems have resulted in significant complications when applying SIT to mosquitoes. Irradiating mosquitoes can result in high mortality rates and a decrease in competitiveness to unirradiated males. New protocols for mosquito sterilization are being investigated in our laboratory which aims to minimize detrimental effects on the irradiated males thereby achieving a high percentage of sterility with minimized reduction of fitness. In particular we have investigated the effectiveness of shorter wavelength radiation than that which has been traditionally been employed. A. aegypti mosquitoes were subjected to X-ray radiation treatments using different target materials. Our results suggest that longer and shorter wavelengths used during irradiation have a significant effect on the outcome of the sterile males longevity. Longer wavelength treatments have demonstrated a steeper death rate over a twenty day observation period suggesting that shorter treatments can be employed to achieve the necessary sterility rate.

Roufan Cau; Chemical Engineering, NMSU

Advances in fluorescence decay analysis: new techniques for use in cytometers

Biomedical research projects rely heavily on culturing and experimentation of mammalian cells and single celled-organisms. Often fluorescent markers are used with such in vitro experiments to help visualize intracellular organelles, proteins, signaling events, metabolic changes, or other molecular phenomena. The fluorescence emission is a beacon; it reports the presence of different intracellular events. Similarly, the fluorescence decay, or time at which a fluorescence label relaxes in its environment to a non-excited ground state, can be measured to indicate different intracellular changes. The fluorescence lifetime is beneficial for experiments that require many different fluorescence labels, which often suffer from spectral (fluorescence) emission overlap. In this contribution we highlight three new ways in which the fluorescence development has allowed us to expand how the fluorescence lifetime is measured using flow cytometry. Flow cytometers are high-throughput single cell counters and operate by detecting fluorescence. We have for the first time demonstrated how the fluorescence lifetime can be incorporated into a flow cytometer with approaches called: (1) peak-time analysis, (2) phase-filtered cell sorting, and (3) cell phasor cytometry. The three methods have demonstrated (1) how the fluorescence lifetime can be measured with minimal modification to commercial cytometers, (2) how cells might be sorted based on their fluorescence lifetime, and (3) how properties called phase

and modulation lifetimes can indicate interesting excited state decays. Future work will involve refinement of each method and optimization for commercialization in order to provide researchers new ways to expand their biomedical assays.

Shenglun Cheng; Curriculum and Instruction, NMSU

Bridging School and Family: Co-authorship of Books as a Transformative Literacy Practice

This presentation will examine parental involvement in childrens literacy development. The disjuncture between school, family, and community has resulted in widespread academic failure among disenfranchised students (Glazier, 2007). The illegitimate status of knowledge, culture, and languages brought to school by these children begets their abhorrence of self, parents, and origin. Several collaborative efforts by these three focal points have been made to bridge the cleft to make school relevant, meaningful, and anti-oppressive (Ada, 1988; Delgado-Gaitan, 2001; Caspe, 2003; Rivera & Lavan, 2012). Co-authorship of family books has been one of the transformative practices adopted widely for minority families to reclaim voice in an alienated education system and for teachers to reexamine their partiality (Mccaleb, 1994). In addition, the creation of books provides a period of quiet time for parents and children to go deeper into mutual understanding and melt misunderstanding. The author of this presentation will demonstrate a collaborative effort by a Chinese mother and her fifth-grader daughter in ESL program to create their own alphabetic bilingual book in school setting. The process and the result of their partnership will be discussed in detail, and their experience helps us revisit the definition of *literacy*.

Frederick Anthony Crawford; Chemical Engineering, NMSU

Detection of the fluorescence lifetime of green fluorescent protein expressed in yeast cells with a time-resolved flow cytometry.

The fluorescence lifetime is the average time a fluorophore spends in an excited state before returning to ground state. It is a useful fluorescence property because it can provide additional quantitative information related to the environment of the fluorescent species. In this contribution, we test the ability to detect the fluorescence lifetime of green fluorescent protein with a flow cytometer, when the protein is expressed in saccharomyces cerevisiae. If detectable, we hope to study a variety of other fluorescent protein lifetime changes within large populations of yeast cells in the context of signal transduction experiments. Yeast cells expressing green fluorescent protein (GFP) were analyzed for the lifetime value with a laboratory-built, time-resolved flow cytometer. The cytometry system used was a modified FACSVantage^{TM} SE (Beckton Dickinson) cell sorter. Additionally, we tested yeast cells with GFP attached to a low-fluorescing citrine fluorescent protein (CFP). The GFP-CFP protein was designed so that there was an obvious fluorescence lifetime change of the GFP when bound compared to the GFP alone. All yeast constructs are courtesy of the Brent laboratory at the Fred Hutchinson Cancer Center, Seattle, WA. After culturing the yeast cells, they were prepared for fluorescence lifetime measurements. To-date we have measured a fluorescence lifetime of 11.2 ns for the GFP-only cells and 10.1 ns for the GFP-CFP expressing cells. Future work is necessary to verify the preliminary fluorescence lifetime changes. If accurate lifetime changes can be obtained from within small yeast cells, then further work can be accomplished where other combinations of proteins are expressed during cell signaling events. Supported by NIH grant R25GM061222.

Om Prasad Dahal; Electrical & Computer Engineering, NMSU

Preliminary Work to Classify the Disturbance Events Recorded by Phasor Measurement Units

With increasing use of phasor measurement units in power system, an enormous amount of data is being stored in phasor data concentrators (PDCs). PDCs have the capability to store disturbance files separately. Over a period of time, the number of such disturbance files keeps increasing. However, these files are not really mined for data and mapped to actual events that may have caused the disturbance. This paper uses actual disturbance files from a PDC in the Public Service Company of New Mexico (PNM) system that collects data from four PMUs, and shows how the data needs to be preprocessed before it can be used. It also evaluates the performance of a feature extraction and classifier tool on some limited data files that store data for known disturbances logged by PNM. Based on these initial results, effectiveness of the classifier tool is evaluated, and future work is proposed that may ultimately lead to real time identification of disturbance events immediately after the disturbance files are created.

Celeste Gabriela Rose Davilla; English, NMSU

From Sex to Acquaintance: The Despised and Desired Gazes of a Black Female Spectator

This essay investigates the flaws of essentialism within the collective black body group and the individual romance with being black by critically looking at the two protagonists in the contemporary film *Medicine for Melancholy* (2008). In a post-civil rights and black power/ consciousness era, blackness has been absorbed and conflated with popular culture and it has become even more difficult to articulate what constitutes as blackness in a nation where black has continually been appropriated and questioned. This essay uses arguments in feminist theory and film criticism by Judith Butler and Susan Fraiman to explore further what it means to be a black female spectator and the pleasures of looking from that point of subjectivity. This study addresses the need for a re-examination of blackness as there are strong indications of new psychological realities and new subjective needs and desires.

Jeanine Deibel; English, NMSU

Poetics of Indeterminacy

This will be a poetry reading and presentation on fragmentation and the poetics of indeterminacy. I will explore this topic through several of my own poems that highlight this method of communication and language usage, as opposed to dominant modes and linear narratives. Lynn Keller, in her book *Thinking Poetry: Readings in Contemporary Womens Exploratory Poetics*, argues that contemporary experimental poets have a responsibility to reveal the truth of complexity; ours is an astonishingly complex world, in which right and wrong are intricately interwoven, in which difficult problems require multifaceted, inventive solutions (2). Through experimental and avant-garde approaches to poetry, a more complex perspective on the world is embraced, since our objectives are not to neatly regurgitate normative ideas of society, but to express the breadth of possibility inherent in human experience.

Lisa Drake; Biology, NMSU

Aquaporins in the Malpighian tubules are essential for water transport in the Yellow Fever mosquito, Aedes aegypti

Female mosquitoes require the uptake of blood for egg production and as a result, they transmit disease pathogens to humans. It is essential for mosquitoes to possess an efficient excretion system to shed excess water and sodium ions and retain nutrients from the blood. After a blood meal, females excrete excessive amounts of urine through their excretory organs, the Malpighian tubules (MT). Aquaporins (AQPs) are a family of membrane transporters that regulate the flow of water, glycerol and other small molecules across cellular membranes in both prokaryotic and eukaryotic cells. Previously, we surveyed genome databases and identified six putative AQPs in the genome of Ae. aegypti. RNAi-mediated knockdown of the MT-expressed AQPs in Ae. aegypti resulted in significantly reduced diuresis. Recently, we have confirmed that the MT-expressed AQPs function as water channels and mediate transcellular water transport in adult female Ae. aegypti. We have expressed Ae. aegypti AQPs in Xenopus laevis oocytes which has resulted in significant increase in water permeability of their cell membranes and subsequent swelling proving that these proteins are indeed water channels. Quantitative PCR and in situ hybridization assays have shown where these AQPs are located within the MTs and the level in which they are expressed during certain time points.

Malnaidelage Nalin Fernando, Leo Zella, Tyne Richele Johns, Yue Qi, Chang H. Kim, Abhaya Datye, & Boris Kiefer; Physics, NMSU

Interactions of Monometallic Pd_n/Pt_n (n=1, 9) Nanoparticles with Support Surfaces

The reduction of carbon monoxide (CO) and hydrocarbon (HC) emissions in advanced low temperature combustion engines has become a challenge for the transportation sector. Platinum (Pt) based catalysts are commonly used to oxidize CO and unburned HC in gasoline engines. However, more efficient and advanced lean burning combustion engines require the design of new oxidation catalysts that are active at lower exhaust temperatures and reduce the Pt dependence. A critical aspect for the applications is to reduce the natural tendency of nanoparticles to form larger particles either by mass transport through the gasphase or on the catalyst support. In this contribution we use parameter-free first-principles theory to investigate bond strength of catalytic nanoparticles with the support. We consider monoatomic dispersed palladium (Pd) and Pt as well as Pd_9 and Pt_9 clusters on an industrially used γ-$Al_2O_3(100)$ support. The preliminary results show that mass transport most likely occurs along the surface of the

support and not through the gasphase. The most favorable Pd_9 (Pt_9) binding geometry is characterized by four Pd (five Pt) atoms binding to the support surface. The average Pd/Pt-O bond length across the interface suggests the formation of covalent bonds, consistent with the high binding energies between the clusters and the support, 3.5 eV and 7.0 eV, for Pd_9 and Pt_9 respectively. Interpolation of the results suggests that the binding energies in (Pt,Pd) alloy catalyst are reduced but remain high, indicating the feasibility to reduce the Pt dependency in catalytic converters.

Ferdinando Floretto; Computer Science, NMSU

A Filtering Technique for Fragment Assembly-based Proteins Loop Modeling with Constraints

Methods to predict the structure of a protein often rely on the knowledge of macro substructures and their exact or approximated relative positions in space. The parts connecting these sub-structures are called loops and, in general, they are characterized by a high degree of freedom. The modeling of loops is a critical problem in predicting protein conformations that are biologically realistic. We introduce a class of constraints that models a general multi-body system and provide filtering techniques, inspired by inverse kinematics, that can drastically reduce the search space of potential conformations. The paper shows the application of the constraint in solving the protein loop modeling problem, based on fragments assembly.

Angel Flores-Abad; Mechanical and Aerospace Engineering, NMSU

Optimal Control of a Space Robot to Approach a Tumbling Object for Capture with Uncertainties in the Boundary Conditions

This paper presents an optimal control strategy for a space robot to approach a tumbling object, such as an out-of-control satellite or a piece of space debris, for capture with minimal impact to the base satellite (also called servicing satellite or chaser satellite) with consideration of random uncertainties in the initial and final boundary conditions. The method consists of two steps. The first step is to determine an optimal future time and the target objects corresponding motion state for the robot to capture the tumbling object, such that, at the time when the tip of the robot intercepts it, the resulting impact or disturbance on the attitude of the base satellite will be minimal. In the second step, the space robot will be controlled to reach the tumbling object at the predicted optimal time along an optimal trajectory. Uncertainties in the initial and final boundary conditions are introduced as errors inevitably exist in the tracking sensing data. Markov Chain Monte Carlo (MCMC) method is employed to solve the optimal control problem with boundary uncertainties. The performance of the method is demonstrated using a dynamics simulation example.

Erika Galloway; Sociology, NMSU

Being Real or Being Black: A Content Analysis of Representations of African American Females in American Cinema.

Through a qualitative content analysis I will examine how the depictions of African American females presented in cinema perpetuate or challenge popular perceptions of African American womanhood. To further examine this phenomenon, I pose the following research questions: 1. How are African American females depicted in Hollywood cinema? 2. To what extent do these depictions portray the multidimensionality and complexity of black womanhood? 3. To what extent do these depictions reinforce stereotypes? Crenshaw (1991) states that intersectionality offers an avenue to re-theorize race as a combination of men and women of color. Using the theoretical framework of Intersectionality theory, I will critique the top grossing films of the last decade, 2002-2012, which depicts an African American leading lady. Intersectionality theory allows one to see the intersecting sources of oppressions; race, gender, sexuality and nation (Collins 2004). A purposive sample of 12 movies meeting the criteria of this study will be analyzed using analytical memos. I expect that my analyses will reveal that while some progression in the representation of African American women in American Cinema has taken place over the years, some of stereotypical depictions are still present throughout most modern films. Similarly, I expect to find that most of the depictions of African American females will be current with Collinss assertion that society perceive black women in three main categories; mammie, jezebel, and bitch.

Adriana Goenaga Ruiz de Zuazu; Curriculum and Instruction, NMSU

Third Graders acquiring a second language

This is a qualitative study which asks the following question: This study took place in an elementary school in the Southwest of the United States .The participants are two third-graders attending the dual immersion Spanish/ English- program. One of the student is a dominate Spanish speaker and the other is a dominate English speaker. I conducted this study in order to learn if there were differences or similarities between these two third graders acquiring a second language. These students were selected because both were struggling to acquire the second language. I used different teaching methods in order to assist the students in acquiring their second language. Through this study I found that childrens first language remained dominant, and that they needed to refer to their first language constantly when speaking and writing in the second language. As Brisk and Harrington (2000) show in their work with second language learners the first language is vital to students learning the second language. The second important finding in this study is that students transfer their speech into their writing. This study helps us understand the methods that are necessary in helping children acquire a second language such as: having a safe learning environment, interactive methods, having children choose the topic of study, and building confidence and self-esteem are essential in order to acquire a second language. I conclude that we must work together as future educators in order to continue to find the best practices needed to acquire a second language.

Candace Leah Gray; Astronomy, NMSU

Venus' Oxygen Green Line and its Connection with Solar Activity

Earth, Venus, and Mars all formed close to the Sun under similar conditions and materials. While having common origins of formation, their various evolutionary paths resulted in two CO2 dominated atmospheres (Venus and Mars) and a one N2/O2 dominated atmosphere (Earth). In order to understand the processes that led to the evolution of these atmospheres we need to understand the present chemistry. Furthermore, knowing the chemical reactions occurring in the upper atmosphere is vital in understanding physical processes such as winds and transport mechanisms. Knowledge of these reactions can be determined by observing nightglow. Nightglow is caused by recombination of atoms into molecules, or electrons with ions, producing excited molecules and atoms, respectively. Venus has several strong nightglow features, one of which is the O(1S-1D) transition at 5577.3 Å(oxygen green line). This feature is known to be highly temporally variable, unlike our own green line. The reason for this variability is unknown. We propose that variability is due to large amounts of extreme ultraviolet (EUV) light and charge particles which occur during solar flare eruptions and coronal mass ejections (CMEs) from the Sun. To test our hypothesis, we observed Venus as a Target of Opportunity with the ARCES high resolution echelle spectrograph on the 3.5m Astrophysical Research Consortium telescope at Apache Point Observatory in April - July 2012. After every CME impact, the Venusian green line was present. However it was not present after every solar flare. The implications of this will be discussed.

Martha Martinez Grimes; Molecular Biology, NMSU

Deciphering the Role of Sucrose Phosphate Synthase in Root Nodules of Medicago sativa *(alfalfa)*

Leguminous plants, like alfalfa, can form a symbiotic relationship with a nitrogen fixing bacteria resulting in the formation of the root nodule. The nodule has the ability to sustain the nitrogen fixing bacteria by providing the optimal conditions for the bacterially encoded enzyme, nitrogenase, to reduce nitrogen to ammonia. The ammonia is then assimilated and exported to the rest of the plant. The plant provides the bacteria with a source of carbon and energy in the form of sucrose in exchange for the fixed nitrogen. Sucrose Phosphate Synthase (SPS) catalyzes the penultimate step in sucrose biosynthesis and plays a key regulatory role in carbon partitioning in the pathway. SPS has a key role in photosynthetic tissues but preliminary work from our lab has shown high SPS activity in the nodules. Of the three SPS gene members that have been identified in alfalfa (SPSA, SPSB3, SPSB5), SPSA is expressed in a nodule enhanced manner, while the SPSB genes are solely expressed in photosynthetic tissues. To address the issue of what might be role of SPSA gene product in the nodules, we are using immunolocalization and site of promoter function to localize the site of expression of SPSA in the nodules in context of nitrogen fixation, ammonia assimilation, and carbon metabolism. We are also using a genetic engineering approach to modulate the expression of SPS genes in a cell specific manner to monitor any changes in the function of the nodules. Preliminary results show SPS to be localized only in infected cells while Sucrose Synthase (SucS), involved in sucrose degredation,

was found in both infected and uninfected cells of alfalfa root nodules. Based on results, we propose SPS functions in infected cells to re-synthesize sucrose from UDP-Glucose and Fructose-6-Phosphate that are produced by sucrose degradation by SucS.

Patricia A. Grubel & Mohammad A. Qayum; Electrical & Computer Engineering, NMSU

Scalable Graph Processor

Big Data - Graph based applications used in areas such as bio-informatics, social-networks, cyber-security etc. present challenges for the next generation of super computers. Currently, graph applications are processed on Symmetric Multiprocessors (SMP), commodity clusters, Multi-Threaded Architecture (MTA) based super computers, and GPU/FPGA based heterogeneous systems. Challenges in these architectures are scalability, power consumption, execution time, and cost. A new computation model, ParalleX (PX), proposes solutions to these challenges. The solutions include moving work to data, fine grain synchronization, massive mult-threading computation, and mitigation of memory bottlenecks. The Advanced Computer Architecture Performance and Simulation (ACAPS) lab at NMSU is researching architectural solutions for these challenges by designing a new Scalable Graph Processor, an integral part of the PX model. For developing a new processor, we are studying existing architectures, conducting computer performance analysis, building simulators, and prototyping a processor in FPGA. This is a presentation of the study of existing architectural bottlenecks and performance analysis of the experimental PX runtime software.

Chris Habrock; Geography, NMSU

Caucasus Migration Patterns into Russia

Russia's population is declining but its economy is growing. It was recently inducted into the WTO (World Trade Organization), which will likely serve as a catalyst to economic growth. Thus, the labor pool is in short supply and the Russian administration has sought to address this through less restrictive immigration policies that will allow migrant workers to help fill the void. Many migrant workers come from the South Caucasus, specifically Armenia, Azerbaijan, and Georgia (northern parts of Turkey and Iran are often included in this region). Entire countries found in this range are Armenia, Azerbaijan, and Georgia. The North Caucasus contains the southern-most portion of Russia, much of which consists of autonomous regions and other federal subjects that are ethnically diverse and different from most of Russia (white, Slavic, and primarily Christian; most notably the Chechen Republic). Throughout this region there are hundreds of ethnic groups, nations (in the sense of a nation defined as a homogeneous group of people with a shared culture, not a political state), and clans that have resided there for centuries. The South Caucasus is generally viewed as the non-Russian (by political boundary) portion and contains the previously mentioned countries. This is a vast area with myriad complexities that is entangled by recent volatility as well as long-standing conflict(s). Rising nationalist sentiment within Russia is cause for concern for many migrants and knowing who, where, and how many is significant when trying to understand the juxtaposition of economic growth, migration, and nationalism.

Kelsie Hahn; English, NMSU

Flash Bang

Flash fiction, or very short fiction, is a growing field in creative writing. Flash fiction is a challenge in compression and control the creation of characters, narrative arc, and emotional investment in a small space. Often, this space is less than 1,000 words, which requires the author to rely heavily on language, pacing, and implication to create a full experience for the audience. This reading of original flash fiction will explore and engage this genre as both an artistic challenge and an artistic opportunity to approach narrative and story telling in novel, compelling ways.

Allison Fitzgerald Heneghan; Biology, NMSU

Investigating the genetic consequences of population fragmentation in Chihuahuan Desert Black Grama using AFLP markers

Grasses and grasslands are among the most important biological systems on the planet, providing habitat for wildlife, forage for grazers, and grain for animal and human consumption. Bouteloua eriopoda (black grama) is a key species of the grasslands that once covered large parts of the Northern Chihuahuan Desert. Over the last 150 years these grasslands have experienced a significant reduction in geographic coverage as a result of creosote and mesquite

shrubland encroachment. The genetic consequences of reduced population size and fragmentation on black grama, or other grasslands, remains unclear. However, research on other wind pollinated plant species suggests that these phenomena result in reduced genetic variation with various potential long-term consequences. Here we present the use of AFLP markers in black grama for future investigations focusing on spatial patterns of genetic diversity in black grama. Thirty-seven black grama populations from New Mexico and Mexico have been sampled; with a total of 563 individuals collected and their DNA extracted. These individuals were screened for genetic variation and population structure using four selective Amplified Fragment Length Polymorphism (AFLP) markers. Data analysis so far supports distinct population structure between the Mexican and American populations, and between the three Mexican populations. We are currently working to resolve the population structure for the American populations in order to make inferences about the effect fragmentation has had on a genetic level. The results of this project will contribute to our understanding of the consequences of fragmentation on a local grassland species while providing critical information for future restoration and conservation efforts.

Amanda Marie Hernandez; Anthropology, NMSU

Its the Pits!: Optimal Field Methods for the Location and Excavation of Prehistoric Roasting Pits in the Jornada Mogollon

This study will discuss standardized methods and the most cost and time efficient way of locating and excavating prehistoric roasting pits in the Jornada Mogollon (AD 200 1450). The National Historic Preservation Act mandates evaluating these sites for their potential to provide information important in understanding prehistoric behavior. Since most CRM investigations (surveys, testing projects, and data recovery) to discover and evaluate roasting pits, are time sensitive and constrained by budgets, it is imperative that a best practice method be implemented. This study is a comparative analysis of differing methodologies to locate and excavate a small number of sites with roasting pits on the southern foothills of the Sacramento Mountains in New Mexico. I will use ethnographic studies of roasting pit construction and use, combined with an investigation of site formation processes through time in an attempt to develop best practices. Field testing of such app roaches will be by geophysical exploration with comparisons between magnetic gradient survey, electrical resistivity, ground penetrating radar and ground truthing of anomalies. This study will contribute to understandings of Formative period subsistence practices in the Jornada Mogollon by elucidating changing patterns in roasting pit size, location, and their function in processing wild plant resources.

Hector Hernandez; Agricultural Economics & Agricultural Business, NMSU

Pyrethrum Production and Marketing Challenges and Opportunities for Smallholder Farmers in Kenya

Kenya has historically been a leading global supplier of pyrethrum extract used in the manufacture of organic insecticides. The extract is derived from the flower heads of a daisy that grows very well in the highlands of rural Kenya (Grdisa et al., 2009). Some estimates indicate that approximately 200,000 smallholder farms are producing daisy flowers in Western Kenya (Lukuyu et al., 2011; IRIN News 2011; Wandahwa et al.,1996). Pyrethrum is a perennial cash crop with a nearly nine month long harvesting season that makes it possible to generate a consistent flow of income particularly for cash strapped smallholders and female headed households. Currently, the Kenyan pyrethrum industry is facing intense competition in the world market and a number of production and marketing challenges at home. As a result, the total production has been declining from more than 28,000 metric tons of dried flowers in 1983 to less than 4,000 tons in 2010 (FAO, 2012). Consequently, Kenya's dominant position as a leading global exporter of pyrethrum extract has dropped along with the livelihoods of its farmers. As a result, growers are uprooting pyrethrum plants and switching to other crops. In this light, this study proposes to evaluate the current state of pyrethrum production in west Kenya by using household level primary survey data and conducting a number of stakeholder meetings with growers, grower association representatives, and other marketing channel partners. A detailed analysis of household survey data is expected to provide a better understanding of pyrethrum production, post-harvest processing, and marketing challenges faced by growers and help in identifying major factors determining crop yield and its eventual impact on farm income, food security, capacity of women farmers, and the overall well being of small rural households. The study will analyze the role that social capital, microfinance, and training, particularly for women farmers, plays for successful pyrethrum growing and marketing in Kenya.

Philip L. Hernandez; Curriculum and Instruction, NMSU

Emerging Technological Tools that Boost Classroom Engagement

This presentation will discuss briefly the growing importance of student engagement, the challenges engagement poses to the instructor, and emerging technological tools instructors can use to increase engagement. Specifically, the use of student responses via SMS messaging and self-publication of course materials will be discussed and examples provided. The focus will be on tools that are both easily integrated and cost effective.

Rebekah L. Horn; Molecular Biology, NMSU

Population genetic structure of a playa lake crustacean

The tadpole shrimp (*Triops* sp.) is a crustacean that occupies playa lakes in arid climates. Like other playa lake inhabitants, tadpole shrimp deposit desiccation resistant embryos called cysts that survive the dry periods. Cysts are passively dispersed throughout the landscape by a variety of vectors including the wind, birds, and mammals. Tadpole shrimp can reproduce through parthenogenesis or hermaphroditism, which facilitates colonization of playa lakes with one dispersing cyst. Utilizing a population genetics approach, that included sequences of the complete mitochondrial control region and nine nuclear microsatellite loci, I have been able to assess the structure and degree of genetic diversity in *Triops newberryi*, a species in southern New Mexico with limited knowledge of its ecology and evolution. Samples were obtained from playa lakes on the NMSU Chihuahuan Desert Rangeland Research Center, the Jornada and a flood pond in Las Cruces. Results of the combined genetic marker analysis revealed that *T. newberryi* exhibited high levels of population differentiation between playas located in close proximity ($F_{ST} = 0.25$) and high inbreeding values ($F_{IS} = 0.60$). There was no evidence of isolation by distance indicating the structure of populations is not consistent with a stepping stone model of dispersal. Genetic diversity within a location varied from one to five haplotypes. The amount of first generation migrants was estimated revealing an overall direction of migration from north to south, contrasting to the prevailing wind in this region. Landscape features were also calculated including the size of each playa lake and the drainage basin the playa is contained within. The largest playa lake was located in one of smallest drainage basins, but also had the highest allelic richness values (4.36). The genetic structure of *T. newberryi* is likely influenced by the dispersal method, environmental variables and its own reproductive system with close inbreeding.

Ping Hou; Computer Science, NMSU

Solving Decision-Making Planning Problems Under Uncertainty

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). Generally, an MDP comprises of a set of world states, a set of available actions, a transition model describing the probability of transitioning to a new state when taking an action in the current state, and an objective function (e.g., maximizing the sum of rewards obtained over a sequence of time steps). An MDP solution determines the agents actions at each decision point. An optimal MDP solution is one that optimizes the objective function. Our work proposes a general framework to bootstrap MDP algorithms to solve problems when an agent has an inaccurate model of its environment (e.g., a Mars rover wrongly assumed that an area is traversable when it is actually not). We show that an agent using our framework can find better solutions than a naive method when they are both given the same amount of runtime.

Cheryl Ingram & Ashley Ryan; Curriculum and Instruction, NMSU

Why Aren't You Here?: An Epistemological Investigation into the Dynamics that Contribute to the Shortage of Black Public School teachers

The following presentation will present research of a qualitative investigation done by the presenters to examine the shortage of Black students enrolled in a teacher education program within the borderland region of the United

States. Participants contributed to the research by sharing their experiences regarding political, cultural, educational and social hurdles that have created immense boundaries in their perspectives of teaching as a profession. Dialogue within the study confront and challenges many participants faced as they chose not to enroll in teacher education programs.

Christopher Kazanjian; Curriculum and Instruction, NMSU

Engaging Higher Education in a Transmigrating World: Humanistic Methodologies and Implications

This presentation discusses the current situation regarding displaced and transmigratory populations coming into the U.S. Many institutions of higher education are seeking to engage rapidly diverse communities. This presentation will outline many efforts around the country and place emphasis on the humanistic methodologies.

Dr. Boris Kiefer & Disoj Neupane; Physics, NMSU

The size dependence of the elastic behavior of Fe2O3 and Al2O3

Materials at the nanoscale are expected to show distinct chemical and physical properties that make these materials suitable for novel scientific and technological applications. In our contribution we present an analysis of the size dependence of the elasticity in oxides. From the experimental observations we can see the materials showing their three distinguished behaviors with changing their particle size; the bulk modulus can increase, decrease, or remain unaffected by changing particle size. The bulk modulus of nanocrystalline ?-Fe2O3 has been observed to be 50% higher than its macroscopic bulk modulus. In structurally isomorphic ?-Al2O3 the bulk modulus has been observed to show the opposite behavior and to decrease by 40% below its macroscopic value at the nanoscale. In contrast, in compositionally identical but structurally different ?-Fe2O3 and ?-Al2O3 show much smaller variations. We will discuss the possible chemical and physical reasons for this counterintuit ive behavior, including electronegativity differences, charge balance, and the role of vacancy formation. Understanding the differences and similarities between the Fe2O3 and Al2O3 systems will provide new insights into the feasibility to use oxide coatings to design materials with improved elastic and mechanical properties.

Phanidhar Kukutla; Department of Biology, NMSU

Mosquito defense against blood meal associated oxidative stress: concerted action of host and gut microbes in Anopheles gambiae

The mosquito gut ecosystem accommodates a dynamic microbiota that is essential for various mosquito life traits. During adult stage, blood meals impose a big impact on the structure of microbial community. The catabolism of a blood meal results in a large amount of free heme released from hemoglobin. This escorts the generation of free radicals and reactive oxygen species (ROS). As an adaptation, mosquitoes have evolved various mechanical and biomedical mechanisms to protect against these toxic molecules. However little is known about mechanisms employed by the gut microbial residents to cope with the oxidative stress. Our RNA-seq analysis of metagenomic gut microbiome revealed that the dominant taxa *(Enterobacteriaceae, Pseudomonadaceae Flavobacteriaceae and Acetobacteraceae)* posses a wealth of genetic capacity to deal with oxidative stress. A total of 326 subsystem counts (functional roles) were assigned to oxidative stress. The major oxidative stress regul ators such as SoxR, OxyR and their associated anti-oxidant genes were identified with multiple taxon origins and are upregulated. In enteric bacteria, these two major regulons are known to control stress response. Superoxide is sensed by the SoxR, which further activates soxS to transcribe an array of genes, including superoxide dismutase (SOD) that converts the highly toxic superoxide into a less toxic H2O2. In parallel, the OxyR senses the H2O2 and regulates the activation of major peroxide-degrading enzymes; including *catalase, alkylhydroperoxide reductase (AhpC), glutaredoxin (Grx), glutathione reductase, the ferric homeostasis regulator Fur, and the DNA-binding ferritin-like protein Dps.* In this study, we constructed a metagenomic reference of gut microbiota. Both SoxR and OxyR regulons and associated anti-oxidant genes were identified with multiple taxon origins in the gut microbiome. Additionally, the RNA-seq data revealed the differential expression patterns o f oxidative stress responsive genes between the sugar and blood fed guts. Overall, our data suggests that the gut microbiome may provide genetic capacity which is crucial in maintains gut redox homeostasis in a blood fed gut.

John Kulpa; Psychology, NMSU

Effect of Loss Size on Gambling Persistence When Subsequently Breaking Even

The gambling behavior of people is of particular interest for those concerned with promoting responsible gambling. However, knowledge about how people behave in gambling situations may also generalize to other situations involving decision-making, risk, and uncertainty. Previous research on machine gaming indicates that the effect of wins and losses on continued slot-machine play may depend on the magnitude of these losses in relation to the original stake of the player. The present experiment investigated how the amount previously lost affects the likelihood that a person will quit a given gambling session. Participants played a slot-machine simulation for credits with the understanding that the number of credits remaining at the end of play was directly related to their chance of winning a $100 drawing. It was hypothesized that those having lost a relatively large amount would tend to quit more quickly when encountering a losing streak then those having lost a relatively small amount. A predictive model is presented, along with results, a discussion of implications and ideas for continued research in this area.

Kuldeep Kumar; Electrical & Computer Engineering, NMSU

Hybrid FSO/RF Symbol Mappings: Merging High Speed FSO with Low Speed RF through BICM-ID

In this paper, we investigate designing of hybrid free space optical (FSO)/ radio frequency (RF) symbol mappers using bit-interleaved coded modulation with iterative decoding (BICM-ID) with asymmetric data rates between the FSO and the RF links. Data bits are first encoded with a channel code and the coded bits after an interleaver are mapped to hybrid FSO/RF symbols instead of separate conventional RF symbols and on-off keyed FSO transmissions. Iterative decoding is used at the receiver. An orthogonal evolutionary (OE) algorithm to obtain optimal symbol mappings is used. Two cost functions to be used in the OE algorithm are proposed. For high SNR regime, analytical error bound expressions are used and at the low signal-to-noise ratio (SNR) regime, extrinsic information transfer (EXIT) chart is used for the cost function. The proposed mappings achieve significant gains over conventional mappings. For a hybrid FSO/RF link with an FSO and RF channel use ratio of 10:1, the proposed mapping achieves an optical SNR gain of more than 7 dB over conventional mapping. A good agreement between simulation and analysis results is obtained for the proposed scheme at high SNR.

Jessica P. Lail; , NMSU

An analysis of the feminist theory of rape

The research I propose to present examines the theorized relationship between the patriarchal need for control (as proposed by Johnson, 2005) and rape. The feminist theory or control theory of rape asserts that control and dominance are two key factors in why males perpetrate. Despite this assertion, little concrete evidence has been supplied to support this assertion. While sex stereotyped attitudes and rape myth acceptance are related to hypermasculinity in males, this does not necessarily clearly outline the relationship of using rape as a method of control and domination. The Burt Rape Myth Acceptance Scale (RMAS) (Burt, 1980) and a perceived control questionnaire (PCQ) will be employed to test the relationship between these two variables. Three conditions will exist within the experiment, all of which will employ only male participants. The first condition will expose participants to a PCQ designed to elicit a heightened sense of control before taking the RMAS, the second will elicit a lowered sense of control prior to the RMAS, and the third will be the control condition where participants will only respond to the RMAS. Since data has not yet been collected (but will be collected and analyzed by conference-time), the outcomes are hypothesized to be either one of two ways. First, the results could show that in the less-control condition, participants were more accepting of rape myths which may be support for the feminist theory. RMAS scores for the less control group must vary significantly from the control group for this conclusion to be drawn. Second, if no significant relationship is observed, this could be evidence against the validity of the feminist theory and would suggest that either the feminist theory should be integrated with other theories for a more comprehensive explanation of the phenomena of rape or that it needs to be revised or removed from the theoretical discussion.

Candace Lewis; Anthropology, NMSU

Residents and Volunteers: Community Response in Disaster Recovery in Tohoku, Japan

The triple disaster that struck the coast of northeast Japan on 3.11.11 left many people without homes, family, jobs, or communities. This paper discusses the ongoing recovery efforts being conducted at the grassroots level by

a community of residents and volunteers. These efforts are empowering individuals to create their own future and rebuild communities. Many of the efforts are innovative and/or defiant and illustrate the importance of working directly with local residents to rebuild throughout a recovery process that will take years.

Wenyan Li; Chemical Engineering, NMSU

Fluorescence lifetime-dependent flow cytometry in the time-domain

Fluorescence decay measurements using a time-domain approach is a powerful and sensitive technology when combined with epifluorescence microscopy. Time domain measurement systems observe the fluorescence decay of molecules, metabolites, or other fluorescent species inside of cells. When images are acquired by fluorescence lifetime imaging microscopy (FLIM) or similar relatives, highly resolved multi-pixel data can be obtained. Lifetime values help indicate concentration independent subcellular phenomena. Although FLIM systems retain high signal to noise, they are still limited in efficiency and throughput. In this contribution we present a new type of flow cytometer designed to rapidly capture fluorescence decay profiles based on a time-domain approach. The instrument was developed based on a traditional design but incorporating a rapidly scanning continuous wave laser beam excitation source. The laser was focused to a tight spot size to yield short interaction pulses when scanned over cells or microspheres between 2 and 10 microns in diameter. The fluorescence decay was deconvolved from the raw fluorescence and scattering cytometric waveforms, which were collected using a high-speed data acquisition system. This new measurement system preserves the efficiency of traditional time-domain systems as well as throughput of standard cytometry. It does not require frequency modulation that traditional phase sensitive instruments require.

Jesse Marczyk; Psychology, NMSU

Does it matter who pulls the switch? Perceptions of intentions in the Trolley Dilemma

Humans face the adaptive problem of predicting the likely behavior of those they interact with. One means through which people try to predict the behavior of others would be through perceptions of their intentions; what goals others seek to achieve through their behavior. Unfortunately for perceivers, intentions are not readily observable in the same way that physical traits like eye color are; rather intentions need to be inferred from other cues. One of those cues might be perceptions of who benefits and suffers from an act. When reacting to a Trolley Dilemma, holding the act (pulling a switch) and the outcome (5 live, 1 die) constant, the payoff for the person who pulls the switch matters when it comes to moral judgments.

Jorge Márquez B, David V. Jáuregui, Brad D. Weldon, & Craig M. Newtson; Civil Engineering, NMSU

Development of preliminary design charts for prestressed Ultra High Performance Concrete bridge girders

The original PCI Bridge Design Manual provides preliminary design charts that were developed based on the AASHTO Standard Specifications. These charts provide initial girder parameters including the girder size and number of prestressing strands required for a given span length and beam spacing for 28-day concrete compressive strengths of f'c = 7,000 and 12,000 psi (48 and 83 MPa). Recently, a few states including Iowa and Virginia have built bridges using ultra-high performance concrete (UHPC) with an f'c exceeding 15,000 psi (103 MPa) and other states such as New Mexico are also interested in this material. This paper presents a general procedure to develop preliminary design charts for prestressed concrete bulb-tee girders considering service load stress limits, flexural strength, and stress limits at transfer in accordance with UHPC tension and compression (release and 28-day) properties. The procedure is illustrated for a prestressed concrete BT-72 beam to determine the number of strands required versus span length and beam spacing. The results are first compared with the PCI design charts for purposes of verification. Using the verified procedure, preliminary design charts are then developed for UHPC girders to show the potential impact on prestressed bridge design.

Griselda Martinez; Economics and International Business/Agricultural Economics, NMSU

Case Study: Does unauthorized Mexican unauthorized immigration has an impact in crime in the US?

The perception in the US that immigrants are directly linked to crime, especially those without the proper immigration documentation, has increased in recent years. The counterargument to this may be that immigrants, whether

unauthorized or authorized, are similarly prone to crime as any other resident in the US. Given the large share of Mexican immigrants in the US and the controversy related to immigration and crime, the relationship between Mexican unauthorized immigration and crime is examined herein in order to reach empirical evidence on this association.

Nigel Mathes; Astronomy, NMSU

A Detailed Spatial Study of HI and OVI Absorbing Gas Around Galaxies

Neutral hydrogen (HI) probed by the Ly-alpha transition in quasar absorption spectra traces the circumgalactic medium of distant galaxies. We present a sample of 15 galaxies imaged by HST/WFPC2 with high resolution HST/COS or HST/STIS spectra covering the Ly-alpha transition. The galaxies lie within 90 kpc of the quasar line of sight and vary in redshift from $0.1 < z < 0.7$. We model each absorption system using a Voigt Profile fitting method which yields a set of N clouds of a given column density, Doppler b parameter, and velocity. We model each galaxy using Galaxy IMage 2D (GIM2D) which performs detailed bulge/disk decompositions of images of distant galaxies. This method produces measured inclinations and position angles (the azimuthal position of the galactic disk on the sky). Of particular interest is the projected azimuthal location of the absorbing gas with respect to the major axis of the galaxy. In line with recent results from MgII absorption, we expect higher column density, more turbulently broadened absorption features located perpendicular to the disk of the galaxy, implying outflowing gas entrained in supernova-driven winds.

Greggory Thomas McPherson; Physics, NMSU

Measuring the concentrations of dissolved N2, O2, and CO2 in water using Enhanced Raman Spectroscopy.

The thermodynamic properties of water change upon the removal of dissolved gases. Our laboratory has been investigating the formation of nano-emulsions in water removed of its dissolved gases in the absence of a surfactant. Degassed, ultra-pure water has been shown to form emulsions on the nano-scale of highly hydrophobic molecular species. For example, Silicon oil and octane have formed stable emulsions over time scales from several hours to several days. In order to better quantify the prepared emulsions, a method of determining the extent of degassing needs to be employed. Near infrared Raman Spectroscopy has been successful in elucidating spectra of dissolved N2, O2, and CO2 in water owing to the reduced symmetry properties of the solvated molecules. Presented is the development of this technique for quantifying the efficacy of three degassing methods; commercial debubbling, flash freeze-pump-thaw cycles, slow freeze-pump-thaw cycles.

Rodrigo Rau Mora; Sociology, NMSU

Democracy, Human Rights, and the GLBTQ Community right to marry (A US/EU Comparison)

When democratic states offer a constitution there are certain rights that those citizens expect. This will be a presentation that compares the UN declaration of Human Rights from 1948, the US and Spanish Constitutions and other historical documents. This presentation was originally presented in Sevilla Spain on October 31,2012 as a thesis defense. It is pertinent to the current atmosphere in a world of "open democracies" and human rights.

David Philip Morin; Biology, NMSU

Population Genetics of the Boechera suffrutescens (Brassicaceae) Complex

The genus /emphBoechera, including over 110 currently recognized species,has long been recognized as a taxanomic enigma due to rampant interspecific hybridization, morphological intergradation, and complications associated with variation in ploidy level. /emphBoechera is becoming the North American corollary to /emphArabidopsis as model system for research because of the close relationship between the model system /emphArabidopsis and /emphBoechera, numerous species being of conservation concern, and the existence and broad distribution of apomictic (asexual) reproduction in both diploid and triploid populations. The focus of this study is the /emphBoechera suffrutescens complex, which includes /emphB. suffrutescens, B. rigidissima, B. rigidissima var. /emphdemota, B. rollei, B. constancei, and /emphB. horizontalis. All except /emphB. suffrutescens are recognized as rare or protected plant species about which we know very little. Members of the complex range from alpine and subalpine ecozones from the central Sierra Nevada Range to Washington, and east into western Nevada and southern Idaho. Specimens were

collected for genetic sampling via field collection and herbarium loans. DNA was extracted and 13 microsatellite loci analyzed for comparison and analysis. While data and results from this project are a work in progress , we hope to gain a better understanding of the number of species and their distribution, patterns of diversification, and apomixis as a reproductive strategy.

Mazen Nairat; Electrical & Computer Engineering, NMSU

Telephoto Lens Design

The design of a Telephoto Lens is analyzed. The system consists of two separated components for anobject located far away. The lenses are assembled in such a way the achieved zoom is maximum. Paraxial Ray Trace principle is employed and performed by the optical design program, Zemax. The design is based on the standard sequential ray tracing through the involving elements. It considers the diffraction limits as well as the effects of air-spaced achromatic. Extensive standard analysis such as spot diagram and ray-fan plots are provided too.

Mauren Gabriela Navarro; Curriculum and Instruction, NMSU

A storytelling: The curere *of marginalized Central American women: Double Wasted lives.*

This study aims to clarify the curricular experience of a specific societal group: women who work on the streets of Tegucigalpa, Hondurasbut it perfectly applies to the same sectors in many other countries around the world. This is an example of wasted lives, of a marginalized sector of society but not exclusive to Tegucigalpa. Because curriculum making is an inherently political activity (Noffke, 1998, pg.113), this study attempts to unmask the ideology behind the social structure that keeps this specific sector in a marginal situation. Apple (2006) stresses that in practice neoliberal policies involving market solutions may actually serve to reproducenot subverttraditional hierarchies of class and race (pg. 59). I want to add to Apples description traditional hierarchies of gender. There is an enormous mechanism structured to work perfectly in society and keep people at the bottom of the system. Obscurantism behind power groups works to prevent some sectors of society from being developed positively and leaves the misery in which they live intact. Different mechanisms exist in order to support this structure. One mechanism is the hidden curriculum. This essay utilizes counter storytelling and Critical Race Theory to refer to a framework because it is used to examine and challenge the ways race and racism implicitly and explicitly shape social structures, practices and discourses (Yosso, 2006, pg. 4). I also utilize Critical Feminist Theory methodologies as approaches; I will try to explore issues of gender, curriculum formation and social justice. This article will discuss the multiple forms of oppression and struggles of this particular group of marginalized women in order to answer the questions: What is the curricular construction for these women? Is their knowledge considered valid knowledge? And very important, what is the curriculum formation of an entire country and system that supports discrimination against these women?

Khoi Nguyen; Computer Science , NMSU

On Computing Conformant Plans Using Classical Planners: A Generate-And-Complete Approach

The paper illustrates a novel approach to conformant planning using classical planners. The approach relies on two core ideas developed to deal with incomplete information in the initial situationthe first focused on using a classical planner to solve non-classical planning problems, and the second aimed at reducing the size of the initial belief state. Differently from previous uses of classical planners to solve non-classical planning problems, the approach proposed in this paper creates a valid plan from a possible planby inserting actions into the possible plan and backtracking only at one level. The algorithm can be instantiated with different classical plannersin particular, the paper presents the GC[LAMA] implementation, whose classical planner is LAMA. GC[LAMA] is empirically evaluated against state-of-the-art conformant planners, using benchmarks from various International Planning Competitions (IPC) and the literature. The experimental results show that GC[LAMA] is superior to other planners, in both performance and scalabilityGC[LAMA] can solve 727 of the 777 collected problem instances, while other planners are able to solve at most 448 instances. Moreover, GC[LAMA] is the only planner that can solve the largest instances from several domains, e.g., look-and-grab, forest, Hall-A, and marker. The paper investigates the reasons behind the good performance of GC[LAMA] and identifies problems that are difficult for GC[LAMA].

Xuan Vu Nguyen; Counseling and Educational Psychology, NMSU

Vietnamese immigrants and descendants: The role of transnational ties in the acculturation and depression relationship

This is a dissertation proposal to examine the role of transnational ties in the acculturation and depression relationship among Vietnamese immigrants and descendants. Acculturation is a phenomenon which result when groups of individuals having different cultures come into continuous first-hand contact, with subsequent changes in the original culture patterns of either or both groups (Berry, 1980, p. 9). Acculturation greatly affects immigrant health and the immigrant experience in navigating between and within cultures (Clark & Hofsess, 1998). Transnational ties is the process by which immigrants forge and sustain simultaneous multi-stranded social relations that link together their societies of origin and settlement (Schiller, Basch, & Blanc, 1995, p. 48). Transnational ties significantly impact economic, socio-cultural, and political processes in the host and sending countries (Vertovec, 2001, p. 575) and should be considered when examining immigrant populations. Acculturation and transnational ties are important variables that have been proposed in theoretical (e.g., Faist, 2000; Mahalingam, 2006; Portes et al., 1999; Predaza, 2006; Schiller, 1999; Schiller et al., 1995) and examined in empirical literature (e.g., Lv, 2010; Murphy, 2006; Murphy & Mahalingam, 2004; Thai, 2006; Odera, 2007) in understanding depressive concerns among immigrant populations. However, to date, no empirical research has investigated these variables concomitantly in one study. Both acculturation and transnational ties have been shown to be related with depression (Alidoost, 2011; Kim, 2009; Lv, 2010; Murphy & Mahalingham, 2004; Haller & Landolt, 2005; Odera, 2007); however, it is unknown the association of these variable to depression among Vietnamese immigrants and descendants.

Paulo A. Oemig; Curriculum and Instruction, NMSU

Bilingual Students in the Standardization Age

This case study surveys a small group of bilingual students in a middle school urban setting. Their thoughts and attitudes regarding standardized tests, their experiences in bilingual programs and implications for their future educational and career interests are analyzed. These students represent various degrees of bilingualism and diverse family backgrounds. Their voices are heard in the midst of the state of New Mexico Public Education new grading system for schools and districts. The data presented reflects the shortcomings of high-stakes testing in fostering the confidence needed in students to follow a STEM career path. The collected data and students accounts go beyond the official metric of success to assess impact on self-concept in relation to cultural backgrounds. Three premises guided this study: First, general perceptions of educational/institutional achievement sustain education reforms based on the generation of standards, testing and accountability. Secondly, high-stakes testing is driven by a market-like model of accountability. Thirdly, accountability is simply reduced to a reporting numbers to support a deficit-thinking educational framework. A brief historical overview will be offered as context to the current reality and direction we are heading. The synthesis of the findings will draw upon contemporary research on critical pedagogy, literature on standardized testing and deficit thinking. This presentation will argue that through standardization driven reform learning becomes artificially constructed rather than building on experiences students bring to the classroom and real-world scenarios. Standardized testing produces irrational consequences for all involved.

Maria T. Patterson & the HALOGAS Collaboration; Astronomy, NMSU

Properties of Gas and Star Formation in the Outer Disk of the Sunflower Galaxy

We present very deep cold hydrogen observations of the nearby galaxy NGC 5055, the Sunflower Galaxy, from the Hydrogen Accretion in LOcal GAlaxieS (HALOGAS) survey. NGC 5055 is a moderately-inclined SAbc galaxy with an extended and warped gaseous disc. This galaxy is also notable for its extended outer disc star formation as traced by UV emission detected by the Galaxy Evolution Explorer (GALEX). We have modeled these new HALOGAS data with a careful tilted-ring analysis of the gas disc. The HALOGAS observations reveal faint emission in the form of extended gas spurs, streams, and anomalous velocity gas, which were undetected in previous data. Our modeling efforts and analysis are focused on characterizing and quantifying the anomalous velocity gas, which we find is confined to the main optical star forming disc. We also find anomalous gas that may be related to the remnant of a past interaction as revealed by recent very deep optical imaging.Additionally, we present new, wide-field imaging of young star formation in NGC 5055. We find very bright star forming regions in the disc that may be responsible for spatially coincident anomalous velocity gas. We also find a significant amount of current star formation in the

outer disc and discuss the properties of these regions as determined from coincident GALEX and neutral hydrogen emission.

Christine Lynn Peterson; English, NMSU

Chain letters and prayers: how praying the rosary is equated to good-luck superstition within popular culture

My area of focus in writing is predominately religion and popular culture. I have been fascinated with the rosary and how its function has been utilized within todays culture. My nonfiction prose piece, Chain letters and prayers: how praying the rosary is equated to good-luck superstition within popular culture, is concerned with documenting the methods of how the rosary has evolved from notches within a devotional to a string of holy beads. Interweaving with my fascination of the rosary as a fetishized way of communication and obedience is the parallelism of chain letters. In popular culture chain letters are widely regarded as a hoax whereas rosaries are seen with reverence and devotion. I compare the prayers of the rosary side by side with bodies of text promising good luck and fortune in exchange for copying and distributing letters during the Great Depression era to the early 2000s. In focusing on the two different textual practices through a rhetorical lens, I pose the question: is there a deity per se that people are ritualizing to, or is it through constant asking and want that we find a deity within ourselves? I will draw on numerous writings, including Dransart (2002), Winston (1993) and Ringborn (1962).

Shiva Pokharel; Electrical & Computer Engineering, NMSU

Integration of Renewable Energy Resources into Distribution System and Microgrids

Planning, operation and control of power systems in future will be signicantly different than its counterpart in the past. This presentation will be focussed on operation and control of microgrids with inverter based distributed generations (IBDGs). Challenges in microgrid protection will be discussed with potential solutions.

Gholamali Rahnavard; Computer Science, NMSU

The New Era of Aspect Oriented Programming by Developing a Generic framework: Focusing on Runtime Monitoring and Dynamic Analysis

Aspect Oriented Programming (AOP) is a software development paradigm which allows developers to implement crosscutting concerns. This style of programming attempts to tangle out common features beyond all different parts of a program. Dynamic analysis and runtime monitoring are the bases to handle most concerns. In this work we are developing a generic extensible AOP framework by focusing on runtime monitoring and dynamic analysis. Our goal is to provide easy-to- extend platform through the high-level abstraction of the framework. Another distinguished idea in this work is introducing new dimension of weaning approaches.

Roshani Rajbanshi; Curriculum and Instruction, NMSU

Professional Development Informs Curriculum

This presentation provides information on professional development that is held for teachers. With the help of training, seminars and workshops held by the expertise, teachers get the benefit and ultimately the school and students gain. Besides that, the presentation will deal with pros and cons of the professional development; how it helps teachers to polish their quality with new updates, teaching strategies and techniques that brings change in the classroom. Professional development also provides hands on training to teachers and trains them how to get students involved in activities, thus providing them practical knowledge to better understand the theory. The main objective of the professional development is to provide three-dimensional approach to differentiate different types of curriculum development (Short, 1983), and the professional development belongs to type 2 curriculum development which can be best described as expert-oriented, generic and limited adaptation. As for the curriculum implementation, teachers still have some, if not complete, freedom to modify products to fit the need of their students. As for curriculum change, a professional development utilizes the Center-Periphery Model (Schon, 1971) which states that any curriculum innovation is developed and diffused from a primary center to secondary centers. However, experts who conduct the professional development do not consider gender, race or social issues as an important factor in the classroom which the teacher and students have to deal every day. Lack of resources and funding to buy the equipment are some drawbacks. In conclusion, it is a top-down as well as central-periphery approach in which experts give information to

teachers. At the end, teachers have the responsibility to bring change in the classroom with the help of the knowledge that they gained in the professional development, thus professional development brings change in the curriculum.

Daniel Ramirez-Gordillo; Biology, NMSU

High throughput methods uncover putative deafness and vestibular genes in two Xenopus species

The inner ear is a complex organ responsible for two essential processes in organisms: hearing and balance. Vestibular and auditory disorders are prevalent sensory disabilities caused by environmental (noise, trauma, chemicals) and genetic factors, often by damaging the mechanosensory hair cells of the inner ear. In this study we present the results of ongoing investigations that use high through put technologies (microarrays and Illumina-Solexa Next generation sequencing) to detect the expression of genes linked to hearing and balance disorders. Total RNA extracted from the X. laevis inner ear s56-58 was sequenced with Illumina-Solexa technology or arrayed on the Affymetrix Genechip® X. laevis genome array. When NCGRs Alpheus® software was used to align Illumina-Solexa sequences to the X. tropicalis reference genome, 17% of reads were found to map uniquely to genome scaffolds. BLAST analysis mapped 261 human deafness genes and 102 vestibular genes from theOMIM database to the X. tropicalis genome and to the Affymetrix Genechip(R) X. laevis genome array. Using this approach we identified genes that are uniquely associated with deafness or vestibular disorders. This investigation demonstrates that even though the inner ear is responsible for hearing and balance, certain genes appear to predominate in each of the two mechanosensory mechanisms. 201 genes were uniquely associated with deafness; 42 genes were uniquely associated with vestibular disorders; 60 genes were associated with deafness and vestibular disorders. Candidate regions have been identified in the X. tropicalis genome that can be used for the development of animal models to study deafness and vestibular disorder using molecular techniques such as targeted gene disruption. Research funded by: NIH (P50GM068762, P20RR016480); NSF (IGERT DGE0504304) ; NIH RISE (R25GM061222).

Harvind K. Reddy; Chemical Engineering, NMSU

Subcritical Water Extraction of Lipids from Wet Algal Biomass to Produce Biofuels

In this work we demonstrated two green extraction processes, conventional heating subcritical water extraction (C-SCW) and microwave assisted subcritical water extraction (MW-SCW), which are both energy efficient extraction methods to obtain neutral lipids from wet algal biomass (Nannochloropsis salina). Subcritical water extraction (SCW) extraction is performed between the boiling point and critical point of water and acts as a unique reaction medium extracting neutral lipid species while preserving valuable nutrients present in the lipid extraction biomass. Subcritical water extraction was performed by conventional heating and microwave heating. In this study the experiments are designed to examine the influence of process parameters such as: extraction temperature, biomass loading and extraction time. The parameters are used to optimize the extraction process for maximum extraction efficiency of bio-crude. The extracted bio-crude was characterized with GC-MS (Gas chromatographymass spectrometry), FT-ICR (Fourier transform ion cyclotron resonance mass spectrometry) and Thermo gravimetric analysis (TGA). Pure algal oil was produced by purifying the biocrude through activated charcoal column. TEM was used to characterize the biomass before and after extraction along with TGA and Bomb calorimeter. The nutrient analysis of lipid extracted algae (LEA) was performed to identify possibility of byproduct development.

Electra Rich; English, NMSU

Patron Saint of Lost Ghosts: Fiction Reading

Patron Saint of Lost Goats explores the relationships between residents of an Eastern Orthodox house of hospitality: Sophie, a recovering substance abuser; Sara, kicked out of her parents' home for practicing Wicca; Tashawna, a single mom trying to break the cycle of poverty to make a better life for her kids; and Masha, a woman who appears out of nowhere, suffering from a mental fugue. As they interact with each other and with the people upon who the house dependthe much loved house- mother' Marie, an eccentric monk, and othersa chain of devastating events threatens the fragile stability each has acquired in her life.

Sasha Richardson; Sociology and Women's Studies, NMSU

"Princess or Not": A Critical Examination of Gender Role Portrayal in Disney's Brave

Disney is big business in this world. One particular line of Disney entertainment comes in the form of stories based on the lives of princesses and their families (Tanner et. al 2003; England, Descartes, Collier-Meek 2011). These stories send messages about traditional gender roles, and are a strong influence in the development of childrens concepts of gender (England et. al 2011). Consistently portrayed gender role images may be interpreted as normal by children and become connected with their concepts of socially acceptable behavior and morality (England et. al 2011:557). Often these messages perpetuate strong stereotypes of what people should or should not do and be in order to be socially accepted. This means that we have a responsibility to look at what we see in the media with a critical eye, constantly question what we are experiencing, and continue to ask ourselves who, if anyone, benefits and who does not from the messages we are presented with.

Rebecca Richman; Geography, NMSU

Analysis of the Spatial-Temporal Distribution of the Mosquito Vectors of Sylvatic Dengue and Chikungunya Viruses

Both dengue virus and chikungunya virus originated in a sylvatic cycle between non-human primates and arboreal Aedes. Dengue has emerged into an endemic cycle between humans and anthropophilic Aedes four times and chikungunya once. The risk that a sylvatic strain will emerge into human hosts is in part determined by the spatial and temporal distribution of the arboreal vectors of the two viruses, which at present is not known. The goal of this study was to narrow this gap by mapping the spatial and temporal distribution of the arboreal mosquito carriers of these diseases in the Department of Kdougou, Senegal. Abundance data on seven mosquito species in were collected as part of the larger Mechanisms of Sylvatic Dengue Emergence Project for 50 collection sites in the study area for each month between July 2009 and March 2010 excluding April 2012. These data were then mapped and analyzed by time, location, and land cover type. The overall temporal patterns of abundance are very similar between the two years, with peaks in July and October, a dip in September, and minimal activity during the dry season between December and May. There is significant clustering for both years in July and August (pj0.05) and the distribution of the clusters is similar in both years. Furthermore, abundance varies by land cover class and is highest in forest sites and lowest in urban sites.

Quinn Robinson; Fish, Wildlife, and Conservation Ecology, NMSU

Carnivore Distributional Patterns in White Sands National Monument, NM

White Sands National Monument (WHSA) is one of New Mexicos most treasured landscapes. However, very little is known about its overall ecology, and no information exists about the distribution or conservation status of many key animal species. We are employing remote cameras to investigate the distribution of mammalian carnivores across WHSA, and a variety of sampling techniques to identify the key habitat features for each carnivore species. Because carnivores likely exert strong influence over the structure and function of the White Sands ecosystem as a whole, our work will provide important information for resource management and conservation. Between 2011 and 2012, remote cameras were deployed to 92 randomly generated sites within 6 major habitat types, using a stratified random design. Rodent abundance, rabbit density, and invertebrate biomass were identified a priori as likely determinants of carnivore distribution, and investigated using mark-recapture trapping, distance sampling, and pitfall trapping, respectively. Results thus far suggest that coyote (Canis latrans) and badger (Taxidea taxus) distribution is governed chiefly by prey availability; both species were most frequently captured by cameras in habitat types with high prey abundance. In contrast, kit foxes (Vulpes macrotis; an arid-adapted species iconic to the monument) were photographed most frequently in habitat types where prey abundance was relatively low. Our data suggest that kit fox distribution at WHSA may be driven by avoidance of competitively superior coyotes, whereby foxes disproportionately occupy resource-poor areas where coyotes are unlikely to occur. These apparent patterns will be tested using occupancy modeling techniques in our final analysis. Our results and conclusions will facilitate informed management decisions at WHSA, helping to maintain the ecological wellbeing of the monument.

Marilupe Rodriguez; Curriculum and Instruction, NMSU

Under the scars of being labeled: Who are worthy of carrying the official knowledge in mathematics?

For several years, educators and researchers have argued about the benefits and weaknesses of tracking and labeling students (Lucas, 1999). Mathematics classes have been highly tracked and the distribution of this subject has been a topic of political and educational debates; for many students, mathematics curriculum has been a gate-keeper of future economic success (Stinson, 2004). The aim of this presentation is to question, problematize and critically analyze the contradictions, exclusions and omissions inside mathematics tracked classrooms. Specifically, tracking denies low ability students challenging curricular opportunities and stigmatizes them with demoralizing labels (Loveless, 1999; Peterson, 2001), and additionally exposes the impact of the organization and distribution of mathematics curriculum and the mirroring of tracking with students social classes. In doing so, I present a critical investigation of how students social and cultural capital is denigrated or prized inside the school system, depending on their background assets, and how their cultural capital is finally shaped into the system needs and expectations.

Stacy Rodriguez; Biology, NMSU

Evaluating Radioprotectors to improve X-ray Sterilization Techniques for Aedes aegypti males.

Sterile Insect Technique has been successfully used to eradicate dipteran insect populations. However, the lack of gentle sterilization methods and other problems have resulted in significant complications when applying SIT to mosquitoes. Irradiating mosquitoes can result in high mortality rates and a decrease in competitiveness to unirradiated males. New protocols for mosquito sterilization need to be investigated to minimize detrimental effects on the irradiated males. Several compounds have been described to act as radioprotectors in different model systems for example ethanol in mice, dimethyl sulphoxide (DMSO) and nordihydroguaiaretic acid (NDGA) in insects. We have investigated the effect of treatment with potential radioprotective compounds on longevity of X-ray sterilized mosquito males. Our results suggest that radioprotective compounds could become an essential part of mosquito sterilization protocols and improve mosquito sterile insect technique.

Daniel Ian Rubin; Curriculum and Instruction, NMSU

Still Wandering: Jews, Social Justice, and Multicultural Thought

Current reports show that acts of antisemitism have been at their highest levels since World War II, yet Jewish oppression is omitted from multicultural/social justice discussions in American university classrooms. This must change in order to create the next generation of social justice educators who can continue to deconstruct antisemitism.

Bahar Sayoldin; Computer Science, NMSU

An Efficient Clustering algorithm for Discovering Protein Complexes and Functional Modules in Protein-Protein Interaction Network

An emerging branch of biology is the study of proteins and how they influence biology. With complete genome sequencing, we can understand the expression, function and regulation of the proteins encoded by an organism. The full complement of proteins is called the proteome which has very wide application to explain how biological processes occur at the molecular level, how they differ in various cell types and causes disease. In general, proteome data provides a wide variety of studies on different protein properties with the purpose of understanding more details of structure, function, and control of biological system in health and disease. Protein interactions control many biological processes and can explain many physical traits. Therefore, identifying these protein-protein interactions (PPI) is important to systematically understanding their cellular role. These protein-protein interactions have different role in biology base on their composition, how they are dependent and life time of their association. The analysis of annotated protein help to discover that the protein in the same cell often interact with each other. Therefore, the function of unknown protein in the same cell can be discovering based on their interaction with known protein. Furthermore, the interaction between two or more proteins can become inactive or destroy a protein, creating a new binding site. In addition, clustering algorithms can help locate strong factors that behave in the cell together. The goal is to find efficient clustering approaches to discover protein complexes or functional modules in protein-protein interactions.

Andrea Severson; History, NMSU

The Moral Mother: Marriage and Maternity in Victorian England

Victorian society had a very strict idea of what role women should play in their culture. The general view taken by most Victorians was that women belonged in the home, being particularly suited to the domestic sphere by nature. Therefore, they considered marriage and motherhood the best and most natural roles for women to occupy in society. However, while Victorians praised motherhood as the completion of a womans calling in life, they also considered certain aspects of motherhood taboo, particularly pregnancy. While the image of the perfect Victorian mother was one of complete innocence and virtue in the realm of sexuality, the physical realities of reproduction made that image difficult to uphold. This paradoxical position caused even married women to attempt to hide their condition for as long as possible. Such cultural taboos meant that a great deal of silence surrounded the condition of pregnancy, and many people viewed it as an impolite topic of discussion. In addition, the Victorians had strong beliefs about who should and should not have children. A womans worth as a mother was directly related to her social class, many considered it irresponsible for those in the lower classes to have children at all. Yet the majority of society frowned on all forms birth control whether preventative or abortive, even among those whom they themselves deemed unworthy of the task of motherhood. The Victorian perspective on maternity was part of a repressive atmosphere, which sought to police womens behavior both in public and in private.

Charlene Shroulote; Criminal Justice, NMSU

Women of Color and Recidivism: A Feminist Criminology Perspective

Over the past two decades there has been a surge in the number of women incarcerated. Of these women many of them are women of color. Upon release, this particular group of women faces significant obstacles when returning to society, much different than their male and non-minority counterparts. Upon release many women of color find themselves returning to detention often times for trivial infractions. This is problematic considering a large number of women of color are incarcerated for low level drug offenses or survival crimes and then locked in a prison system modeled to incarcerate men; one that does not take into consideration the unique needs women of color. This research explores recidivism of women of color utilizing a feminist criminology approach, looking at issues of gender, race, discrimination in employment and housing, and lack of resources while incarcerated and upon reintegration into the community. To better understand this phenomenon, I completed an analysis of the existing literature and supplemented it with several testimonies from women of color who have been incarcerated and have recidivated. The literature maintains that women of color are disproportionately incarcerated and have a higher risk for recidivism than their white counterparts. The testimonies add nuance to our understanding of who these women of color are and the obstacles they face when trying to reenter society. This preliminary inquiry is part of an ever growing body of research on the increasing number of women entering and re-entering prison.

Nafull Alam Siddique; Electrical & Computer Engineering, NMSU

Local Memory Store- Proposing a Multi-purpose Memory Replacing On-chip Cache

Processor performance is fully dependent on the performance of cache. In recent years the number of cores in a processor chip is increased to perform parallel operation. Cache performance decreases in multi-core parallel operations, as different processes step on each others data on shared cache causing increased cache misses. Also there are multiple threads in a core to enhance per core performance. The data sharing/passing between different processes in different cores is time consuming, that also makes the cache performance worse. Thus, parallelism makes the cache performance worse and it eventually affects the overall performance of a processor. To mitigate these problems cache hierarchy has been introduced though it adds additional logic, latency, and path overheads. To overcome these problems we design a local memory LMStr that can eliminate conflict between process data. The intent for LMStr is to replace data caches with a memory that stores only one copy of data and can be shared by all processes, and that has none of the problems of current implementations like having one process stepping on anothers cache lines. A variable portion of local memory can be dedicated for processes to reduce memory misses. Also easy data sharing can be accomplished more efficiently between processes in local memory. We are expecting energy consumption will be reduced in our design.

Mia Sosa-Provencio & Tamara Anatska; Curriculum and Instruction, NMSU

A Living, Breathing Curriculum of Body: Navigating Socioeconomic and Political Realities through Tattoo Artistry

This ethnographic study explores the curriculum of body self-authored by five tattoo artists as they create art enabling them to (re)claim social, and cultural identities historically distorted and tainted within inequitable economic and sociopolitical structures (Fanon, 1963; Olguin, 1997; Taliaferro-Baszile, 2010). The tattoos they inscribe upon their bodies represent a complex, profound, intertextual (Albin, 2006) curriculum present in their public and private worlds (Grumet, 1989; Pinar, 2008), a curriculum of body utilized as a vehicle toward emancipation and reinterpretation of their horizons of possibilities (Slattery, 2006). These mens curricular agency challenges us toward continual reconstructions of inequitable social realities in order to attain a new totality in which previously unimagined possibilities may take root and germinate (Counts, 2009; Greene; 2009).

Karen R. Trujillo; English, NMSU

Hampered by the Himation: The Emotional Cloak of the Non-Traditional Student

The global economic downturn in has resulted in an increased number of non-traditional students entering the university, changing the face of the undergraduate population. The experiential knowledge from which these non-traditional students invent the university for themselves is important to instructors of dialogical classrooms as the academy oftentimes does not know how to quantify, honor, or discuss the emotional contributions that come from reflection and experiential knowledge. In this paper, I argue that the intersectionalities of gender, race, and class, shape and are shaped by the ways in which non-traditional students respond to texts, peer contributions, and instructor feedback. In particular, this paper looks at the non-traditional students perceived roles through a feminist lens with focus on the necessity to police emotional responses so as to avoid the gendered and ageist expectations placed on the adult learner versus the youth learner. Ultimately, the aim of this paper is to articulate the function of the rhetoric of emotion in the dialogical classroom, considering the ancient Greek link of emotion to femininity, as non- traditional students bridge from workplace writing and communication to academic writing with consideration of gender and ageist reinforcing rhetoric.

Kyle Uckert; Astronomy, NMSU

An Investigation of the Temperature Variations in Neptunes Upper Stratosphere via a July 2008 Stellar Occultation Event

We extract physical atmospheric parameters from a 23 July 2008 single-chord stellar occultation of the star USNO-B1.0 0759-0739128 by Neptune using a light curve model fitting technique and find isothermal temperatures of 117.5 $\pm$ 12.6 K and 156.9 $\pm$ 13.6 K for the immersion and emersion light curve profiles respectively. We observed the occultation using the Agile CCD camera mounted on the Astrophysical Research Consortium 3.5 m telescope at Apache Point Observatory. We compare the stratospheric temperature derived from the 2008 occultation to published temperatures of Neptune at similar atmospheric pressures derived from previous stellar occultations observed in the 1980's and from long-term photometric measurements made routinely throughout this time period. Several hypotheses for explaining the observed temperature variations of Neptune include seasonal variability, variations in the Lyman-alpha flux received at Neptune due to the 11-year solar cycle, diurnal variations, heliocentric variability, UV and IR heating of hydrocarbons, aerosol precipitation, inertia-gravity wave dissipation, and effects due to atmospheric tidal perturbations by Triton, which we investigate for the first time herein. We investigate the effect each of these mechanisms has on the local and gradual temporal changes of Neptune's local stratospheric temperature and conclude that local variations in stratospheric temperature during each event, on the order of 20K, are dominated by inertia-gravity wave dissipation and a response of the upper stratosphere to perturbations caused by Triton's tidal force.

Jacob Vander Vliet; Astronomy, NMSU

The Distribution of Metals in the High Redshift Circumgalactic Medium Around Milky Way Progenitors

In an effort to understand the connection between star formation, feedback, and the circumgalactic medium (CGM), we examine mock quasar spectra through the CGM (within 200 kpc) of simulated non-group Milky Way progenitors at redshifts 2.5 and 4. The galaxies were simulated in the cosmological setting using Eulerian Gasdynamics plus

N-body Adaptive Refinement Tree (ART) code with a resolution of 35-70 pc with two different star formation rates. The first simulations use a Miller-Scalo IMF and did not account for radiation pressure. The second simulations use a Chabrier IMF with a star formation efficiency one third of the first simulations, as well as description of radiation pressure. We measure the absorption lines of several ions including CIV, OVI, SiIV, and Ly beta and compare the covering fraction, equivalent width distribution and the velocity distribution at both redshifts and both star formation recipes. We also compare these to the observational results of the Keck-Baryon Structure Survey (Steidel et al., 2010) for z=2-3 star-forming galaxies.

Wenjie Wang; Curriculum and Instruction, NMSU

Language Policy and Language Planning: A Comparative Study between Mandarin in China and English in U.S.

U.S. as one of the biggest immigrant country has accepted globally thousands of immigrants with diverse linguistic backgrounds; China, as a multinational country, has fifty five minorities, each with their own language identity. In this regard, both U.S. and China should be considered a multilingual country. However, U.S. does not have any official languages, although English as a dominant language has been established as a standard; in China, on the other hand, among numerous dialects, mandarin has been acknowledged as an official language and is spreading rapidly. In a few decades Mandarin has emerged as a required language with increasing number of learners. As a consequence, English and Mandarin have become two dominant languages in the respective countries. A single dominant language has posed a threat to the language spoken by smaller domain, in both countries. This paper compares the development of Mandarin in China and English in U.S. through investigation of language policy and language planning as a historical review; explores how language policy and planning influence the language education and multilingualism development; addresses similarities and differences in language policy and planning in U.S. and China; raises the concerns how dominant or official languages affect social justice, language rights, multilingual development; and discusses possible solutions for a balanced language education.

Nancy Wasser, Veronica Gallegos, & Wenjie Wang; Curriculum and Instruction, NMSU

Stock Stories of U.S. Education Refuted: Transforming our Perspective through Historical Review

This paper explores historical roots of the philosophical and pedagogical growth and evolution of free public education in the United States with a view to understanding the forces leading to our current situation of standardized curriculum with its emphasis on standardized testing as the primary assessment of teaching and learning. Is the stock story (Bell, 2010) of US education as a phenomenon born of a fervent democratic desire to provide free education to all children the one and only story, or was and is there a hidden agenda, thinly veiled, to regulate the kinds and types of pedagogy delivered to certain groups, past and present? This is the research question this paper examines as we trace these historical roots. We begin our journey in the late 19th century when curricular changes were sweeping the public school landscape, moving curriculum from teacher-centered to the knowledge-based and contextual pedagogy that was to dominate the 20th century (Kliebard, 2004), continuing to present day. Recognizing the many branches, often intertwined, of various pedagogical movements, we have roughly delineated three main branches springing from the great trunk of US education: the Developmental /Social Efficiency movement, the Progressive/Humanist movement, and the Critical/Progressive movement. This theoretical paper studies the warp and woof of these schools of thought as they were woven together to become the Standardization Movement of the 21st century. The conclusion of our paper examines ways the education community may unravel some of these threads and reweave them into an open-ended model that treats educational curriculum and pedagogy as an act in the service of teaching and learning.

Nichole Kay Weber; Sociology, NMSU

Media Construction of Climate Change and Global Warming: A Corpus Linguistic Approach to Critical Discourse Analysis

Commercial media is an entity that acts as a filter for the dissemination of scientific information. This filter has the motive to accumulate capital, thus often sensationalizing media to draw in viewers.Media serves as information provider to the public that is often taken as fact. Issues such as climate change get lost within this filter and are often politicized with skepticism on one end and vehement belief on the other. As climate change is the number one threat to humanity, uncovering possible obstacles to progressing a sustainable future must be addressed. My research

seeks to uncover the ideologies of climate change within commercial media, while further problematizing media as an obstacle for social action in the mitigation of climate change. Methodologically, I employ a critical discourse analysis with a corpus linguistics approach, allowing both a quantitative and qualitative analysis of over 3000 broadcast media transcripts. I statistically describe the terms "climate change" and "global warming" and use these as "points of entry" within the transcripts. These "points of entry" are then expanded to view the context in which the terms are described. I qualitatively examine the data through downsampling and assessing emergent themes. Theoretically, I use the neo-marxist theory of the treadmill of production to describe the processes of capitalism and maintenance of power within commercial and for-profit discourse.

Erandi Wijerathna, Leo Zella, & Dr. Boris Kiefer; Physics, NMSU

Design Hard Materials for Industrial Applications

Mechanical Hardness is an intuitively clear concept: Diamond is hard; Graphite is soft. Both of these materials are composed only of Carbon atoms. This suggests that composition is an insufficient metric to evaluate mechanical hardness. Furthermore materials composed of second row elements in the periodic table tend to be superhard but are unsuitable candidates for hardness improving coatings due to the lack of adhesion between the coating and the substrate. Hardness is an empirical measure and consequently a number of different hardness predicting models have been proposed over the past fifteen years. In this contribution we will discuss the merits and limitations of these models. This assessment will give insight into the usefulness of these models as predictive tools to identify novel candidate hard materials for coatings with possible applications in the car industry and for space exploration.

Deann Williams; Sociology, NMSU

Am I Too Good For School? A Qualitative Study of the Rivalry Between the Student-Athlete Identities

Many student athletes will find themselves questioning if they are more of a student or an athlete at some point in their academic career. Previous research has looked at gender roles and masculinity when developing male student-athlete identity, however, for my thesis, I want to understand what other factors might influence male student-athletes to privilege one identity over another? To answer this question, I will conduct semi-structured interviews with 20 male student-athletes that meet the following criteria: have a cumulative GPA of 3.0 on a 4.0 scale, expected to graduate in five years or less, and a member of the Football team. According to Strykers Identity Theory, the creation of roles come from interaction with external forces and is linked to social positions within the social structure. I suppose that potential external forces could include injuries, family, faculty, and/or history; for these influences could help create the roles of the student" and athlete identities. This study will explore the individual factors (same or opposing) that influence the student and the athlete identity, and how that individual negotiates between these identities. Although student-athletes were not specifically discussed in Strykers Identity Theory, contributions of this study include looking at how social and academic influences shape the identity of the student, as well as the athlete identity. Looking at these identities together allows for a deeper understanding of the processes and tensions experienced by these individuals.

Nazarine William-Titre; Curriculum and Instruction, NMSU

The Underpinnings of Holistic Literacy Pedagogy: Harnessing Meaning in Reading

Our language learners are nested squarely at the heart of holistic literacy pedagogy. As such, this paper does not only make a clear argument for holistic literacy pedagogy, but also provides the necessary theoretical support. It attempts to dispel some myths about the reading process which have been perpetrated by proponents of the skills-based and sub-skills models of reading. Carefully avoiding emphasis on the decontextualized measurement of skills, this paper demonstrates how the organic principles of holistic literacy pedagogy make it democratic, student-centered, dialogic, culturally relevant, and meaning focused. The paper situates holistic literacy within the framework of constructivism, as an approach that is well suited for all learners, but offers hope to non-native learners of English, and teachers who are seeking a literacy praxis that is empowering, liberating, and truly geared towards helping students develop into self-regulating literate beings.

Xiaofei Wu; Chemical Engineering, NMSU

Synthesis of Zeolitic Imidazolate Framework ZIF-7 and Application for CO2 and CH4 Separation

Zeolitic imidazolate framework ZIF-7 was synthesized by both conventional hydrothermal method (ZIF-7_h) and microwave-assisted method (ZIF-7_m). The cubic structures of these two ZIF-7 samples obtained in this work were confirmed by X-ray powder diffraction results. The scanning electron microscopy (SEM) images of these two samples revealed that they have different particle sizes. The pore textural properties obtained by carbon dioxide adsorption at 0°C also indicated that they have similar BET surface area (ZIF-7_m: 282 m^2/g, ZIF-7_h: 312 m^2/g) with different median pore diameter (ZIF-7_m: 4.2 , ZIF-7_h: 3.9). Adsorption equilibrium and kinetics of CO_2 and CH_4 on these two samples were determined at various temperatures and gas pressures up to 1 bar. Adsorption equilibrium selectivity (?), adsorbent selection parameter for pressure swing adsorption processes (S), and kinetic selectivity were calculated from the adsorption isotherms and the adsorption kinetic plots, showing that both of these two ZIF-7 samples have a good selectivity of separating CO_2 and CH_4. ZIF-7_h performances even better with ? value 12.22, S value 179 and CH_4/CO_2 separation kinetic selectivity of 18.5, at 298 K.

Pu Xie; Mechanical and Aerospace Engineering, NMSU

Development of A Bio-Inspired UAV Perching System

Landing, perching on and taking off from an arbitrary object reliably like a bird are still very difficult tasks for currently available unmanned aerial vehicles (UAVs) or micro air vehicles (MAVs). Research efforts are still needed in order to advance the technology for practical applications. This paper presents a bio-inspired design of a novel UAV landing and perching system, which allows the vehicle to perform tasks including landing on, perching on, and taking off from not only a flat surface but also an object like a tree branch. It can also perform pick-and-place task for transporting a payload. Such combined capabilities can significantly improve the agility and applicability of UAVs for many very useful applications. The presented system includes a cable-driven leg mechanism, a cable-driven underactuated three-digit gripper, a grasping control system, and a body balance control system. The mechanical design is based on an analysis of the anatomy of bird legs and feet and the control design is based on the observation of birds behavior for landing and perching tasks. The grasping capability includes both active and passive grasping just likes how a bird does the similar tasks. The quasi-static modeling for individual digits and the dynamics modeling for the system are presented for simulation based performance analysis. A physical prototype of the system and its flight experiment are currently being developed.

Wenwu Xiu; Mechanical and Aerospace Engineering, NMSU

Trajectory Estimation of Human Mass Center using an Inertia Identification Approach

Mass center of a human body is not a fixed point on the human body because the inertia distribution of the human body changes with body posture. Real-time estimation of the location of human mass center is often required for many biomechanical or biomedical applications. This is not an easy task if the inertia properties of the humans body segments are unknown. This paper presents a technique for estimating the trajectory of the human mass center based on a recently developed inertia properties identification technology which was derived based on the impulse-momentum principle. The proposed technique assumes a human body as a general tree-like multibody system, such that the mass center of the human is predictable with the knowledge of the barycentric parameters of the human. The latter can be identified using inertia identification method. This technique is advantageous because it requires only the 3D motion capture data as its primary input and does not need to know the inertia and geometric parameters of individual body segments of the human. The paper presents a dynamic simulation based study of the proposed estimation technique and also describes an on-going experimental testing.

Natasha Yazzie; Biology, NMSU

Identification & characterization of the immune molecule Alpha-2-macroglobulin (A2M) in Euprymna scolopes

Our lab focuses on the study of immune molecules associated with the mutualistic relationship between the squid, *Euprymna scolopes* and its beneficial symbiont *Vibrio fischeri*. The goal of this project is to determine the presence of Alpha-2-macroglobulin (A2M) in the bobtail squid, and characterize its role in the squid-vibrio association. A2M belongs to the superfamily of thioester-containing proteins (TEPs), which is known to play an important role in

the destruction and elimination of microorganisms (MO). A2M is a wide-range protease inhibitor that has been indentified in both invertebrates and vertebrate species. Identification of A2M in *E. scolopes* would suggest that this squid species utilizes this protease-inhibitor to help fight-off invading MOs by removing bacterial proteases. To obtain the complete *E. scolopes* A2M transcript sequence, specific primers were designed to an EST (650 bp) presenting homology to other known TEPs. Using rapid amplification cDNA ends technique, we were able to obtain the complete cDNA sequence (4221 ntdes) of *E. scolopes*. BLASTp analysis of the translated sequence (1407 aa) revealed 29% identities to *Harpegnathos saltator* A2M-like protein, its closest homologue. Analysis of twelve different adult squid tissues by PCR showed the presence of A2M in 9 of these samples. These results have allowed us to confirm the presence of at least one A2M protein in *E. scolopes*. Further experiments include quantifying the difference in A2M expression levels in colonized vs uncolonized juvenile light organs in response to bacteria establishment.

Feras Ahmad Yousef; Mathematical Sciences, NMSU

Mathematical analysis of a Landau-de Gennes phenomenological model for bent-core liquid crystals

Bent-core molecules liquid crystals are achiral soft matters compounds that exhibit supramolecular chiral structures. The rich variety of novel mesophases observed in these systems are enormously fascinating from both the theoretical and application standpoint, and they have been extensively studied from an experimental point of view. On the other hand, there are relatively few theoretical studies dealing with their phase transitions. The available mathematical treatments are even more scant, certainly not for a lack of interest from the applications side or of challenges in the mathematics involved, rather perhaps for a lack of well-tested theoretical models. The role that applied mathematics can play in the subject is substantial, encompassing modeling, numerical simulations and rigorous analysis. Due to the complexity of the modeling issues involved with the bent-core materials, the use of a Landau-de Gennes approach is of particular appeal, and the available mathematical works show interesting and promising results. In my research, I analyze the layer and director structure in bent-core liquid crystal phases, as modeled by a slight modification of a Landau-de Gennes type energy used in the physics literature. Mathematically, this translates into studying minimizers of an integral functional.

Yuliana Zaikman; Psychology, NMSU

The effects of the media on gambling attitudes and behavior

Gambling addiction is a serious condition that affects approximately five percent of adults (Prakash, Avasthi & Benegal, 2012), and four to eight percent of adolescents (Kundu et al., 2012). One reason why gambling addiction might be a problem is that it is frequently portrayed positively on television and in movies. Social learning theory posits that people learn how to behave by observing the rewards and consequences experienced by others when engaging in certain behaviors (Bandura & Walters, 1963). Media such as movies and television can also influence people. For instance, research has shown a positive correlation between watching aggressive behavior on television and behaving aggressively (Bandura, Ross & Ross, 1963). It is important to examine this relationship because gambling can become a serious addiction. If the portrayal of gambling on television and in the movies causes a) more positive attitudes toward gambling and b) a greater likelihood of gambling itself, then it might be a factor in gambling addiction. The purpose of this research was to determine whether positive and negative media portrayals of gambling affect peoples attitudes and behavior toward gambling. In one study, I examined the relationship between viewing valenced movie clips depicting gambling and the attitudes people held after viewing these clips. In another study, I examined the relationship between viewing valenced gambling clips and the probability of people gambling.

Sabrina S. Zamora; Educational Management & Development, NMSU

La administradora: A mixed methods study of the resilience of Mexican American women administrators at Hispanic Serving Institutions

This research talk will discuss a mixed methods study that explored the resilience of Mexican American women administrators at Hispanic Serving Institutions (HSIs). The women administrators that were considered in the study included department chairs, deans, and vice presidents at four-year public HSIs. The purpose of this study was to investigate the resilience characteristics of Mexican American women administrators at HSIs. Data was collected through a survey and interviews. Results were analyzed through a descriptive analysis and an analysis of narratives.

Lin Zhang; Mechanical and Aerospace Engineering, NMSU

A pilot study of dynamic stability indices for potential application of identifying older fallers

Falls are the number one cause of death and injury among older adults. Therefore, the development of technologies for prediction and prevention of falls is highly needed, especially for the aging society. This paper presents a preliminary study of two indices related to stability and mobility of a human body in standing and walking, respectively, for the potential application of predicting the risk of falls. The stability index for standing measures the distribution of center of pressure from a human body when the human is intended to stand still. The mobility index for walking is derived from a 3D inverted pendulum model of human walking dynamics. The two indices can be easily computed from the test data measured by a 3D motion capture system and an instrumented treadmill. As a pilot study, 16 older adults with a recent history of falls and 11 older adults without a history of falls were tested. The test data reveal that the values of the indices for the two groups are clearly distinguishable. This is a good indication that the proposed indices have a potential for predicting the risk of falls of older adults, and encourages further development of the approach.