NM STATE UNIVERSITY

Graduate Research & Arts Symposium

2010

Organized by:

Graduate Student Council of New Mexico State University

Funded by:

ASNMSU THE ASSOCIATED STUDENTS OF NEW MEXICO STATE UNIVERSITY

Dear NMSU Graduate and Undergraduate Students, Administration, Faculty, and Staff,

We welcome you to the 2010 NMSU Graduate Research and Arts Symposium (GRAS). GRAS is a celebration of the dedication, diligence, and creativity of our NMSU graduate community. It is an annual opportunity for graduate students from diverse areas – business, science, mathematics, government studies, education, health, the humanities, and the Arts – to come together to share their work and the contributions they have made to their chosen fields. This year, we have nearly 110 submissions from 30 departments here at NMSU represented at GRAS. In addition, graduate students from regional universities will be showcasing their work in this year's symposium. During two days in March, the 2nd and the 3rd, the entire NMSU community has the opportunity to explore the breadth of leading-edge work done by our graduate students.

GRAS is a time to recognize our graduate students for their degree work in research and the performing arts and for their efforts to help both other students and the local community. Graduate students spend a significant amount of their time teaching and mentoring their fellow NMSU students. Many graduate students support the local Las Cruces community by volunteering for a variety of educational outreach and charity events throughout the region. NMSU graduate students represent our university at professional seminars and conferences throughout the world. The work of NMSU graduate students directly reflects the reputation of New Mexico State University as a leading institution of higher learning.

GRAS provides an opportunity for graduate students to meet one another, learn about academic work outside their own expertise, and develop the presentation skills crucial to success in research and the arts. It is an opportunity for NMSU undergraduates to find out what graduate students do and to ponder graduate studies for themselves. For NMSU administration, staff, and faculty, GRAS is an opportunity to recognize the continuing success of our graduate students.

As Chairs of the Graduate Research and Arts Symposium and President of the Graduate Student Council, we invite you to explore the world of NMSU graduate studies through GRAS. We thank the many people who have helped make this year's symposium possible. This includes our GRAS participants, judges, and volunteers, the GRAS committee, our fellow Graduate student council executive members, and ASNMSU for providing critical funding. We sincerely appreciate everyone's hard work and we wish everyone a rich and stimulating experience at GRAS 2010.

Sincerely,

Paul Kuhns
President
Graduate Student Council
New Mexico State University

Kiran Sapkota & Wes G. Smith
Vice Presidents of Operations
Graduate Student Council
New Mexico State University

The Graduate College

Dr. Linda Lacey
Dean, Graduate College

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Sean Lindsay, GSC,
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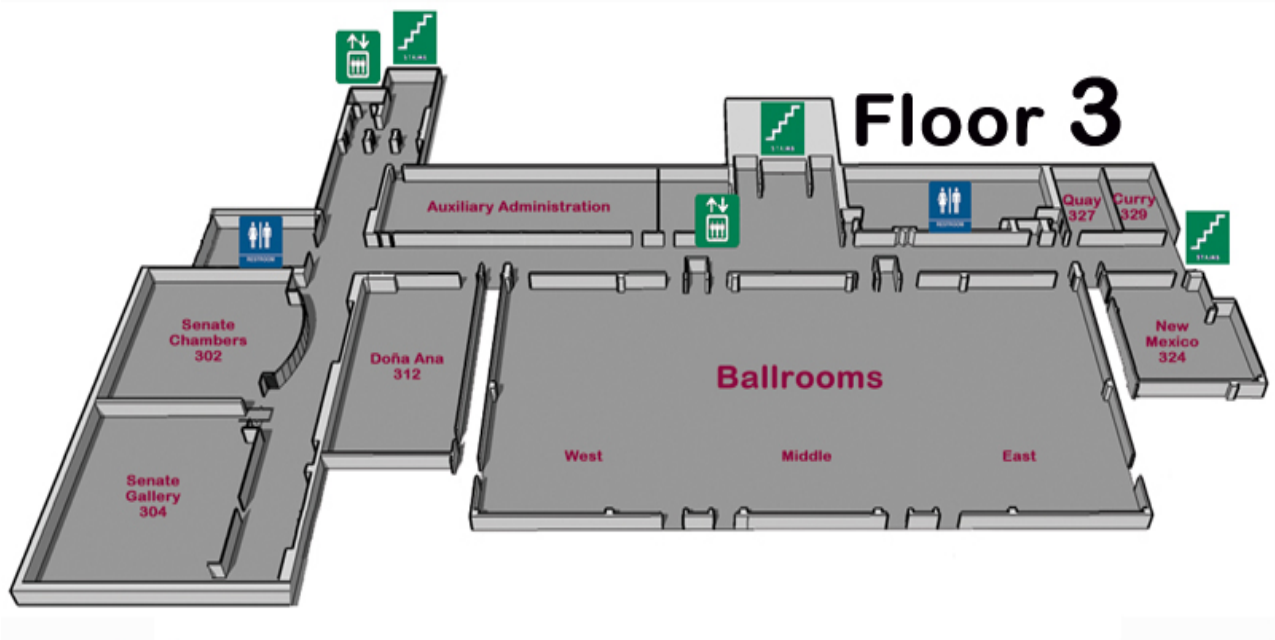
VP of Development

Niki Harings, GSC,
VP of Activities

Wes Smith, GSC,
VP of Operations

Kiran Sapkota, GSC,
VP of Operations

Graduate Research and Arts Symposium Floor Plan



Brief Schedule of Events

Tuesday, March 2, 2010

8.00am-10.00am	:	Registration, 3rd Floor Lobby Area (Breakfast item provided)
10.00am-12.00 pm	:	**Poster Sessions,** (Ballrooms)
12.00pm-1.00pm	:	Lunch Break
1.00pm-5.00pm	:	**Research Presentation: Senate Chambers (302) & Senate Gallery (304)**

Wednesday, March 3, 2010

8.00am-9.00am	:	Registration, 3rd Floor Lobby Area (Breakfast item provided)
9.00am-12.00pm	:	**Art and Research Presentations, Senate Chambers (302), Senate Gallery (304) & Dona Ana (312)**
12.00pm-12.30pm	:	Lunch Break
12.30pm-4.30pm	:	**Art and Research Presentations, Senate Chambers (302), Senate Gallery (304) & Dona Ana (312)**
6.00pm-8.00pm	:	**Banquet, Ballrooms**
		-Keynote Speaker: Dr. Jon Hunner, Department of History, NMSU
		-Short Film/Documentary by Kefaya Diab
		-Gift Card Raffle
		-Presentation of Certificates and Awards

Ballrooms, Corbett Center

Poster Number	Name	Abstract Title	Affiliation	Department
1	Yahya Al-Khatatbeh	Mechanical strength and stability of high-pressure ZrO2 phases	NMSU	Physics
2	Nabil Al-Aqtash	Covalent functionalization of Boron/ Nitrogen doped Graphene : an ab Initio Study	NMSU	Physics
3	Cat Wu	Halo Gas Velocities Using Multi-Slit Spectroscopy	NMSU	Astronomy
4	Cat Wu	Shifting Focus: Southern India and the Himalayas through the eyes of an astronomer	NMSU	Astronomy
5	Ryan T. Hamilton	Are Short Period CVs Normal?	NMSU	Astronomy
6	Jillian Bornak	Eye of the Beholder	NMSU	Astronomy
7	Jillian Bornak	Dust in the Wind: Grain Formation & Evolution in Classical Novae	NMSU	Astronomy
8	Michael Sussman	Simulation of the Uranian Circulation with the EPIC GCM	NMSU	Astronomy
9	Charles Miller	Analysis of Images from the Apache Point Observatory LCROSS Impact Observation Campaign	NMSU	Astronomy
10	Teresa Ross	Examining the Mg II Absorber-Galaxy Connection at Intermediate Redshifts	NMSU	Astronomy
11	Maria T. Patterson	HII Regions in the Outer Disk and Tidal Arms of M81	NMSU	Astronomy
12	Elizabeth Klimek	Effects of Shielding on Metallicity Estimates in QSO Absorption Line Systems	NMSU	Astronomy
13	Lisa Drake	The role of SLC7-type amino acid transporters in mosquito immunity, reproduction and lifespan	NMSU	Biology
14	Yihua Leng	Detection of post-transcriptional components in muscle-like cells of the electric fish *S. macrurus*.	NMSU	Biology
15	Betty A. Strietelmeier , A. Craine & G.B. Smith	Survey for Avian Influenza A Virus in the Rio Grande River	NMSU	Biology
16	Phanidhar Kukutla	The Role Of Melanization In Defense Against Plasmodium Yoelii In *Anopheles Gambiae* Mosquitoes	NMSU	Biology
17	Aaron Bueno-Cabrera	Assessing SINAP's role in protecting critical habitat of endangered charismatic species at Mexico: An ecological niche modeling approach	NMSU	Biology
18	Martha Martinez Grimes	The role of nitrogen status on the genes in sugar metabolism in the leaves and root nodules of alfalfa	NMSU	Molecular Biology
19	Mark Seger	Repercussions of increased leaf sucrose biosynthesis in *Medicago Sativa*	NMSU	Molecular Biology

Posters and Exhibits, Tuesday (10am-12pm)

Posters and Exhibits, Tuesday (10am-12pm)

Ballrooms, Corbett Center

Poster Number	Name	Abstract Title	Affiliation	Department
20	William Graves	Video Game Experience and Visual Attentional Abilities	NMSU	Psychology
21	Joshua Sandry	Students Misperceive Their Instructor's Expectations Regarding Appropriate Classroom Behaviors	NMSU	Psychology
22	Garrett L. Strosser, Robert Lawson	Explicit and Implicit Attitudes Toward Atheists and Other Unreligious Concepts	NMSU	Psychology
23	Lisa Busche	Effects of Recent Sexual Relationships on Mate Desirability	NMSU	Psychology
24	Sieun An	Applying signal detection strategies to investigate the differences in making moral attribution across cultures	NMSU	Psychology
25	Jamie Hughes	Implicit Beliefs about Stability and Change: A Construct Validity Study	NMSU	Psychology
26	Matteo Serena	Dormant Seeding and Sodding for Faster Turfgrass Establishment Under Saline and Subsurface Drip Irrigation	NMSU	Plant and Environmental Science
27	Marco Schiavon	Growing Degree Days to Predict Warm Season Turfgrass Establishment from Seed under Saline and Subsurface Drip Irrigation	NMSU	Plant and Environmental sciences
28	Pradip Adhikari	Identification of Soil Properties Based Indicators Using Principal Component Analysis for Desert Soils Irrigated with Treated Wastewater	NMSU	Plant and Environmental sciences
29	Sayed Gebril	Characterization of SPS gene in Pea (*Pisum sativum*)	NMSU	Plant and Environmental sciences
30	F. Omar Holguin	Integration of experimental studies with mass spectrometric metabolomic techniques to study and model the metabolism changes in GS1 transgenic alfalfa	NMSU	Plant and Environmental Sciences
31	Leah Lankford	Effects of human gonadotropin on serum progesterone concentrations, embryonic survival, and lambing rates in ewes	NMSU	Animal and Range Sciences
32	Piedad Esther Mayagoitia González	Status And Habitat Use of Neotropical Otters In Southern Tamaulipas	NMSU	Fish, Wildlife and Conservation Ecology
33	Mary Jean McCann	Bolson Tortoise (*Gopherus flavomarginatus*) Headstart in New Mexico	NMSU	Fisheries, Wildlife, and Conservation Ecology

Posters and Exhibits, Tuesday (10am-12pm)

Ballrooms, Corbett Center

Poster Number	Name	Abstract Title	Affiliation	Department
34	Karunakar Gampa	Errors in Fault Analysis of Power Distribution Systems Using Sequence Components Approach	NMSU	Electrical and Computer Engineering
35	Mohammed Habeeb Ur Rahman	Mathematical Formulations for Electromagnetic Pulse Propagation in Rocard-Powles-Debye Dispersive Model of Distilled Water	NMSU	Electrical and Computer Engineering
36	Nafish Quraishi	Velocity estimation by UWB noise radar using superresolution technique	NMSU	Electrical and Computer Engineering
37	Michael Abravanel	Rotman lens waveguide implementation in Ku band	NMSU	Electrical and Computer Engineering
38	Zachary Libbin	A Study to Improve Irrigation Management for a Vineyard in Deming, New Mexico	NMSU	Civil Engineering
39	Aldo R. Pinon-Villarreal	Retention And Transport Of Nitrate And Ammonia In Two Media: Clinoptilolite Zeolite And Sandy Loam	NMSU	Civil Engineering
40	Khaled S Hatamleh	Unmanned Aerial Vehicles Dynamics Modeling & Parameter Estimation	NMSU	Mechanical and Aerospace Engineering
41	Qi Lu	Virtually Offloading Body Mass for Rehabilitation: A Simulation Study	NMSU	Mechanical and Aerospace Engineering
42	Prafulla D Patil	Microwave-Assisted Catalytic Transesterification of Camelina Sativa Oil	NMSU	Chemical Engineering
43	Areen Khattabi	Wetting of fatty acid monolayers by organic solvents	NMSU	Chemistry and Biochemistry Department
44	Janeth Sanchez	Gender and Ethnic Differences In Eating-Specific Motivational Tendencies	NMSU	Health and Social Services
45	Cynthia Renteria	Preserving Memory/Promoting Justice: A Collection on U.S.-Mexico Border Activism	NMSU	History

Presentations and Performances (Tuesday March 2, 2010)

Senate Chambers, Corbett Center Room 302

Time	Name	Title	Affiliation	Department
1:00p – 1:30p	Ahmed Mohamed	Using high resolution satellite imagery to evaluate the relationship between honey mesquite canopy cover and forage production on Chihuahuan Desert	NMSU	Animal and Range Sciences
1:30p – 2:00p	Dan Zamborsky	Na+-driven multidrug efflux pump locus may effect colonization and symbiotic competence in the sepiolid squid-*Vibrio fischeri* mutualism	NMSU	Biology
2:00p – 2:30p	Nicole Harings	The Influence of Environmental Factors on Southwestern Toad Occupancy	NMSU	Biology
2:30p – 3:00p	Jesus Cuaron	The *Staphylococcus aureus* Tea Tree Oil Stimulon	NMSU	Biology
3:00p – 3:30p	Sandra Campos	Arsenate Sorption on Calcareous Soils of New Mexico	NMSU	Plant and Environmental Sciences
3:30p – 4:00p	Lilian Cibils	Immigrant Mothers' Interactions with their Children's Schools: Narrative Reconstruction of their Stances, Resources and Strategies	NMSU	Curriculum and Instruction
4:00p – 4:30p	Rachel Guy	Inductive Habitat Modeling of the American Marten over the Western US	NMSU	Fish, Wildlife and Conservation Ecology
4:30p – 5:00p	Vanessa Macias	Characterization of the role of TOR signaling in fecundity in the malaria mosquito, *Anopheles gambiae*	NMSU	Biology

Senate Gallery, Corbett Center Room 304

Time	Name	Title	Affiliation	Department
1:00p – 1:30p	Thasha McVey	Health Reform: We've Been Here Before	NMSU	History
1:30p – 2:00p	Shiva Prasad Pokharel	An Optimal Placement of PMUs for Finding Fault Location	NMSU	Electrical and Computer Engineering (ECE)
2:00p – 2:30p	Sophia Cisneros	Dark Matter: missing cross terms in the metric, As opposed to missing matter	NMSU	Physics
2:30p – 3:00p	Malini Murugesan	Hardware implementation of microcontroller based governor	NMSU	Electrical and Computer engineering
3:00p – 3:30p	Ivan Rodriguez Borbon	Reliability Model with Applications in Aerospace Materials	NMSU	Industrial Engineering
3:30p – 4:00p	Diane Delida Walker	A Pedagogy of Happiness in Teaching and Learning	NMSU	Curriculum and Instruction

4:00p – 4:30p	Qiumin Dong	Globalized Remix/Mix: Integrating non-Western Rhetoric in Graduate Programs	NMSU	English
4:30p – 5:00p	Reina Nashiro	New Potential for Post-colonial Writing: Jean Rhys' Wide Sargasso Sea.	NMSU	English

Presentations and Performances
(Wednesday March 3, 2010)

Senate Chambers, Corbett Center Room 302				
Time	**Name**	**Title**	**Affiliation**	**Department**
9:00a – 9:30a	Paul Kuhns	Through the Looking Glass: Identity Formation in Political Cartoons of the 1906 Iranian Constitutional Revolution	NMSU	History
9:30a – 10:00a	Bryan Buschner	The Portrayal of Japan in American movies, 1980-2000	NMSU	History
10:00a – 10:30a	Mohammed Habeeb Ur Rahman	Simulation Technique to Observe Brillouin Precursor in Loamy Soil	NMSU	Electrical Engineering
10:30a – 11:00a	Kate Baldwin	The General Strike for Peace, 1962	NMSU	History
11:00a – 11:30a	Maria Schrock	Mexican Women: A Traditional Society	NMSU	History
11:30a – 12:00p	Ying Xu	A Body of Troubled Site/Sight:Re-signifying Double Consciousness in Yung Wing's My Life in China and America	UNM	English
12:00p - 12:30p	-	-	-	-
12:30p- 1:00p	Kyle Traylor	Lizzie's Laughter: Mortification of the Flesh in "Goblin Market	NMSU	English
1:00p – 1:30p	Victor Munoz	The Elements of Existence in Gary Soto's The Elements of San Joaquin	NMSU	English
1:30p – 2:00p	Ramona Reeves	Join Me! (Creating Community in the Online Classroom)	NMSU	English
2:00p – 2:30p	Victor Valdivia	Non-normative Spanish Se-constructions. A functional approach	UNM	Linguistics
2:30p – 3:00p	Tiffany Holder	Using Internet Communication to Market Museums	NMSU	History
3:00p – 3:30p	Naomi Moreno	I Want to Suck Your Blood (and borrow a cup of sugar too): Sympathetic, Social Bloodsuckers in 20th Century Literature	NMSU	English
3:30p – 4:00p	Nina Javaher	Outcome differences in participating and non participating Hispanic students in supplemental Instruction classes supporting Organic chemistry I and II at New Mexico State University	NMSU	Educational Management and Development
4.00p- 4.30p	Kiran Sapkota	Prevalence and Antibiogram of Methicillin Resistant *S. aureus* (MRSA) in Clinical Samples from Tertiary Care Hospital	NMSU	Biology

Presentations and Performances
(Wednesday March 3, 2010)

Senate Gallery, Corbett Center Room 304

Time	Name	Title	Affiliation	Department
9:00a – 9:30a	Sravan Kumar Buggaveeti	A Morphological Filter to Distinguish a Fault from Capacitor Switching	NMSU	Electrical Engineering
9:30a – 10:00a	Venkatasiddhinagaraju Daram	Removal of Chromium(VI) from aqueous solution using Pecan shell activated carbon as adsorbent	NMSU	Chemical engineering
10:00a – 10:30a	Carl Swopes	A Fundamental Mathematical Argument for a CMY-RGB Color Model	NMSU	Industrial Engineering
10:30a – 11:00a	Shyam Kattel	Catalytic Selectivity of Transition Metal Functionalized Graphene	NMSU	Physics
11:00a – 11:30a	Joe Peterson	Study on Potential Fuel Cell Catalyst CoNx	NMSU	Physics
11:30a – 12:00p	Abdulla M Alqaddoumi	Functional Logic Programming	NMSU	Computer Science
12:00p - 12:30p	-	-	-	-
12:30p – 1:00p	Lekha N. Adhikari	Study of Glassy Selenium Tellurium Antimony Ternary System ($Se_{85-X}Te_{15}Sb_X$; X= 0, 2, 4, 6, 8 &10)	NMSU	Physics
1:00p – 1:30p	Suresh Gautam	Application of Mathematical Morphology Based Tool to Detect a Power Swing	NMSU	Electrical and Computer Engineering
1:30p – 2:00p	Muhammad Wasequr Rashid	Adaptive Biasing Technique for Class AB Amplifier Output Stage	NMSU	Electrical and Computer Engineering
2:00p – 2:30p	A. Gariimella	Novel Frequency Compensation Techniques for Low Drop-out Voltage Regulators	NMSU	Electrical and Computer Engineering
2:30p – 3:00p	Amjad Abu-Baker	Minimizing Energy Consumption in Wireless Sensor Network by using Solar Power	NMSU	Electrical & Computer Engineering
3:00p – 3:30p	Alejandro Alvarado	Neural Networks for Quality Defect Prediction in Injection Molding	NMSU	Industrial Engineering
3:30p – 4:00p	Anna Patterson	Examination of vegetation intercept-transect sampling in an arid environment	NMSU	Geography

Presentations and Performances
(Wednesday March 3, 2010)

Dona Ana, Corbett Center Room 312				
Time	**Name**	**Title**	**Affiliation**	**Department**
9:00a – 9:30a	Santosh Dulal	Isolation and Characterization of a Neutralizing Antibody Specific to Clostridium botulinum Neurotoxin Serotype F (BoNT/F)	NMSU	Biology
9:30a – 10:00a	Qin Yang	Regular completions	NMSU	Mathematics
10:00a – 10:30a	Ana Luz Vivas	Dynamics of a Single-Strain Influenza (SAIQR)	NMSU	Mathematics
10:30a – 11:00a	Megan M. Wong	Apologia for Living Messy (Art performance)	NMSU	English
11:00a – 11:30a	Lisa Jo Elliott	Analogical Reasoning and Naturalistic Decision	NMSU	Psychology
11:30a - 12:00p	Kari Simonsen	Sonification in a UAV	NMSU	Psychology
12:00p - 12:30p				
12:30p - 1:00p	Saran Kumar Rai	Barriers of Prostate Cancer Screening(PCS) Among Hispanic Male Population	NMSU	Health & Social Services
1:00p – 1:30p	Jessica Havstad	Autographics: Uncovering Identity in the Visual Memoir Fun Home	NMSU	English
1:30p – 2:00p	Floydd Michael Elliott	Clouds Being Torn By Mountains	NMSU	English
2:00p – 2:30p	Wes Smith	Managing Public Wealth: A case study reviewing the planning process for expenditures of a Regional Recreation and Aquatic Center	NMSU	Government
2:30p – 3:00p	Laura D. Reyes	A Pilot Study on Inter-Individual Proximity In Black Howler Monkey (Alouatta Pigra) Groups In Northern Belize	NMSU	Anthropology
3:00p – 3:30p	Laura D. Reyes	First evidence for female transfer in *Australopithecus afarensis*	NMSU	Anthropology
3:30p – 4:00p	Sieun An	Moral Attribution and Emotions	NMSU	Psychology

Departmental Abstract Submission Counts for GRAS 2010

Department	Number of Abstracts Submitted
Biology	12
Astronomy	11
English	10
Psychology	9
History	7
Electrical and Computer Engineering	7
Plant and Environmental Sciences	6
Physics	6
Molecular Biology	3
Industrial Engineering	3
Fisheries, Wildlife, and Conservation Ecology	3
Sociology and Anthropology	2
Animal and Range Sciences	2
Chemical Engineering	2
Mechanical and Aerospace Engineering	2
Civil Engineering	2
Department of Health	2
Mathematics	2
Computer Science	1
Chemistry and Biochemistry	1
Linguistic	1
Curriculum and Instruction	1
Educational Management and Development	1
Counseling and Educational Psychology	1
Electrical Engineering	1
Geography	1
Government	1
Marketing	1
Special Education & Communication Disorders	1

Poster and Exhibit Abstracts

(In alphabetical order by author)

1. Aaron Bueno-Cabrera, Biology, NMSU

Assessing SINAP's role in protecting critical habitat of endangered charismatic species at Mexico: An ecological niche modeling approach

Natural Protected Areas (NPA) is an important tool preserving critical habitat for many species, especially those under any protection category. I analyzed the effectiveness of the SINAP (Sistema Nacional de Areas Naturales Protegidas; Mexican NPA National System) for a suite of charismatic and endangered species listed under the NOM-059 species act occurring at Mexico. I developed Habitat Suitability Models (HSM) for each species using presence-only modeling techniques (Maximum entropy algorithm) and climatic and topographic variables from several sources at a 0.01 arc-sin degree pixel resolution. I tested each model using the AUC (area under the curve) parameter, the Kappa index, simple Chi-square tests and the historical range. All procedures were conducted in ArcMap 9.3, ArcView 3.2, DIVA-GIS 7.1 and Excel. HSM models performed well, averaging an AUC of 0.9, a Kappa index >0.5 and all tests significant (Chi2<0.05). According to our results, the Mexican NPA are protecting between 22% and 60% of the species historical distribution. In terms of habitat suitability, the SINAP protects only 19% of moderate quality habitat, however, for the high quality habitat category, this is reduced to only 11% for all the analyzed species; the Quetzal (Pharomachrus mocinno) habitat situation is particularly critical in the Mexican Southern region. Management implications, as well wildlife and its habitat conservation are discussed under the perspective and utility of the ecological niche modeling as a biodiversity conservation and management tool.

Keywords: NPA, NOM-059-SEMARNAT-2001, habitat, Ecological niche modeling, SIG, Maxent, charismatic species

2. Aldo R. Pinon-Villarreal, Department of Civil Engineering, NMSU

Retention and Transport Of Nitrate And Ammonia In Two Media: Clinoptilolite Zeolite And Sandy Loam

The use of large amounts of fertilizers in agriculture poses a risk of groundwater contamination. Clinoptilolite zeolite (CZ), a sedimentary volcanogenic mineral, could be applied to soil to enhance water and nutrient retention, reduce the risk of groundwater contamination and increase crop yields. The objective was to conduct batch and leaching experiments with CZ and native sandy loam (SL) of Mesilla Valley, New Mexico to determine effects of CZ on retention and dispersion of nitrate (NO_3) and ammonia (NH_4) ions. Batch adsorption experiments were undertaken by mixing six different concentrations of nitrate (NO_3) and of ammonia (NH4) fertilizer solutions with CZ and SL. Leaching experiments were performed by repacking two 10 cm diameter, 10 cm long Plexiglas columns with CZ and SL. The columns were saturated with deionized water, and a 200 mL pulse of 35 mg/L NO_3-/NH_4 solution was passed through the columns using a peristaltic pump (Control, CO., Friendswood, Texas). The effluent was collected in 20 mL bottles until the pulse was leached completely. Nitrate and NH4 concentrations were determined with spectrophotometer. The CXTFIT program was used to fit observed data into equilibrium and non-equilibrium transport models. Results from batch experiments indicated an increase in the NO_3/NH_4 adsorption in CZ as compared to SL. Nevertheless, the leaching experiment indicated no retention of NO3 by CZ but rather anion repulsion, and only NH_4 retention. More studies are needed to ascertain the effect of CZ at different pore water velocities on the transport and retention of NO_3.

3. Areen Khattabi, Chemistry and Biochemistry Department, NMSU
Wetting of fatty acid monolayers by organic solvents

Covalent monolayer assemblies of stearic, elaidic and oleic acids are characterized by infrared (IR) absorption and the contact angle with water and organic solvents. The contact angle variations with water and small organic molecules correlate with the monolayer density, which is the lowest for unsaturated hydrocarbon tails and is due to a kink at the double bond, the latter especially pronounced in the case of oleic acid (the cis isomer). Contact angle with hexadecane is distinctly peculiar in demonstrating enhanced wetting of low density monolayers. Such a behavior is in line with the density effects in phospholipid bilayers and can be used in mid and upper chemistry laboratory classes as a physical illustration of the effects of saturated and unsaturated fatty acids on the fluidity of cell membranes.

4. Betty A. Strietelmeier, A. Craine and G.B. Smith, Department of Biology, NMSU
Survey for Avian Influenza A Virus in the Rio Grande River

Avian Influenza A virus (AIV) is found as Low-Pathogenicity (LPAI) and High-Pathogenicity (HPAI) Avian Influenza species. Two viral proteins determine the pathogenicity: hemagglutinin (H) and neuraminidase (N). These two proteins are used to classify AIV, with the H5N1 subtype being primarily responsible for extreme virulence in HPAI-infected species. This subtype has caused illness and death in domestic birds (e.g. chickens, turkeys) and wild birds (e.g. mallards, pintails, snow geese) in Southeast Asia and elsewhere since 1996. Subsequently, the virus has spread over Asia, Northern Europe and Africa, through several mechanisms, including live-bird markets and wild-bird migration. It appears several duck species are adapting to this virulence, allowing birds to survive and spread AIV (as “Trojan ducks”) worldwide. The rate of spread is causing concern in many countries, especially those close to migratory pathways, such as the Rio Grande fly-way. This study utilizes concentrated water from ponds/lakes frequented by migratory birds to detect AIV. The scientific literature reports use of the matrix (M) gene, which codes for matrix protein (surrounds and protects viral RNA genome), for detection of AIV by RT-PCR. Water was obtained from Bosque del Apache preserve and used to further develop methods for ultrafiltration/concentration of samples to obtain protozoa, bacterial and viral fractions for analysis. We describe here sampling, ultrafiltration and RT-PCR results, as well as the design of new M-gene PCR primers, using current NCBI database sequences. The data used included a large, representative sample of M-gene sequences obtained from >60 species of infected birds (>6400 sequences).

5. Cat Wu, Department of Astronomy, NMSU
Halo Gas Velocities Using Multi-Slit Spectroscopy

Extra-planar gas in spiral galaxies could originate from disk-halo cycling driven by star formation in the disk or from infalling gas clouds. Studying halo gas kinematics can provide evidence for which scenario is more plausible, and edge-on galaxies provide an opportunity to study extra-planar gas. We measure gas velocities from H-alpha emission as a function of height above the galactic disk for a sample of nearby, edge-on galaxies. Using a multi-slit setup on the ARC 3.5m telescope in Sunspot, NM, we are able to measure H-alpha velocities along 11 slits simultaneously. By positioning the slits parallel to the minor axis, we can cover 11 radial distance bins in one exposure. We compare our results to studies of HI velocities in these galaxies.

6. Cat Wu, Astronomy, NMSU
Shifting Focus: Southern India and the Himalayas through the eyes of an astronomer

During the summer of 2008, I studied at the Indian Institute of Astrophysics in Bangalore, India. I had the opportunity to travel around the southern states of Karnataka, Tamil Nadu, and Kerala. I also visited the Taj Mahal and spent some time in the Himalayas. These are some pictures from my travels.

7. Charles Miller, Department of Astronomy, NMSU
Analysis of Images from the Apache Point Observatory LCROSS Impact Observation Campaign

The 2009 LCROSS impact in Cabeus crater at the lunar south pole provided an opportunity to observe the ejecta plume from an impactor of known mass, velocity, and entry angle. We observed the LCROSS target with the 3.5 meter and 1.0 meter telescopes at Apache Point Observatory and the 0.6 meter telescope at Tortugas Mountain in Las Cruces. We discuss the challenges of observing a diffuse plume against the illuminated lunar limb. We also present images of Cabeus before and after impact and analyze these images for evidence of a faint plume. This work is supported by USRA grant number GR0002970.

8. Cynthia Renteria, Department of History, NMSU

Preserving Memory/Promoting Justice: A Collection on U.S.-Mexico Border Activism

Social justice, service and activist groups in Las Cruces, El Paso and Ciudad Juárez work daily to address human rights, economic, labor, environmental, housing, land tenure, violence and other critical issues. Recognizing the importance of this work, members of the New Mexico State University (NMSU) faculty and library staff got together and applied to the Southwest Border Cultures Institute for a grant. After the grant was awarded I was one of two graduate students hired for the acquisition portion of the project. The goal of this project is to preserve activism along the U.S.-Mexico border. A group in each city was selected; in Las Cruces the Colonias Development Council, in El Paso, Paso del Sur and in Ciudad Juárez the residents of Lomas del Poleo. The project resulted in a permanent collection on social justice housed at the NMSU library. This collection will benefit students, researchers and community groups wishing to learn more about the history and social justice work done in the region. The organizations will benefit by having a safe place to deposit their materials and ensure that their work is preserved for future generations. This presentation focuses on the work done to connect the community and the university by working with the organizations, collecting materials and conducting oral histories. In addition, the presentation will highlight the ongoing working relationships established between the archive and these organizations.

9. ***Elizabeth Klimek, Astronomy, NMSU***

Effects of Shielding on Metallicity Estimates in QSO Absorption Line Systems

One of the powers of QSO absorption line systems is estimating the metallicities and abundances over cosmological time and in a variety of environments (i.e., DLAs, galaxy halos, and the IGM). Most all metallicity estimates in the literature have not investigated UV photon shielding by optically thick material in the proximity of the absorber being studied. Shielding removes ionizing photons, thereby softening the ionizing spectrum incident on the absorber. This process results in ionization fractions that differ from an unshielded photoionized cloud and can lead to a substantial underestimate in the inferred metallicity. This may have consequences for metallicity estimates, especially in Lyman Limit Systems, which are thought to arise in close proximity to galaxies.In this work we use the photoionization code Cloudy to investigate the effects of shielding on the observed column densities of MgII, CIV, and OVI for both the optically thin and optically thick cloud scenarios. We test this for shielding clouds with different HI column density as a function of total hydrogen number density, n_H. Shielding results in an underestimate of the metallicity relative to unshielded absorbers. Generally, the greater the shield cloud N(HI), the greater the metallicity underestimate for all three ions. For MgII, the greater the shield cloud n_H, the greater the metallicity underestimate, while the opposite is true for the higher ionization ions CIV and OVI. The effect is more sensitive to the shield cloud N(HI) than to its n_H. The amount of underestimation is more severe for higher N(HI) absorbers.

10. Garrett L. Strosser, Robert Lawson NMSU, Psychology

Explicit and Implicit Attitudes toward Atheists and Other Unreligious Concepts

While national polls suggest that atheists are one of the most despised social groups by Americans, little research has dealt with the issue of attitudes toward this group. This study sought to address this topic by evaluating explicit and implicit attitudes held by American theists and atheists towards both religious believers and nonbelievers and related religious/unreligious concepts. Theoretically, the study addresses the issue as to whether or not implicit and explicit measures tap into the same underlying attitudinal domain. To assess implicit attitudes, participants completed a paper-and-pencil version of the Implicit Association Test (IAT), (Lemm, Lane, Sattler, Khan, & Nosek, 2008) in which pre-tested religious and unreligious words were paired with pleasant and unpleasant words. To assess explicit attitudes, participants completed two feeling thermometers in which they rated how “warm” versus “cold” they felt toward both religious believers

and nonbelievers. Findings from the paper IAT indicate that while theists showed an implicit attitudinal bias favoring religious concepts over unreligious concepts, atheists showed no implicit preference for unreligious or religious concepts. However, atheists reported less warm feelings towards religious believers than theists reported. Overall, the correlation between the explicit attitude measure and the IAT is weak and nonsignificant. This finding is interpreted as showing a partial dissociation between the two measures; while theists displayed a preference for religious concepts at both the explicit and implicit levels, atheists only favored unreligious concepts at the explicit level.

11. F. Omar Holguin, Plant and Environmental Sciences, NMSU

Integration of experimental studies with mass spectrometric metabolomic techniques to study and model the metabolism changes in GS1 transgenic alfalfa

By integrating experimental studies with quantitative approaches that better deduce, characterize, and optimize the regulation and integration of complex and interacting metabolic pathways, we can model and engineer the gene regulatory networks (GRNs) and metabolic networks (MNs) involved in and related to C and N metabolism for effectively improving nitrogen use efficiency and biomass. GS plays a key role in N assimilation and may play a key role in N use efficiency. By applying mass spectrometric techniques we are looking for other steps in underlying biochemical pathways that may become the bottleneck in the N assimilatory pathway. Towards this objective we have produced transgenic alfalfa plants with increased cytosolic GS (GS1) activity that exhibit improved biomass compared to control plants. We have subjected the extracts from leaf tissues of these transformants and control plants to metabolite analysis using GC/MS, LC/MS, and FT-ICR/MS. Our data shows th at increased GS1 activity is accompanied changes in many metabolic pathways, including those involved in nitrogen metabolism, carbohydrate metabolism, and the TCA cycle.

12. Janeth Sanchez, Department of Health and Social Services, NMSU

Gender and Ethnic Differences in Eating-Specific Motivational Tendencies

Background: Gray's (1994) two factor learning theory includes a Behavioral Approach System (BAS) that responds to stimuli signaling reward by facilitating appetitive behavior, and a Behavioral Inhibition System (BIS) that responds to stimuli signaling punishment by inhibiting motor behavior. Individual differences in these systems have been related to risk behaviors in past research. Of interest in this study is the relationship of motivational tendencies to eating behavior. Methodology: A pilot study examined eating-specific BIS and BAS motivational tendencies among 160 college students. Specifically, a survey consisting of four BAS (Escape, Sensation Seeking, Positive Emotion, and Reward) and two BIS subscales (Punishment and Negative Emotion) was employed in this study. A 2x2 research design with gender (male/ female) and ethnicity (Hispanic/non-Hispanic) as independent variables and all 6 motivational subscales as dependent variables was used. Results: Multivariate analysis of variance identified significant gender effects for Negative Emotion ($p<.001$), Positive Emotion ($p<.05$), and Sensation Seeking ($p<.001$). In anticipation of eating, male participants demonstrated greater Positive Emotion and Sensation Seeking than female participants, while females demonstrated greater Negative Emotion than males. This analysis also found a significant Ethnicity effect for Punishment ($p<.05$). Specifically, Hispanics demonstrated greater Punishment in anticipation of eating than non-Hispanics. Discussion: This study identified gender and ethnic differences in eating-specific motivational tendencies. It is important to further examine the relationship between motivational tendencies and actual eating behavior. Understanding individual differences in eating-specific motivational tendencies may help develop more effective behavioral interventions for groups at risk for overeating and obesity, such as Hispanics.

13. Jamie Hughes, Department of Psychology, NMSU

Implicit Beliefs about Stability and Change: A Construct Validity Study

Implicit theories are beliefs about the relative stability or malleability of human characteristics. Individuals can hold these beliefs about intelligence, morality, or personality. Further, the particular belief one holds (entity beliefs versus incremental beliefs) are shown to predict a particular pattern of behavior. However, it is not known whether beliefs about broad domains such as intelligence, are consistent with beliefs about specific domains such as mathematical ability. An association between specific and broad domains would provide evidence of the construct validity of implicit belief theory. One hundred and twenty seven participants completed a series of four-item implicit belief measures about specific domains related to

person attributes, intelligence, and morality. Results indicated that most participants endorsed incremental beliefs. The classification of participants into entity theorists, incremental theorists, or neither revealed that approximately 70 percent of participants were unclassified or incremental theorists. A confirmatory factor analysis provided evidence for the construct validity of implicit beliefs, and high correlations between specific domains and latent constructs were obtained.

14. Joshua Sandry, Psychology, NMSU

Students Misperceive Their Instructor's Expectations Regarding Appropriate Classroom Behaviors

Classroom incivility degrades the quality of education and accurate description of classroom rules serve to reduce incivility. We assessed the accuracy of student's perception of their professor's expectations for appropriate decorum. Students in eight classes rated how irritating they believed 16 classroom behaviors were to their instructor and we compared students ratings to the ratings given by their instructor. Students frequently had misassumptions about what their instructor believed were important errors of classroom decorum. We suggested several ways that faculty can better communicate their expectations.

15. Jillian Bornak, Astronomy, NMSU

Dust in the Wind: Grain Formation & Evolution in Classical Novae

We see dust everywhere we look, from our own Milky Way galaxy to the distant universe, but dust formation is poorly understood. Classical novae are a convenient way to study dust formation on human timescales, however dust masses derived from observations are erroneously large. We propose the flaw resides in assuming that the dust is distributed in homogeneous shells. We will present the results of using the advanced dust modeling code, DIRTY, to over 200 days of data of Nova Cen 1991 (V868 Cen), a classical novae with dust formation and strong evidence of inhomogeneous ejecta.

16. **Jillian Bornak, Astronomy, NMSU**

Eye of the Beholder

I present photos from the past 4 years, taken in the Southwest and the East Coast.

17. Karunakar Gampa, Klipsch School of Electrical and Computer Engineering, NMSU

Errors in Fault Analysis of Power Distribution Systems Using Sequence Components Approach

This poster presents quantification of errors using sequence component method of fault analysis for IEEE 13-bus, 34-bus, and 123-bus distribution test systems. However, few studies are published that attempt to quantify such errors. All major types of faults are considered at each bus and results using the sequence component model are compared with results using the three-phase model. The spectrum of errors for each type of fault is presented through graphs.

18. Leah Lankford, Animal and Range Sciences Department, NMSU

Effects of human gonadotropin on serum progesterone concentrations, embryonic survival, and lambing rates in ewes

This study was conducted to determine if human chorionic gonadotropin (hCG) will increase circulating concentrations of progesterone (P4) in sheep and prolong elevated levels through the period of implantation. Fifty-nine Suffolk ewes (avg BW =79.7 ± 2.5 kg) received an intravaginal P4-containing insert (CIDR, 0.3 g P4) for 12 d and were mated with fertile rams on the second estrus (d 0) after CIDR removal. Ewes were randomly assigned to one of two treatments. Treated ewes received 200 IU (0.4mL) of hCG im and controls received 0.4 mL saline im on d 4, 7, and 10. Blood samples were taken via jugular venipuncture beginning on d 0 and on alternate days until d 35. Serum P4 concentrations were similar ($P > 0.10$) between groups through d 5. However, on d 7, ewes treated with hCG had greater ($P < 0.01$) serum P4 concentration than controls, and P4 remained higher ($P < 0.05$) throughout the sampling period (d 35). Of ewes receiving hCG, 68% had 4 or more total CL present compared to 33% for controls ($P < 0.05$). On d 60 85% of hCG-treated ewes had multiple fetuses compared to 62% of controls ($P < 0.10$). In addition, 82% of hCG-treated ewes gave birth to two or more lambs compared to 63% of control ewes ($P = 0.17$). In conclusion, hCG administration on d 4, 7, and 10 after mating resulted in elevated serum P4 from d 7 through d 35, and more ewes carrying multiple fetuses.

Keywords: hCG, Progesterone, lamb crop, CL

19. Lisa Drake, Biology department, NMSU

The role of SLC7-type amino acid transporters in mosquito immunity, reproduction and lifespan

Mosquitoes are successful as disease vectors because they require vertebrate blood as a nutrient source for egg development. After a blood meal, yolk protein precursor (YPP)-synthesis is up-regulated in the fat body. Amino acid (AA)-transporters, located in the fat body plasma membrane, facilitate blood meal-derived AA import and generate a signal that is transduced to the yolk protein gene via the TOR/S6K signal transduction pathway. YPP gene expression in *Aedes aegypti* is dependent upon the cationic AAs histidine, arginine, and leucine. Arginine is also the precursor to nitric oxide which is an important molecule for the innate immune system of mosquitoes. We identified 68 putative AA transporters in the genome of A. aegypti, eleven members of the subgroup of SLC7-type AA transporters, and five of the subfamily of cationic AA transporters (CATs). We determined fat body expression levels of the eleven SLC7-transporters and found several of them strongly up-regulated after a blood meal. Using RNAi-mediated knockdown and subsequent analyses of reproductive fitness, aging, and immunity we demonstrate the role of SLC7-type AA transporters in adult female *A. aegypti.*

20. Lisa Busche, Psychology, NMSU

Effects of Recent Sexual Relationships on Mate Desirability

Previous research offers a consensus that individuals with promiscuous sexual histories are less desirable mates. This finding is often attributed to an increased risk of cuckoldry for men and of diversion of resources for women who are involved with promiscuous partners. Despite these risks, most individuals do have more than one sexual partner over the course of their lifetime. One variable that may help individuals decide when it is acceptable to enter a relationship with a partner who has previous sexual experience is the recentness of the partner's previous relationships. In particular, we expected to find men avoiding partners who had terminated their most recent sexual relationship within the past four months, because in such a scenario a woman could be pregnant from her last relationship but not showing any physical signs of the pregnancy. Participants were asked about their willingness to engage in a causal, long-term, or purely sexual relationship with a new partner. The amount of time since the most recent sexual relationship of this potential partner was varied between subjects. Results confirmed our predictions showing that recentness of a past relationship influences the degree to which an individual is desired as a mate.

21. Khaled S Hatamleh, Mechanical and Aerospace Engineering, NMSU

Unmanned Aerial Vehicles Dynamics Modeling & Parameter Estimation

Dynamics modeling of Unmanned Aerial Vehicles (UAVs) is an essential step for design and evaluation of an UAV system. Many advanced control strategies for nonlinear dynamical or robotic systems which are applicable to UAVs depend upon known dynamics models. The accuracy of a model depends not only on the mathematical formula or computational algorithm of the model but also on the values of model parameters. Many model parameters are very difficult to measure for a given UAV. The poster presents the results of a simulation based study of an in-flight model parameter identification method. The method can identify the unknown inertia parameters of the UAV under certain conditions. Using the recursive least-square technique, the method is capable of updating the model parameters of the UAV while the vehicle is in flight. sensor noise effect on the identified parameters is also considered by the study.

22. **Marco Schiavon, Matteo Serena, Plant and environmental sciences, NMSU**

Growing Degree Days to Predict Warm Season Turfgrass Establishment from Seed under Saline and Subsurface Drip Irrigation

A growing scarcity of potable water in the southwestern United States sets limits on its availability for nonessential uses such as turfgrass irrigation. Low quality ground water and recycled water have been identified as alternatives to potable water for irrigation. Both types of water can exhibit higher salinity levels

than potable water and the resulting salt build-up in the turfgrass rootzone requires a change in species selection in transition zones from traditional cool season grasses to salt tolerant warm season grasses. However using warm season grasses in high altitude desert locations has been challenging, because the growing season for the warm season grasses can be relatively short and salinity stress can further slow down growth and establishment. A study was conducted at New Mexico State University in Las Cruces, NM in 2008 and 2009 to determine the Accumulated Average Daily Soil Temperature (AADST) necessary to establish bermudagrass [Cynodon dactyon (L.)] cultivar Princess 77 and seashore paspalum [Paspalum vaginatum (Swartz)] cv. Sea Spray. The grasses were irrigated at 100% potential ET with both with saline (1500 ppm TDS) and potable (500 ppm) water under 2 irrigation systems (sprinkler vs. subsurface-drip). In 2008 grasses were planted early March [dormant] and early June [standard]) and in 2009 grasses were seeded every 15th day of each month from March to June. Response of percent ground cover to AADST was fitted to linear regression equations. In 2008 early seeded plots established faster than late seeded plots regardless of irrigation type and water quality. With the exception of saline drip irrigated plots, all late seeded treatments required fewer heat units (AADST) to reach 50% ground cover than early seeded plots. AADST strongly predicted percent ground cover for all treatments.

23. **Matteo Serena, Plant Environmental Science, NMSU**

Dormant Seeding and Sodding for Faster Turfgrass Establishment under Saline and Subsurface Drip Irrigation

Establishing warm season grasses from seed or sod in the transition zones of the United States poses a challenge because of the short growing period in which turf can be transplanted. To assess the establishment of turf during dormancy, a study was conducted at New Mexico State University in 2008 to compare the effects of 2 planting dates (early March [dormant] vs. mid-June [late]) and 2 irrigation systems (sprinkler vs. subsurface-drip) on the establishment of bermudagrass [Cynodon dactylon (L.)] cultivar Princess 77 under 2 qualities of irrigation water (saline at 1800ppm Total Dissolved Salts vs. potable at 500 ppm). Plots were irrigated daily at 100% pET and fertilized every two weeks at 2.5 g N/m2. In 2008, quality of irrigation water had no effect on establishment. When data were pooled for water quality, dormant sodded sprinkler irrigated plots established faster than all other treatments and dormant sodded drip irrigated plots and late seeded sprinkler irrigated plots reached 75% ground cover 147 and 152 days after early seeding or sodding (DAES). Early seeded drip irrigated, late sodded drip irrigated, and late seeded sprinkler irrigated reached 75% ground cover 177, 182, and 186 DAES respectively. Plots that were drip irrigated and seeded late did not reach 75% ground cover by the end of the study period. Our results suggest that bermudagrass established better from sod during the dormant season than from seed.

24. Mohammed Habeeb Ur Rahman, Klipsch School of Electrical Engineering, NMSU

Mathematical Formulations for Electromagnetic Pulse Propagation in Rocard-Powles-Debye Dispersive Model of Distilled Water

It has been long known that propagation of electromagnetic pulse through dispersive media give rise to Brillouin and Sommerfeld type precursors. The mathematical model to represent these precursors, in most dispersive media, results in mathematically intractable complex differential and integral equations. However, modern asymptotic theory of pulse propagation through dispersive media gave rise to closed-form formulations for Brillouin type precursors. There are, however, very few experimental studies reported in the literature to experimentally observe the existence of the precursors and characterize the evolution of these precursors in a given dispersive media. A simple mathematical formulation has been introduced to observe electromagnetic pulse propagation in Rocard-Powles-Debye model of dispersive dielectric for distilled water using a waveguide. Moreover, these formulations are validated using existing reported results

25. Michael Abravanel, Department of ECE, NMSU

Rotman lens waveguide implementation in Ku band

Modern satellite, wireless communication, and radar systems often demand the wide-band performance for multi-channel operation. Phased array beam steering provides the benefit of multi-directional radiation without changing the physical position of the array. Phased array antennas have been widely used in orbital communications as well as radar applications. Specifically, recent applications such as the collision avoidance feature in automobiles provide the need for the compact dimensions that result from the use of

high frequency design. Stationary beam steering, utilizing beam switching techniques, offer a less expensive and compact, and low profile alternative to traditional phased arrays. Rotman lenses have been used in the past as attractive candidates in beam forming networks. Typical implementation involves microstrip design equations based on wave, ray tracing assumptions and path length from one contour (circular) to another (typically parabola or hyperbola). Such devices tend to have losses that increase with frequency as well as the number of ports used. Implementation of the Rotman lens in a waveguide, or stripline form could help improve the power efficiency of the system.

26. Maria T. Patterson, Department of Astronomy, NMSU

HII Regions in the Outer Disk and Tidal Arms of M81

The outer disk spiral arms of M81, caused by the interaction with M82 and NGC3077, are fertile grounds for exploring star formation in low density environments. The area is characterized by extended HI arms and filaments within which are found HII regions and dwarf galaxies, including HoIX. Much attention has focused in past years on the evidence for star formation and on the properties of the stellar populations detected in these HI features, especially from recent GALEX and HST observations. Here we report on a study of the HII region population over a 1.5 degree field, derived from a Burrell Schmidt H-alpha composite supplemented with ARC 3.5-m telescope emission line images of both inner and outer disk HII regions. We discuss the luminosities and morphologies of the HII regions and compare the current massive star formation with the recent and past rates inferred from the stellar populations detected in the outer disk features.

27. Martha Martinez Grimes, Molecular Biology, NMSU

The role of nitrogen status on the genes in sugar metabolism in the leaves and root nodules of alfalfa

The legume-Rhizobium symbiosis involves very complex interactions, which lead to the formation of a new organ, the root nodule. The bacteria residing in the nodule fixes atmospheric N2 into a form usable by the plant and in turn obtains photosynthate derived carbon substrates from the plant. The photosynthate is delivered to the nodule in the form of sucrose and the carbon derived from the metabolism of sucrose in the nodules is used for several physiological processes; including plant and bacterial respiration, N2-fixation and assimilation, and the biosynthesis of starch and cellulose. C assimilation, C partitioning and N assimilation are highly coordinated and there are many points of reciprocal control. Our objective is to analyze the expression pattern of genes encoding key enzymes in Carbon metabolism in the nodules and leaves under conditions where the symbiont can fix or not fix N2, thus providing conditions of nitrogen sufficiency on deficiency. Our results will determine how nitrogen status regulates the expression of key genes in C metabolism in both the leaves and the nodules. By integrating experimental studies with quantitative approaches that better deduce, characterize, and optimize the regulation and integration of complex and interacting metabolic pathways, we can model and engineer the gene regulatory networks (GRNs) and metabolic networks (MNs) involved in and related to C and N metabolism for effectively improving nitrogen use efficiency and biomass. GS plays a key role in N assimilation and may play a key role in N use efficiency. By applying mass spectrometric techniques we are looking for other steps in underlying biochemical pathways that may become the bottleneck in the N assimilatory pathway. Towards this objective we have produced transgenic alfalfa plants with increased cytosolic GS (GS1) activity that exhibit improved biomass compared to control plants. We have subjected the extracts from leaf tissues of these transformants and control plants to metabolite analysis using GC/MS, LC/MS, and FT-ICR/MS. Our data shows that increased GS1 activity is accompanied changes in many metabolic pathways, including those involved in nitrogen metabolism, carbohydrate metabolism, and the TCA cycle

28. Mark Seger, Department of Molecular Biology, NMSU

Repercussions of increased leaf sucrose biosynthesis in Medicago Sativa (Alfalfa) when grown under symbiotic nitrogen conditions

Legumes form a unique organ called the root nodule that is the site of nitroge(N2) fixation to ammonia by the bacterial symbiont, *Rhizobia*. In exchange for ammonia, the plant provides the root nodule a source of carbon in the form of sucrose and its metabolism supports bacteroid growth, fuels N2 fixation, and provides the carbon skeletons needed for ammonia assimilation. Synthesis of sucrose begins in the source leaves and a key regulatory enzyme, sucrose phosphate synthase (SPS), catalyzes the penultimate step in the

pathway. Our objective is to increase sucrose synthesis in the leaves of alfalfa to determine how increased sucrose transport to the nodules will affect both carbon and nitrogen metabolism. To date, a maize SPS gene driven by the CaMV35S promoter has been introduced into alfalfa to constitutively increase SPS activity. Expression of the maize SPS transgene has been demonstrated in the source leaves with a concomitant increase in SPS activity and sucrose levels. The transformants demonstrated changes in the levels of several key carbon and nitrogen metabolites when grown under symbiotic conditions. Moreover, transformants demonstrated a change in appearance and an increase in the number of nodules.

29. Michael Sussman, Astronomy, NMSU

Simulation of the Uranian Circulation with the EPIC GCM

Uranus' emitted infrared irradiance is only 6% more than its absorbed insolation, thus unlike other giant planets, Uranus appears to emit little internal heat. This results in an important role for solar radiation in the planetary energy budget, in spite of its large heliocentric distance. Furthermore, its extreme axial tilt of 97 degrees generates a strongly varying insolation pattern which may act as a forcing mechanism to drive seasonal circulation effects. Some evidence such as increased discrete cloud features and altered zonal winds suggest seasonal change has already been observed (Hammel et al., 2005, Icarus 175, 534-545).

To model potential seasonal changes on Uranus' circulation, we employ the use of the Explicit Planetary Isentropic Coordinate (EPIC) GCM (Dowling et al., 2006, Icarus 182, 259-273), previously used successfully for simulations of atmospheric circulation for the other giant planets. To properly model the effects of seasonal insolation patterns, we replace EPIC's default Newtonian cooling, and introduce a new, more realistic two-color (visible and mid-IR) fully radiative scheme which properly models radiative diffusion. Our radiative scheme generally reproduces the planet's temperature-pressure profile with only three free parameters: extinction coefficients for visible radiation and mid-IR radiation, and an assumed abyssal temperature.

We present the results of our modeling efforts, showing spin-up of zonal and meridional winds with forcing from various seasonal insolation patterns.

30. **Mary Jean McCann, Fisheries, Wildlife, and Conservation Ecology, NMSU**

Bolson Tortoise (Gopherus flavomarginatus) Headstart in New Mexico

Endangered bolson tortoises presently occur in the wild in a small region of the Chihuahuan Desert in Mexico. Restoration of them is dependent on captive breeding and headstarting of young. Three known populations of bolsons now exist in the United States, all in New Mexico. Two of them on Ted Turner's Armendaris and Ladder ranches. In 2009, 25 hatchlings were produced in New Mexico. Various techniques have been used to increase the production of neonates to assess their survival. X-rays have proven to be particularly useful because they not only tell us the number of eggs each gravid female has, but also estimate time of laying. On the Armendaris ranch during the summer of 2009, 10 females were x-rayed 4 times during the nesting season (May-July). Ninety percent were determined gravid for the first clutch, 70% for a second clutch, and none produced a third clutch. Identifying natural nests had limited success. Nests found were either protected with a predator-proof enclosure or eggs were removed for indoor incubation. Three tortoises hatched as laid in one of these enclosures. X-rays determined 84 eggs total from gravid females. Among these eggs, 27 (32%) were located in the fenced enclosures. Of the 27 eggs, 19 (70%) were removed for artificial incubation and 8 (30%) were incubated naturally. Time of indoor incubation from eggs hatching ranged between 72-80 days and natural incubating ranged between 100-110 days. We will continue to refine techniques to obtain large numbers of hatchlings for future releases in the wild.

31. Nafish Quraishi, Electrical Engineering, NMSU

Velocity estimation by UWB noise radar using superresolution technique

UWB radar systems are being widely used for remote sensing applications, such as, detection of underground mines, utility lines and pipes, etc. These systems offer a very fine range resolution capabilities and hence enhancing the underline image. However this system suffers to estimate the velocity of a moving target precisely. In UWB radar systems, the Doppler spread by which we determine the velocity is bandwidth dependent and susceptible to noise. MUSIC (multiple signal classification) algorithm is used to

determine the Doppler frequency which provides much better resolution when the system is operating under noisy conditions. The most important property of MUSIC method is that, at least in principle, they produce unbiased frequency estimation with infinite resolution, regardless of the signal to noise ratios. MUSIC is an improvement of Pisarenko harmonic decomposition. The idea is to decompose the autocorrelation of input signal into two subspaces, signal and noise subspace, then a frequency estimation function is build to extract the frequencies of the desired signals. Simulations are carried out to show how smoothly MUSIC can detect the Doppler spectrum and hence the velocity under noisy conditions.

32. **Nabil Al-Aqtash, Department of Physics, NMSU**

Covalent functionalization of Boron/ Nitrogen doped Graphene : an ab Initio Study

We have studied the mechanism of chemical functionalization of graphene by COOH groups. Our study was performed in the framework of ab initio pseudopotential density functional computational methods. The structural and electronic properties of carboxylated graphene sheets were examined in cases of graphene containing no defects, containing a SW defect, containing a vacancy, and containing defects combined with N/B- doping . We observed significant structural changes in graphene after the attachment of the COOH group to its surface. We found that the binding energy between the COOH group and graphene increases significantly in the presence of SW defects and vacancies combined with doped B. The B-doping appears to enhance the interactions between the defective graphenes and the COOH molecule. However, the N-doping appear to depress these interactions. Our calculations show that surface defects combined with B-doping play an important role in the carboxylation of graphene.

33. Pradip Adhikari, Department of Plant and Environmental Science, NMSU

Identification of Soil Properties Based Indicators Using Principal Component Analysis for Desert Soils Irrigated with Treated Wastewater

Knowledge of soil heterogeneity is useful for designing site specific soil management practices especially for those affected by anthropogenic activities. The objectives of this study were to determine the variability of soil physical and chemical properties and to identify the minimum number of principle components (PCs) necessary to explain the total variability of lagoon treated wastewater irrigated soils of West Mesa. Variability in soil properties was identified by coefficient of variation (CV) as the indicator and a property was ranked as least (CV < 0.15), moderate (0.15< CV<0.35) or most (CV > 0.35) variable using the criteria proposed by Wilding (1985). Nitrate (NO3-), chloride (Cl-), sodium adsorption ratio (SAR), hydraulic conductivity (Ks), sodium (Na+), exchangeable sodium percentage (ESP) and electrical conductivity (EC) were observed most variable in the irrigated plots at 0-20 cm depth. Using Principle Component Analysis (PCA), 16 soil physical and chemical properties were grouped into four components (eigenvalue> 1) as: soil sodicity, water transport, soil texture and organic matter (OM) at 0-20 cm depth and soil sodicity, soil texture, water retention and OM at 20-40 cm depth. The soil sodicity factor was the most dominant with ESP the most dominant measured soil attributes at both 0-20 and 20-40 cm depths. Therefore, ESP should be monitored over time in the west mesa land application site. The mean SAR for study site was 19.17 in the irrigated plots, it is necessary to initiate management strategies on controlling soil sodicity in the West Mesa land application site.

34. Phanidhar Kukutla, Department of Biology, NMSU

The role of melanization in defense againt plasmodium yoelii in Anopheles gambiae mosquitoes

Malaria is a mosquito-born disease that kills over one million people annually. An understanding of the mosquito-parasite interactions is critical for developing control strategies to intervene malaria transmission by Anopheles mosquitoes. One way in which Anopheles gambiae responds to some species of malaria is through melanization of oocysts. A black coating of melanin is formed on the parasites in response to recognition of the parasite. Here we report that serine protease CLIPA8 is required for oocyst melanization of Plasmodium yoelii in An. gambiae. However, while RNA interference (RNAi) mediated inhibition of CLIPA8 decreases the number of melanized oocysts, the live parasite load on the midgut is not changed, suggesting that the melanization may not be necessary for the early oocyst killing.

35. Qi Lu, Mechanical & Aerospace Engineering, NMSU

Virtually Offloading Body Mass for Rehabilitation: A Simulation Study

This paper describes a computer simulation based investigation of an active body-weight support (BWS) technology which has a high potential of significantly improving treadmill-based locomotion rehabilitation. Using acceleration feedback and force control strategies, the active BWS system can offload not only partial body weight but also partial body mass (thus the dynamic load) of the patient who is supported by the system. As a result of the reduced mass, the patient can perform training with ease and comfort. Due to the safety requirements, the proposed technology has to be thoroughly investigated through simulation and experiment before a human subject experiment can be safely conducted. The work reported in this paper is such a simulation work. In the simulation the physical human is modeled as a multi-body system with 54 degrees of freedom. The model also predicts physical interaction of the feet with the treadmill using contact dynamics simulation. The simulation results verify that the proposed new active BWS system can dynamically and seamlessly reduce dynamic load of the patient in training.

36. Ryan T. Hamilton, Astronomy, NMSU

Are Short Period CVs Normal?

We present the continuing results of VLT ISAAC K-band spectroscopy of short period cataclysmic variable (CV) systems below the "period gap" between 2 to 3 hours. It is extremely difficult to see the secondary stars in short period systems, since the low luminosity secondaries are swamped by the accretion disks in these objects. We show the infrared spectra for 9 systems below the gap: V2051 Oph, V436 Cen, EX Hya, VW Hyi, Z Cha, WX Hyi, V893 Sco, RZ Leo, and TY PsA. We are able to clearly detect the secondary stars in all but WX Hyi, V893 Sco, and TY PsA. We present the first direct detections of the secondary stars of V2051 Oph and V436 Cen, and present new detections for EX Hya, VW Hyi, Z Cha, and RZ Leo. Previous infrared spectroscopic surveys of CVs above the period gap reveal that these secondaries suffer a universal deficit of C12, enhanced levels of C13, and unusual abundance patterns for other species (e.g., Mg,Si, Al, Ca). Infrared spectroscopy of short period magnetic CVs (polars) have shown that their secondary stars appear completely normal, and the secondaries in a sample of "pre-CVs" have normal carbon abundances. Implications for CV evolution and formation scenarios will be discussed.

37. Sayed Gebril, Mark Seger, Jose Ortega, Champa Sengupta-Gopalan, Department of Plant and environmental sciences, NMSU

Characterization of SPS gene in Pea (Pisum sativum)

Sucrose phosphate synthase (SPS) is an enzyme that catalyzes the first step in sucrose synthesis. Sucrose is the only source of carbon compounds that can be transferred between source and sink tissue. Sucrose is utilized as source of energy in sink tissues such as root nodules and seeds where it is broken down by sucrose synthase (SucSy). The goal of this study is (1) to characterize SPS gene families in pea Pisum sativum, (2) to understand the expression of this gene in source and sink tissues. Southern blotting and probing with alfalfa SPS showed that SPS is encoded by multi gene families.

38. Sieun An, Department of Psychology, NMSU

Applying signal detection strategies to investigate the differences in making moral attribution across cultures

An and Trafimow (2007) found that there are differences in making moral attributions in Americans and Koreans. While Americans had more moral attributional weight after perfect duty violations (e.g. dishonesty and disloyalty) than imperfect duty violations (e.g. unfriendliness and uncharitability), Koreans did not differentiate between perfect and imperfect duties. This indicates that people from the two counties handle moral attribution differently. Based on the previous findings, it seems that people from different cultures may have different ideas about what are perfect duty violations (such as dishonest behaviors) and what are imperfect duty violations (such as unfriendly behaviors). Specifically, some specific behaviors in the same categories would be considered differently depending on the culture in which a given transgression occurred. Therefore, to conclude the question on moral attribution differences across the cultures, we decided to figure out cultural moral behavior domain/frame by applying signal detection strategies. To define people's cultural moral domain/frames, specific behaviors in the moral domain were needed and were borrowed from work by Chadwick, Bromgard, Bromgard, and Trafimow (2006). 25 items from their dishonest category for perfect moral duty behaviors and 25 items from the unfriendly category for imperfect moral duty behaviors were used in the current study. Items were randomly mixed and presented in four conditions. All

the participants were asked to rate each item on whether should be deemed immoral behavior or not. The result of the study suggested that Korean and American moral domains were not the same, which means that, because Koreans and Americans consider certain behaviors differently with respect to their morality, they would make moral attribution differently on particular violations.

39. Teresa Ross, Department of Astronomy, NMSU

Examining the Mg II Absorber-Galaxy Connection at Intermediate Redshifts

A fundamental astrophysical question is the role of gas in galaxy evolution. Mg II absorption as observed in quasar spectra is found to arise in a broad range of gaseous galactic environments. But the overall relationship between the distribution of Mg II absorbers, their host galaxies, and the larger scale galactic structure is not well known. Lyman-alpha studies have been successful in showing how galaxies and galaxy over densities correlate to neutral hydrogen absorption; therein providing insights into the absorbing gas-galaxy correlation function. However such studies have not been preformed using a tracer of low ionization metal enriched material that has been processed through galaxies. We present our study, in progress, to examine the relationship between Mg II absorbing gas and galaxies in 25 sight lines.

Our goals are to analyze how impact parameter, galaxy morphology and Mg II absorption kinematics are related, to constrain the gas distribution within an impact parameter of 500 kpc, and to study whether absorbing and non-absorbing galaxies differ in morphology. We also aim to quantitatively compare the Mg II-galaxy correlation, Lyman-alpha -galaxy correlation and galaxy-galaxy correlation functions.

40. Prafulla D Patil, NMSU, Chemical Engineering

Microwave-Assisted Catalytic Transesterification of Camelina Sativa Oil

Catalytic conversion of Camelina Sativa oil to biodiesel through both conventional heating and microwave radiation was investigated. Three different types of catalysts: homogeneous catalysts (NaOH and KOH), heterogeneous metal oxide catalysts (BaO and SrO), and sol-gel derived catalysts (BaCl2/AA and SrCl2/ AA) were evaluated for their efficacy on biodiesel production. The following conditions were obtained for the catalysts based on the maximum biodiesel yield: Potassium hydroxide: methanol to oil ratio of 1:9, catalyst concentration of 1% (w/w), and reaction time of 60 s; Sodium hydroxide: methanol to oil ratio of 1:9, catalyst concentration of 0.5 wt.%, and reaction time of 60 s; Barium oxide: methanol to oil ratio of 1:9, catalyst concentration of 1.5 % (w/w), and reaction time of 4 min; Strontium oxide, methanol to oil ratio of 1:9, catalyst concentration of 2 wt.%, and reaction time of 4 min. For the sol-gel derived catalysts, different catalyst loading rates in the range of 1-10 mmol/g were used. Low biodiesel yield of 10-25% on the sol-gel derived catalysts were observed. Based on energy consumptions in the transesterification processes with both conventional heating and microwave-heating methods evaluated in this study, it was estimated that the microwave-heating method consumes less than 10% of the energy to achieve the same yield as the conventional heating method. The fuel properties of camelina biodiesel produced were compared with those of the regular diesel and found to be conforming to the American Society for Testing and Materials (ASTM) standards.

41. Piedad Esther Mayagoitia González, Fish, Wildlife and Conservation Ecology, NMSU,

Status and Habitat Use of Neotropical Otters in Southern Tamaulipas

The neotropical otter (Lontra longicaudis) is listed as in danger of extinction by IUCN and as a threatened species by the Mexican government. Otters in southern Tamaulipas have been deleteriously impacted by poaching, the clearing of riparian vegetation and by water pollution due to industrial, agricultural and municipal wastes. Our study was conducted in La Vega Escondida Protected Area (LVPA), located near the terminus of the Tamesi River (TR), during the summer of 2008 and February-August 2009. The objectives of this study were: 1) to determine otter distribution and habitat use; 2) determine fish biomass and 3) determine local attitudes towards otters. Distribution was determined using surveys to detect otter sign (tracks, scats, sightings). We classified the study area into river, canal and lagoon habitats and conducted transects to evaluate landscape features related with otter presence such as roots, logs, debris, sandbar, gravel and rocks. Fish biomass was also assessed in the three habitats. We conducted interviews of commercial fishermen in LVPA. The majority of otter scats were found in canals during both seasons. In all three habitats, roots, logs and debris occurred at a frequency greater than 40%. Lagoon

had the greatest average fish biomass value (> 800 g), followed by canal (< 700 g), and river (< 400 g). Eighty-eight percent of the interviewees had a favourable attitude towards otters. Our data suggests canals are the most used habitat by otters. However, there is an urgent need to limit the impact of anthropogenic disturbances.

42. William Graves, Psychology, NMSU

Video Game Experience and Visual Attentional Abilities

Much recent research has examined the question of whether playing video games is beneficial. Bavalier and colleagues (2003, 2006, 2009) have shown that avid video game players have an improved attention capacity and are able to track more moving objects than the average person. The current study extends this work by comparing the performance of videogame players and non-videogame players on four standard cognitive measures of attention: black-and-white and color versions of the flanker compatibility task, an enumeration task, and an attentional blink task.

43. **Yahya Al-Khatatbeh, Physics department, NMSU**

Mechanical strength and stability of high-pressure ZrO_2 phases

It has long been speculated that materials synthesized at high pressures provide a promising route to systematically develop materials that can replace expensive diamond as an industrially used abrasive. We investigate the feasibility of this proposal in the case of zirconia (ZrO_2), a material that is thought to possess extremely hard high-pressure phases, by combining experiment and theory. We provide revised equations of state (EOS) for the low-pressure ZrO_2 phases (monoclinic MI and orthorhombic OI). The small volume decrease of 3.4% across the MI → OI transition at ~10 GPa is associated with a 38% increase in the bulk modulus consistent with our ab initio calculations that predict a ~36-39% increase. In contrast to the EOS of MI and OI, we find that our experimental EOS for the high-pressure OII phase is in good agreement with previous measurements. The large volume decrease across the OI → OII phase transition as obtained from both our experiments and calculations is ~10%. Using scaling relations we find that all three observed ZrO_2 phases show very similar hardness of ~10 GPa. This finding is against the common belief that hardness increases as the specific volume of high-pressure phases decreases. Our findings imply that the relationship between hardness and phase is more complicated than previously thought and synthesis procedures and strategies for superhard abrasives should be re-evaluated.

44. Yihua Leng, Department of Biology, NMSU

Detection of post-transcriptional components in muscle-like cells of the electric fish S. macrurus

Cells in multicellular organisms show multiple phenotypes because of different gene expression profiles. In the weakly electric fish S. macrurus, cells of the electric organ (EO) are called electrocytes and are derived from skeletal muscle. Electrocytes are not contractile, yet continue to make some muscle proteins. How can it that an electrocyte be partial muscle-like and not be a contractile cell is unknown. Previous data from out lab suggest that regulation is not solely at the transcriptional level. Hence, we hypothesize that the partial muscle phenotype of electrocyte is under post-transcriptional regulation. One post-transcriptional regulation mechanism in eukaryotes involves P-bodies, protein complexes that store mRNAs until these are translated. To determine whether P-body dependent events are involved in electrocyte phenotypic regulation, we first set out to study their presence in electrocyte and skeletal muscle cells by using antibodies to detect P-body components: RCK, HuR and Dicer. Western blotting and immunohistochemistry studies detected RCK, HuR and Dicer in muscle and electrocytes. Their distribution differed in that RCK and Dicer were not only localized along the membrane in skeletal muscles like those in electrocytes, but were also diffused in cytosol. Moreover, this distribution is altered in the absence of electrical input into electrocytes. These data warrant further verification of the role that post-transcriptional events play in the conversion of the skeletal muscle phenotype to give rise to electrocytes, and how they mediate changes in electrical activity from the nervous system.

45. Zachary Libbin, A. Salim Bawazir, Bernd Maier, Department of Civil Engineering

A Study to Improve Irrigation Management for a Vineyard in Deming, New Mexico

Growing grape vines for wine production is increasing in New Mexico. Despite this increase, limited knowledge exists on management of soil moisture and salinity, consumptive water use (evapotranspiration), and microclimate effects on the vines. In an effort to improve irrigation management practices of vineyards

and crop yield, soil moisture and salinity, evapotranspiration (ET) and microclimate within a vineyard in Deming, New Mexico were measured during a growing season of 2009. These measurements are part of a 3 year study that ends in 2011. A 20-ft flux tower was installed in 2008 in a large area of vineyard at Deming, New Mexico to measure ET. A three-dimensional sonic eddy covariance (3DSEC) and one-propeller eddy covariance (OPEC) systems were installed on the tower to measure ET. Temperature and relative humidity above and within the vines were measured. A weather station was also installed nearby to measure weather parameters such as wind speed and direction, solar radiation, ambient temperature and relative humidity, precipitation, and soil temperature. In addition, soil salinity, soil moisture and temperature were measured. Soil moisture characteristic curves were then developed. Soil texture and salinity were mapped to determine their spatial and temporal distribution. Preliminary results from the study are presented.

Presentation and Performance Abstracts

(In alphabetical order by author)

1. ***Abdulla M Alqaddoumi, Department of Computer Science, NMSU***
Functional Logic Programming

Functional logic programming is a multi-paradigm programming that combines the best features of functional programming and logic programming. Functional programming provides mechanisms for demand-driven evaluation, higher order functions and polymorphic typing. Logic programming deals with non-determinism, partial information and constraints. Both programming paradigms fall under the umbrella of declarative programming. For the most part, the current implementations of functional logic languages belong to one of two categories: (1) Implementations that include the logic programming features in a functional language. (2) Implementations that extend logic languages with functional programming features. In this paper we describe the undergoing research efforts to build a parallel virtual machine that performs functional logic computations. The virtual machine will tackle several issues that other implementations do not tackle: (1) Sharing of sub-terms among different terms especially when such sub-terms are evaluated to more than one value (non-determinism). (2) Exploitation of all forms of parallelism present in computations. The evaluation strategy used to evaluate functional logic terms is needed narrowing, which is a complete and sound strategy.

2. **Amjad Abu-Baker, Klipsch School of Electrical & Computer Engineering, NMSU**
Minimizing Energy Consumption in Wireless Sensor Network by using Solar Power

Energy consumption is considered as one of the important issues in the design of wireless sensor networks (WSNs). WSN consists of connected sensor nodes which are battery-powered devices. Since the energy supplied by battery is limited, different approaches have been studied to address this problem. This research focuses on this issue and proposes a linear programming model for energy efficient routing to minimize the energy consumption in WSNs by using solar power. This model is applied to different WSN topologies where random sensor nodes are generated in a specific area. A framework is developed to formulate this linear programming model with varying numbers of battery-powered sensor nodes and solar-

powered sensor nodes. WSN is constructed and solar-power nodes with different degree of solar power are deployed. Finally, the formulated linear model is solved and the results are collected, visualized, and represented for performance comparisons.

3. Ahmed Mohamed, Department of Animal and Range Sciences, NMSU

Using high resolution satellite imagery to evaluate the relationship between honey mesquite canopy cover and forage production on Chihuahuan Desert

Honey mesquite (Prosopis glandulosa Torr.) invasion can negatively impact rangeland grazing capacity, spatial livestock distribution, and forage production in Chihuahuan Desert rangelands. High resolution remote sensing data can be used to develop shrub encroachment maps for arid rangelands. The objectives of this study were: 1) to use QuickBird satellite imagery to map honey mesquite invasion and estimate invaded areas in four pastures in the Chihuahuan Desert Rangeland Research Center (CDRRC) in south-central New Mexico, USA, and 2) to evaluate the relationship between honey mesquite canopy cover and perennial grass forage production in the CDRRC. QuickBird Ortho-ready satellite image with spatial resolution of 2.4 m at multispectral bands and 0.6 m at panchromatic band was acquired for the study area in May 19, 2009. Maximum likelihood supervised classification algorithm was performed to distinguish honey mesquite from other land cover categories. Plots of 12 x 60 m were subset from the classified map and used to calculate honey mesquite canopy cover percent on the 40 transects across the study area. The total honey mesquite invaded areas estimated from the image analyses were 143, 50, 92, and 136 ha in pastures 1, 4, 14, and 15, respectively. Regression analyses showed that increasing in honey mesquite canopy cover results in decreasing in perennial grass forage production ($r = + 0.73$, $n = 40$). Our findings indicate that classification of high- resolution satellite images imagery is are very useful tool for mapping invasive shrubs and determining their influences on forage production in desert landscapes.

4. Alejandro Alvarado, Department of IE, NMSU

Neural Networks for Quality Defect Prediction in Injection Molding

Injection molding has been characterized as one of the most versatile processes with rapid production rates. In the injection molding process, the polymer (plastic) is continually melted in a heated, traveling screw extruder. Some of the main issues involved in injection molding process are reduction of cycle time, lower production cost, and quality improvement of molded parts. Causes of variations in injection molding are related to the complexity of the process. This complexity is generally due to the vast number of factors acting during a regular production run, which directly impacts the quality of final products. Some of these factors are variations related to plastic behavior which is affected by changes in process parameter settings such as injection speed, pressure, temperature, time, and screw position. Various approaches show improvements on overcoming the complexity of the process, the manipulation of processing parameters, and the non-linearity of the process parameters. However, these approaches have been focused on analyzing the effects of changes of process parameters on the quality of products. Very little is known about the analysis of the effects of plastic behavior in quality of molded parts specifically in predicting quality defects due to plastic behavior during processing. This paper presents a neural network approach as a prediction method to map input data (related to melt temperature) with output data (related to quality defects). The resulted model shows the capability of neural networks to predict defects.

5. A. Gariimella, Klipsch School of Electrical and Computer Engineering, NMSU

Novel Frequency Compensation Techniques for Low Drop-out Voltage Regulators

Frequency Compensation Techniques are important for Low Drop-out Voltage Regulators in the stability point of view. This presentation focuses on the several techniques that we have developed as part of our research.

6. Ana Luz Vivas, Department of Mathematics, NMSU

Title- Dynamics of a Single-Strain Influenza (SAIQR)

Mathematical models have become important tools in analyzing the spread and control in infectious disease. Influenza A virus is one of the most common diseases in humans. Starting from the basic epidemiological model SIR (Susceptible-Infectious-Recovered), two additional classes are included: A class (asymptomatic class, individuals less or equal infectious than the individuals from the I class) and Q class (quarantine class, individuals that are isolated after knowing that posses the infection). The model is denoted by SAIQR, and the results for the basic reproduction number Ro and the stability for endemic equilibrium E* are obtained by using dynamical systems theory. Understanding the characteristic of influenza can lead to better approaches to follow the evolution of the disease, to contribute its diagnostic, and to prevent its transmission through vaccination programs.

7. Anna Patterson, Geography, NMSU

Examination of vegetation intercept-transect sampling in an arid environment

Rapid assessments of vegetative boundaries traditionally rely on interpretation of remotely sensed imagery. Field verification is necessary to determine if such plant boundaries are properly established. Variations of intercept-transect sampling are the most common sampling methods used in field verification. This article is a critical review of intercept-transect sampling literature, methods, and best practices pertaining to the establishment of vegetative boundaries in an arid environment. To assist the evaluation of intercept-transect sampling methods discussed in the literature, I performed a preliminary micro assessment. Based on this assessment, as well as a critical review of literature, I have concluded that line-intercept transects should be used in open terrain such as desert shrublands and grasslands, while twenty centimeter belt transects should be used to establish boundaries between two sparse (<5% cover) vegetation types. Recommendations for sampling rules, implementations, and terminology standardization are also included.

8. Bryan Buschner, Department of History, NMSU

Title-The Portrayal of Japan in American movies, 1980-2000

In the 1980s and 1990s the cultural relationship between the United States and Japan transformed into something new. Cultural perceptions transitioned from thirty five years of slow evolution to a brief period of divergent development due to Japan's bubble economy. The nature of this change was not terribly unlike the sudden shifts in past economic and political policy that led to conflict. In the late 1980s and early 1990s tension ran high. This transition is visible in the evolution of American movies such as Blade Runner, The Karate Kid, Black Rain, Mr. Baseball, and many others. In the same way I also investigate the change in portrayal of Japan after the bubble economy in the middle and late 1990s as well as the early part of the new millennium. To investigate this period I look at the portrayal of Japan in movies like Street Fighter, Hunted, Kill Bill and Last Samurai.These films, along with the critical, scholarly, and public reaction they created, show a change in American perceptions of Japan.

9. Carl Swopes, Department of Industrial Engineering, NMSU

A Fundamental Mathematical Argument for a CMY-RGB Color Model A FUNDAMENTAL MATHEMATICAL ARGUMENT FOR A CMY – RGB COLOR MODEL

mathematical argument for “A Fundamental Definition Of Color” CMY – RGB (subtractive – additive) Color Model of primary colors per the acknowledged method of combining two proportional and pure primary colors to get the third proportional and pure primary color within its group. This mathematical color model also allows the addition or subtraction of values between corresponding CMY and RGB colors to shift (increase or diminish) one or the other color directly and the other colors indirectly.Per this color model, CMY – RGB color requires the application of the GRCC as “values” at their corresponding “frequencies” per the “long second”, which are defined with this presentation. Coloring outside the lines, coloring outside the box, color vector analysis, three-dimensional color systems, and mixing color pigments are beyond the scope of this presentation.

10. Dan Zamborsky, Department of Biology, NMSU

Na+-driven multidrug efflux pump locus may effect colonization and symbiotic competence in the sepiolid squid-Vibrio fischeri mutualism

Bobtail squid from the genus Euprymna form an environmentally-transmitted mutualism with gram-negative bacteria from the genus Vibrio. Symbiotic vibrios are acquired after hatching and therefore can exist in either seawater or mutualistically within squid. Identification of differentially expressed genes in symbiotically competent Vibrio fischeri has led to studies examining the roles of specific genes during either their free-living or symbiotic states. One such gene is the recently discovered Na+-driven multidrug efflux pump in Australian and Hawaiian V. fischeri, and is believed to play a part in persistence of symbiosis-competent vibrios in the free-living (seawater) state. Therefore, the goal of this study was to test the relative importance of this efflux pump and whether it plays an active role in metabolic processes or competitive traits that result in differential success in infection of the squid light organ. A mutated strain of V. fischeri with a derived Na+-driven multidrug efflux pump locus demonstrated significantly reduced growth rates at sodium concentrations when compared to environmental conditions. The mutant strain also had significantly slower growth in saltwater media as compared to the wild type under normal abiotic conditions (temperature and salinity). These preliminary results indicate a possible role for the Na+-driven multidrug efflux pump for survival during the free-living stage of V. fischeri, and may have similar effects when establishing a stable symbiosis with its host squid.

11. Diane Delida Walker, Department of Curriculum and Instruction, NMSU

A Pedagogy of Happiness in Teaching and Learning

Students and teachers are increasingly stressed from the unrelenting demand to perform well on standardized tests. Despite the government-mandated attention to standards, standardization and assessment, evidence from national tests indicates test performance and levels of literacy and numeracy continue to fall. Data indicate students lack an explicit understanding of what they are expected to know and be able to do. Many do not enjoy their time in learning institutions and realistically fear failure in our classrooms. Some students (and teachers) cannot make connections between conceptual knowledge and its practical application to everyday life. This lack of confidence and preparation often translates into an inability to do the work required for university success, and/or an altogether disinterest in pursuing higher education. I will present data from my current doctoral research on happiness in teaching and learning. I asked nine people to talk about what made them happy in teaching and learning. My research indicates how we can contribute to student and teacher happiness (also known as subjective well-being) by incorporating strategies that potentially reduce stress and increase conceptual understanding and retention of knowledge. We can make education more responsive to the need for relevance and connection by tapping into what the physicist Feynman calls, “The pleasure of finding things out,” Csikszentmihalyi calls, “Flow,” or the psychology of optimal experience (when we are doing something so interesting that time seems to stop), and what educational philosopher Noddings calls, “Happiness in education.”

12. Floydd Michael Elliott, English, NMSU

Clouds Being Torn By Mountains (Art Performance)

As a poet in the MFA program here at NMSU, lately I have been focusing my work on the fracturing of the psyche. How do things such as Alzheimer's and dementia affect the self, and those around them? How about Schizophrenia and other forms of mental illness? My poetry explores, through differing lenses, the costs, pains and damages that are inflicted, as well as the coping mechanisms that some employ to survive. I will read from my current portfolio, "Clouds Being Torn By Mountains," as well as my soon to be published lyric essay, "We were asked to leave - The collected works of no interest to anyone."

13. Ivan Rodriguez Borbon, Department of Industrial Engineering, NMSU

A Bayesian Reliability Model with Applications in Aerospace Materials

This research presents the application of Bayesian analysis to construct a model for reliability analysis to determine lifetimes of aerospace innovated materials. The methodology consists of employing the Weibull proportional hazards model to estimate the lifetimes of the desired materials. In addition, Markov chain Monte Carlo (MCMC) techniques are used to estimate the parameters involved in the model under analysis and predict the reliability of the product under study. Since the resulting posteriors distributions of the parameters involved in the model are not standard probability distributions, Laplace method is used to find a proposal density for metropolis random walk chain. Finally, estimation of Reliability probabilities in aerospace data are obtained by computing this function on the simulated draws of the parameters. The results show that the methodology employed is a good estimator of lifetimes applied to aerospace innovated

materials because Bayesian analysis provides more accurate results than regular inference methods. The reason for this is that Bayesian approaches integrate prior information into the analysis result in reliable inference compared with frequentist methods.

14. J. A. Cuaron[1], S. Dulal[1], J. Rivera[1], V. Nagarajan[2], Y. Song[3], A. K. Singh[3], R. K. Jayaswal[3], B. J. Wilkinson[3], And J. E. Gustafson[1], Department Of Biology, NMSU

The Staphylococcus aureus Tea Tree Oil Stimulon

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Background: The biocide tea tree oil (TTO) is a steam distillate of Melaleuca alternifolia that denatures bacterial membranes and proteins and interferes with cell wall metabolism. We now report the first bacterial TTO stimulon expressed by Staphylococcus aureus. **Methods:** *S. aureus* microarrays and array data analysis protocols (NIAID-PFGRC) were utilized to determine the TTO shock transcriptome (0.25% v/v TTO at OD625nm = 0.4 and 1.0, for 15 and 30 min) of S. aureus strain SH1000, which were then compared to 93 other transcriptomes utilizing the S. aureus microarray metadatabase (SAMMD). TTO MICs, MBCs, and kill curves were also utilized in these studies. **Results:** SAMMD revealed that all TTO treatment stimulons were most similar to the S. aureus ethanol (ETH) shock stimulon (41 to 48% overlap). All TTO treatments also altered expression of the two-component system operons vraSR and saeRS and numerous genes controlled by VraSR and SaeRS. A vraSR-inactivated mutant also demonstrated a lower TTO MIC compared to the parent strain (0.15% ± 0 and 0.23% ± .01, respectively, p = 0.0005). A dnaK-inactivated mutant also demonstrated a reduced TTO MIC (0.25% ± 0) compared to the parent strain (0.28% ± 0.1, p = 0.02). **Conclusions:** The TTO stimulon is similar to the ethanol stimulon, and genes required for cell wall maintenance and the general stress response are required by S. aureus to react to the denaturing effects and altered cell wall metabolism induced by TTO.

15. Jessica Havstad, Department of English, NMSU

Autographics: Uncovering Identity in the Visual Memoir Fun Home

The term "Autographic" is the academic hybrid for an autobiographical comic book. In Alison Bechdel's Fun Home, one of the best examples of this genre, the narrator searches for her identity through the death of her father. Bechdel employs both text and image to allow audience into the forlorn memories of her past. The text weaves in and out of two timelines, the past and the present, where Bechdel uncovers personal meaning from her past and connects it with her own current revelations about her identity. The Autographic genre has evolved from a history of identifiable and important graphic artists and novels. Fun Home is a text that draws inspiration from such notable texts as Art Spiegelman's Maus. Its autographical context, explored within a richly personal graphic narrative, is embedded with literary and symbolic references eluding to the importance of finding identity through understanding intimate relationships. My research objective is to explore and explain both fundamental and elusive aspects of the genre, using Fun Home as the template for analysis.

16. Joe Peterson,Physics, NMSU

Study on Potential Fuel Cell Catalyst CoNx

One aspect preventing fuel cells from becoming a market viable product is prohibitively high cost in catalysts. To address this problem new materials that combine desirable catalytic properties with durability and low cost are being analyzed. This research focuses on exploring the atomic configuration of one candidate material, CoNx, to aid in identifying structures that help in the catalytic process.

17. Kyle Traylor, Department of English, NMSU

Tuesday Lizzie's Laughter: Mortification of the Flesh in "Goblin Market

This essay examines the roles of religion and sexuality in Christina Rossetti's poem,"Goblin Market." Contemporary criticism of "Goblin Market" often focuses on the relationship between the poem's two protagonists as being in some way radical, proposing that their actions advance a new model of spiritual female sexuality, one that treats the Eucharist as a form of body erotic. The alternate reading put forth within this paper, one based on the character Lizzie's laughter during a scene of violent, quasi-sexual assault, proposes that there is nothing radical about this model. Instead, Rossetti is drawing from medieval religious practices of mortification of the flesh, practices which conflated the act of suffering in emulation of Christ with a form of sexual release.

18. Kari Simonsen, Department of Psychology, NMSU

Sonification in a UAV

Sonification is the use of non-speech sound to present data or information. It is used as an aid for the visually impaired and as a method for augmenting cognition. Previous research has used sonification to make auditory graphs and sonified spreadsheets. This research aims to use sonification in an Unmanned Air Vehicle (UAV) display. The experiment was conducted with a 2x3 factorial design with both factors being within subjects. In both the visual condition and the sonified condition there were 4 gauges to monitor. There were also 3 competing task conditions (visual, auditory, and no competing task) in order to test the strain of each type of display on attentional resources. Results showed a significant effect of both display type and competing task as well as a significant interaction. Both reaction times and accuracy were tested. Results suggested that reaction times for the sonification display were less variable than for the visual display and were not as affected by the competing tasks. Future research should aim to test other sonification methods, test the number of sonified gauges it is best to use, and test the best type of information to display in sonified gauges.

19. Kate Baldwin, History, NMSU

The General Strike for Peace, 1962

The 1962 General Strike for Peace was the first multi-city strike to be successfully carried out in the United States. Organized by Julian Beck and Judith Malina, founders of the avant-garde, off-Broadway Living Theatre troupe, the General Strike took place not only in the United States but in countries like Mexico, Germany and England, where noted social critic Bertrand Russell sponsored the London GSP committee. The General Strike for Peace might be one of the greatest unsung moments in American protest history.

20. Kiran Sapkota, Biology, NMSU

Prevalence and Antibiogram of Methicillin Resistant S. aureus (MRSA) in Clinical Samples from Tertiary Care Hospital

Methicillin-resistant *S. aureus* (MRSA) was first detected in the 1960s, and since that time it has spread rapidly worldwide, becoming a leading cause of nosocomial infection. Because MRSA are also resistant to many antibiotics, the infections caused by them are particularly difficult to treat. A total of 4690 clinical samples were microbiologically processed and antibiogram was preformed from the positive *S. aureus* isolates in tertiary care hospital in Nepal. MRSA was isolated from variety of clinical specimens. Among a total samples, 31.1% (82/264) *S. aureus* were found to be methicillin resistant. The antibiotic resistance of MRSA was highest with Amoxicillin (100.0%) followed by Cloxacillin (90.2%), Cotrimoxazole (68.3%) and Erythromycin (61.0%). Good communication should be established among laboratory, hospital wards and physicians for effective infection control against MRSA in tertiary care hospitals.

21. Lisa Jo Elliott, Psychology, NMSU

Analogical Reasoning and Naturalistic Decision Making

Decision making in the natural world has garnered much attention lately. In laboratory experiments, behavioral decision-making studies reveal that people rely on cognitive heuristics and biases, which result in sub-optimal decisions. In the natural world, professionals in decision-making positions rely on their expertise. It is hypothesized that experience modifies a decision maker's perception and judgment of the situation's features. The ability to separate the important features from the unimportant features of a situation is vital to building and exercising expertise. I contend that analogical reasoning, a type of inductive reasoning, underlies this ability in problem solving and decision-making. In this regard, problem solving and decision-making are similar. The current experiment examines the role of analogical reasoning in feature noticing using two operational decision making domains. I believe that analogical reasoning and feature noticing performance are strongly correlated in both domains.

22. Lekha N. Adhikari, Department of Physics, NMSU

Study of Glassy Selenium Tellurium Antimony Ternary System
($Se_{85-X}Te_{15}Sb_X$; X= 0, 2, 4, 6, 8 &10)

Study of Glassy Selenium Tellurium Antimony Ternary System ($Se_{85-X}Te_{15}Sb_X$; X= 0, 2, 4, 6, 8 &10) using **Differential Scanning Calorimetry**" is based on different atomic percentages of antimony and selenium with the element tellurium held fixed at the 15 atomic percentage level. The glassy sample for the present study is Se-Te-Sb which has been prepared by the melt quenching technique. Different amounts of antimony and selenium have been added to the fixed proportion of tellurium element to give the ternary sample $Se_{85-X}Te_{15}Sb_X$.The study of glass transition phenomena and the calculation of activation energies for different atomic weights has been carried out by the use of Differential Scanning Calorimetry (DSC).The main purpose of this instrument is to generate and analyze the data from the given samples. The glass transition temperature (T_g); the onset crystallization temperature (T_c) & the peak crystallization temperature (T_p) have been determined from the data obtained from DSC for different heating rates for the samples. Then, the activation energy for the glass transition and crystallization phenomena have been calculated with the help of T_g,, T_c and T_p. These energies have been calculated on the basis of Kissinger's and Matusita's models and different values of T_g,, T_c and T_p obtained from different heating rates, have been compared for the corresponding samples. An attempt has also been made to determine the dimension of the growth process of the prepared samples.

23. Laura D. Reyes, Department of Anthropology, NMSU

First evidence for female transfer in Australopithecus afarensis

Previous literature equates high body mass and canine sexual dimorphism with elevated male-male competition, indicating polygyny. Australopithecus afarensis demonstrates a high degree of body mass sexual dimorphism, suggesting polygyny, yet a low/moderate degree of canine sexual dimorphism, suggesting monogamy. Some argue A. afarensis was polygynous and lived in harem-like social groups, while others assert its monogamy. Early hominid sex ratios and sexual dispersal patterns have not yet been examined. We examined the sex ratio and non-metric traits of 14 mandibular molars representing eight individuals from the "First Family" site at Hadar (A.L. 333/333w). We used the distribution of molar areas to determine sex, with larger molars deemed male, and smaller molars deemed female. The non-metric traits employed are protostylid, postmetaconulid, hypoconulid, tuberculum sextum, and groove pattern. To determine which sex is more similar, we calculated the range of scores for each trait and compared the amount of intra-sexual variation between sexes. We identified four males and four females within the sample. Analyses show males demonstrate more similarity in the hypoconulid, protostylid, postmetaconulid, and groove pattern. In contrast, females demonstrate more similarity only in the tuberculum sextum. Results suggest A. afarensis had a social organization with an even sex ratio and more similarity among males than females. Despite arguments for both monogamy and polygyny based on body mass and canine size dimorphism, an analysis of A.L. 333/333w molars does not support either type of social organization. A. afarensis likely practiced male philopatry in a multi-male, multi-female group, much like Pan.

24. **Laura D. Reyes, Department of Anthropology, NMSU**

This study uses pilot data to examine proximity among members of three Alouatta pigra groups at two study sites in Belize to determine group cohesion. Group cohesion conveys information about a group's vigilance for predators and other groups, along with intra-group relationships. Group cohesion was measured by assessing proximity among individuals in a group: more proximity indicated higher cohesion and stronger relationships, while less proximity suggested lower cohesion and weaker relationships. Proximity was compared among males and females, and adults and juveniles during four activities: feeding, resting, howling, and traveling. Inter-individual contact was considered separately since it occurred at one site and close proximity was inherent. Results showed that inter-individual proximity was closest during travel than any other activity. Additionally, females were in closer proximity to other members than were males, while juveniles kept the least proximity. The smaller group showed less cohesion than larger groups, although the only instance of contact occurred within this group. These findings indicate group cohesion is group-size dependent, as smaller groups are likely less cohesive due to increased vigilance. Intra-group relationships are age and sex dependent: close proximity among females and other members indicates that they are not involved in vigilance activities and may seek closer proximity for protection, while juveniles may exhibit less proximity to dissociate from their current group in preparation for group transfer. This pilot study presented avenues for future research, particularly further examination of how group size and vigilance influence group cohesion and social relationships.

25. Muhammad Wasequr Rashid, Department of Electrical and Computer Engineering, NMSU

Adaptive Biasing Technique for Class AB Amplifier Output Stage

A simple but effective scheme for a novel class AB amplifier technique is introduced. This work uses a Wilder current mirror circuit at the output stage of a multi-stage amplifier in order to reduce quiescent current. The new class AB amplifiers are designed in a 0.5µm process with power supplies of ±1.5V and simulated with HSPICE. The use of Wilder current mirror circuit results in a low-voltage, low-bias current amplifier. Simulation results illustrate the improved operation of the proposed class AB amplifier.

26. Mohammed Habeeb Ur Rahman, Klipsch School of Electrical Engineering, NMSU
Simulation Technique to Observe Brillouin Precursor in Loamy Soil

It has been long known that propagation of electromagnetic pulse through dispersive media give rise to Brillouin and Sommerfeld type precursors. The mathematical model to represent these precursors, in most dispersive media, results in mathematically intractable complex differential and integral equations. However, modern asymptotic theory of pulse propagation through dispersive media gave rise to closed-form formulations for Brillouin type precursors. There are, however, very few experimental studies reported in the literature to experimentally observe the existence of the precursors and characterize the evolution of these precursors in a given dispersive media. A simple mathematical formulation has been introduced to observe electromagnetic pulse propagation in Rocard-Powles-Debye model of dispersive dielectric for distilled water using a waveguide. Moreover, these formulations are validated using existing reported results

27. Malini Murugesan, Department of Electrical and computer engineering, NMSU
Hardware implantation of microcontroller based governor

The objective of this project is to implement a microcontroller based governor for the synchronous generator. The microcontroller used in this project is the Freescale MCF51QE128 which is a 32 bit coldfire Architecture. The governor is designed to control the speed/frequency of the synchronous generator. The speed/frequency of the synchronous generator is required to be a constant. The increase or decrease in the load could change the speed of a synchronous generator. The governor senses the change in speed/frequency of the generator and increases or decreases the steam (or any source) so that power going into the generator equals the output power. The design consists of ADC, PWM and digital PID on a microcontroller. The ADC module will compare the change in the speed/frequency of a synchronous generator and compares it with the reference speed. This error that is produced as a result of the comparison is given as an input to the PID controller. The PID is the basic feedback mechanism which will provide the corrective action to minimize the error signal. The resulting signals from the PID controller will be

used to generate the PWM (pulse width modulation) signals. The PWM duty cycle will control the switching action of DC-DC converter which drives the DC motor. The PID is the basic feedback mechanism which will provide the corrective action to minimize the error signal. The resulting signals from the PID controller will be used to generate the PWM (pulse width modulation) signals. The PWM duty cycle will control the switching action of DC-DC converter which drives the DC motor.

28. **Maria Schrock, History, NMSU**
Mexican Women: A Traditional Society

Women in Latin America have struggled for freedom and equality since the arrival of the Spanish and Portuguese peoples to the American continent. Both, Spanish and Portuguese viewed women somewhat different from the view that some of the natives of the Americas had. One could use Mexican women as a great example. Prior to the arrival of the Spaniards, women in Mexico had more freedom in their lives; unfortunately for them, things were to change. Soon the Spaniards began conquering their land and changing their lives. This paper will examine the evolution of the rights of Mexican women, focusing primarily on the years right after independence (1821) to the 1980s. Also, it will describe how women in Mexico fought and struggled over this long period of time to obtain rights such as the right to an education and the right to vote. The paper will also seek the answer to the question of how the actions of the Mexican government affected women's lives in the area as of marriage, education, and political participation. The paper argues that while the Mexican government passed several laws designed to protect women during the long period of 1880s through the 1980s, women's lives remained restricted and social views about women remained traditional in the areas of marriage, education and politics.

29. Megan M. Wong, Department of English, NMSU
Apologia for Living Messy (Art Performance)

How does a young widowed mother negotiate her perspective in the world of the domestic? What place do men have in a female-driven society? These sometimes called "snarky" poems question the most basic attitudes women assume in their relationships with children, men, and the ethical questions that pop up when the two don't fit together very well.

30. Nicole Harings, Boeing Wiebke, Biology and Fish, Wildlife, and Conservation Ecology, NMSU
The Influence of Environmental Variables on Southwestern Toad Occupancy

Amphibian populations are biodiversity gauges and still declining across the globe. Causes include climate change, habitat modification, and combinations of factors. Climate change is defined by increases in temperature, ultraviolet radiation (UVR), and decreases in pH. Preliminary observations suggest five desert toad species (*Spea multiplicata, S. bombifrons, Scaphiopus couchii, Bufo cognatus,* and *B. debilis*) partition cattle tanks according to time, space, and habitat quality. I surveyed cattle tanks in Jornada Long-term Experimental Range, in Dona Ana County, New Mexico for toads to determine their relative abundances and distributions using occupancy modeling methods supplemented by call surveys. I also measured water quality parameters (temperature, UVR, pH, salinity, O_2, NO_3, and NH_3) to determine habitat influences relative to occupancy. Call surveys were conducted using a standardized index based on call intensities (0 = absent, 1 = few individuals, 2 = overlapping, individual calls distinguishable, 3 = full chorus, individual calls indistinguishable) during five minute intervals. To estimate occupancy rates, a count statistic was acquired using sight to observe for species presence and breeding aggregates. Occupancy states were ordered as follows: 0 = species absent, 1 = species present and not breeding, and 2 = species present and breeding. Environmental parameters explain some but not all of the toads' abundance and distribution. Furthermore, questions will be addressed concerning ecological processes and population-level dynamics. This study will add to the understanding of life histories, determine the current status, and indicate influential habitat parameters on relative abundance and distribution of southwestern toads.

31. Naomi Moreno, English, NMSU
I Want to Suck Your Blood (and borrow a cup of sugar too): Sympathetic, Social Bloodsuckers in 20th Century Literature

This essay, which is part of a larger project, analyzes the evolution of the vampire. The early vampire was isolated, morally depraved, and feared. Around the middle of the 20th century vampires become sympathetic due to their portrayal as moral, social, attractive beings that are consequently desired by

humans. This essay attempts to answer why and how the vampire has changed drastically over time. The change in the representation of the vampire has often been attributed to Anne Rice who deviated from her predecessors' portrayal of the traditional vampire. However, two overlooked deviations of the classic vampire tale occur before Anne Rice's transformation; both Richard Matheson's I am Legend and Theodore Sturgeon's Some of your Blood have characters that are not your typical bloodsuckers. By examining these two books along with Rice's Interview with the Vampire, I argue that vampires must change, as our society does. The bloodsuckers in these works demonstrate shifting social values in regards to sexuality, morality, and family structure. My research primarily focuses on cultural and social movements in the 1950s, 1960s, and 1970s. Through applying my research to my analysis of the three novels I discovered that each author's transformation of their monster could be interpreted as a response to cultural anxiety over social ideals of the normative.

32. Nina Javaher, Educational Management and Development, NMSU

Outcome differences in participating and non participating Hispanic students in supplemental Instruction classes supporting Organic chemistry I and II at New Mexico State University

Lack of academic success of Hispanic students in higher education has caused university administrators from cross the nation to seek alternative programs to improve academic success and retention of Hispanic students. Hispanic students are less likely than white students to complete advanced science classes including Chemistry (National Center for Education Statistics, 2003). With the shortage of an educated workforce, the nation is dependent on educating the fastest growing ethnic/racial population. Of the 17,200 student enrollment in Fall 2008, 40% were Hispanics which makes NMSU a Hispanic serving institution (New Mexico State University Fact book, 2008). There are many programs at NMSU which supports Hispanic students. One of these programs called supplemental Instruction (SI). The purpose of this study is to investigate whether SI reduced the number of D's, F's and W's among Hispanic students in Organic Chemistry courses at NMSU between the years of 2001–2004. This study is significant because it examines a method to retain Hispanics students in school at New Mexico State University (NMSU) which is a Hispanic serving institution.

33. Paul Kuhns, Department of History, NMSU

Through the Looking Glass: Identity Formation in Political Cartoons of the 1906 Iranian Constitutional Revolution

In the late nineteenth century, Iran stood at the crossroads of British and Russian imperialism. As pawns in the "Great Game," the Qajar monarchy oftentimes found itself powerless even within its own borders. A string of economic concessions granted to foreign powers, allowing them to claim virtual sovereignty over the Persian economy, led to growing dissension amongst sectors of the Iranian citizenry. The people ultimately erupted in the Iranian Constitutional Revolution of 1906-11, which resulted in the formation of a legislative body (majlis). During the early revolutionary period (1906-1908), the Iranian press blossomed as writers and artists debated countless socio-political issues. Political cartoons were one of the most influential mediums through which notions of nationalism, constitutionalism and collective identity spread to the Iranian citizenry. This presentation, which forms the basis for my M.A. thesis, is based on primary sources gathered from the Iranian World Collection at the Library of Congress, namely political cartoons from the newspapers Mulla Nasrredin and Kashkul. These political cartoons used competing tropes when representing foreigners in order to solidify a sense of unity by being critical of foreign intervention while self-reflective at the same time. Thus, examining representations of foreign "Others" will provide insight not only into how Iranians during the revolutionary period viewed foreigners, but also how Iranians viewed themselves. Close examination of these images will lead to a better understanding of what issues were important to Iranian citizens. To illustrate this point, I will be discussing competing theories of identity formation and Orientalism/ Occidentalism by investigating several political cartoons from these two newspapers.

34. Qiumin Dong, Department of English, NMSU

Globalized Remix/Mix: Integrating non-Western Rhetoric in Graduate Programs

This presentation addresses the need to develop/strengthen intercultural and comparative rhetoric instruction in graduate programs of Rhetoric and Composition. After identifying the lack of/inadequacy in non-Western rhetoric teaching in many programs, the presentation proposes a comprehensive metatheoretical perspective, representing a more profound instructional attempt to bring in the lens of

cross-cultural rhetorical traditions and conventions to the current curriculum. Although many researchers have described, analyzed, and conceptualized rhetorical traditions and practices of non-Western cultures as well as urged on enhancing students' cultural awareness, most rhetoric programs have overlooked this research scholarship and failed to consider non-Western rhetoric in their curriculum. Therefore, I argue that non-Western rhetoric receives little attention within the rhetoric and composition program, and based on an examination of courses in the programs, I also propose a change in current curriculum by integrating non-Western rhetoric in graduate coursework through combining the perspectives of comparative rhetoric, intercultural communication, and intercultural rhetoric. Such an approach promises students an opportunity to develop a complex understanding of communication across cultures and resonates with our field's goal of globalization and internationalization. This presentation is structured as follows: after an introduction, it will examine the opportunity of the integration by briefly reviewing recent studies on program development and critiquing current curricula adopted by a range of universities. Next, the presentation will outline some of the prominent themes of comparative rhetoric, intercultural communication, and intercultural rhetoric and examine their implications as related to course design. Concluding remarks and instructional recommendations are addressed in the last section.

35. Qin Yang, Mathematics, NMSU

Regular completions

Ordered algebraic structures plays an important role in a wide range of areas, including analysis, logic etc. It is our interest to complete an ordered algebraic structure in a way that preserves some aspects of the algebraic structure and certain families of joins and meets. My advisor Dr. John Harding has proved that there are only two varieties of lattices closed under MacNeille completions: the trival variety of lattices and the variety of all lattices. How about regular completions? This is an open problem. In this presentation, I will show that if we add one more assumption, then we can get a good result.

36. Ramona Reeves, Department of English, NMSU

Join Me! (Creating Community in the Online Classroom)

With the loss of body language and cues that are common in the face-to-face classroom, how do we as teachers go about building community in the online classroom? As Rena Palloff and Keith Pratt point out in their book "Building Online Learning Communities," a "community" no longer refers only to a place-based group, and yet, what it means to be part of a community--feeling a sense of belonging and support--remains important in the virtual classroom. Transferring this sense of community to the online classroom can not only enliven discussions and increase participation, but it can also create a dynamic learning environment where students learn from each other as well as from the instructor. This session will focus on how to create a sense of community in the online classroom and will encourage audience participation and discussion.

37. Rachel Guy Fish, Wildlife and Conservation Ecology Department, NMSU

Inductive Habitat Modeling of the American Marten over the Western US

Recently, modeling species habitat distribution at the landscape scale has been recognized for its importance in predicting dispersal patterns and identifying new pockets of habitat. Traditionally, modeling at large extents has been accomplished using habitat relationships with environmental factors such as vegetation communities, elevation and climatic variables. However, as is the case with the American marten (Martes americana), other gradient variables, such as the percent of the landscape that is forested, have not been created over large extents. It is also uncertain if the influence of these variables can be extrapolated to the entire range of a species. The objectives of this study were to: i. model marten distribution over four disparate regional extents and over the 11 state region of the western United States of America, ii. Interpret the contribution of the new datasets iii. Compare results to the literature concerning the influence of these environmental variables. The results from the four small regional models when compared to marten occurrences was in agreement with the literature at each site. The western wide

model of the marten's range, created in Maxent, resulted in a strong predictive model with percent forest cover contributing to most of the model, also in agreement with the literature. These results highlight the importance of a dataset that spatially models gradients of cover change and offer a method by which such a dataset can be interpolated. This type of spatial dataset would have application in conservation planning for a variety of terrestrial species.

38. Reina Nashiro, Department of English, NMSU

New Potential for Post-colonial Writing: Jean Rhys' _Wide Sargasso Sea_.

The most remarkable feature in Jean Rhys' post-colonial novel Wide Sargasso Sea is her willingness to give Rochester a voice. The novel allows two narrators, Antoinette and Rochester, to give independent points of view. Rhys' primary intention is to give a voice and life to Charlotte Bronte's mad Creole character Bertha (Antoinette), who is not allowed to speak prior to her death in Jane Eyre. However, in giving Rochester a voice, Rhys also allows her readers to sympathize with Antoinette's tormentor by showing his emotional turmoil and human weakness. In the novel, Rhys does not force the reader to empathize only with Antoinette. This attitude is what distinguishes her novel from the standard set by earlier post-colonial writings, which are often characterized as acts of resistance against colonialism and colonial works. Her point of view as a Caribbean-born white Creole differentiates her perspective from colonial writers' and even from earlier post-colonial writers' because she also embodies the heritage of the native. Through Wide Sargasso Sea, Rhys develops the potential of pluralistic interpretations of postcolonial writing and inspires subsequent post-colonial authors to not over simplify the roles of the conqueror and the conquered.

39. Reyna Munoz, English, NMSU

Bridging the Tensions Between Love and Hate for Mexican Men in Sandra Cisneros' Woman Hollering Creek and Other Stories

I would like to present on Sandra Cisneros' Woman Hollering Creek and Other Stories. Specifically, I'm interested in the different tensions that exist between the relationships between a Mexican woman and the Mexican man. Within the stories, Cisneros seems to be commenting on how different elements (myth and legend) as well as popular culture influences (telenovelas and Mexican films) seem to influence how these women are shaped emotionally particularly in regards to their expectations and desires of/towards men. I'm interested in how this love/hate relationship is manifested throughout these stories which are broken up in three parts, tracing the Mexican woman from childhood through adolescence up to adulthood. The intracultural perspectives showcased within these stories exemplify how these relationships are problematic in a sense, and highlight how that internal struggle exists in each Mexican woman because of her cultural background and influence(s).

40. Sophia Cisneros, Department of Physics, NMSU

Dark Matter: Missing Cross Terms in the Metric, as Opposed to Missing Matter

We show a preliminary analysis of the flat rotational velocity curves observed for galactic discs, in which the observed Doppler shifts are partially representative of actual rotation speeds and partly a function of the rotation of the space itself; as per frame dragging effects. As noted by W. Rindler; "if there are cross terms in the metric, we get two very different speeds of light..." These effects are analogous to a varying index of refraction arising from the covariant wave equation. Current work has focused on interpreting wave length shifts via the Lorentz flat space metric or by linearizing the Kerr metric to arrive at estimates of frame dragging effects. We show that these linearized theories are necessarily inconsistant with the non-linear Einstein Equations. By making use of the manifest symmetries of galactic discs, we are able to exactly solve the full Kerr wave equation to show that the change in light speeds does in fact contribute far more heavily than predicted by linearized theory. Further, we show that there may be a direct correlation between luminous matter and the observed rotation curve. This perhaps does not obviate Dark Matter, but simply identifies it with the missing cross terms in the metric involving time.

41. Sandra Campos, Department of Plant and Environmental Sciences, NMSU

Arsenate Sorption on Calcareous Soils of New Mexico

The strong affinity of calcite for arsenic predicts its importance for arsenic sorption on calcareous soils. More sorption sites for arsenic are provided as the calcite content increases, but the sorption capacity is not solely related to the amount of sorption sites and arsenic concentration. Precipitation and dissolution of calcite can favorably or adversely affect arsenic sorption. A mechanistic approach was applied to batch sorption experiments on prepared calcareous sand to study arsenate sorption as a function of calcite content ranging from 1.5% to 8%. Calcareous sand with 8% calcite content has the capacity to significantly sorb arsenate from solutions containing

50 ppm arsenate. Unavailability of sorption sites at the 1.5% calcite content sample was apparent at arsenate solutions of 10 ppm, which indicates that this calcite content is insignificant for arsenate sorption. The dissolution of calcite has implications for immobilizing arsenate by trapping it in its crystal lattice as it re-precipitates. Calcite dissolution may have occurred with hydrochloric acid addition to samples resulting in a decrease in sorption by the sample containing 8% calcite. The buffering capacity of calcite could be a determining factor in the amount of arsenic immobilized. Observed trends from such sorption isotherms are of interest due to input of arsenic to calcareous soils from sources such as ground and surface waters through irrigation and land application of wastewater effluent. Analyses of the samples containing sorbed arsenate by X-Ray Diffraction may reveal the formation of calcium arsenate precipitates.

42. Santosh Dulal, Department of Biology, NMSU

Isolation and Characterization of a Neutralizing Antibody Specific to Clostridium botulinum Neurotoxin Serotype F (BoNT/F)

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Background: Seven immunologically distinct botulinum neurotoxin serotypes denoted as BoNTs/A-G are produced by the bacteria Clostridium botulinum. BoNTs are initially synthesized as 150kDa single-chain polypeptides consisting of a 100kDa heavy chain (HC), a 50kDa light chain (LC), and a linking disulfide bridge. Methods: mAb, designated as FHNM, was isolated by BoNT/F toxoid immunization and hybridoma techniques. Specificity, cross reactivity, and epitope localization of FHNM were characterized by performing indirect ELISAs, SDS-PAGE, Western blot, and immunoprecipitation. In vivo neutralization assays were performed via injection of purified FHNM challenged to BoNT/F. Synthetic genes encoding BoNT/F partial fragments were designed, cloned, purified, and analyzed for the recombinant catalytic (rFLC), translocation (rFHN), and receptor binding (rFHCc) domains. Results: Indirect ELISAs revealed that FHNM only recognizes BoNT/F and shows intermediate avidity towards the HN domain when compared to BoNT/F recombinant fragments and all BoNTs investigated. FHNM recognition of 100kDa BoNT/F HC, 75kDa rGST-FHN, and 50kDa rFHN domain (GST free) indicates the presence of an epitope region. Neutralization assays with the introduced FHNM delayed death in mice by 26 hours when intoxicated with 10LD50 BoNT/F. Interestingly; all mice survived 5LD50 BoNT/F when given FHNM. Conclusions: Immunoprecipitation assays clearly demonstrated that FHNM has a conformational epitope and internalization of BoNTs into a host may not result when complementation of FHNM/HN occurs. In addition, partial neutralizing activity towards BoNT/F by FHNM has been observed. Further research may contribute to a better understanding of the immunological aspects of BoNT/F and corresponding applications in pathogen detection and vaccine candidacy.

43. Shyam Kattel, Department of Physics, NMSU

Catalytic Selectivity of Transition Metal Functionalized Graphene

Shyam Kattel, Boris Kiefer; Physics Department, New Mexico State University, Plamen Atanassov; Department of Chemical and Nuclear Engineering, University of New Mexico

Energy production is expected to be one of the most significant challenges in the 21st century. Fuel cell technology can provide a solution to this challenge but relies currently on catalysts such as Platinum or Palladium. These precious metals are rare and expensive, therefore it is important to develop technologies that utilize more abundant and cheaper metals as catalysts while showing a similar performance. We have performed density-functional-theory calculation to investigate the interactions between small molecules, a transition metal (TM) and a carbon support that was modeled as a graphene. The results show thatN2, CO and O2 bind and retain their molecular identity. In contrast, H2O2 decomposes and forms a stable TM-(OH)2 complex. The binding energies of O2 and H2O2 translate into desorption temperature of 490 K and 800 K respectively. These two very different interaction scenarios and binding energies provide an explanation for the experimentally observed O2 selectivity: O2 can readily desorb under processing conditions while the removal of OH from the TM requires the assistance of one or more particles in the electrolyte, and is thus less probable. Therefore the O2 pathway is expected to be dominant, consistent with experimental observations. This understanding provides the insight that is needed to optimize current designs for non-platinum based catalysts for energy generation for example in direct methanol fuel cells.

44. Sieun An, Department of Psychology, NMSU

Moral Attribution and Emotions

An and Trafimow (2007) found differences in moral attributions for Americans and Koreans: Americans had more moral attributional weight after perfect duty violations (e.g. dishonesty, disloyalty) than imperfect duty violations (e.g. unfriendliness, uncharitability). Koreans did not differentiate between perfect and imperfect duties. Subsequently, responses to moral violations were tested to assess the role of affect: Koreans did not appear to use affect in making attributions about moral violations. However, another study involved manipulating affect of participants and suggested that Koreans do use affect in response to moral violations in making moral attribution, but do so differently. Therefore, differences in evoked affect may cause differences in moral attributions. To test this idea we chose the four basic negative affects: fear, anger, sadness, and disgust.The results replicated previous findings about the number of immoral behaviors needed to override previous impressions. Participants indicated how they felt about others' immoral behaviors, and which was the most negative of the four emotions. Importantly, there were differences between Koreans and Americans for types of negative affective response to immoral behaviors: Koreans reported sadness most strongly; Americans reported anger most strongly for unfriendly behavior. Only two Americans reported fear as the most negative affect. In contrast, more than half of the Koreans reported fear at least once as the most negative affect in response to immoral behaviors. These results suggest that people in different cultures have different affective responses, and this may reflect in their behaviors. Specifically, processes surrounding moral judgments differ across cultures.

45. ***Suresh Gautam, Department of Electrical and Computer Engineering, NMSU***

Application of Mathematical Morphology Based Tool to Detect a Power Swing

Mathematical Morphology (MM) is primarily used as a tool for analysis of geometrical shapes and structures. Recent literatures discuss this tool for its possible applications in power systems. However, the application of MM as a real-time filtering tool in power systems has not been explored and documented adequately. This paper reports further contributions to the previous efforts in this direction. The paper illustrates how an appropriate choice of the structuring element (SE) can change the way the signal is filtered and develop a method to detect low frequency phenomena in power system. Power swing being a typical low frequency phenomenon in a power system, the developed method is used to detect a power swing simulated in a double circuit transmission line. PSCAD/EMTDC® is used for simulation and Matlab® for the analysis of waveform obtained from the simulation. The result of the study are presented and analyzed. Based on the analysis, future work is outlined for construction of an improved out-of-step blocking tool using this method.

46. **Saran Kumar Rai, Kiran Sapkota,, Ashley Graboski, , Thriveni Reddy, Robert W. Buckingham**

Barriers of Prostate Cancer Screening (PCS) Among Hispanic Male Population

There is a growing research interest in the association between Prostate Cancer Screening (PCS) and Hispanic males. Prostate Cancer is one of the common cancers found in Hispanics (American Cancer Society), and early PCS lowers mortality rate to some extent. However, Hispanic males receive later diagnosis of cancer, and have consistently lower survival rates. There is relatively little substantive information available in the published literature regarding men's PCS issues among Hispanics. This analysis will help to understand the predictors of PCS in Hispanic males as this group of people differs in incidence and mortality rates in United States. The statistical data of incidence and mortality rate of prostate cancer in Hispanic males from different sources were analyzed. Many Hispanic males lack knowledge about PCS. As a result, many Hispanic communities underestimate prostate cancer risk compared to white non–Hispanic communities. Prostate cancer interventions focusing on risk perceptions need to be tailored to accommodate subgroup differences in acculturation levels, knowledge and attitude towards PCS.

47. **Sravan Kumar Buggaveeti Electrical Engineering, NMSU**

A Morphological Filter to Distinguish a Fault from Capacitor Switching

Modern digital relays have substantially reduced false operation of overcurrent relays used for capacitor protection and are fast in operation. Various structural designs of capacitor banks have come up to improve the protection. However, faster and more reliable operation can be useful. This paper proposes a morphological filter for fast and clear distinction between fault currents and switching currents that can benefit all types of overcurrent relays used for protection of capacitor banks. The morphological filter is modeled using the MATLAB®. The filter performance is tested using waveforms generated from PSCAD/EMTDC® simulation of a standardized test-system.

48. **Shiva Prasad Pokharel, Department of Electrical and Computer, NMSU**

An Optimal Placement of PMUs for Finding Fault Location

Phasor Measurement Units (PMUs) have been increasingly used in a power system for various applications. Some of the online applications include state measurement, energy management systems, wide area monitoring and control, adaptive protection and so forth. They are equally used in offline applications like post-mortem analysis and finding of the fault location. In order to get the measurement data required for various applications,

PMUs have to be deployed in a power system in an optimal way so that sufficient information is collected at the least overhead. Minimum number of PMUs required for different online applications would be different from that required for finding the location of a fault in a power system. A linear programming based method for finding out the minimum number of PMUs and their placement, in order to locate any fault in a power system, is presented in this paper. Modeling of zero injection bus is also considered. Simulation results for the IEEE 14 bus and 30 bus systems are reported.

49. Thasha McVey, Department of History, NMSU

Health Reform: We've Been Here Before

There has been a lot of focus lately on the health care system in America. Consequently, this is not a new suggestion. The health care industry has constantly been changing, reforming and evolving in this nation since its birth. Health care reform has been on the legislative docket longer than most Americans are expected to live. This research examines the history of American health reforms during the 20th century.

50. Tiffany Holder, Department of History, NMSU

Using Internet Communication to Market Museums

The age we live in has become increasingly technologically driven. To be a successful business, organization, and even individual you must have a website. But these days communication over the internet is not limited to websites alone; Twitter, Facebook, Myspace, Youtube, Flickr, and LinkedIn are all communication forums utilized through the internet. These sites may have started for simple communication networks between individuals, but have evolved into a way for associates to network and for businesses and organizations to advertise. A museum can be thought of as a business that supplies knowledge to the public. The public spends more and more time on the internet for work and pleasure. If a museum wishes to compete in the business world then they must join the communication wave. Many large museums such as the Smithsonian and the Chicago Field Museum have already jumped on the train with Twitter, Facebook, and Flickr. Many have even advanced beyond the basics, creating podcasts to accompany tours or applications on portable media devices to be used as a hand-held tour guide. Many have RSS (Really Simple Syndication) web feed formats used to publish frequently updated works, keeping the public informed on blog or news updates. In order to compete with more popular leisure activities, museums must integrate new media methods into their current marketing strategies. The key to the use of these media forums to market museums is a combination of them, allowing them to attract and keep the public interested in the museum.

51. Victor Valdivia, Linguistics, University of New Mexico (UNM)

Non-normative Spanish Se-constructions. A functional approach

In this paper, I will analyze non-normative agreement in Spanish Impersonal constructions such as Se descubrieron a individuos que comercian con droga 'Some persons were caught dealing drugs', in which the verb agrees with the noun individuos even if this is marked as an object by the preposition a. While Spanish constructions with SE have been widely studied, researchers have paid little attention to the phenomenon formerly described. When mentioned, it is described as 'something that some speakers do' or as a linguistic error. Contrary to such position, I argue that the construction occurs in actual communication because speakers use it to solve a communicative need. Furthermore, the fact that the agreement occurs not only in spontaneous spoken language, but also in written, highly organized, language, indicates that it is less marginal than grammarians would like to think. Hence, this paper aims to contribute to the understanding of the phenomenon. Data for the research come from "Corpus del español" (www.corpusdelespanol.org)

52. **Victor Munoz, English, NMSU**

The Elements of Existence in Gary Soto's The Elements of San Joaquin

I will be presenting on my Master's Essay which is on Gary Soto's first book of poetry The Elements of San Joaquin. What I am focusing on is how in this particular collection Gary Soto unfolds the lives of the working class Mexican-Americans of the San Joaquin Valley to show how these people are not only subdued by the natural elements of the land but also by the elements of ordinary working-class existence. The unnamed speaker of the poems provides a collective voice for the voiceless that are unable to articulate their harsh realities. Though voiceless, their existence cannot be denied or ignored. Within these poems, Soto provides an insight into the lives of a Mexican-American community struggling with their own reality which involves oppression, violence, terror, indifference, and loneliness. The reason for Soto's intertwining of the natural and the social is to emphasize that the people, their lives, and their histories are all elements that are part of the San Joaquin Valley; the irony is that the people who give themselves to working the land and existing within the San

Joaquin Valley will ultimately be consumed by it.

53. Vanessa Macias, Biology Department, NMSU

Characterization of the role of TOR signalling in fecundity in the malaria mosquito, Anopheles gambiae

In female anautogenous insects, a blood meal stimulates the transition into vitellogenesis (yolk protein synthesis) and egg production. Activation of the Target of Rapamycin (TOR) pathway has been shown to be essential in the midgut for the degradation of proteins in the blood meal to amino acids required for synthesis of yolk protein. The pathway is also key in the fat body for relaying the signal to activate vitellogenesis in response to amino acids. Presently, we report that inhibition of this pathway in Anopheles gambiae, the African vector of Malaria, by injection of double stranded TOR kinase RNA inhibits egg laying in response to a blood meal. TOR kinase knock-down mosquitoes are significantly dwarfed in their ability to deposit eggs en masse and individually. Dissection of 3 day post-blood meal females that failed to lay eggs shows that these mosquitoes do develop eggs in the ovaries but many more appeared to be only partially developed than observed in control knock-down mosquitoes ($p=0.03$). This study highlights the importance of TOR signaling in mosquito egg production and suggests it as a potential target for Malaria vector control strategies.

54. Venkatasiddhinagaraju Daram, Department of chemical engineering, NMSU

Removal of Chromium (VI) from aqueous solution using Pecan shell activated carbon as adsorbent

Chromium (VI) belongs to the family of heavy metals and it is considered as one of the highly toxic pollutant in waste water streams. Chromium and its compounds are widely used in the leather tanning, electro-plating, anodizing baths and rinse waters. Pecan shells, one of the waste products from agricultural industry are used for the removal of chromium (VI) from waste water streams. Pecan shell activated carbon is produced by chemical activation of pecan shells with phosphoric acid followed by oxidation with air. Equilibrium studies were carried out at constant pH with carbonization temperature serving as the main parameter. Characterization studies of produced activated carbon were carried out using Nitrogen adsorption isotherms and BET surface area were determined and is found to be 555 m2/g, 822 m2/g,1547 m2/g,1432 m2/g for PS360,PS410,PS450 & PS500 respectively. The equilibrium isotherm data is well fitted using various isotherms and the maximum adsorption capacity for chromium is determined.

55. Wes Smith, Government, NMSU

Managing Public Wealth: A case study reviewing the planning process for expenditures of a Regional Recreation and Aquatic Center

Accumulating public wealth is a popular option for promoting the quality of life for a community. Public wealth can come in the form of public use areas like convention centers, but also parks and recreational facilities. There are several ways to fund the design and construction of facilities that contribute to public wealth; however, many of these programs do not assist in funding the operation and management of the facilities as they are sources for capital improvement projects only. Introducing new projects like recreation centers are essential to economic development. For a firm to enter into a community there must be an attractive venue in which to settle down and open business. A community that offers more entertainment and leisure for its citizens is much more marketable to new business than a community with less to offer. Therefore, investing in capital projects that promote new business firms to locate in a community is justified by promoting economic development. This paper describes policy and economic conditions that serve as barriers to completing a capital improvement project via case study.

56. **Ying Xu, English, University of New Mexico (UNM)**

A Body of Troubled Site/Sight: Re-signifying Double Consciousness in Yung Wing's My Life in China and America

Yung Wing, the first Chinese graduate from a distinguished American university (Yale, 1854), has interested many scholars. His connection with missionaries, his education in America, his involvement in the modernization of China in the late 19th century, including the Chinese Education Mission he launched in 1872, and his ambiguous citizenship have become the subject of many historians and scholars; however, the significance of his autobiography, My Life in China and America (1909), is not fully explored as the scholars of Asian American studies often dismiss Yung's work as either lacking "resistance" or falling into the category of the "writing of

cultivated Chinese" who do not represent typical Asian American experiences. Situating Ying's writing in the socioeconomic and political contexts that shaped the construction of the text in the late nineteenth century and the early twentieth century, the paper argues that Yung's text should be read as a body of troubled Site/sight which sets an early model of self-assertion for later Asian American writers. By borrowing Du Bois's theory of "Double-consciousness," this paper will go beyond a paradigm of resistance and accommodation in its examination of the construction and interplay of double-consciousness in Yung's autobiography.