Presented by the Graduate Student Council, 6th annual

Graduate Research & Arts Symposium

6th Annual Graduate Research & Arts Symposium

APRIL 4-6TH

Las Cruces, New Mexico

THURSDAY, APRIL 4TH, 2019

Turn Your Degree into a Career

Academia Focused Panel, Hardman Jacobs Room 126, 3:30-5:00pm
Industry Focused Panel, Hardman Jacobs Room 126, 5:30-7:00pm

Bring your questions, get real advice!

FRIDAY, APRIL 5TH, 2019

Research Presentations

Corbett Center 3rd floor Senate Chambers & Dona Ana Room
9:00am - 5:00pm (lunch will be provided)

Reception and Poster Presentations

Corbett Center Ballroom, 5:00-600pm & 7:00-8:00pm
Light Refreshments Served

Keynote Speaker

Corbett Center 3rd floor Ballroom, 6:00-7:00pm

SATURDAY, APRIL 6TH, 2019

Education Beyond Borders: Tearing Down Walls

O'Donnell Hall, Breakfast/Lunch Included, 8:00am-6:00pm

gsc.nmsu.edu - Graduate Student Council - FREE EVENT

KEYNOTE SPEAKER

DR. BLANCA CAMPA

Professor of Educational Psychology at El Paso Community College, Author, and Researcher.

Graduate Research Arts Symposium

Turn Your Degree into a Career: Academia Focus

Laura Madson
Psychology dept.

Laura Gutierrez-Spencer
Chicano Programs

Jason Jaciewicz
Astronomy dept.

Michael Hout
Psychology dept.

Graciela Unguez
Biology dept.

Christopher Brown
Geography dept.

Jennifer Hernandez Gifford
Animal and Rance Science dept.

Thursday, April 4th, 3:30pm-5:00pm
Hardman Jacobs Undergraduate Learning Center, Room 126

Learn valuable tips for how to be successful on the academic job market, how to find jobs and prepare your materials, and how to best market yourself for academic focused jobs. Bring your questions, get real answers!

Graduate Research Arts Symposium

Turn Your Degree into a Career: Industry Focus

Bryan Chasko
Chief Technology Officer, Electronic Caregiver

Garrett Busch
Senior Financial Analyst, MountainView Regional Medical Center

Carrie Hamblen
CEO/President, Green Chamber of Commerce

Jennie Ward
Materials Engineer, NASA

Karen Rodriguez
Project Manager, NASA

Thursday, April 4th, 5:30pm-7:00pm
Hardman Jacobs Undergraduate Learning Center, Room 126

Learn valuable tips for how to be successful on the job market, how to find jobs, and how to best market yourself for industry focused jobs. Bring your questions, get real answers!

Schedule Overview

Thursday, April 4th, 2019		
Time	**Event**	**Location**
3:30-5:00	Academia Focused Panel	Hardman Jacobs Undergraduate Learning Center, Room 126
5:30-7:30	Industry Focused Panel	

Friday, April 5th, 2019		
Time	**Event**	**Location**
8:00-9:00	Symposium 1	
9:00-10:00	Symposium 2	Corbett Center 3rd floor – Senate Chambers & Dona Ana Room
10:00-11:00	Symposium 3	
11:00-12:00	Symposium 4	
12:00-1:00	Data Blitz Presentations & Lunch	
1:00-2:00	Symposium 5	
2:00-3:00	Symposium 6	
3:00-4:00	Symposium 7	
4:00-5:00	Symposium 8	
6:00-7:00	Keynote Speaker Dr. Blanca Campa	Corbett Center 3rd floor Ballroom
5:00-6:00 & 7:00-8:00	Poster Reception with Drinks and Food	Corbett Center Ballroom

Saturday, April 6th, 2019		
Time	**Event**	**Location**
8:00AM–6:00PM	Education Beyond Boarders: Tearing Down Walls	O'Donnell Hall

Oral Presentations

Symposium 1, 8:00-9:00

Corbett Center 3rd floor – Senate Chambers

Examining "Authenticity" in Traditional Cuisines: the Case of Hawaii and Local Food

Ana Cárdenas

This presentation examines the intersections of culinary tourism and culinary colonialism through the history of Hawaiian cuisine. Native Hawaiian peoples maintain a traditional subsistence and foodways tied to taro (kalo) and native foodways. Immigrant populations, including Japanese, Portuguese, and mainland United States, among others, brought new foodways that were subsequently incorporated into the Hawaiian cuisine. Hawaii presents an important case within which to examine the cultural construction of a regional cuisine. As well, the dynamics of Hawaiian cuisine provides a framework within which to examine the issue of culinary "authenticity."

Conserving Culinary Traditions in the Diaspora: the Palestinian Experience

Enas Khaleq

This presentation examines the strategies employed by Palestinians to maintain their food traditions. Within the context of the diaspora, Palestinians struggle to protect themselves from cultural hegemony, culinary appropriation, and ethnic assimilation through the maintenance of culinary traditions. This paper unpacks the components of traditional Palestinian cuisine, examining how dishes and recipes are transformed in the international arena. As well, I examine the role of food and traditional recipes in resisting ethnic assimilation and reclaiming culinary history.

Social Determinants of Health and Food Choices in the United States

Sofía Cobos

In the United States, public health officials and the public in general express concern about the growth of processed food consumption and subsequent impact on general health. Public health researchers have identified critical social determinants of health that affect different populations throughout the United States. This presentation examines how these social determinants of health may impact food choices and food availability for certain groups within U.S. society. Drawing on food security and food desert research in the U.S., this presentation addresses impacts on health and the role of culture in shaping local responses.

Symposium 1, 8:00-9:00

Corbett Center 3rd floor - Dona Ana Room

Addressing Nutritional and Health Issues in the US-Mexico Borderlands: the Important Role of Cooking and Traditional Cuisines

Jesse Van Maanen

This presentation addresses the foodways of the Southwest United States and perceptions of nutritional values with a special interest in traditional foods of Hispanic and Mexican-American populations. Recognizing the complexity of modern life and dietary changes, the paper then turns to the modern day influence of socio-economic factors, such as education, income, food insecurity and acculturation, among others, that influence the kinds of foods consumed and nutritional health. Finally, this paper draws on the perceptions and strategies adopted by local communities and local chefs who are linking cooking and nutritional health to the conservation and revival of traditional culinary cuisines.

New Forms of Culinary Learning and Exchange: Examining the Role of the Internet

Jared Van Natta

The internet has become a common presence in the daily lives of U.S. citizens, providing us access to a wide range of new information, ideas, and connections. In cooking, people have begun to change, adapt, and expand the types of dishes, ingredients, and cuisines that they prepare and consume. This presentation examines the way that online sources (Youtube videos, cooking shows, among others) have influenced the way that users in the United States prepare foods and expand their palates.

Symposium 2, 9:00-10:00

Corbett Center 3rd floor – Senate Chambers

Queen Bees No More, Why Mentorship Matters
LeAnne Salazar Montoya

Objective: Educational leadership's top administrators lack women leaders. Mentorship however, is essential for success and increased numbers of school administrators with gender equity. Sadly we have learned from previous research that women are one of the barriers in the success of other women reaching great heights and top administrative positions Previous works by, Dellesega note that when you least expect it: the sudden, painful sting that hurts deeply, because you thought you were in a safe place, with other women and immune from harm betrayal and hostility take control. "A word, a gesture, or some other seemingly innocuous behavior can be all it takes to wound in a way that hurts more than any physical blow" (Dellesega, n.d.). According to the professionals this behavior is known as female relational aggression (RA): the subtle art of emotional devastation that takes place every day at home, at work, or in community settings. The purpose of this paper/presentation is to share my auto ethnographic research and to offer solutions to help empower women and create strong leadership/mentorship models to build bridges amongst our top women leaders and to present ways we can build social capital, powerful professional support and organized mentorship. Through this research, the power and oppression issues that women face enroute specifically to the superintendency will be further examined. This research will support continued research intended to inform and improve current educational practices and to educate and empower a new generation of school leaders.

Investigating the Effects of Cognitive Styles on Team Coordination and Formation in Distributed Multiplayer Games
Sultan A. Alharthi

In distributed multiplayer games, players need to coordinate their actions to succeed, thus team formation is crucial. This work investigates the effect of cognitive styles on performance of dyads engaged in collaborative gaming activities. Fifty-four individuals took part in a mixed-methods user study; they were classified as field dependent (FD) or independent (FI) based on a field dependent--independent (FD-I) cognitive-style-elicitation instrument. Three groups of teams were formed, based on the cognitive style of each team member: FD-FD, FD-FI, FI-FI. We examined performance in terms of game completion time, cognitive load, and player experience. The analysis revealed that FD-I cognitive style had an effect on the performance and the mental load. We expect the findings to provide useful insight for practitioners and researchers on improving team collaboration in different contexts, such as learning, eSports, and disaster response.

Strontium Isotope Analysis of Dorsal Spines to Assess Natal Origin of Largemouth Bass in Elephant Butte Reservoir
Alexander V. Vaisvil

Elephant Butte Reservoir in south-central New Mexico supports a much sought after population of Largemouth Bass (Micropterus salmoides). New Mexico Department of Game and Fish augments the population through periodic stocking. The management goal for this project is to identify the success of fingerling stocking through the use of 87Sr/86Sr isotopes of dorsal spines as a non-lethal method to reconstruct natal origin of hatcheries versus Elephant Butte origin. Both dorsal spines and otoliths were extracted from 35 adult bass to validate, along with water samples, the 87Sr/86Sr methodology for spines. From this small sample of the adult bass population, one fish was positively identified as hatchery origin while 34 fish were positively identified as hatching in the reservoir. While the methodology shows promise for non-lethally characterizing natal origin of Largemouth Bass, we describe the challenges that should be taken into consideration when considering 87Sr/86Sr isotopes as a management tool.

Symposium 2, 9:00-10:00

Corbett Center 3rd floor - Dona Ana Room

Modeling Tensile Properties of Pecan Wood Plastic Composite using Finite Element Analysis
Juan Miguel Diaz

Characterizing mechanical properties of natural fiber composites (NFC) has been determined mostly by experimentation. Tensile strength is one of the properties that is used to establish some of the characteristics for composites. To determine it is needed to build samples using ASTM standards and perform testing to establish the average value. In this study, a modeling of tensile properties was made using computer simulation by finite element. The study was made to compare tensile behavior of a wood plastic composite (WPC) base on pecan wood flour with the experimental data. The approach to model the composite was based in a small representative volume element (SRVE). Factors used for the simulation were based on mesh size, and volume fraction. Simulation results were equal, or less than 10% error compared with the experimental data.

Sugar Cane Bagasse: a Byproduct as a Source of Bioactive Compounds
Victor Velazquez-Martinez

Sugarcane bagasse is the waste of the sugarcane after sugar extraction. Bagasse has potential industrial use as a source of bioactive compounds. The global bagasse production for 2018/19 is forecast to 186 million metric tons where the principal contributors are Brazil, India, China, Pakistan, Thailand, and Mexico. This investigation aims to analyze the bioactive compounds in sugarcane bagasse and their antioxidant potential. Bagasse from Mexico and the USA were chopped and dried. Also, different methods of extraction of bioactive compounds were statistically analyzed. The polyphenol compounds in sugarcane bagasse were identified by HPLC-MS. Flavonoids (Orientin, Quercetin, Kaempferol, Isorhamnetin, among others), Alkaloids (Pseudojervine, Gardnerine, among others), Terpenoids (Madecassoside, Lupulone), Phenylpropanoids (Caffeoylquinic acid) and Lignans were identified. The flavonoid, Orientin has potential as an antiviral and anti-inflammatory compound for future antibiotics development.

Thickness-dependent Optical Properties of ZnO Films from the Mid-infrared to the Vacuum-ultraviolet
Nuwanjula Samarasingha

The conventional approach to describe the dielectric function Îµ as a sum of oscillators (Drude, phonons, interband transitions) sometimes fails because each term only has a single broadening parameter. Instead, we find it more convenient to describe Îµ over a broad range from the mid-infrared to the vacuum-ultraviolet as a product of Drude, TO/LO phonon [1], and electronic interband transition factors. Specifically, we explore the behavior of phonon and excitonic absorption in c-oriented bulk zinc oxide (ZnO) and ZnO thin films grown on Si using variable angle UV/VIS spectroscopic ellipsometry and FTIR ellipsometry from 0.03 to 6.5 eV. We find that the real and imaginary parts of Îµ in ZnO films on Si with a thickness of 37 nm or less are much smaller than in bulk ZnO. Excitonic enhancement, absorption coefficient, and refractive index decrease monotonically with decreasing film thickness.

Symposium 3, 10:00-11:00

Corbett Center 3rd floor – Senate Chambers

Flexible constructions for bivariate copulas emphasizing local dependence
Xiaonan Zhu

For the purpose of describing the dependence among random variables, in recent years, copulas are extensively studied by researchers and have been applied in many fields. In this talk, a flexible construction for bivariate copulas is provided, which is a generalization of the so-called gluing method and rectangular patchwork constructions of bivariate copulas. Its statistical interpretation and properties are discussed. For the illustration of
our results, several examples are given.

The Plausibility Regions for Shape Parameter under Multivariate Skew-Normal (MSN) Settings Based on Inferential Models (IMs)
Ziwei Ma

Inference on shape parameter is a challenging issue for the skew-normal family, especially under multivariate skew normal settings. In this paper, the plausibility regions for shape parameter of the multivariate skew normal family are constructed by Inferential Models and its generalization, generalized IMs when location parameters and scale parameters are known. For the illustration of our results, simulation studies have proceeded as well.

Stochastic cholera epidemic model with general non-linear incidences
Tuan A Phan

Based on our deterministic models for cholera epidemics, we propose a general stochastic model for cholera epidemics to incorporate environmental fluctuations which is a system of nonlinear stochastic differential equations. We conduct an asymptotical analysis of dynamical behaviors for the model. The basic stochastic reproduction value Rs is defined in terms of the basic reproduction number R0 for the corresponding deterministic model and noise intensities. The basic stochastic reproduction value determines the dynamical patterns of the stochastic model. When $Rs<1$, the cholera infection will extinct within finite periods of time almost surely. When $Rs>1$, the cholera infection will persist most of time, and there exists a unique stationary ergodic distribution to which all solutions of the stochastic model will approach almost surely as noise intensities are sufficiently small. When the basic reproduction number R0 for the corresponding deterministic model is greater than 1, and the noise intensities are large enough such that $Rs<1$, the cholera infection is suppressed by environmental noises. We perform numerical simulations to illustrate our analysis, and also point out biological implications.

Symposium 3, 10:00-11:00

Corbett Center 3rd floor – Dona Ana Room

Performance Analysis and Estimation of GPGPUs
Yehia Arafa

Graphics processor units (GPUs) originally designed to render images to display(s) have evolved to be powerful co-processors that perform complex calculations efficiently in a very short time. Hence the last decade has seen an increase in usage of GPUs for high-performance computing and machine learning. This drives the need for fast and accurate ways to evaluate the performance of different applications under various GPU architectures. However, due to the complexities found in these hardware architectures, modeling and predicting the runtime of GPUs have become a non-trivial challenge and an active area of research for many years. In this work, we present PPT-GPU, a scalable and accurate simulation framework that enables GPU code developers and architects predict the performance of GPU applications in a fast, and accurate manner on different GPU architectures. Our framework is very useful for early GPU design space exploration and analysis as our results are within 10% of error compared to the real device(s). In addition, we produce our results in a very short time (few seconds), unlike other states of the art simulators.

EMU SPmV
Ammar ELWazir

Sparse matrices are common place in modern computing and due to the rise of machine learning algorithms it has become apparent that sparse matrix operations play a large role in simulating and modeling systems. In this talk we look at a new architecture being developed by EMU Technologies that focuses on distributed memory and migratory instruction sets. We will use various sparse matrix methods to compress and solve sparse matrix-vector multiplication and compare the performance of this new architecture vs that of the modern x86 architecture.

Machine Learning For Security Purposes
Abdelrahman Elkanishy

Due to the complexity of the integrated smart devices that use the Bluetooth communication protocol, most manufacturers are outsourcing the chips to third-party suppliers. The integration between many outsourced ICs has resulted in the need to add a hardware security layer to ensure appropriate operation. One way to monitor the chip is to consider it as a black box which consumes and transmits power. Thus, abnormal behavior can be detected using Machine Learning outliers the normal input/output (I/O) power signatures.

Symposium 4, 11:00-12:00

Corbett Center 3rd floor – Senate Chambers

Solar-Powered Uninhabited Aerial Vehicle for Autonomous Soaring
Jesus Rosales Rosales

Solar-assisted autonomous soaring promises to significantly extend the flight time of electrically powered small uninhabited aerial vehicles (UAVs). An existing aircraft with 12.7ft wingspan was equipped with 64 5Ã—5in solar cells and the current versus voltage curve of the solar cells was measured with a custom designed Arduino-based circuit. The dynamic stability of the aircraft was analyzed with the XFLR5 software. A simple circuit with voltage regulator was developed to protect the battery from overcharging. An endurance ground test was carried out to evaluate the performance and reliability of the electrical system. Two autonomous flight tests with Pixhawk autopilot were carried out that provided suggestions for further improvements of the aircraft. Finally, a six degrees-of-freedom point-mass model was implemented. The model provides the basis for a simulation environment for the development and testing of solar-assisted autonomous soaring algorithms.

Numerical Investigation of Turbine Endwall Flows
Sergio Romero

In this research, the endwall flow in a highly loaded linear low-pressure turbine cascade is numerically simulated. The present CFD simulations are highly resolved (in time and space) which allows for modal analysis of the instantaneous flow. Both the proper orthogonal decomposition (POD) and dynamic mode decomposition (DMD) were applied to gain insight of the LPT flow physics. Unstable DMD modes were forced with unsteady active flow control (AFC) strategies and significant total pressure loss reductions were obtained when blowing with a frequency of 0.8 and a duty cycle of 0.5. Steady blowing that directly opposes the secondary flow effectively lowers the total pressure losses but requires large amplitudes which makes it inefficient. Unsteady forcing is demonstrated to be a very efficient way for decreasing the coherence of the passage vortex and for obtaining a moderate reduction of the total pressure losses.

Modal Decomposition of Dynamic Stall for Helicopter Blade Section
Guangwei Wen

Helicopters in forward flight employ cyclic control for neutralizing the roll moment. At high advance ratios, the associated variation of the blade angle of attack can become large enough for dynamic stall to occur. Dynamic stall has to be avoided because it decreases the aerodynamic and fuel efficiency and generates noise as well as large vibrations that transmit into the fuselage. An insightful physical comprehension of the underlying flow physics can stimulate the development of effective control strategies that delay the onset of dynamic stall or counter its detrimental effects. Data from an implicit large-eddy simulation of a pitching and surging blade section with Sikorsky SCC-A09 airfoil for a chord-based Reynolds number of Re = 200, 000 and a reduced frequency of k = 0.0456 were analyzed with two modal decomposition techniques. The ensemble empirical mode decomposition was employed to decompose the aerodynamic coefficients into several intrinsic mode functions. Spatial modes were obtained by least-squares fitting the flow field to the mode functions and by conditional sampling. As a reference, the same flow data were also analyzed with the proper orthogonal decomposition. Results from the different techniques are compared and discussed with focus on the dynamics of the coherent flow structures and their effect on the aerodynamic coefficients.

Symposium 4, 11:00-12:00

Corbett Center 3rd floor – Dona Ana Room

Online Democracy Changing Political Activity one Click at a Time
Armando Altamirano

Citizens are not being informed about how new online technologies categorized as Digital Democracy tools are greatly impacting the policy-making process and democracy. This session will inform participants about how new technologies are helping everyday citizens change democracy.

Implementing formative assessment tools to encourage participation in active learning strategies in an undergraduate non-majors biology course.
Suparna Chatterjee

Authentic performance assessment tools are used in the non-majors introductory biology course to monitor studentsâ€™ ability to apply their understanding of the content to real life issues. Tools such as group projects; peer teaching; debates and discussions; polling; interviewing; interactive lectures and presentations; game-based learning; posters; gallery walks; blogging; making videos and other non-traditional ideas were used to engage students and encourage participation in active learning. These tools were used to measure scientific thinking skills that cannot be easily measured through traditional assessments.

Everyone can be a TOEFL teacher
Xinyue Fan

The Test of English as a Foreign Language (TOEFL) is an exam used to evaluate studentâ€™s language ability in non-English speaking countries. Most universities use the TOEFL score as one of their admission standards. This project focuses on â€œhow to improve TOEFL reading comprehension.â€ The lesson plan consists of two different kinds of word activities and reading texts about a special cave in South France, how bats land and mock UN meetings. The author constantly changes lesson plans to find out the studentâ€™s reading problems. After the project, the students improve their ability to guess the meaning of the words, grasp the main idea of the passage, are able to retell the story and make connections with their own experience. The student got an accuracy of 66% from the beginning of class and 55% in one and a half months of class.

Symposium 5, 1:00-2:00

Corbett Center 3rd floor – Senate Chambers

Evolution of Neutral Oxygen During Reionization
Caitlin Doughty

We use the statistics of synthetic neutral oxygen (OI) absorbers extracted from a cosmological radiative transfer simulation of the Epoch of Reionization (EOR) to study how OI absorbers respond to the progress of reionization from z=8 to 5. We find that while the cross-section of oxygen around halos is increasing, that of O I absorbers is dropping, particularly for z=7 to z=6. O I absorbers located at relatively lower overdensities (Delta<100) and with smaller equivalent widths (EW<0.1 Angstroms) are strongly affected during reionization, likely in response to the evolving ionizing background. The incidence rate of O I systems of EW>0.02 Angstroms shows strong evolution from z=6.5 to z=6, decreasing by a factor of 1.5. Further, we find that O I absorbers may be used as a tracer of neutral hydrogen gas, and to estimate the global mass-weighted neutral hydrogen fraction well into the EoR.

SDSS IV MaNGA: Characteristics of edge-on galaxies with counter-rotating gaseous and stellar disks
Minje Beom

We identified four edge-on galaxies in which the gas and stars rotate in opposite directions within a co-planar disk. We analyze the kinematics and emission line strength and compare them to a control sample of galaxies with similar stellar mass in order to see how the properties in the counter-rotating galaxies differ from those in normally rotating spirals. The four counter-rotating galaxies show no strong star formation region in the disk compared to the control samples. One of the counter-rotating galaxies has a small "tail" feature in deep optical imaging. This may provide direct evidence of an external origin of the gas in support of the likely scenario that all counter-rotating gas disks were accreted.

Numerical Investigation of Rayleigh-Benard-Poiseuille Instability in Plane Channel Flow
MD Kamrul Hasan

For plane channel flow, thermal stratification resulting from a wall-normal temperature gradient together with an opposing gravitational field can lead to buoyancy-driven instability of three-dimensional waves. Moreover, viscosity-driven instability can lead to the amplification of two-dimensional Tollmien-Schlichting waves. Temporal stability simulations considering different combinations of Reynolds number and Rayleigh number were performed to investigate both the buoyancy and viscosity-driven instability of Rayleigh-Benard-Poiseuille flow.
The investigated cases are either (1) stable, (2) unstable with respect to three-dimensional waves (buoyancy-driven instability), or (3) unstable with respect to two-dimensional waves (viscosity-driven instability).
Two new and highly accurate computational fluid dynamics codes have been developed for solving the full and linearized unsteady compressible Navier-Stokes equations in Cartesian coordinates. The codes employ fifth-order-accurate upwind-biased compact finite differences for the convective terms and fourth-order-accurate compact finite differences for the viscous terms. For the case with buoyancy-driven instability, strong linear growth is observed for a broad range of spanwise wavenumbers and the wavelength of the spanwise mode with the strongest non-linear growth is gradually decreasing in time. For the case with viscosity-driven instability, the linear growth rates are lower and the first mode to experience non-linear growth is a higher harmonic with half the wavelength of the primary wave. The present results are consistent with the neutral curves from the linear stability theory analysis by Gage and Reid.

Symposium 5, 1:00-2:00

Corbett Center 3rd floor – Dona Ana Room

Impacts of Temperature and Non-Native Brown Trout on Rio Grande Cutthroat Trout Production
Lauren M. Flynn

Native Cutthroat Trout (Oncorhynchus clarkii spp.) populations in the western U.S. continue to decline from non-native trout invasions, but mechanisms to explain replacement vary widely by subspecies and geography. Brown Trout (Salmo trutta) are the most widespread nonnative trout in New Mexico, and threaten Rio Grande Cutthroat Trout (O. c. virginalis, RGCT) population persistence. Our goal was to investigate the potential interactions among temperature and Brown Trout invasion on RGCT secondary production rates (g/m2.yr-1) in wild populations. We gathered biomass, growth, and temperature data from four sympatric and four allopatric RGCT populations in northern New Mexico (August 2017-August 2018) using three-pass depletion and mark-recapture techniques. Based on non-overlapping 95% confidence intervals, allopatric populations had consistently higher abundance, biomass, and production than sympatric populations. Though the streams clearly separated into cold and warm temperature treatments, our results lacked evidence for a strong temperature effect on production (overlapping 95% CIs). Looking forward, we will explore the trophic basis of production as a possible mechanistic explanation for low RGCT rates of production in sympatric populations with brown trout.

Effects of translocation on burrowing owls (Athene cunicularia) in Arizona
Dejeanne Doublet

The burrowing owl (Athene cunicularia) is a declining species. Conflicts between the owls and development have led to translocation programs including one in Arizona that relocates the owls from construction sites to artificial burrows. Our goal was to evaluate the effectiveness of this program. We used radio telemetry from 2017-2019 to track the fates of 43 translocated owls and 42 wild owls. Annual survival was lower for translocated owls (0.35Â±0.08) compared to wild owls (0.80Â±0.07). Translocated owls also had lower nest survival (0.21Â±0.06) than wild owls (0.76Â±0.06). In Arizona, the owls are released in springtime in groups of 10 owls/release cage.

Symposium 6, 2:00-3:00

Corbett Center 3rd floor – Senate Chambers

The accumulation of IGFBP-1 results in EGFR/MAPK activation and drives the development of tamoxifen resistance in breast cancer cells

Yan Zheng

Insulin-like growth factor (IGF) system plays a significantly role in cellular processes, including proliferation, survival, and mitogenesis. The IGF system consists of two soluble ligands, IGF-1 and IGF-2; two transmembrane receptors, IGF-1R and IGF-2R; and six high affinity IGF binding proteins, IGFBPs 1-6. Evidence shows that the IGF system is involved in breast cancer. For example, at least 50% of breast cancer tumors have elevated IGF-1R signaling; the level of circulating IGF-1 is found positively associated with the incident of estrogen receptor positive breast cancer. Tamoxifen, a selective estrogen receptor modulator and antagonist for estrogen receptor alpha (ERÎ±) in breast tissue, is a commonly prescribed adjuvant treatment for patients presenting with ERÎ±-positive breast cancer. However, tamoxifen resistance also occurs, and its exact mechanism is not well understood. Recently, we discovered that the accumulation of IGFBP-1 was stimulated by tamoxifen treatment, which subsequently prevented the activation of IGF-1R and inhibited the proliferation in MCF-7 cells. As a result, we hypothesized that the accumulation of IGFBP-1 due to the long-term tamoxifen exposure would result in tamoxifen resistance. In order to mimic the accumulation of IGFBP-1 after tamoxifen treatment, we employed MCF-7 and T-47D breast cancer cells to generate stable cell lines with IGFBP-1 overexpression. We found that the expression of IGF-1R was largely reduced in both MCF7-BP1 and T47D-BP1 cells, which was also observed in tamoxifen resistant MCF-7 and T-47D cells. Furthermore, we demonstrated that both MCF7-BP1 and T47D-BP1 were not responsive to tamoxifen, and epidermal growth factor receptor (EGFR) signaling pathway was significantly upregulated, as shown by higher levels of EGFR, phospho-EGFR (pEGFR), and phospho-Erk (pErk).

Synthetic Studies Towards the Total Synthesis of Laingolide A

Alexandra Golliher

Laingolide A is a unique, 15-membered enamideâ€“containing secondary metabolite first isolated in 1999 from a cyanobacteria of genus Lyngbya collected off the northern coast of Papua New Guinea. We wish to report our current progress towards the first total synthesis and determination of the relative and absolute stereochemistry of the naturally occurring macrolide. An efficient, yet versatile, retrosynthetic route was designed and envisioned to exploit three novel building blocks: a dibromo olefin obtained via a Corey-Fuchs homologation; an acid chloride featuring a terminal azide handle; and a boronic acid subunit which can be easily manufactured from the Roche ester. The key steps of our total synthesis will be a Suzuki-Miyaura cross coupling reaction followed by a domino azide reduction / concomitant lactone to lactam ring expansion which directly proceeds enamide generation.

Science Self-Efficacy in University Level Students: A Phenomenological Study of Organic Chemistry

Joann Latorre

Science education at the post-secondary level is essential to building a foundation for increasing support, participation, and interest in STEM occupations and careers. This current study uses a phenomenological approach to explore the lived experiences and perspectives of eight post-secondary science majors while enrolled in a university 200-level organic chemistry course. Semi-structured, in-depth interviews among participants were conducted to analyze how post-secondary science majors negotiated their science dispositions for perceiving science and developing meaningful conceptual understanding of science in different settings. This study examines elements of the classroom and laboratory atmosphere that can influence student self-efficacy towards acquiring science skills. Thematic analysis (Seidman, 2006) in addition to social cognitive theory (Bandura, 1997) provides the framework for disclosing intersecting schema. In the summary of the findings emerged two major themes: Science Connectiveness and Science Connectedness.

Symposium 6, 2:00-3:00

Corbett Center 3rd floor Dona Ana Room

Post-Apocalyptic literature in a world increasing in chaos and fear:
Bernice Koppner

Almost all apocalyptic fiction is based on fear, and sometimes the concern is real. Humans cause most chaos that creates fear. We regularly place ourselves in jeopardy and run the gambit of world annihilation or self-destruction. Human abuse of the environment, fluctuating world economies with unstable markets, and warfare and territorial, tribal instinct have reached record highs. Modern weaponry and the fear of retaliation permeates every aspect of our daily lives. Today's world is ripe for an apocalyptic event which could create post-apocalyptic societies. This paper presents thoughts on the media and rhetorical influence of modern post-apocalyptic or dystopian literature.

Whitmana's Bodies: The gates are opened with purpose
Jacquelin Huerta

Throughout Whitmana's work, it is clear that the Spiritualism movement influenced his representations of body and soul. Often, the body and soul are considered two separate entities in Spiritualist thought. Even though the body and soul are often viewed as separate, there is a âœsparkâ that allows the identity to become embodied in Whitmana's work. This can also be a Spiritualist influence. Throughout âœ The Sleepersâ, âœI Sing the Body Electrica, âSong of Myselfâ and âœ. The City Dead Houseâ, the body is witnessed to be a set of gates that is actively open to release the soul from the body. Gate imagery in Whitman demonstrates Whitmana's belief that every identity has a purpose of labor to fulfill; once the purpose is fulfilled, only then can the body release the accomplished soul.

Looking Feels Abnormal After A While
Brittany Chavez

My work addresses the contradictory nature of experience through representations of fragmented bodies moving through experimental structures. By playfully employing shifts in context, as well as proposing new interactions between body and object, I highlight ways in which a body may become more aware of itself, through its use. In working with video, performance and photography, I address ways of seeing â€“ ways not separate from the dynamics present within the context of sex work. Influenced by my personal dealings with bipolar disorder, as well as my experiences as a sex worker â€“ I deliberately exploit boundaries drawn between art and porn, asking the viewer to consider social structures at play in definitions of disgust and pleasure. In addressing ambiguity and contradiction as inherent and productive modes of living within a precarious political landscape, I expose a fragmented identity as creating performative possibilities and offering alternative explorations of self and body.

Symposium 7, 3:00-4:00

Corbett Center 3rd floor – Senate Chambers

Effect of Glandless Cottonseed Content as the Main Protein Source of Extruded Shrimp
Jorge Galarza

Feeds are often amongst the largest variable costs in shrimp aquaculture, representing up to 60% of total costs. Glandless cottonseed meal (GCSM) is a cheaper alternative as a fish meal substitute. This research aimed to evaluate the effect of different ratios of glandless cottonseed meal and fish meal (FM) as the primary protein source of a previously standardized shrimp feed on growth performance and in vitro digestibility of shrimp. Four GCSM based diets were developed. The scanning electron microscopy of the extruded diets with CSM showed a more corrugated structure than the commercial diet. In vitro digestibility was affected ($P < 0.05$) by the amount of GCSM present in the diet. The amount of CSM did not affect ($P > 0.05$) on shrimp growth. There were no differences ($P > 0.05$) between the extruded shrimp feed containing GCSM and no fish meal and a commercial diet.

Interaction between the Teashirt (Tsh) and C-terminal binding protein (CtBP) regulates the tissue specification during eye development in the Drosophila melanogaster
Surya Jyoti Banerjee

Eye development has been studied in Drosophila melanogaster for decades because the cellular and molecular processes are similar to vertebrates including humans. Human orthologs for D. melanogaster tsh and CtBP genes regulate transcription during neuronal development in humans. It was shown that Tsh, a zinc finger transcription factor, promotes cell proliferation in the larval eye disc of D. melanogaster. On the other hand, CtBP, a transcription coregulator, helps to limit proliferation of the eye precursor cells in eye disc. The Tsh protein contains PXDLS motif known to be bound by CtBP protein. I hypothesize that interactions between Tsh and CtBP controls tissue specification during eye development. I have demonstrated by GST pull down assays that Tsh and CtBP physically interact in vitro. I have used co-immunoprecipitation to show the two proteins interact in vivo in eye disc. I will design experiment to establish in vivo genetic interaction between the two.

Cameras or traps? Evaluating survey techniques for the PeÃ±asco least chipmunk
Fiona McKibben

The PeÃ±asco least chipmunk (Neotamias minimus atristriatus) is only known to persist in the White Mountains subrange of the Sacramento Mountains, New Mexico. The species co-occurs with the morphologically similar grey-footed chipmunk. N. m. atristriatus is only known to occur at remote high elevation sites where traditional live trapping methods are logistically challenging. We developed and tested a diagnostic key for differentiating between the sympatric chipmunk species using camera trap photographs. When we reported higher confidence in our identifications, we correctly identified 98.14% of specimen photographs. We conducted paired surveys using Sherman live traps and remote cameras. NaÃ¯ve detection probability reached 98% by day 3 when Sherman live trapping and by day 5 when camera trapping. This suggests that where N. m. atristriatus is present it is readily detectable using either method. We provide preliminary data on the ecology of the White Mountains population of N. m. atristriatus.

Symposium 7, 3:00-4:00

Corbett Center 3rd floor - Dona Ana Room

Refining the Uplift History of the Rio Grande Rift and Basin and Range in Southern New Mexico Using Low-Temperature Thermochronology
Michelle Gavel

The Rio Grande Rift and Basin and Range are considered two of the most widely studied extensional provinces in the world, yet thermochronologic data allowing for the temporal constraint of their evolution remains sparse in southern New Mexico where the two provinces meet. (U-Th)/He thermochronologic methods were applied to 96 apatite grains and 43 zircon grains 14 different samples from fault-block uplifts across southern New Mexico (the Burro Mountains, Cookes Range, Caballo Mountains, and the San Andres Mountains) to date the initiation of their exhumation during tectonic activity. Time-temperature models generated using these dates suggest rapid uplift beginning between 30-20 Ma in the Burro Mountains (eastern Basin and Range), and as late as 20 Ma in the San Andres and Caballo Mountains (Rio Grande Rift). This information, combined with other fault data provide insight into mechanisms that drove crustal extension in the Western US during the Cenozoic.

Slip Rates Along the Santa Susana Fault from Geomorphic Mapping and Cosmogenic Dating, Western Transverse Rages, California
Michael Reed

The Santa Susana Fault (SSF) is a 38-km-long thrust fault that connects active faults within the Western Transverse Ranges of southern California. Despite proximity of the SSF to metropolitan areas, the slip rate on the SSF remains very uncertain at a range of 0.5-10 mm/yr. Therefore, we aim to receive age results from 36Cl cosmogenic nuclide depth profile samples of the offset fan surfaces to assist in correlating alluvial fan surfaces and yield the first late Quaternary slip rate for the SSF derived from modern chronologic techniques. These methods, coupled with geomorphic parameters of normalized channel steepness and construction of pre-development DEMs from historic aerial imagery will provide a better understanding of the local tectonic regime, and constrain the slip rate for the SSF. These parameters will assist earthquake hazard forecasting for southern California and reveal spatio-temporal patterns of sedimentation and erosion associated with tectonism for the Western Transverse Ranges.

Comparison of Critical Thermal Limits of Three Gila Trout Lineages
Tyler Wallin

Stream temperature and the presence of non-native fishes can affect the distribution of native cold- and cool-water fishes. This is especially true for native fishes that have already experienced contractions in their range. The Gila drainage, of New Mexico, support unique fishes adapted to the arid system. These fishes are losing habitat due to non-native fishes, drought and fire. Understanding the thermal limits of these fishes is key. This study examined the critical thermal limits for three lineages of Gila Trout. Onset of spasm for Diamond Creek, South Diamond Creek, and Whiskey Creek lineages were 29.834Â°C, 29.470Â°C and 30.069Â°C respectively. These thermal thresholds were then paired with temperature metrics from 2016 to 2018 at or near the drainages of the lineages. The highest temperatures recorded ranged from 25.94 to 32.02, which indicates the importance of this work.

Symposium 8, 4:00-5:00

Corbett Center 3rd floor – Senate Chambers

Nutrient Dynamics of Jujube (Ziziphus jujuba Mill) at Different Maturity Stages
Govinda Sapkota

Phenolic compounds in Jujube (Ziziphus jujuba Mill) are attributed to health beneficial properties. Dynamics of phenolic compounds and antioxidant activities of New Mexico grown four jujube cultivars were studied at different harvest dates of a 14-day interval. Total Phenolic Content (TPC) and proanthocyanidins (PA) were quantified using the Folin-Ciocalteau method and vanillin colorimetric method, respectively. Antioxidant activities were assessed using DPPH and Ferric reducing antioxidant power (FRAP) methods. TPC decreased with maturity for âLangâ and âSugarcaneâ. TPC for âLiâ increased from first to the second harvest, while TPC for âSeptember lateâ did not differ significantly ($p < 0.05$) during that period. Both cultivars followed a decreasing trend in TPC thereafter. PA decreased with maturity for all cultivars except for â€˜September lateâ from first to the second harvest. TPC was positively correlated ($p < 0.01$) with PA. Antioxidant activity (FRAP) was positively correlated ($p < 0.01$) with both TPC and PA.

Voluntary Folic Acid Fortification of Corn Masa Products and Need of Education among Consumers in the U.S.
Sylvia Gabriela Phillips

Previous research has well documented that fortified wheat products have diminished the deficiency of folic acid and neural tube defects. The FDA recently approved voluntarily folic acid fortification of corn masa products. However, not all the corn products are fortified with folic acid. Hispanics and other populations are at higher risk of folic acid deficiency due to high consumption of corn masa products, such as corn tortillas, tortilla chips, tamales, etc. Nutrition education is an important step to improve folic acid intake among key populations.

Chromosome dynamics in bacteria: triggering replication at opposite location and segregation in opposite direction
Ady Melendez Molina

The accurate onset of chromosome replication and segregation are fundamental for cell survival. In Caulobacter crescentus, DnaA triggers the onset of replication once per cell cycle and only from the stalked pole. Soon after replication initiates, ParA segregates one of the replicated centromeres from the stalked to the new pole. The timing control for the onset of DnaA and ParA activities remains unclear. To analyze whether these regulators' activities are restricted to the stalked pole, we constructed a C. crescentus strain where the movement of the origin of replication (ori) can be triggered away from the stalked pole without chromosome replication. Our data show that DnaA can initiate chromosome replication independently of ori's subcellular localization and that ParA gradient can be reorganized to segregate one replicated centromere in the opposite orientation. We expose the chromosome's arrangement roles in the cell cycle regulators organization and cell flexibility to rearrange molecular machineries.

Symposium 8, 4:00-5:00

Corbett Center 3rd floor Dona Ana Room

Inclusive education systems in People's Republic of China: A closer look at its development in the past 40 years
Dongmei Liu

This study provided an overview of literature to establish which projects have been undertaken within the past 40 years in the Republic of China to support the inclusion of students with disabilities. Following the framework described by Pijl and Meijer (1997), the results were presented by addressing the four factors. The findings indicated the implementation of inclusive education demonstrated a divergent pattern. Additional findings were described for a complete view of the issue.

Exploring the Pathway Framework for Access to Water and Educational Attainment
Margie R. Vela

Access to water and educational attainment share a strong relationship for many communities around the world. According to the 2006 World Water Report, cultural values and social norms define the way these variables are related. Colonias are rural communities found along the U.S.-Mexico Border with unique culture, embracing influences of Mexican and U.S. norms. This study used youth participatory action research to collect data from students attending a high school serving four colonias in West Texas. The purpose of this study was to find relevant connections and relationships presented in the Pathway Framework for Access to Water and Educational Attainment (Vela et al., 2018) for this population of students. Pictures and narratives tell the stories about the quality of life and the conditions that students felt had an impact on their lives. The results of this study can help inform future research and policy decisions.

Effects of Preconditioning (value added programs) on Health, Performance, Mannheimia Haemolytica and Pasturella Multocida in Cattle Received on Wheat Pasture
Josiah Brooks

Guided by current literature, stocker cattle producers will often buy high-risk (cohort), less expensive calves and turn them out to graze winter wheat pasture between November 1 and March 1 for beef production. However, higher morbidity and subsequent mortality rates occur in their cattle due to bovine respiratory disease (BRD), a common infectious disease that disrupts lung function. This results in staggering economic losses for the producer. Our research was designed to challenge the current ideology by using low-risk (preconditioned), more expensive cattle on winter wheat pasture compared to the alternative. The administration of timely vaccinations, coupled with better management practices, often increase the long-term health of low-risk cattle. Our hypothesis is that low-risk cattle will be less susceptible to BRD thereby maximizing the economic gains for the producer.

Data Blitz Presentations, 12:00-1:00

Corbett Center 3rd floor – Senate Chambers

The Promotion of Literacy in Preschool Education in Mexico: A Black Feminist and Postcolonial Analysis ***Gloria M. Calderon-Garcia***

To broaden the impact of literacy towards social justice, education professionals have engaged with critical literacy perspectives (CLP) (Morrell, 2008). However, in my research both the curriculum of Preschool-Education in Mexico (SEP, 2011) and classroom-pedagogy, does not seem to encompass CLP. The curriculum, as a colonizing instrument, minimized narratives of people color. Likewise, the role of educators appeared to be colonized (Gandhi, 1998) through "recommendations" of the Secretary of Public Education, which aligned with Western, developmental narratives. As Latina women and teacher educators oriented towards social justice, I have looked at Black feminisms, postcolonialism, and critical literacy theories to re-imagine what is possible in literacy praxis in Mexico.

J.U.M.P. Jail Understanding Mathematics Project
Julia Ruiz

Proportion of Population Contributes to Precision More than Sample Size
Hunter Myuz

Inferential statistics aim to provide unbiased estimates of population parameters, and account for a certain amount of error, or difference from the population within any given sample. What is not taken into account, however, is the proportion of the population that is in one's sample. Some fields that study small populations (e.g., rare species, diseases, or cultures) collect far more of the population of interests, proportionally speaking, than even very large-n studies in other fields. Null Hypothesis Significance Testing (N.H.S.T.) makes it difficult for these small n-studies to produce publishable (or, statistically significant) results, when their relative precision is quite high. Statistical simulations are presented demonstrating increases in precision as proportion of the population of interest increases, and compares these to larger-n studies.

Fatherhood voices: The Experiences of Fathers Raising Children with Intellectual Disabilities in the US-Mexico Borderland
Sergio Madrid

In spite of a great amount of enlighten studies regarding families experiences rising children with intellectual disabilities (Buxbaum, 1964; League, & Ford, 1996; Valle, 2009) scholars do not have enough information about the role of fathers. Roy (2014) suggested two interrelated reasons; First a scholarly interest on the mothers experiences, and second the social and historical role of fatherhood (i.e. Fathers as providers or accomplishing exclusively an instrumental role). I plan to overcome these literature limitations by taking a phenomenological research approach to explore the experiences of these fathers rising children with intellectual disabilities in the US-Mexico borderland. This research proposal intends to open the door to a group that has not had a voice in the literature frequently; this is an opportunity to listening not only their dilemmas and challenges, but also their hopes and gratifications (Ricci, & Hodapp, 2003).

The Case for Cottonwood: Recommendation of NRHP Eligibility
Jacqueline Monsell

The National Register of Historic Places is a federal program that grants protection and incentives to safeguard our nation's history. I propose to nominate Cottonwood Spring Pueblo Archaeological Site (LA 175) for listing on the NRHP. Cottonwood Spring Pueblo (LA 175) is one of the largest recorded El Paso Phase (A.D. 1200-1450) pueblos in the Jornada. It is located along the west slope of the San Andres Mountain range, approximately 40 miles north/ northeast of Las Cruces, New Mexico. Initial surveys of the site identified six artifact or architectural concentrations (Areas A through F; Chapmen 1926, Lekson & Rorex 1987, Yeo n.d.). Artifacts from ongoing investigations by New Mexico State University (NMSU) indicate that the pueblo was occupied from A.D. 900-1400, a time range that witnessed the formation of many large villages in the area of the Jornada Del Muerto basin, the Rio Grande valley, and the Southern San Andres Mountains.

Sexual and Romantic Fantasies of Heterosexual and non-Heterosexual Men and Women
Tara M. Young, Michael J. Marks

This research aimed to examine whether fantasies are better explained and predicted by sexual orientation or gender. In two studies (n = 376), the sexual, romantic, and sexual-romantic fantasies of heterosexual men and women were compared to those of lesbians and gay men. Participants completed the Measure of Romantic and Sexual Fantasies in order to determine fantasy frequency by type. Overall, gender better predicts and explains fantasies of men, whereas sexual orientation better explains and predicts fantasies of women. Further fantasy patterns by gender and sexual orientation are discussed.

Data Blitz Presentations, 12:00-1:00

Corbett Center 3rd floor – Dona Ana Room

Rho GTPases, branched actin networks and the control polar body extrusion during oocyte maturation
Debadrita Pal

The actomyosin cytoskeleton determines cell shape and drives cell shape change. Work in the lab has demonstrated that during cytokinesis, linear unbranched actin filaments form the contractile ring whereas branched actin (nucleated by the Arp2/3) is cleared from the cell equator. Unbranched and branched actin are under the control of the GTPases Rho and Rac, respectively, and it is believed that in both crawling cells and dividing cells, these molecular switches are functionally and spatially segregated. We are interested in understanding how this regulatory scheme functions during meiosis in oocytes, where meiotic divisions are highly asymmetrical to ensure conservation of cytoplasm in the future gamete (egg) while still reducing ploidy (by polar body extrusion). The biomechanics of polar body formation differ significantly from symmetric cell divisions, and yet the same contractile proteins are used in both cases. During meiosis, there is a local depression of cortical tension at the site of polar body extrusion, suggesting that polar body extrusion occurs through a combination of myosin-based contractility and a local depression of cortical tension, possibly created by local activation of Arp2/3. We hypothesize that while Arp2/3 is dispensable for symmetric divisions, Arp2/3 (and Rac) is essential for polar body extrusion during meiosis. Sea star oocytes undergoing meiosis in the presence of an Arp2/3 inhibitor or dominant-negative mutant of Rac fail to form a polar body. Current efforts are focused on characterizing the localization dynamics of Arp2/3, Rac, Rho and myosin II to determine how these different factors coordinately regulate polar body extrusion. Lastly, we have developed an optogenetic tool to locally activate Arp2/3 and branched actin in response to 405 nm light. We will locally activate Arp2/3 at the region of polar body extrusion to see how increasing the zone of Arp2/3 actin affects myosin II recruitment and polar body morphology.

Community Schools. What are they? And what do they do?
Felicia Herrera

The research that I have been conducting this semester is around Community Schools, more specifically our local Community School Lynn Middle School. I have been conducting a literature review on Community Schools and the outcomes of several Community School initiatives across the U.S. I would like to speak about the importance of Community Schools, and what they are. I would also like to speak about the impact of our Local Community School, Lynn Middle School and how it has impacted our local community.

Automated Proofs of Signatures using Bilinear Pairings
Guruprasad Eswaraiah

In our paper, we extend an automated proof-generation tool, AutoG& P with new axioms and formalizations to support composite data types and q-type assumptions, which in turn can be used to automate pairing-based signature schemes. AutoG& P due to Barthe et at. was designed as a tool to automate proofs of cryptographic primitives based on bilinear pairings in the standard model, but the initial version only supported a limited set of data types, limited pairing-based assumptions, and only provided automated proofs for encryption schemes, notably the Boneh-Boyen identity-based encryption scheme. As examples of our extensions, we provide automated proofs for the Boneh-Boyen pairing-based signature schemes under the well-known and widely-used notion of signature security: existential unforgeability under chosen message attacks in the standard model, and the Boneh-Boyen-Shacham group signature scheme, under standard notions of group signature security: anonymity and traceability.

The Direct Band Gap of alpha-Sn Investigated by Infrared Ellipsometry
Rigo Carrasco

Interest in gray tin has been revived because it is the endpoint constituent of Ge1-xSnx alloys, which have potential applications as mid-infrared detectors and lasers. Gray tin becomes a topological insulator or Dirac semimetal due to stress.

Compost program development: pecan farmer and dairy collaborations in arid regions for improved environment management.
Emily Creegan

Biomass utilization, including plant detritus, animal byproducts and manures, and food waste, is a vital and critical component to sustainable landscaping and agriculture. Incorporating organic matter into the soil system may be the most important factor in increasing soil carbon sequestration (a significant climate change mitigation factor), nutrient cycling, soil water remediation and conservation, landscaping and agrochemical mitigation, and plant productivity. Additionally, organic matter utilization reduces landfill waste and associated methane emissions. My primary research site is an approximate 1,600 acre pecan farm in Roswell, New Mexico (currently the 7th largest pecan farm in New Mexico). Pecans are a New Mexico cash crop and synthetic fertilizers may be more readily utilized than organic inputs for pecan crop productivity. However, the cost of synthetic fertilizers has been shown to diminish pecan profitability. My research is predicated on developing comprehensive organic waste-to-resource compost programs, with both local and global translations. On-farm compost programs utilizing pecan trimmings and locally produced manure has been established. The compost products and pre and post soil-sample compost applications are being analyzed, including soil carbon and soil water retention analyses. One of the connections of critical importance is economic analysis and legislation for regulations related to organic waste management so that policies enhance the sustainability of the process, rather than unnecessarily hinder its implementation. Chemical engineering aspects with analysis in the realm of thermodynamics and processing efficiencies are also being conducted.

Metal Contaminants in the Animas and San Juan Watershed after the Gold King Mine Spill (2015)

Gaurav Jha

On August 5, 2015, three-million gallons of acid rock drainage was accidentally released into the Animas Watershed from the Gold King Mine (GKM) in Silverton, Colorado. While contamination from this one event may not have reached closed irrigation ditches and fields, legacy mining waste has been seeping into the river for over 150 years which has sparked concern over the safety of the watershed. The total concentration of nine elements was analyzed in soil, leaf, and produce samples. Portable X-Ray fluorescence was used in 8 different agricultural fields to assess soil and leaf tissue samples. The average concentration of As in soils exceeded the guideline value (7.07 ppm) specified by NMED at certain hotspots that were identified for pasture (7.19 ppm), alfalfa (6.92 ppm) and vegetable (7.13 ppm) fields. On observing the exceedances in areas close to the irrigation sources, plant tissue samples were collected in four quadrants in a gradient of irrigation water flow of the field. The concentration range of As in leaf tissues for pasture (0.89-1.25 ppm, n = 12), alfalfa (0.94-1.11 ppm, n = 12) and vegetable (0.5-0.9 ppm, n = 24) fields were all below the guideline value of 1.7 ppm. Thus, higher concentrations of arsenic and manganese that in some hotspots did not correlate to increased metal uptake in leaf tissues. Furthermore, inductively-coupled plasma optical emission spectrometry testing did not reveal an excessive uptake of metals in above-ground produce, as evidenced by the toxic metal, Arsenic values of all produce samples (n=19) presenting at non-detectable amounts. For now, the people of San Juan County should not be fearful of consuming locally grown produce from the area because the product tested is below safety guidelines released by the World Health Organization.

Poster Presentations

Corbett Center Ballroom

Poster #	Poster Session A - 5:00-6:00 PM
1	One Seed Juniper Sapling Regrowth Following Targeted Grazing Treatments in Relation to Terpenoid Concentration *Yasse M. Almalki, AndrÃ©s F. Cibils a, Richard E. Estell b, Dave Stricklan a, Santiago A. Utsumi c, Alexander G. Fernald a*
3	Immunomodulatory role of aryl-hydrocarbon receptor in insects *Aditi Kulkarni, Wanqin Yu, Jennifer Curtiss, Jiannong Xu*
5	Study of the role of the SwnT (the putative transmembrane transporter) of the fungus Slafractonia leguminicola *Sumanjari Das, Dr. Rebecca Creamer*
7	Foam-templated macroporous polymers *Ryan Zowada, Reza Foudazi*
9	Polymer-assisted deposition of SrTiO3 film as cathode buffer layer in inverted polymer solar cells *Haizhen Wang, Haizhen Wang, Brian Patterson, Jianzhong Yang, Di Huang, Yang Qin, Hongmei Luo*
11	Application of Molecular Fluorescence Spectroscopy for In Situ Real-Time Detection of Food Borne Pathogens *Suzanne Lee and Khue Nguyen, Khue Nguyen, Suzanne Lee, G. Rayson, E. Delgado, S. H. Munson-Mcgee*
13	Assessment of Produced Water Treatment Technologies for Beneficial Use *Alfredo Zendejas Rodriguez, Dr. Pei Xu*
15	Experiences of campus-based international students in online courses *Gaspard Mucundanyi, Carolyn Trussell*
17	Widespread Insecticide Resistance in yellow fever mosquitoes (Aedes aegypti L.) from New Mexico, U.S.A. *Yashoda Kandel, Julia Vulcan, Stacy D. Rodriguez, Emily Moore, Hae-Na Chung, Soumi Mitra, Joel J. Cordova, Kalli J. L. Martinez, Alex S. Moon, Aditi Kulkarni, Paul Ettestad, Sandra Melman, Jiannong Xu, Michaela Buenemann, Kathryn A. Hanley, Immo A. Hansen*
19	Provenance analysis of detrital heavy minerals using Laser-Induced Breakdown Spectroscopy in the Abo Formation, New Mexico *Jacob M. Piper*
21	Recursive and Cluster-Based Hungarian Approaches to Task Allocation *Arezoo Samiei, Sarah Ismail, and Liang Sun*
23	Effect of Glandless cotoonseed content ad the main protein source of extruded shrimp feed digestibility *Jorge Galarza, Wiebke Boing, Efren Delgado*
25	Effects of translocation on burrowing owls (Athene cunicularia) in Arizona *Dejeanne Doublet, Martha J. Desmond, David H. Johnson, Fitsum Abadi*
27	Refining the Uplift History of the Rio Grande Rift and Basin and Range in Southern New Mexico Using Low-Temperature Thermochronology *Michelle Gavel, Jeff Amato, Jason Ricketts, Shari Kelley*

Poster #	Poster Session B - 7:00-8:00 PM
2	Archaeology Spatial Analysis at a Colonial Campsite in Southern New Mexico *Hannah Dutton*
4	Galaxies and Supermassive Black Holes in the Local Universe: The Velocity Dispersion Function and Black Hole Mass Function *Farhanul Hasan, Alison Crocker*
6	Efficacy of active ingredients from the EPA 25B List in repelling Aedes aegypti mosquitoes *Soumi Mitra, Stacy Rodriguez, Julia Vulcan, Rebecca Melendez*
8	Nanoporous Hydrogels through Emulsion Templating *Zahra Abbasian Chaleshtari, Zahra Abbasian, Neda Sanatkaran, Reza Foudazi*
10	Polymer-assisted deposition Li(Ni,Co,Mn)O2 thin films *Di Huang, Qi Zhou, Randa Kassis, Brian Patterson, Hongmei Luo*
12	New methodology for the preparation of 3,4-dihydroxybenzenesulfonamide chelators for iron complexation *Thuy Pham, Amudhu Gopalan*
14	Electronic Structure and Chemical Properties of Long-Bonded Isonitrosyl Compounds *Punhasa Senanayake, R.R. Syrlybaeva and M.R. Talipov*
16	Awareness of PrEP among mental health professionals *Ryan E. Flinn, Elliott N. DeVore, The University of Tennessee*
18	Blended Learning in Public Health Sciences Programs in Africa: Challenges and Benefits *Gaspard Mucundanyi,*
20	TiO2-Reduced Graphene Oxide Nanocomposites as Advanced Photocatalytic Materials *Jiuling Yu, Jiuling Yu, Litao Yan, Hongmei Luo*
22	An Analytical Shared Memory Model for Performance Prediction of Parallel Programs *Atanu Barai, AHA Badawy, G Chennupati, N Santhi, S Eidenbenz*
24	Information Fusion for Acoustic and Visual sensing systems *Robert Selje II, Dr. Liang Sun*
26	Recovery and Microencapsulation of Jujube (Ziziphus jujuba Li) Bioactive Compounds using Cottonseed Meal Protein Isolate as carrier agent *Dante Rojas-Barboza, Shengui Yao; Delia Valles; Stephanie Rougas; Efren Delgado*
28	Trojan (YY Male) Brook Trout as an Eradication Tool of Wild Brook Trout Populations in New Mexico *Ben Armstrong*
30	Analysis of non-native aquatic predators on native anuran richness and intra-population niche variation of an invasive ranid *Lauren A. Samaniego*
32	Slip Rates Along the Santa Susana Fault from Geomorphic Mapping and Cosmogenic Dating, Western Transverse Rages, California *Michael Reed, Reed Burgette, Katherine Scharer, Nathaniel Lipton, Devin McPhillips*