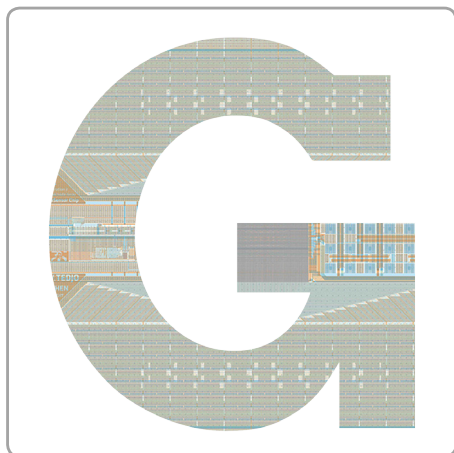


2015

GRADUATE STUDENT SHOWCASE



CELEBRATING RESEARCH AND CREATIVITY
NOVEMBER 11, 2015

Colorado State University

Acknowledgments

Planning Committee

Kirsten Graham

Maeve O'Donnell

Dr. Tammi Vacha-Haase, Associate Dean of the Graduate School

Graduate School Staff

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Thank you for joining us at the Graduate Student Showcase. Special appreciation goes to all of the graduate students who presented, as the Graduate Student Showcase would not have been possible without your willingness to share your creative works and scholarship. An additional thank you to the judges who volunteered for the Graduate Student Showcase. Your time and efforts truly made all the difference in allowing us to recognize and celebrate graduate student excellence here on campus.

ABSTRACTS – ALPHABETIC

PERFORMING ARTS

Performer	Performance Time	Page
Lydia Bechtel	12:10 p.m.	1
Cedar Brant	10:30 a.m.	1
Melissa Hohl	10:20 a.m.	1
Abby Kerstetter	Noon	1
Sam Killmeyer	11:30 a.m.	1
John Mcdonough	11:50 a.m.	1
Lara Mitofsky Neuss	10:10 a.m.	2
Katie Naughton	10:00 a.m.	2
Beth Stoneburner	11:40 a.m.	2

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5.	Nuray Packard	3
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Poster and Visual Arts Presentations by Group

9:30 a.m.-11 a.m. **GREEN**

Poster and Visual Arts Presentations

11 a.m.-12:30 p.m. **GOLD**

Poster and Visual Arts Presentations

Please Note:

Odd numbered abstracts are in the **GREEN** presenting group.

Even numbered abstracts are in the **GOLD** presenting group.

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Sam Killmeyer	11:30 a.m.	1
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Beth Stoneburner	11:40 a.m.	2

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9:30 a.m.-11 a.m. **GREEN**

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11 a.m.-12:30 p.m. **GOLD**

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59.	Ryan Fulgham	11	43.	Gustavo Diaz	9	116.	Chris Kotalik	19
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81.	Ryan Haunfelder	14	113.	Phillip Knabenbauer	19	183.	Kat Sever	29
83.	Ash Heim	15	139.	Amanda Mcguire	23	185.	Nikki Seymour	29
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Performing Arts

12:10-12:20 p.m.

Songs from Letters: Giving Calamity Jane Another Shot at Life

LYDIA BECHTEL

DEPARTMENT: SCHOOL MUSIC, THEATRE,
AND DANCE

Songs from Letters: Calamity Jane to Her Daughter Janey, 1880-1902 is a song cycle by composer Libby Larsen. The letters are surrounded by controversy over their validity because of historical and biographical inconsistencies. Whether the documents are true or not, Larsen's cycle dramatically recounts the story of a mother willing to do anything to provide for her beloved daughter. Through the facts presented I hope to prove that whatever a person might believe about the existence of Calamity Jane's daughter, the drama created in *Songs from Letters* is so realistic it gives one reason to believe she did exist.

10:30-10:40 a.m.

A Life Chart: Border Inventories

CEDAR BRANT

DEPARTMENT: ENGLISH

Both science and poetry are organizational nets that I place over the erratic natural and emotional worlds and begin to track patterns, growth, and unlikely relationships. I explore idea of home in relation to landscape – in small, personal ways, and in an increasingly global way. How does the increasing field of vision necessary to address the global impacts of our politics, consumption, and growth impact our complex sense of home? I seek to work at the intersection of language, science, and imagination to explore these shifts in scope personally, communally, and globally.

10:20-10:30 a.m.

The Other in Mother: A Poetics of Excavation

MELISSA HOHL

DEPARTMENT: ENGLISH

The poems are preoccupied with the idea of the other in mother, and what happens when a letter or a word goes missing (and, by extension, this becomes a meditation on sudden death). To explore the idea of the other in mother, the poems agitate the boundaries between the personal pronouns "I" and "you." To discover what occurs when a letter or word goes missing, the poems excavate the terrain of language to find words within words and make/break connections between meanings. The poems investigate space on the page, asking questions like an archaeologist might, probing the lexicon of space.

Performing Arts Performance Times

Time	Performer	Time	Performer
10:00 a.m.	Katie Naughton	11:40 a.m.	Beth
10:10 a.m.	Lara Mitofsky		Stoneburner
	Neuss	11:50 a.m.	John
10:20 a.m.	Melissa Hohl		Mcdonough
10:30 a.m.	Cedar Brant	Noon	Abby Kerstetter
11:30 a.m.	Sam Killmeyer	12:10 p.m.	Lydia Bechtel

Noon-12:10 p.m.

The Part of the Blood that Troubles

ABBY KERSTETTER

DEPARTMENT: ENGLISH

In 1901, Michael Chabitnoy was sent to the Carlisle Indian School, removed from his Native Alaskan heritage. This practice was common in the early twentieth century but is glossed over in American history, as are the effects of this history on Natives today. As a result of early and brutal contact, much Aleut culture has been lost. This project seeks to redefine history through family, Aleut culture, and myth to address questions of the relationship of culture, place, and the individual. Heavily influenced by research and documentary poetics, this work seeks to provide witness to and understanding of the Aleut.

11:30-11:40 a.m.

Growing out of the Rust Belt

SAM KILLMEYER

DEPARTMENT: ENGLISH

Spoken word performance by an MFA poet partnering with an electric guitarist to explore the question "what is home?" This project grows out of the writer's hometown, Cleveland, Ohio, and seeks to understand our relationship to the rust belt and dying industry. Other collaborations between poets and musicians, such as Allen Ginsberg and Phillip Glass, inspire this creative work.

11:50-Noon

Good Friday: The Outsider in a Contemporary Urban Landscape

JOHN MCDONOUGH

DEPARTMENT: ENGLISH

"Good Friday" is a coming-of-age story for our contemporary world. Centered on a late twenty-something living in a Chicago neighborhood that is not his own, the story takes shape when a friend and coworker of the protagonist is killed in a random act of violence. As the protagonist struggles to deal with his grief and ownership of the tragedy, the story explores themes of isolation, community, privilege, gentrification, complicity, and more.

10:10-10:20 a.m.

**Lone Wolf – Lara Mitofsky Neuss,
Bass Clarinet**

LARA MITOFSKY NEUSS

DEPARTMENT: SCHOOL MUSIC, THEATRE,
AND DANCE

I am the Lone Wolf. On my own and free to share with the students at CSU what it's like to be a fiercely independent and sensitive mammal. Listen as I share with you all that we have in common. I am also Lara Mitofsky Neuss, a graduate clarinet performance major at CSU. I study mindfulness, am certified in Reiki, and I have a strong emotional connection to non-human mammals. Journey with me for a peek inside my world as I show you how I, the Lone Wolf, think, dream, and experience the world that we share.

10:00-10:10 a.m.

Poetry by Katie Naughton

KATIE NAUGHTON

DEPARTMENT: ENGLISH

My poems investigate the limits of the individual and perception, especially of relationship and place. These poems are about intimacy, and what limits us in our relationship with others and our environment. They are concerned with the nature of change and time on these relationships, and with the context of the global climate crisis. The poems enter into an ecocritical and eco-poetic conversation about how to write in the tradition of lyric poetry, with its obsession with the individual, subjective consciousness, in an era of collective human catastrophe. The poems desire to speak into questions of knowledge and action.

11:40-11:50 a.m.

Confessions of a Jew-ish Skeptic

BETH STONEBURNER

DEPARTMENT: ENGLISH

"Confessions of a Jew-ish Skeptic" is a memoir-in-progress about a Jewish convert to Christianity reflecting on what Judaism means to her after a failed attempt at seminary, and after her father died on the eve of Rosh Hashanah, the Jewish New Year, last September. "Confessions" is not a story about finding God, but about what happens when questions threaten to break the faith of your own choosing – and how one seeker chooses to confront questions that don't have easy answers, if any answers at all.

Visual Arts

1 52 Reasons Why to Hire Me

MAGGIE ADAMS

DEPARTMENT: ART AND ART HISTORY

In this competitive world we live in, we have to find a way to stand out, market our strengths, and grab the attention we have worked so hard to get. In my design, I strive to push the limits, think outside the norm, and explore outside the flat dimension. I needed an innovative resume to demonstrate my skills as an “anything but ordinary” graphic designer. My solution was to create a deck of cards showcasing 52 reasons why to hire me. This has gotten me the attention I was looking for from employers.

2 Accumulation of Good Intensions

SONJA ALLEN

DEPARTMENT: ART AND ART HISTORY

My passion lies not only in understanding the world, but in recreating it into something that allows others a new perspective on its worth. I use sculpture as a way of exploring the form and physiology of marine organisms to emphasize their complexity. As an artist invested in the sciences I’m exploring the idea of art and science as two sides to one coin. Artists visually interpret their interactions with the world just as scientists relay their interactions through data. Both are necessary when we look at human existence as something without absolute truths or definitive rules. Both are making sense of an infinite unknown, and together these two ways of thinking aid one another in painting a more cohesive if not definitive picture. I’m focused on creating works of art that question how we as a species respond to nature, and how the decisions we make as a culture shape the future of so many living things.

3 Digitally Printed Portable Prayer Rugs

MARAM ALTILMISANI

DEPARTMENT: DESIGN AND MERCHANDISING

In Islamic culture, it is imperative that prayer is an integral part of each Muslim’s day. To do so, they must utilize a prayer rug as a means of separating themselves from the dirt of the floor while praying towards Mecca. By producing these digitally printed portable prayer rugs, they represent a lessened environmental impact to popular knotted prayer rugs. Conducting future research to explore of how female Muslim consumers might respond to purchasing digitally printed portable prayer rugs, as a strategy to help other low-income Muslim women, could make a contribution to academic literature.

4 The Ascent – Revitalization of the Belden Mine, Gilman, Colorado

RITA MANNA

DEPARTMENT: HORTICULTURE AND
LANDSCAPE ARCHITECTURE

The Ascent is an ecological restoration project which proposes community growth, economic revival, historic preservation, human health and safety, and habitat revival through the rehabilitation of the Eagle Mine EPA Superfund site, located just outside of Vail, Colo.

5 Pulsations

NURAY PACKARD

DEPARTMENT: ART AND ART HISTORY

In my drawings, I combine unfamiliar and familiar geometric forms in spontaneous ways to evoke my cultural identity and memory to explore the relationship with the places I have been seen. In my studies, I researched artists from the last one hundred years. They have shown me the appeal of looking to the past and offerS new contemporary way as a source for inspiration. I am interested in drawing with magic water beads and aroma beads to capture fluid motion and energy, because it allows me to explore various creative materials and techniques to realize my creative vision.

6 RAD Resurgence – Landscape Architecture and Environmental Justice

KLARA ROSSOUW

DEPARTMENT: HORTICULTURE AND
LANDSCAPE ARCHITECTURE

The setting of this project takes place on the banks of the French Broad River in the River Arts District of Asheville, N.C. After careful and extensive research within the realm of sociology and design, a strategy to overcome the brownfield status of the site, flood prevention, and gentrification, was proposed as a conceptual site design. The design of the site upholds the community’s cultural heritage, zoning is proposed in efforts to overcome gentrification, and specific environmental goods are provided for the surrounding community to create a safe and diverse park.

Research, Scholarship, and Entrepreneurship

7 “Kicked Out of Everywhere”: Homeless Persons’ Exclusion from Public Spaces

REUBEN ADDO

DEPARTMENT: SCHOOL OF SOCIAL WORK

The rights of homeless persons to use public spaces have been questioned by community residents and city authorities. Residents and city authorities have excluded the homeless from the use of public spaces – reinforcing the notion of “deserving and undeserving poor.” Using a critical perspective, this study explores how homeless persons perceive the attitudes of community members towards them in public spaces in Fort Collins, Colo. The results show homeless persons describe being excluded from public spaces, through covert and overt means by community members’ attitudes and the actions of city authorities.

8 Genetic Analysis of the Zebrafish Heart Under Altered Blood Flow

NEHA AHUJA

DEPARTMENT: INTERDISCIPLINARY – CELL AND MOLECULAR BIOLOGY

Blood flow is essential for proper heart development; however the mechanism by which blood effects cardiac morphogenesis has yet to be elucidated. Zebrafish are an ideal model organism for studying heart morphogenesis as their optical clarity coupled with the ease of genetic manipulation make them suited for a plethora of experiments. We have developed a variety of ways manipulate blood flow *in vivo*. We utilize quantitative polymerase chain reaction and *in situ* hybridization to assess expression of flow responsive genes at different developmental stages. Our results indicate that altering blood patterns dramatically changes the expression of Kruppel-like transcription factor, *klf2a*.

9 Variations in Flavor Between Different Barley Varieties Using Metabolomics

HARMONIE AKERS

DEPARTMENT: FOOD SCIENCE AND HUMAN NUTRITION

In the beer industry, identifying ingredients that provide distinct flavors and enable brewers to maintain quality control is an important area of research. Here, we used a metabolomics approach to characterize the chemical content of five barley grains and the corresponding malt and beer. Statistical analysis revealed significant variation in the chemical content of the barley grain, malt, and beer. Future work will include integrating non-volatile metabolite and ionic datasets with volatile metabolomic profiles, as well as sensory data collected on each beer. These data support barley as a future target to breed plants for improved flavor and flavor stability in beer.

10 Going Beyond Concordance Lines in ESP Instruction Using Corpora Exploration

ALHASSANE ALI DROUHAMANE

DEPARTMENT: ENGLISH

The use of concordancing in ESP classrooms, especially data-driven learning, is criticized for a number of shortcomings, its emphasis on linguistic forms instead of meaning and interaction, and its bottom-up approach to text processing where truncated concordance lines are examined without considering the overall discourse (Barbiere and Eckardt 2007; Flowerdew, 2009). Hence, I propose to show a technique using more top-down methods, and which includes illustration, interaction, intervention and induction where students examine the wider texts in which the concordance lines occur to overcome some of these shortcomings.

11 Distractive Communication: Effects of Mobile Electronic Devices on Conversation Satisfaction

RYAN ALLRED

DEPARTMENT: COMMUNICATION STUDIES

With the ever advancing presence of mobile electronic devices, this study tests the effects of the presence of mobile electronic devices on conversation satisfaction in one-on-one face-to-face communication. Using Hecht’s satisfaction scale, participants rated their satisfaction after conversations with or without the presence of mobile devices. Results showed no significant relationship between the presence of mobile electronic devices and conversation satisfaction. It is suggested that generational acceptance, increased understanding, and increased entertainment surrounding the use of these devices may have played a role into findings. Future research is suggested to expand understanding of the effects of these devices.

12 Identification of Clathrin and Dynamin in the Porcine Ovary

MEG BACON

DEPARTMENT: BIOMEDICAL SCIENCES

Primordial follicles represent the reproduction potential of a female during her lifetime. Communication mechanisms that occur in primordial follicles causing them to mature or remain quiescent remain elusive. It is possible that primordial follicles use clathrin-mediated endocytosis (CME) as a form of receptor mediated endocytosis for cellular communication. Both the protein clathrin and the GTPase dynamin heavily contribute to the machinery used in this process. Here we use fluorescent immunohistochemistry techniques to identify and locate clathrin and dynamin in the pig ovary. Identifying this mechanism provides the foundation in studies aimed at tissue specific pharmacodelivery.

13 Examining Semantic Relatedness as a Moderator of Indirect Testing Effects

LAUREN BATES

DEPARTMENT: PSYCHOLOGY

The testing effect is an established memory phenomenon that demonstrates that retrieval enhances memory relative to restudying. Testing effects can be both direct and indirect. One example of an indirect effect of testing is retrieval-induced forgetting (RIFO), in which taking a test on information can actually impair recall of related, but nontested information. Recent research has also demonstrated retrieval-induced facilitation (RIFA), the opposite pattern, in which testing on information enhances memory for related but non-tested information. The present study sought to investigate the role of semantic relatedness as a moderator for these indirect testing effects.

14 Translational Evidence for Endoplasmic Reticulum Stress in Endothelial Dysfunction

MICAH BATTSON

DEPARTMENT: FOOD SCIENCE AND
HUMAN NUTRITION

Obesity is a major risk factor for cardiovascular disease, due in part to the development of endothelial dysfunction (ED). While the underlying mechanisms are not fully known, growing evidence suggests that endoplasmic reticulum (ER) stress may be involved in obesity-related ED. Using cultured human endothelial cells (HUVECs) and experimental animals our lab is investigating the contribution of ER stress to obesity-related ED. Treatment with ER stress inducers Tunicamycin and palmitate reduced cell health in HUVECs and endothelial function in isolated mouse arteries. Upcoming experiments will test the efficacy of ER stress inhibitors to improve endothelial function in obese mice.

15 Timing of Superovulation and Embryo Collection in North American Bison

HAYLEY BENHAM

DEPARTMENT: BIOMEDICAL SCIENCES

The goal of this study was to determine the best day to collect embryos after superovulation of bison with brucellosis from Yellowstone National Park. Reproductive tracts were collected from naturally bred females to determine the location of embryos 7 or 8 days after breeding. Determining when embryos enter the uterus post-insemination in this species could improve the success of embryo recovery after superovulation by improving timing of embryo collection. Superovulation coupled with embryo washing can increase the reproductive efficiency of bison providing a mechanism to preserve genetics from Yellowstone bison ultimately increasing the number of genetically valuable offspring without brucellosis.

16 Halloween Gene Expression in the Blackback Land Crab

SAMIHA BENRABAA

DEPARTMENT: BIOLOGY

Molting, a vital physiological process, is necessary for growth and development in all arthropods. Halloween genes are expressed in Y-organs (YO, an endocrine gland) and encodes for P450 enzymes. These enzymes catalyze synthesis of ecdysteroid hormones that regulate molt

cycle. We used insect Halloween genes to extract and characterize the land crab orthologs. This resulted in identification of seven Halloween genes from the land crab YO transcriptome. Sequences were validated by end-point PCR and Sanger sequencing. Using qPCR we will quantify the expression of these genes in different stages of YO.

17 Science Fiction and the STEM Fields

PAUL BINKLEY

DEPARTMENT: ENGLISH

According to the Department of Education, only 16 percent of high school seniors are proficient in mathematics and interested in STEM careers. When the United States is falling behind other countries, educators need to seek out new avenues for engaging students in the STEM fields. "Science Fiction and the STEM Fields" is a pilot study to examine how science fiction can be used to excite students' curiosity and passion for the sciences. The researcher found a particularly strong correlation between students' interest in sci-fi movies and their interest in science and math. This promising result opens new doors for interdisciplinary education.

18 Telehealth: Emerging Opportunities for Occupational Therapy Services in Colorado

ELISE BLANTON-HUBBARD

DEPARTMENT: OCCUPATIONAL THERAPY

Is telehealth a key to providing occupational therapy services to under-served populations and expanding reach in existing client contexts? Research indicates telehealth has promising long-term benefits for a variety of client populations and practice settings but practitioners must consider appropriateness, reimbursement, licensing, and competency when using telehealth in practice. This poster presentation will review current research, examine telehealth's benefits and barriers, and provide a tool-kit for practitioners considering using telehealth in Colorado.

19 Dung Beetle Assemblage Effects on GHG Fluxes from Temperate Grasslands

ALEX BLEVINS

DEPARTMENT: BIOAGRICULTURAL SCIENCE AND
PEST MANAGEMENT

Dung beetles are crucial to grassland biogeochemistry cycles. These insects modify, aerate, and physically move dung. They also impact greenhouse gas (GHG) emissions from dung. However, research focuses on a single species of the genus, *Aphodius*. In this study, I documented the dung beetle assemblage on the Shortgrass Steppe of Colorado, and quantified the impact of dung beetle assemblages on GHG fluxes. A two year study measured GHG emissions from dung pats using semi-static chambers with and without dung beetle activity inside replicated microcosms. Results of this study will show that dung beetles are important constituents of grassland biogeochemistry cycles.

20 New Approaches to Study Ubiquitin, the “Molecular Kiss of Death”

SARAH BOLLINGER

DEPARTMENT: BIOCHEMISTRY AND
MOLECULAR BIOLOGY

The attachment of the protein ubiquitin to other proteins provides a mode of intracellular regulation used in a multitude of essential processes and pathways. Because ubiquitin is needed throughout cells at many different times and locations, the pool of free ubiquitin is highly regulated. We know that too much or too little free ubiquitin is catastrophic for normal cell function, but there is little quantitative information about this system. My work is focused on developing tools that will make possible quantitative measurements of intracellular ubiquitin and its movement through biochemical pathways in order to better understand regulation of ubiquitin-dependent systems.

21 Group Occupational Therapy and Yoga Benefit Adults with Chronic Stroke

RUBY BOLSTER

DEPARTMENT: OCCUPATIONAL THERAPY

Community reintegration and activity constraints significantly improved for people with chronic stroke after an 8-week intervention combining yoga and group occupational therapy focused on fall risk management. Occupational therapists may wish to add yoga and group OT to community or hospital settings to improve similar outcomes.

22 The Consequences of Woodland Reduction for Birds and Small Mammals

SARA BOMBACI

DEPARTMENT: INTERDISCIPLINARY – ECOLOGY

Woodland reduction to improve habitat for certain species is well underway, and novel techniques are increasingly being used. Yet, little is known about the relative effects of novel (e.g. roller-chopping and hydro-axing) or traditional (e.g. chaining) woodland reduction methods on non-targeted wildlife. We experimentally tested the effects of three woodland reduction methods on bird and small mammal use of treatment areas. We found no significant differences in small mammal use among the treatment methods, or between treatments and controls. We found lower use in treatments for some bird species, but found no differences in bird use among the treatment methods.

23 Flavor Profiling of Potato Clones Using HS-SPME/GC-MS and Sensory Analysis

RAVEN BOUGH

DEPARTMENT: HORTICULTURE AND
LANDSCAPE ARCHITECTURE

Flavor components include non-volatile and volatile metabolites. As with most food commodities, overall cooked potato flavor is largely determined by volatiles, which exhibit more complex flavor notes and interactions compared to non-volatiles. In this study, fifteen potato clones were analyzed for flavor. Volatiles were semi-quantified using headspace solid-phase microextraction coupled with gas chromatography-mass spectrometry (HS-SPME/GC-MS). Flavor perceptions were rated independently per clone using a trained sensory panel. The relationship between volatile and sensory analyses was examined using

various modeling procedures. A prediction model for sensory analysis will enable germplasm screening and selection for potato flavor improvement during the breeding process.

24 Alan Hovhaness: An Overlooked American Master Composer

MICHAEL BOWLES

DEPARTMENT: SCHOOL MUSIC, THEATRE,
AND DANCE

As a composer, Alan Hovhaness is an often overlooked contributor to American music. His music explores the depth of the human soul, and brings to light our innermost emotions. In order to bring more of this relatively unknown American master's music to light, ensembles and directors must champion it. Two of his works, Symphony No. 17 for chamber ensemble and Symphony No. 4 for Wind Symphony, will be performed at Colorado State University this academic year. In addition to conducting these two works, Michael Bowles will write a thesis analyzing and justifying these two works as staples in band literature.

25 Ground and LEO-Based GNSS Observations of Common Atmospheric Volume

BRIAN BREITSCH

DEPARTMENT: ELECTRICAL AND COMPUTER
ENGINEERING

The Advent of Low-Cost High-Quality Global Navigation Satellite Systems (GNSS) Receivers Has Brought With It a Proliferation of Their Use for Observing Earth's Atmosphere. The Geometric Circumstance of GNSS Orbits Leads to Two Principle Perspectives – From the Ground and From LEO (Low Earth Orbiting) Satellites – for Their Use in Making Atmospheric Observations. This Work Examines the Observation Volumes of These Two Receiver Platforms and Presents Results On the Spatial and Temporal Occurrence Distribution for Their Observations of a Common Volume.

26 Medieval Women Writers: Unknown Authorship as Female

LINDSAY BROOKSHIER

DEPARTMENT: ENGLISH

The purpose of the research is to find a presence of pre-era feminist discourse in a sampling of unknown authors during the middle ages. The procedure involved a textual and feminist analysis of the works: Judith, The Wife's Lament, and The Mabinogion. Specifically, the presence of a female voice reflected in the narrative that conveys aspects of female life such as marriage, motherhood, and sexuality. The research forms the argument that the unknown texts were not only authored by women but that they each showcase a variance of discourse that can connect to contemporary feminist ideologies.

27 The West Fork Fire and Spruce Beetle Severity

AMANDA CARLSON

DEPARTMENT: INTERDISCIPLINARY – ECOLOGY

The unprecedented extent and severity of bark beetle outbreak in the spruce forest of Colorado's San Juan Mountains have raised many concerns about long-lasting ecological impacts. It has been speculated that one of the most significant impacts may be an elevated risk for severe fires, though research has not shown a conclusive link between bark beetle death and fire. We examined this link for the 2013 West Fork Complex fire, using Landsat imagery to assess pre-fire severity of bark beetle outbreaks. We found a statistically significant link between our severity metric and measures of burn severity.

28 Improved Body Composition and Health-Related Attitudes: A 6-Week Lifestyle Intervention

SHELBY CHANDLER

DEPARTMENT: FOOD SCIENCE AND
HUMAN NUTRITION

Obesity has a negative impact on health care costs, social stigmas and health risks for those burdened by this disease. Due to a rise in obesity in the United States, a major need has been expressed for programs that promote weight loss and improve the health of these individuals over the long term. Delivery of a strong nutrition education curriculum in a setting that provides social support can encourage successful behavior change for these individuals to lose weight and maintain a healthy lifestyle moving forward.

29 Russian Wheat Aphid Biotypic Diversity in Colorado Natural Environments

MARIANA CHAPELA

DEPARTMENT: BIOAGRICULTURAL SCIENCE AND
PEST MANAGEMENT

The objective of this study was to compare the biotypic diversity of Russian wheat aphid in northern Colorado montane and prairie environments. The biotypic diversity of Russian wheat aphid present on crested wheatgrass, intermediate wheatgrass, slender wheatgrass, western wheatgrass and foxtail barley was compared in montane and prairie environments using plant differentials (wheat and barley lines) currently of interest to the Colorado State University wheat breeding program. Our overarching goal was to determine if noncultivated grass hosts in montane environments are a potential source of the biotypic diversity of Russian wheat aphid affecting wheat production in eastern Colorado.

30 Lentiviral Vector Mobilization for Treatment of HIV in Humanized Mice

PAIGE CHARLINS

DEPARTMENT: INTERDISCIPLINARY – CELL AND
MOLECULAR BIOLOGY

Gene therapy is one of the greatest advancements utilizing lentiviruses. Unique to lentiviruses, they are able to stably integrate their genetic material into the hosts' genome. This gives rise to the ability to artificially deliver therapeutic constructs, such as siRNA, into patients' cells via lentiviruses, known as lentiviral vectors. When HIV positive cells are

treated with such a vector, the therapeutic construct is able to exploit HIV's packaging system, replace the virulent genome, and produce a mature vector capable of infecting and treating or preventing infection. We are using this novel approach for treatment of HIV infection in humanized mice.

31 Dengue Virus Infection Induced Lipids Alteration in the Mosquito Midgut

NUNYA CHOTIWAN

DEPARTMENT: MICROBIOLOGY, IMMUNOLGY
AND PATHOLOGY

Dengue viruses (DENV) are obligate intracellular parasites that rely on host resources for replication. They induce alterations in the metabolic repertoire in human and mosquito cells. However, the impact of viral infection on the metabolism of the primary vector, *Aedes aegypti*, is unknown. We have explored global metabolic changes in the midgut of this vector upon DENV infection. We have found significant fluctuations in the lipid repertoire including changes in lipids that function as membrane building blocks, bioactive messengers, energy storage molecules and intermediates in lipid metabolic pathways. These findings will be discussed in the context of infection and intervention.

32 Mentor the Garden Mentor: a Gardening Curriculum for Marginalized Populations

MONICA CLARK

DEPARTMENT: ETHNIC STUDIES

Growing vegetables, fruits, herbs and flowers is enjoying a renaissance. We want to eat fresh food because it tastes good and it is good for us. Not everyone has the same access to fresh food, or the means to grow it. Often the people who need to eat better are excluded from the fresh food conversation inadvertently or deliberately. This project and gardening curriculum are based on that premise. The Mentor the Garden Mentor Gardening curriculum is designed to close the gaps that marginalized people experience and teach them how to build a garden and grow food.

33 The Food Corridor: The AirBnB of Commercial Kitchen Space

ASHLEY COLPAART

DEPARTMENT: FOOD SCIENCE AND
HUMAN NUTRITION

THE FOOD CORRIDOR is the first online marketplace for food entrepreneurs to find commercial kitchen space. Food entrepreneurs can find and book commercial kitchens, commissaries, processing, co-packing and food storage spaces. Commercial kitchen owners can more effectively utilize their assets, providing additional revenue streams to schools, food banks, churches, restaurants and more. THE FOOD CORRIDOR provides online booking, payment processing, disbursement, and reviews within a seamless, efficient marketplace.

34 Age and Depositional History of the Jurassic Agardhfjellet Formation, Svalbard

MARISA CONNORS

DEPARTMENT: GEOSCIENCES

Rhenium-Osmium (Re-Os) radiometric ages for the Upper Jurassic Agardhfjellet Formation are used to make regional correlations with previously studied correlative source rocks within the North, Norwegian, and Barents Seas. Ages were determined from core segments of organic-rich shales in the Agardhfjellet Formation from two CO₂ sequestration wells drilled near Longyearbyen, Svalbard. Four core segments yield ages with large uncertainties, indicating possible syn- and/or post-depositional interferences in the Re-Os system. Additional information from CT scans, optical microscopy, as well as hydrocarbon, trace element, and stable isotope analyses will help identify the possible sources of uncertainties leading to the imprecise ages.

35 Stimulation of Chromosomal Rearrangements by Ribonucleotides

HAILEY CONOVER

DEPARTMENT: INTERDISCIPLINARY – CELL AND MOLECULAR BIOLOGY

We show that loss of RNaseH2 activity increases loss of heterozygosity (LOH) in *Saccharomyces cerevisiae* diploids harboring mutant DNA polymerase ϵ that increases ribonucleotide incorporation. This led us to analyze the effects of loss of RNaseH2 on LOH and non-allelic homologous recombination in mutant diploids with deletions in genes encoding RNaseH2, topoisomerase 1, and/or mutant DNA polymerases. We found an asymmetric, TOP1 dependent elevation in LOH between strains with mutant polymerase ϵ and mutant polymerases ϵ or δ . These data add to recent reports on asymmetric mutagenicity of ribonucleotides caused by topoisomerase 1 processing of ribonucleotides incorporated during DNA replication.

36 An Electrophysiological Study of Auditory-Motor Entrainment

JEWEL CRASTA

DEPARTMENT: OCCUPATIONAL THERAPY

Neurophysiological research has shown that the auditory and motor system interact during movement to rhythmic auditory stimuli, through the process called entrainment. This study used electroencephalography to explore the neural mechanisms underlying auditory-motor entrainment. Twenty participants were randomly assigned to an auditory only task or a motor only task, followed by a combined task. For the combined task, time-frequency analysis indicated better synchronization of motor responses for the auditory first group compared to the motor first group indicating different neural patterns based on prior group exposure. Results provide support for the use of repetitive rhythmic auditory signals in therapeutic interventions.

37 Effects of Metal Contamination and Sediment on Benthic Invertebrate Colonization

BRITTANIE DABNEY

DEPARTMENT: FISH/WILDLIFE/CONSERVATION BIOLOGY

The combined effects of sediment deposition and metal contamination can pose serious risks to aquatic ecosystems, particularly in mountainous regions. This research examined the effects of metal contamination and sediment infiltration on benthic invertebrate colonization at the North Fork of Clear Creek (NFCC), a U.S. EPA Superfund site in Black Hawk, Colorado, USA. In addition to the presence or absence of metal-contaminated sediment, results were interpreted using grain size, organic matter, and species traits. Our results indicate a need to focus on interpreting other abiotic variables and species traits when estimating stream recovery.

38 Novel in Vitro Assessments of Prion Disease Species Barriers

KRISTEN DAVENPORT

DEPARTMENT: MICROBIOLOGY, IMMUNOLGY AND PATHOLOGY

Prion diseases are unique among protein misfolding disorders in their transmissibility within and between species, but the mechanisms that dictate cross-species transmissibility are poorly understood. Here, we show that prions derived from infections with bovine spongiform encephalopathy (BSE, mad cow disease) have similar species-crossing characteristics, while prions derived from chronic wasting disease (CWD) infections are more likely to adapt to the new host and not maintain the original CWD characteristics. Because these experiments rely on protein-protein interactions, these results support the critical role for prion structure in determining the propensity for cross-species prion transmission.

39 Corpora and Semantic Change of French Loanwords in English

LESLIE DAVIS

DEPARTMENT: ENGLISH

This paper explores four French loanwords in English to understand how the semantics (meaning) of those words change with time compared to words with Anglo-Saxon origins. I chose four French-origin words that have a long history of use in English: appeal, reflect, chair, and beauty. Two control words of Anglo-Saxon origin were chosen for comparison. Using the Helsinki corpus (730CE-1710CE) and the Corpus of Historical American English (1800CE-2009CE), I discovered that corpora give evidence of several types of semantic change, but the comparison between French and Anglo-Saxon origin words was not conclusive.

40 Realities and Resilience – Undocumented Life in Fort Collins Colorado

NIGEL DAWSON

DEPARTMENT: ANTHROPOLOGY

I am curious as to how under served and undocumented people navigate the complex institutional and governmental domains requisite for attaining social assistance. Through my research at The Family Center I explored the tangled web of available social services in the city of Fort Collins. I interviewed front line workers to gain their perspective on the internal contradictions inherent in providing social services to people legally marginalized by their immigration status. By doing so I discovered both inspiring solutions and frustrating complications inherent in the local systems of social assistance.

41 Characterizing Beef Rib Products Resulting from an Alternative Carcass Break

TALITA DE PAULA E MANCILHA

DEPARTMENT: ANIMAL SCIENCES

Beef industry is interested in separating the rib and chuck between the 4th and 5th rib which would ultimately result in additional weight and value to the “rib” primal. This study was aimed at further investigating the impacts of separating the rib between the 4th and 5th rib versus the 5th and 6th ribs. Carcasses were selected and fabricated into either an 8-rib rib or a traditional 7-rib rib. Analyses were done and we concluded that tenderness was not affected by fabrication style and, regardless of muscle size and proportion at any given steak, it is similar for all muscles.

42 Benefits of Interleaving versus Blocking Study: A Meta-Analytic Review

SARAH DELOZIER

DEPARTMENT: PSYCHOLOGY

Alternating one's study between two or more types of to-be-learned information, or interleaving, is a problem frequently faced by students (i.e., students are likely to have more than one type of information to learn at any given time). However, there is not yet a consensus on whether an interleaved schedule of study benefits memory performance. The present study uses meta-analysis to examine the effects of interleaved versus massed (i.e., “crammed”) schedules of study on memory performance. Results provide evidence for the effectiveness of interleaving as a schedule of study, and the influence of moderators are discussed.

43 Protein Dynamics in Exosomes from Mycobacterium Tuberculosis Infected Patients

GUSTAVO DIAZ

DEPARTMENT: MICROBIOLOGY, IMMUNOLGY AND PATHOLOGY

Currently, 2.5 billion people are latently infected with Mycobacterium tuberculosis (Mtb). A major obstacle to control Tuberculosis (TB) is the lack of disease biomarkers. Our aim was to identify a set of exosomal proteins that could be used as a bio-signature of treatment response. Exosomes from sera of TB patients were analyzed during 57 days of treatment. Protein abundances were identified by Liquid

Chromatography/Tandem Mass Spectrometry and Tandem Mass Tag® for quantitation. Eight human proteins significantly decreased after treatment. The Mtb protein Mce2B was present during 57 days of treatment and could represent a marker for latent TB.

44 Effect of Precipitation of Asphaltenes on Re-Os Isotopic Ratios

JENNA DIMARZIO

DEPARTMENT: GEOSCIENCES

Knowledge of how Re and Os in crude oil are fractionated during petroleum system processes is essential to the interpretation of oil Re-Os isochrons. Asphaltenes, precipitated from a crude oil, were divided by polarity into sub-fractions, which were then analyzed for their Re and Os contents. The results show that Re-Os concentrations and Os isotopic ratios first increase, then decrease with each successive sub-fraction, while Re/Os isotopic ratios increase from about 5000 to 7000. This suggests that the natural precipitation of asphaltenes may significantly change the Re/Os isotopic ratios of the remaining bulk asphaltenes, or even reset the geochronometer.

45 Crowdsourcing Water Management through Video Gaming

ANDRE DOZIER

DEPARTMENT: CIVIL AND ENVIRONMENTAL ENGINEERING

Water management is becoming a more challenging task as the gap between supply and demand of fresh water resources grows in arid and semi-arid places due to population growth and projected higher temperatures. This project aims to improve beneficial use and reuse of water through sustainable and equitable adaptation strategies generated by video gamers. Not only does the project benefit from a crowdsourcing mechanism to brainstorm new sets of solutions to adapt to an uncertain future, but also helps to spread awareness and understanding of broader water management issues, supporting collective action.

46 Ramming of Bighorn Sheep: How do Rams Avoid Brain Injury?

AARON DRAKE

DEPARTMENT: MECHANICAL ENGINEERING

In order to obtain mating privileges, male bighorn sheep (rams) undergo massive impact loads to the head during ramming. Aside from being stunned momentarily, the rams suffer no ill effects from the impact. In humans, concussions are the most common traumatic brain injury with 4 to 5 million occurring annually. These facts provide sufficient motivation to study the materials and structures of ram skulls and horns. Computer models (FEA) of a bighorn sheep skull were developed to investigate mechanisms of energy dissipation and acceleration mitigation during impact. Dynamic response experiments (modal analysis) were performed to study vibrations in the horn.

47 Towards Laser Ignition by Rapid Heating of Water Vapor

CIPRIAN DUMITRACHE

DEPARTMENT: MECHANICAL ENGINEERING

We discuss a novel approach to laser ignition based on rapid heating of water vapor (in air) with a pulsed infrared (NIR) laser source at ~2.6-2.7 microns. Laser energy is absorbed by water vibrational modes that quickly transfer the energy to translational modes leading to temperature increase. If the laser absorption can produce a hot-spot of size of one cubic millimeter and a temperature of ~2000 K the approach would allow ignition of many fuel-air mixtures. The main goal of the project is to improve combustion efficiency by reducing CO and NOx emissions and increase engine performance.

48 Individual Personality Differences in Adjustment to Retirement

RACHEL EBY

DEPARTMENT: PSYCHOLOGY

Personality has been shown to influence the quality of adjustment in many areas of life (e.g., adjustment to unfamiliar work and cultural environments). Little research has assessed the impact of individual differences in longitudinal analyses of retirement adjustment. The current study proposes that individual differences will predict adjustment to retirement mediated by resources (such as income, education, and coupleness). Latent Growth Curve Mixture Modeling will be used to analyze the impact of individual differences on patterns of adjustment over time in this longitudinal, nationally representative data from the Health and Retirement Study.

49 Isolation and Characterization of Primordial Follicles from Canine Ovarian Tissue

KATHLEEN EDDY

DEPARTMENT: BIOMEDICAL SCIENCES

Seventy-five percent of the world dog population is feral, increasing disease transmission, livestock predation, and bite injuries. In areas of limited resources, population control has been limited to lethal culls. Current non-surgical sterilization options have limited efficacy, requiring supplemental applications; a single, permanent option is lacking. Finite ovarian primordial follicle stores represent an individual's total reproductive potential; depletion would result in permanent sterility. Our objectives are to maintain isolated canine primordial follicles in culture and determine protein expression before and after treatment with ovotoxins. The overall aim is to identify novel ovotoxic compounds that will target and destroy primordial follicles.

50 Mitochondrial Biogenesis in Response to Exercise or Hydrogen Peroxide Treatment

SARAH EHRLICHER

DEPARTMENT: HEALTH AND EXERCISE SCIENCE

Beneficial adaptations to exercise including mitochondrial biogenesis may occur, in part, through redox signaling. We hypothesized that, compared to vitamin C (VitC), treatment with the Nrf2 activator Protandim (Pro) would not blunt mitochondrial adaptations to exercise in vivo, or H2O2 treatment in vitro. Deuterium oxide labeling

was used to measure mitochondrial protein synthesis (mPS). In vivo, skeletal muscle mPS was significantly greater in high volume runners compared to sedentary controls. This increase in mPS was blunted by VitC but not by Pro. When mPS was assessed in vitro during H2O2 treatment, Pro decreased mPS while VitC had no effect.

51 Are There Predictable Differences in How Plants Defend their Leaves?

STACY ENDRISS

DEPARTMENT: INTERDISCIPLINARY – ECOLOGY

Plants form the base of most food webs, and insect pests consume more plant tissue than all other animals combined. Thus, understanding how plants defend themselves against the insects that eat them is crucial to maintaining food production and important ecosystem services. Differences between how plants defend young and old leaves could be: (1) due to how plants grow (i.e., simple fact of plant physiology), or (2) an adaptation to protect against pests. I used populations of plants that have evolved under either low or high levels of insect attack to test the relative importance of these two alternate explanations.

52 Collaborative Disaster Research: Applied Social Science in Northern Colorado

TREVOR EVEN

DEPARTMENT: ANTHROPOLOGY

This poster presents the results of two years of multi-disciplinary research on disaster recovery in Northern Colorado, where multiple, overlapping disaster processes have given rise to dynamic community networks for collaborative disaster recovery and the fostering of community resilience. It will outline projects developed in concert with organizations and officials engaged in area disaster recovery, highlighting the complexity of both contemporary policy environments and the multi-dimensional nature of disaster risk. Further, it presents points for improvement in the practice of participatory, action-oriented social science research, and more broadly, the engagement of scholars in issues of community concern.

53 A High-Density Electrode Array for Chemical and Biological Imaging

RACHEL FEENY

DEPARTMENT: CHEMISTRY

A high-density electrode array has been generated to provide complementary chemical gradient imaging capabilities. The ability to image the chemistry occurring at the surface of live tissue can elucidate how chemical gradients drive biological processes, providing insight on disease progression, such as cancer metastasis. Imaging techniques employed require high spatiotemporal resolution and a large library of target molecules. In this work, individual, closely packed electrodes act as "pixels" in the resulting electrochemical image. Model neurotransmitters have been monitored to exhibit imaging capabilities. The system interfaces with a microscope to simultaneously image biological systems using multiple techniques, maximizing the information obtained.

54 Structural Identification of Novel Polyamine Metabolite Associated with Tuberculosis

BRYNA FITZGERALD

DEPARTMENT: MICROBIOLOGY, IMMUNOLGY AND PATHOLOGY

A major impediment to metabolomics-based biomarker discovery is that approximately 50% of detectable products do not match structures in existing databases. Recently, six urine-based metabolites, that lacked structural identification, were shown to accurately classify tuberculosis patients before and after 1 month of therapy. One metabolite with the accurate mass of 202.1326 Da was targeted for structural identification. Using a combination of tandem-mass spectrometry based partial structural prediction and enzyme catalyzed synthesis this product was identified as N-acetylispotureanine, a previously uncharacterized but proposed terminal catabolite of polyamine metabolism. These data indicate dysregulation of polyamine metabolism as a metabolic outcome of tuberculosis.

55 Development of a Fecal Matter Combustion System

MAX FLAGGE

DEPARTMENT: MECHANICAL ENGINEERING

CSU is working with Research Triangle Institute on the reinvent the toilet challenge (RTTC) to develop a fecal matter combustion system. The proposed system will dry, pelletize and combust fecal matter from a community bathroom in a net zero energy consumption process. This technology has the potential to reduce disease by improving sanitation in rural villages that lack modern plumbing.

56 Comprehensive Modeling of Halogen Bonds for Drug and Protein Design

MELISSA FORD

DEPARTMENT: BIOCHEMISTRY AND MOLECULAR BIOLOGY

Recently, there has been a resurgence of the significance of halogens in biological contexts; particularly in pharmaceuticals halogens provide many beneficial properties. Computational design of biological systems must be both accurate and time-efficient, yet current programs cannot satisfy both of these criteria for halogens. We have developed and parameterized an empirical force field for biological halogen bonds (ff-BXB) that correlates very well with the energies found experimentally. In the proposed research, the ffBXB will be implemented into a design program, creating the first force field to accurately predict halogen bond energies without the need for time-consuming calculations.

57 Efficient Discrete Stochastic Analyses of Single-Cell Gene Regulation

ZACH FOX

DEPARTMENT: INTERDISCIPLINARY – BIOENGINEERING

Emerging biological experimental techniques are generating unprecedented amounts of quantitative data. Unfortunately, the quality of this new high resolution data does not guarantee a meaningful analysis of this data. In fact, experimental capabilities have far out-paced our ability to analyze and draw meaningful conclusions about the information

they generate, particularly at a single-cell, single-molecule level. Cell to cell fluctuations, while difficult to analyze, are paramount to understanding, predicting, and eventually controlling gene expression. By developing new data-driven theoretical and computational tools, we are able to analyze these data with order-of-magnitude increases in efficiency.

58 Does Ischemic Preconditioning Improve Blood Glucose Tolerance?

SIMON FREDERICKS

DEPARTMENT: HEALTH AND EXERCISE SCIENCE

Type II diabetes is characterized by impaired glucose regulation. The current investigation was to determine the influence of ischemic preconditioning (IP: 40-minute, repeated blood flow occlusion) on glucose regulation. On two separate occasions, seven overweight/obese adults ingested 75g of dextrose in 300ml of water; blood glucose concentrations were measured over 180 minutes. One visit began with IP, the other by CON. Area under the glucose curve was 4% lower in the IP condition compared to CON indicating improved glucose regulation. These preliminary data suggest ischemic preconditioning does improve blood glucose control in overweight and obese adults.

59 A Novel Measurement for Biosphere-Atmosphere Exchange of Gaseous Organics

RYAN FULGHAM

DEPARTMENT: CHEMISTRY

Gaseous organic compounds are removed from the atmosphere by dry deposition, direct uptake by the biosphere. Dry deposition is estimated to remove as much as 60% of organic carbon from the atmosphere, but estimates are highly uncertain. This exacerbates uncertainty in atmospheric models used for policy-making. Recent developments in chemical ionization mass spectrometry (CIMS) enable the fast and sensitive detection of hundreds of gaseous organics with high resolution. Acetate reagent CIMS measurements will demonstrate that this system is fast and sensitive enough to measure dry deposition of gaseous organics.

60 Multimodal Literacy for Multiple Literacies: Monsignor Oscar Romero's Successful Rhetoric

DARCY GABRIEL

DEPARTMENT: ENGLISH

Through an analysis of Monsignor Oscar Romero's homilies, audio diaries, and pastoral letters, I examine the effectiveness of Romero's rhetoric. The multiple types of surviving documents attest to the multimodal character of Romero's rhetorical position as archbishop and revolutionary figure. Considering the various types of literacy in El Salvador, Romero's multimodal approach allowed the majority of Salvadorans to access his message. Because of Romero's demonstrated understanding of multiple literacies, his call for peace resonated widely. Romero's success with multimodal approaches to literacies encourages further investigation into the effects of multimodal rhetoric beyond the purely technological.

61 Representations of Henry VIII on Screen

AFRICA GARCIA FARINA

DEPARTMENT: FOREIGN LANGUAGES AND LITERATURE

As historical films and series become more popular it is noticeable how certain figures and periods are more recurrent than others. The English king Henry Tudor and his polemical life have inspired more than a hundred representations in which his figure changes according to the historical moment in which they were filmed. In my essay, differences and similitudes are analyzed in *The Private Life of Henry VIII* (1933), *The Six Wives of Henry VIII* (1970), and *The Tudors* (2007-10) to discover that he can be represented as a childish king or as a tyrannical person depending on the depiction.

62 Insecticycle: We Upcycle Organic Waste into Animal Feed

JOHN GARVEY

DEPARTMENT: COLLEGE OF BUSINESS

Insecticycle is pioneering in an insect driven recycling process that converts organic waste into animal feed. Our mission is to divert a problematic waste stream from the landfill and produce a robust alternative protein source. Black soldier fly (BSF) larvae are harvested as they approach maturity, becoming a palatable, safe, and nutritious product which can be used as a component in animal feed or a stand-alone food source. This process will also mitigate price fluctuations that characterize commercial animal feed and curb methane emissions. Insecticycle is founded upon our vision of a sustainable, closed-loop food production system.

63 Recognition of DNA Lesions by the Archaeal RNA Polymerase

ALEXANDRA GEHRING

DEPARTMENT: BIOCHEMISTRY AND MOLECULAR BIOLOGY

DNA lesions are known to halt transcription in bacteria and eukaryotes. Blocking the progression of the transcription complex can be detrimental to cells, primarily by leading to double stranded breaks, and is known to cause diseases in humans. The archaeal RNAP has a strong sequence and structural homology to eukaryotic Pol II. We are able to apply our understanding of the archaeal system to the eukaryotic system. Using an in vitro transcription system from the archaeal organism *Thermococcus kodakarensis*, we demonstrated that the archaeal RNAP is sensitive to DNA lesions.

64 Enhanced Oil Recover: Increasing Petroleum Recovery by Modifying Surface Chemistry

CHASE GEROLD

DEPARTMENT: CHEMISTRY

Because of petroleum's ubiquitous usage, it is unfortunate that current petroleum recovery techniques are inefficient resulting in a significant amount of original petroleum left in reservoirs. To increase the efficiency of petroleum recovery, Enhanced Oil Recovery (EOR) techniques must be employed. EOR relies on modifying the surface chemistry of oil reservoirs to increase production and can be done by carefully controlling the presence of ionic salts and naturally occurring surfactants.

Salts and surfactants change the interaction that petroleum has with the surrounding reservoir rock environment resulting in the petroleum's ability, or inability, to be displaced and recovered.

65 Bégué Coco: A Senegalese Coconut Social Enterprise

EMMA GILOTH

DEPARTMENT: COLLEGE OF BUSINESS

Bégué Coco is a social enterprise started in Dakar, Senegal to promote environmental sustainability, healthy living and economic development through production and retail of coconut products. Started in 2014, in its first year Bégué Coco produced a variety of food, drink, cosmetic and ecological coconut products to build the market for all natural "Made in Africa" products. Bégué Coco now specializes in virgin coconut oil through its cosmetic line Nayi. It is building a coconut plantation to control supply and promote agro-forestry. Using a triple bottom line analysis, Bégué Coco is leading the way for young social entrepreneurs in Senegal.

66 Resilience to Poaching in Female African Elephant Social Networks

SHIFRA GOLDENBERG

DEPARTMENT: INTERDISCIPLINARY – ECOLOGY

Understanding of resilience to perturbation in natural networks is lacking. Ivory poaching of older elephants mirrors theoretical removals of highly connected nodes in complex networks. Here we show that the hierarchical bonding and the presence of social hubs characteristic of elephant society were conserved despite ~70% population turnover. Social positions of daughters after poaching were predicted by those of their mothers in years prior and were actively built using their mothers' social context. Our study provides a bridge between network theory and an evolved system, demonstrating redundancy as the mechanism by which this socially advanced species is resilient to perturbation.

67 Social Networking Harassment, Electronic Threats, and the Association with Delinquency

IAN GREENWOOD

DEPARTMENT: SOCIOLOGY

Cyberbullying is a serious form of victimization that exposes juveniles to a variety of harassment, ridicule, and stalking behaviors. Modern technology allows adolescents to engage in peer group activities virtually, which removes the physical constraints that govern face-to-face interactions. Evaluating the 2013 School Crime Supplement of the National Crime Victimization Survey, varying forms of cyberbullying are tested as significant predictors of delinquency. While controlling for known correlates, including face-to-face bullying, the results display that harassment via social media is a significant predictor of truancy, beyond direct electronic threats.

68 Plant Drought Tolerance Predicts Grassland Sensitivity to Extreme Drought

ROBERT GRIFFIN-NOLAN

DEPARTMENT: INTERDISCIPLINARY – ECOLOGY

Climate change models forecast an increase in drought severity and frequency globally. Grassland ecosystems, which constitute 40% of Earth's terrestrial surface and provide valuable services such as carbon storage, soil stabilization, and forage production, are particularly sensitive to drought given that most are water limited systems. This sensitivity can vary twofold across different grassland types from desert grasslands to tallgrass prairies. I propose a method for explaining ecosystem level drought sensitivity using the drought tolerance traits of several dominant grass species in 6 different US grasslands.

69 Can Ischemic Preconditioning Protect Against Hypoxia Mediated Glucose Intolerance?

NATE GRIMM

DEPARTMENT: HEALTH AND EXERCISE SCIENCES

Poor regulation of blood sugar is a hallmark of type II diabetes. Intermittent blood flow occlusion to limbs, ischemic preconditioning (IP), may help with glucose regulation. Blood glucose was measured in 5 adults over 120min following ingestion of 75g of glucose mixed in 300ml of water in three randomly ordered conditions (normoxia, hypoxia, and hypoxia+IP). Preliminary data, although not statistically significant, suggest that compared with normoxia, hypoxia decreased glucose tolerance, while IP was able to normalize glucose tolerance.

70 Evolution of Female Social Roles in Native Hawaiian Society

HAILEY GROO

DEPARTMENT: HISTORY

In the nineteenth century, the traditional female Hawaiian social position was wildly transformed due to the arrival of Western men in the area. Examination of primary sources from the period revealed that the larger role of women in both Hawaiian social classes was an essential contributing factor to the modification and eventual dissolution of the native power structure. History is most often told through a male lens, but this research reveals that the drastic cultural change during the nineteenth century was a product of female actions.

71 An Efficient Transmitter for Bio-medical Telemetry in 401-406 MHz Band

ABHIRAM REDDY GUNDLA

DEPARTMENT: ELECTRICAL AND COMPUTER ENGINEERING

With the increasing applications of biointegrated telemetric systems, there is growing demand for wireless transceivers for these systems to interface to the outside world. This project proposes a multichannel transmitter in the Device Radio Communications Service (Med radio) band at 401-406 MHz. The transmitter consists of a multichannel Phase Locked Loop (PLL). The power consumption of the transmitter is 420 μ W at 1.2 V, and consumes only 7 nJ of energy for every bit transmitted. The overall global efficiency of the transmitter is 17.2 percent. The proposed transmitter meets all the federal communications commission (FCC) requirements for the MedRadio band.

72 The Archaeology of Small-Scale Slavery in Antebellum Missouri

JIM HAAS

DEPARTMENT: ANTHROPOLOGY

Historian David Davis called the unacknowledged sacrifice and labor of African slaves "the dark underbelly of the American Dream". However, the conditions of slavery and levels of agency achieved by slaves varied, depending on region and tacit negotiations between owners and slaves. How were these circumstances manifested in the material lives of African slaves? Small-scale slavery in the Upper South presumably affected the material lives of slaves differently than it did their owners, despite some commonalities. This hypothesis will be evaluated by assessing the qualitative and quantitative differences in artifacts and features found in slave-occupied versus owner-occupied sites in Missouri.

73 Students Strategies for Dealing with Misunderstandings in the Classroom

KATHLEEN HAMEL

DEPARTMENT: ENGLISH

The presenter will discuss the strategies students use in dealing with misunderstandings in the classroom. Specifically addressing if these misunderstandings are culturally-based and their implications from a pedagogical perspective. These implications are based upon a study done at a university which surveyed L1 English, Chinese, and Arabic speakers which targeted question types and contexts that were used.

74 Hop Phytoestrogens to Prevent Gut Dysbiosis Due to Estrogen Loss

ALI HAMM

DEPARTMENT: FOOD SCIENCE AND HUMAN NUTRITION

The microbial composition of our gut has been associated with several diseases including inflammatory diseases. Little research has linked gut microflora with menopause. Using an ovariectomized mouse model, we measured changes in gut microbial community structure, microbial metabolites, and several health parameters, in response to synthetic estradiol or hop extract supplementation. Preliminary findings show that loss of estrogen alone alters major phyla in the gut microbiota. Estrogen and hop extract supplementation mediates this dysbiosis, and protects against liver triglyceride accumulation. Such findings so far infer there's an important gut component with loss of estrogen.

75 Effects of Snow Persistence on Streamflow Generation in Mountain Regions

JOHN HAMMOND

DEPARTMENT: GEOSCIENCES

In mountain regions, both snowpack trend analyses and modeling studies suggest that streamflow generation is sensitive to loss of snow, yet we still lack understanding of where the most snow-sensitive regions are located. Snow persistence (SP), defined as the fraction of year that an area is snow-covered, is a useful variable for identifying snow-sensitive regions because it is easily observed globally using remote sensing. We used the MODSCAG fractional snow cover product and 68 USGS reference catchments across five mountainous regions of the Western U.S. to compute annual and mean annual SP and discharge for water years 2000 to 2011.

76 Novel Computational Approaches to Modeling Macromolecular Diffusion Within Nanoporous Materials

LUKE HARTJE

DEPARTMENT: BIOCHEMISTRY AND
MOLECULAR BIOLOGY

We demonstrate a novel computational modeling technique for simulating macromolecular diffusion within nanoporous materials. Our approach consists of implementing Fourier-correlation docking algorithms to efficiently calculate discrete guest-scaffold interaction potentials. We combine these potential energy scores with Brownian dynamics derived kinetic transition probabilities in the form of a weighted Markov state model. The weighted Markov state model represents both potential energies of interaction and kinetic energies of diffusive particle transitions in a statistical framework. This is a novel approach to modeling diffusion within confined spaces and may provide a new way of statistically representing dynamic macromolecular systems for alternative analytical insights.

77 Compressibility of Mine Tailings Amended with Fly Ash

MOHAMMAD REZA HASSANZADEH GORAKHKI

DEPARTMENT: CIVIL AND ENVIRONMENTAL
ENGINEERING

The objective of this study was to evaluate the re-use of mine waste (i.e., tailings) and power plants waste (fly ash) mixtures in earth work construction applications. This study had three objectives: (1) evaluate the effects of fly ash type on compressibility of fine-grained tailings amended with fly ash; (2) evaluate the effect of fly ash content on the compressibility behavior of tailings-fly ash mixtures; and (3) evaluate the effect of curing time on the compressibility behavior of tailings-fly ash mixtures.

78 An Agent-Based Approach: Simulating Ancient Human Dispersals in Pleistocene Eurasia

EMMA HATCHER

DEPARTMENT: ANTHROPOLOGY

Ancient human (hominin) dispersal patterns during the late Pleistocene provide information about the variables that define the preferred human niche. Site locations in extreme environments also provide valuable insight into human cultural adaptations. Such archaeological sites exist in Central Asia, indicating sites which serve as both glacial refugium and interglacial source population sites for hominins. Here, agent-based modeling is used to simulate climate-constrained migration, using these unique sites as starting points. This preliminary agent-based model generates migration patterns consistent with datasets such as those from Central Asia and Eurasia, including Scandinavia.

79 Estimating Crop Water Requirements with Unmanned Aircraft System Remote Sensing

JEFFREY HATHAWAY

DEPARTMENT: CIVIL AND ENVIRONMENTAL
ENGINEERING

During the summer of 2015, CSU conducted weekly UAS remote sensing operations over corn, in order to collect multispectral remote sensing data over the Near Infra-red, Red, Green and Thermal bands of the electromagnetic spectrum. We are able to create frequent, economical, high resolution, spatially distributed Soil Water Content, Crop Water Stress Index, Crop Water Use and plant health maps for use in precision agriculture. This information can be applied to a precision agriculture program, enabling informed decision making on irrigation and agro-chemical application, which will decrease overall water use, while keeping increasing or keeping constant yields through better management.

80 The Reading and Writing Transition from High School to College

KELSEY HATLEY

DEPARTMENT: ENGLISH

The transition from high school to college signals a significant change in what students are expected to know and do in an educational context. The purpose of this research is to examine first year college students' experiences with reading and writing in high school; their perceptions of what they'll need to know and be able to do in college; their degree of preparation for college-level reading and writing; and their recommendations for what teachers can do to help make this transition smoother for students.

81 Statistical Modeling of Social Networks Containing Group Relationships

RYAN HAUNFELDER

DEPARTMENT: STATISTICS

Common statistical analyses of social network data assume that relationships are dyadic. However, in many scenarios the relationships are observed at a group level, involving 2 or more nodes. In these cases existing methods will result in a data representation that discards information. We propose a hypergraph as a more accurate representation of the data. We extend familiar network concepts, graph motifs relevant to group formation, and probabilistic models and apply these techniques to data involving collaborations on NSF and NIH research grants between academic institutions.

82 Modulation of mRNA Stability through m6A Methylation in Stem Cells

ADAM HECK

DEPARTMENT: INTERDISCIPLINARY – CELL AND
MOLECULAR BIOLOGY

The N(6)-methyladenosine (m6A) RNA modification influences establishment and maintenance of pluripotency and has global effects on mRNA metabolism and gene expression. The YTHDF2 RNA-binding protein specifically recognizes m6A-modified mRNAs and targets them for decay. We have determined that YTHDF2 is dramatically down-reg-

ulated in pluripotent cells which correlates with increased stability of its target mRNAs. We are now characterizing the regulation of YTHDF2 expression and how methyl-specific RBPs influence the establishment and maintenance of pluripotency.

83 The Role of Long-Chain PUFAs in Cold-Exposed Brown Adipose Tissue

ASH HEIM

DEPARTMENT: BIOLOGY

Brown adipose tissue (BAT) is a thermogenic tissue that possesses a large number of mitochondria containing uncoupling protein-1 (UCP1). UCP1 uncouples oxidative phosphorylation from ATP synthesis, hence dissipating the proton gradient as heat. Activation of BAT is consistently associated with increased n-6 polyunsaturated fatty acid (PUFA) composition of BAT mitochondria, mainly arachidonic acid (AA, 20:4n6). However, any functional relevance of the effect of cold exposure on n-6 PUFAs is unclear. I hypothesize that the absence of LC-PUFAs, specifically AA, will cause mitochondrial dysfunction in cold-exposed BAT. BAT mitochondria of cold-exposed wildtype and FADS2 knockout mice (lacking AA) will be compared.

84 Estimating the Effective Population Size of Demes

MARK HEIM

DEPARTMENT: COMPUTER SCIENCE

In order to predict the likelihood of the survival of a population of an endangered species, scientists estimate a parameter known as the effective population size (N_e). Although there are a few methods to estimate this quantity, scientists can use approximate Bayesian computation, a Monte Carlo simulation strategy, that has been shown to work with certain types of genetic data. We present a computer program that is able to estimate N_e using this method and compare its output on simulated and real genotypes against an existing program that uses a separate linkage disequilibrium strategy.

85 MOVI Market Over Video: The New Video Ads Trend

SANTIAGO HERRERA TRIANA

DEPARTMENT: COLLEGE OF BUSINESS

This is a business case entrepreneurship idea in which we want to get advantage of the current internet video boom. In order to address videos ads in a proper way, we want to develop the technology to give the online video viewers the possibility to choose the information they want when seeing a free online video.

86 Analysis and Discussion of Chorrera Ceramics from Northern Manabí, Ecuador

COREY HERRMANN

DEPARTMENT: ANTHROPOLOGY

The archaeology of Late Formative Ecuador (ca. 2800-2000 BCE) remains only partially explored and understood, especially when compared to studies of contemporary cultures in Peru and Bolivia. However, ceramics looted from these contexts suggest a vibrant and complex array of cultures in this region. This paper discusses results of recent modal ceramic analysis of the materials recovered from these ex-

cavations, with the intent of comparing results from northern Manabí to prior modal analyses of Chorrera ceramics from the Guayas region, and informing future study of Ecuador's western lowlands.

87 An Economic Analysis of Local Opposition to Hydraulic Fracturing

JOSH HESS

DEPARTMENT: ECONOMICS

Hydraulic fracturing (fracking) can bring economic benefits such as employment and increased incomes but also has uncertain costs, including pollution, road congestion, and noise. As fracking becomes more prevalent, policymakers can learn about the true costs associated with non-traditional shale gas development. We develop a finite horizon dynamic programming model of local fracking policy. In each period, policymakers obtain information about the damages of fracking and compare the expected costs to the benefits determined within a computable general equilibrium (CGE) model. The ability to learn creates additional incentives to temporarily ban fracking until more information becomes available.

88 Understanding Nontuberculosis Mycobacteria: Pathogenesis and Treatment

EMILY HILL

DEPARTMENT: MICROBIOLOGY, IMMUNOLGY AND PATHOLOGY

Mycobacterium abscessus emerged as a human pathogen associated with higher fatality rates than other rapidly growing mycobacteria (RGM). Lack of understanding of bacterial pathogenesis and contribution of biofilms on phenotypic drug resistance in the host limit drug development. Mycobacterium abscessus was treated in vitro with standard antimicrobial compounds and biofilm inhibitors to assay minimum inhibitory concentration and minimum bactericidal concentration. Through inhibition of biofilm formation with small molecule inhibitors during in vitro infection with M. abscessus, increased bactericidal activity is present when combined with standard anti-NTM treatment. This reversal of nontuberculosis mycobacterial phenotypic antimicrobial resistance using biofilm inhibitors is novel.

89 Caregiver Burden Decreases for Caregivers After Occupational Therapy and Yoga

KATIE HINSEY

DEPARTMENT: OCCUPATIONAL THERAPY

This study focuses on the caregivers of people with stroke who participated in a twice weekly group OT and yoga intervention for 8 weeks. The caregivers were given the option to participate in the intervention or take respite time. Caregivers of people who have had a stroke participated in group OT (focusing on fall prevention) and yoga experienced a 46% decrease in caregiver burden. This family centered intervention shows promising results leading to positive outcomes for caregivers of this population.

90 Systematic Mapping Review of Hippotherapy (HPOT)

BETH HOESLY

DEPARTMENT: OCCUPATIONAL THERAPY

Hippotherapy (HPOT) uses the three-dimensional movement of the horse as a treatment strategy in occupational, physical, and speech and language therapy. These programs have grown in popularity, producing claims of benefits that have not been extensively scientifically investigated. This study aimed to create a comprehensive map, or topography, of national, international and interdisciplinary refereed literature on HPOT published between 1980 to 2014 as a guide for future practice and research.

91 Characterization of Biogenic VOC Emissions of a Ponderosa Pine Forest

JULIE HOLDER

DEPARTMENT: CHEMISTRY

Biogenic volatile organic compounds (BVOC) emitted from plants make up a large portion of the reactive chemical species in the atmosphere and are key components in air quality and climate change. In spite of the magnitude of global BVOC emissions, there is still little known about their sources, feedbacks and ultimate fate. To close this knowledge gap, the first in a series of seasonal field studies was completed where BVOC emissions were measured from above the canopy of a local Ponderosa pine forest and analyzed via proton-transfer-reaction time-of-flight mass spectrometry (PTR-TOF-MS). Preliminary results from this initial summer season are presented.

92 Pigs Gone Wild: Spatio-Temporal Management under Heterogeneous Damage

JASON HOLDERIEATH

DEPARTMENT: AGRICULTURAL AND RESOURCE ECONOMICS

A species of particular recent interest to policy makers dealing with invasive species is feral swine (*Sus scrofa*). Feral swine have dramatically expanded their global range over the past 30 years, and conflicts over management have also increased. One case of a contentious management decision is of the tradeoff between removal efforts and repairing the damage inflicted. This paper describes a numeric dynamic optimization model that prescribes optimal management strategies given different scenarios. The unique contribution of this model to the literature is that feral swine are modeled as being responsive to both population pressure and removal pressure.

93 Novel Vesiculovirus Glycoproteins are Potential Candidates for Lentiviral Vector Pseudotyping

SHUANG HU

DEPARTMENT: INTERDISCIPLINARY – CELL AND MOLECULAR BIOLOGY

We generated two novel vesiculovirus envelope glycoproteins from Chandipura virus and Piry virus (CNV-G and PRV-G), as alternative to the gold standard vesicular stomatitis virus glycoprotein (VSV-G). Both CNV-G and PRV-G pseudotyped lentiviral vectors can be produced at similarly high titers and stabilities as with VSV-G pseudotype. Besides,

CNV-G and PRV-G pseudotypes are efficient in transducing fibroblast and epithelial cells derived from different tissues across different species and some human T-lymphocyte cell lines in vitro. Additionally, both novel pseudotypes are more resistant to inactivation by human serum than VSV-G pseudotype, providing better candidates for systemic administration in this aspect.

94 Investigating Age and Prevalence of Enamel Hypoplasias at Pottery Mound

ELLIOT HUBBARD

DEPARTMENT: ANTHROPOLOGY

Human adaptation to the physical and social environment produces generalized stress. Stress can result in abnormalities associated with development of permanent dentition and exhibited as enamel hypoplasias. This study examines the occurrence of enamel hypoplasias across chronological age categories in a skeletal assemblage from the American Southwest (Pottery Mound 1375-1450 A.D.) Results show that 3-4 year olds display the highest prevalence of enamel defects. The pressures of adapting during this period may be related to age at weaning and its impact on diet. However, other interpretations are possible and require a multi-faceted approach to the study of stress related pathologies.

95 Leaping Linguistically into the Arena: How Space Influences Language Learning

REBECCA HULSE

DEPARTMENT: COMMUNICATION STUDIES

The purpose of this project is to demonstrate how language learning spaces can influence English language learners from Spanish-speaking backgrounds. The research indicates how English language learners can be influenced by space and what we need to be more aware of. Space includes the setting of the room, but also materials used and time of day. With this information, we can be hyper vigilant in creating productive and welcoming language learning spaces. The project will include an in depth theoretical review in order to place this project alongside traditional theoretical and critical ideas. Results are forthcoming.

96 Fouling Reversal and Tunability in Micellar Ultrafiltration Membrane Assemblies

NABILA HUQ

DEPARTMENT: CHEMICAL AND BIOLOGICAL ENGINEERING

Ultrafiltration systems are a class of membranes in which the pore size is below the microscale. Though used in multiple industries, one application is that of separations in protein solutions. However, current systems suffer from fouling by particulate deposition and scaling and complexity in fabrication and design resulting in high costs. We have found that self-assembling crosslinked block copolymer hydrogel networks offer highly tunable mechanical and rheological properties based on fabrication and processing, integrating photoactive molecules and the ability to selectively install and remove the filtration mesh in situ to combat excessive fouling.

97 Dietary Effects on Carcass Characteristics in Wagyu Cattle

SAM JALALI

DEPARTMENT: ANIMAL SCIENCES

The objective of this study was to investigate the effect of roughage inclusion rate of 10, 20, and 30% on feedlot performance, carcass composition and marbling distribution in Wagyu cattle (n=41). Treatments included 1) 10% roughage inclusion on dry matter basis; 2) 20% roughage inclusion and 3) 30% roughage inclusion on dry matter basis. Diets were formulated to be isonitrogenous, and isoamylolytic. Overall, data suggest that roughage inclusion rate causes little impact on feedlot and carcass performance, fatty acid composition and marbling distribution in Wagyu cattle.

98 Post-Transcriptional Mechanisms Coordinate Expression of Zinc Finger Protein mRNAs

AIMEE JALKANEN

DEPARTMENT: INTERDISCIPLINARY – CELL AND MOLECULAR BIOLOGY

Pluripotent cells, including embryonic stem (ES) cells and induced pluripotent stem (iPS) cells, are characterized by their ability to undergo self-renewal and to differentiate into multiple cell types. The role of transcription in maintaining pluripotency has been well-studied, but less is known about the impact of post-transcriptional gene regulation, including mRNA processing and metabolism, in stem cells. We believe that an in depth evaluation of post-transcriptional regulation of related genes (e.g. zinc finger transcription factors) could have major implications on our understanding of the mechanisms that control the cellular gene expression programs that ultimately determine cell fate.

99 Intersecting Attributed Blame and News Media Genre

CAITLYN JARVIS

DEPARTMENT: COMMUNICATION STUDIES

This research explores the way in which attribution of blame was made in news reporting on the Ray Rice scandal. Through a content analysis of three news genres, traditional news, hybrid online news, and weblogs, this paper seeks to understand if certain news genres were more inclined to attribute fault in the Rice scandal internally or externally. While no statistically significant findings were found in the relationship between news genre and attributed blame, interesting patterns did emerge that could lead to an expanded understanding of the role of the media in advocating for change within sports culture.

100 Economic Impacts of Asian Carp on Lake Erie Commercial Fishing

JENNY JOHNSON

DEPARTMENT: AGRICULTURAL AND RESOURCE ECONOMICS

Bighead carp and silver carp threaten to establish and potentially harm the Great Lakes. We analyze their potential impacts on the walleye and yellow perch commercial fisheries in Lake Erie using a computable general equilibrium model. Structured expert judgment elicitation and a widely used food web model are employed to measure ecolog-

ical changes resulting from an invasion. We find that changes in revenue and employment are likely to range from a loss of 96 percent to a gain 121 percent in the walleye fishery, and a loss of 55 percent to a gain of 31 percent in the yellow perch fishery.

101 Protein Design for Biofuel Applications

LUCAS JOHNSON

DEPARTMENT: CHEMICAL AND BIOLOGICAL ENGINEERING

Increased global energy demand has raised concern that dependence on fossil fuels could negatively impact the environment, strain international relations, and increase market volatility. Domestic production of cellulosic biofuel offers an opportunity to overcome these challenges. Conversion of agricultural residues, municipal solid waste, or dedicated energy crops provides a path forward for production of biofuels and biochemicals. To make this process more economically viable, we aim to rationally design enzyme catalysts with improved heat and solvent tolerance. Our design strategies have successfully improved thermal stability of a model enzyme and provided insight regarding unique interactions in ionic liquid solvents.

102 Malfeasance at the Mounds: Mismanagement at Effigy Mounds National Monument

MAGGIE JONES

DEPARTMENT: HISTORY

Established in 1949 in order to preserve sacred Native mounds along the Mississippi River, Effigy Mounds National Monument suffered from decades of neglect due to ignorance, lack of funding, and the Park Service's prioritization of natural resources over cultural resources. Over the past two decades, Effigy Mounds became a severe example of how overextended responsibilities and decreased funding within a culture of austerity led to damaged public lands, and the desecration of sacred Native spaces.

103 The Good, Bad, and Ugly of the Prion Protein

SARAH KANE

DEPARTMENT: INTERDISCIPLINARY – CELL AND MOLECULAR BIOLOGY

The immune system helps eliminate diseases and bodily threats. However, what happens when normal processes "go bad"? The present work shows a type of Jekyll and Hyde situation, where a certain type of interaction in the immune system helps fight off bacterial infection, yet the same interaction is utilized by another type of infection. Specifically, this work shows the importance of the prion protein, PrPC, likely in conjunction with Complement Receptor 2, in fighting off bacterial infection. However, when PrPC becomes misfolded and causes disease, as seen in prion diseases, this same interaction helps prions spread before reaching the brain.

104 Musical Neglect Training for Visual Neglect

KYU RIM KANG

DEPARTMENT: OCCUPATIONAL THERAPY

The purpose of this study was to examine the effectiveness of the Musical Neglect Training (MNT) on Visual Neglect. Two Visual Neglect participants were part of research. Both participants had 6 sessions, 30 minutes long. Two standardized assessment (Albert's Test and Line Bisection Test) were collected pre- and post- intervention for all 6 sessions to examine for the immediate effect. One week after the 6th session, two same assessments were tested to determine longer-lasting effect. All the data were used paired t-test to examine significant differences. Also, both participant were combined and calculated with paired t-test to determine general effectiveness of MNT. Both participants showed significant improvement with Albert's Test in immediate effect ($p=.02$ and $p=.01$).

105 Can Bees Compensate for a Poor Nutritional Past?

KEZIAH KATZ

DEPARTMENT: INTERDISCIPLINARY – ECOLOGY

The timing of nutritional stressors has been shown to have strong effects in many animals with stress at key development points often leading to irreversible deficits in both physiology and behavior. However, some compensation for these early deficits may be possible if animals have access to supplemental nutrition later in life. In this study, we examine the effects of chronic nutritional stress, and nutritional stress occurring only during development or adulthood. Using the honeybee as a model, we test whether and to what extent animals can make up for a nutritional stress during development with regard to their cognitive performance.

106 Tax Utilizes the Calcium/Calmodulin Kinase Pathway to Increase CREB Phosphorylation

ANNA KEITH

DEPARTMENT: BIOCHEMISTRY AND MOLECULAR BIOLOGY

The human T-cell leukemia virus, type-1 (HTLV-1) oncoprotein Tax, potentially activates HTLV-1 transcription in a DNA-bound complex with the cellular transcription factor, CREB. Strong viral transcription requires CREB to be specifically phosphorylated at serine 133. HTLV-1 infected cells possess elevated levels of phosphorylated CREB, which is directly due to Tax expression (Kim, et. al. 2007). Tax, is not a kinase, therefore, we hypothesized that Tax stimulates the activation of a cellular kinase. Using specific kinase pathway inhibitors we identified the calcium/calmodulin family of cellular kinases as the target of Tax which may play a key role in HTLV-1 malignant transformation.

107 Predictors of Physical Activity Levels in Patients with Multiple Sclerosis

NATHAN KETELHUT

DEPARTMENT: HEALTH AND EXERCISE SCIENCE

The purpose of this study was to identify predictors of physical activity levels in patients with multiple sclerosis (MS). Participants completed a battery of tests that assessed symptom severity. Physical activity was

measured for 7 days and a multiple regression analysis showed that the decline in force of the knee extensors following a fatiguing task on the more-affected side and the Falls Efficacy Scale-International questionnaire best predicted physical activity. Rehabilitative specialists should focus on improving voluntary maximal activation of the knee extensors and reducing perceived fall risk in order to increase physical activity levels in patients with MS.

108 Structured Peer Feedback in the CSU Middle School Outreach Ensemble

BRYAN KETTLEWELL

DEPARTMENT: SCHOOL MUSIC, THEATRE, AND DANCE

The Middle School Outreach Ensemble (MSOE) is a multi-tiered program that fosters the development of musicians and future music educators. On the collegiate level, this program gives undergraduate music education majors the opportunity to plan and teach weekly lessons, harnessing their teaching skills in a supervised environment. We implement a feedback system in which all teachers and ensemble conductors receive feedback from a peer or supervisor on their lesson plans and implementation of teaching strategies. This peer feedback system is the educational backbone of this program and allows all participants to gain practical experience throughout the program.

109 A Lincoln-Petersen Abundance Estimator of Estes Valley Elk

ALISON KETZ

DEPARTMENT: INTERDISCIPLINARY – ECOLOGY

The National Park Service instigated a ground-based plan for surveying elk (*Cervus elaphus nelsoni*) in Rocky Mountain National Park and the greater Estes Valley in order to aid management of the population across the elk winter range. We combine multiple sources of data in a mark-recapture modeling framework using Bayesian estimation, using radio telemetry data of park-town cross boundary movement along with monthly ground census executed by volunteers. The modeling approach enables us to overcome the assumption of closure in a Lincoln-Peterson estimator of population size and provides understanding of the temporal variation throughout the elk winter range.

110 Structural Modifications for Improved Ionic Conductivity in Sodium Anti-Perovskites

LORYN KILLPACK

DEPARTMENT: CHEMISTRY

As the world moves away from non-renewable energy sources towards green, sustainable energy production, the development of energy-storage technology that parallels that level of sustainability has become increasingly important. Solid-state batteries, utilizing solid electrolytes, are safe and inexpensive. This work focuses on the development and understanding of the sodium anti-perovskite family of materials, with formulas Na_3OX and Na_3SX ($\text{X} = \text{halide}$). This class of materials offers a variety of experimental handles through which we can probe the relationship between structure and the resultant properties, specifically, ionic conductivity. This is a step in the long-term effort to develop improved solid-state electrolytes.

111 Brown Fat and CNS Activity in Young and Older Men

JOHN KINDRED

DEPARTMENT: HEALTH AND EXERCISE SCIENCE

The purpose of this study was to examine brown adipose tissue (BAT) and central nervous system (CNS) activity in young and older men during cold exposure. Participants rested in temperature controlled room while wearing a cold-vest stuffed with icepacks. After 1 and 2 hours of cold-vest wear time participants received and intravenous injection of [18F]-Fluorodeoxyglucose and underwent full-body Positron Emission Tomography/Computed Tomography Imaging, respectively. BAT was undetectable in the older men, easily identifiable in the young men, and CNS activity was lower in the older men. Impaired CNS activity may contribute to BAT loss in older adults.

112 Solar Energy Conversion from Abundant Resources: Water, Dye, and Catalyst

JOEL KIRNER

DEPARTMENT: CHEMISTRY

We prepare and characterize a novel organic dye with phosphonate groups, designed to couple with a well-known cobalt-based water oxidation catalyst. Photoanodes composed of thin films of the dye and cobalt catalyst on a conductive glass substrate are shown to successfully oxidize water using light energy and with the help of applied electrochemical potential. While photocurrents achieved by this initial anode are too low for practical use, we have identified low light absorption and competitive charge carrier recombination as the likely limitations of our current system. These findings point us towards future strategies to optimize device performance through nanostructuring.

113 Establishment and Systematic Characterization of Mycobacterium Tuberculosis in Bioreactors

PHILLIP KNABENBAUER

DEPARTMENT: MICROBIOLOGY, IMMUNOLGY AND PATHOLOGY

Mycobacterium tuberculosis infection is characterized by active and latent disease states. Granuloma-induced oxygen tension may shift bacteria into bacteriostatic persistence. Current models of hypoxia-induced mycobacteria have limitations, requiring establishment of novel culturing methods. Here, M. tuberculosis was propagated under defined oxygen concentration in bioreactors. Initial analyses confirmed mycobacterial non-replicating persistence. This study will provide insight into core physiological adaptations of M. tuberculosis while reducing bias from the contaminants during adaptation into dormancy. The findings from this study will greatly improve our understanding of M. tuberculosis bacilli in latency, and possibly contribute to novel analytes for diagnosis of latent TB infections.

114 Synthesis of Menaquinone Analogs and Their Function with Reductase MenJ

JORDAN KOEHN

DEPARTMENT: CHEMISTRY

The novel enzyme, MenJ, which selectively saturates the γ -isoprene of Menaquinone (MK), represents a novel virulence factor for Mycobacterium tuberculosis (TB) survival in host macrophages. The

goals of this research are: 1. Synthesize MK analogs, 2. Characterize properties of MK analogs, and 3. Assay enzyme function of MK analogs. MK-1, MK-2, and MK-3 [II-H2] are examples that we have made or are in progress of synthesizing. Access to these compounds is essential for understanding the properties and function of MenJ and the ultimate goal of finding an inhibitory drug to combat multiple drug resistant strains of TB.

115 "What Does Cooking Mean to Kids?"

TESSA KOMINE

DEPARTMENT: FOOD SCIENCE AND HUMAN NUTRITION

This Plan B master's research project was focused on assessing the face validity for select items on the student survey for CSU's Fuel for Fun program. A protocol for conducting cognitive interviews with 3rd, 4th, and 5th grade students was developed, and the results of the interviews were preliminarily analyzed to identify congruence and comprehension. The main focus was to ensure that the survey items are accurately measuring cooking-related constructs that reflect the impact of the Fuel for Fun program on its participants.

116 Effects of Major Ions on Montane Stream Benthic Communities

CHRIS KOTALIK

DEPARTMENT: FISH/WILDLIFE/CONSERVATION BIOLOGY

Elevated concentrations of major ions are associated with a variety of anthropogenic disturbances in streams, including mountain top removal and valley fill operations (MTRVF), urban runoff, and road deicing. We conducted a series of stream mesocosm experiments exposing montane stream benthic communities to several salt mixtures that bracket the recently proposed USEPA benchmark of 300 $\mu\text{S}/\text{cm}$ for streams affected by MTRVF. In general, effects were observed at conductivity levels near the proposed benchmark. These results suggest that major ions are toxic to some aquatic insects, and effects on benthic communities in the field are likely when conductivity exceeds this benchmark.

117 Polynomial Chaos for Variability Analysis using Optimal Design of Experiments

ADITI KRISHNA PRASAD

DEPARTMENT: ELECTRICAL AND COMPUTER ENGINEERING

This work presents a novel generalized polynomial chaos approach for quantifying the uncertainty in high-speed networks arising from random variations in the circuit parameters. The key feature of this work is the development of a non-intrusive linear regression methodology that is able to accurately evaluate the polynomial chaos coefficients using only a sparse set of nodes located within the multidimensional random space. These non-intrusive regression nodes are extracted using an optimized design of experiments (DoEs) approach based on the concepts of exchange algorithms and D-optimality criteria commonly applied in the field of estimation theory.

118 Cortical Receptor Num1 Activates Dynein Motility by Relieving Pac1-Mediated Inhibition

LINDSAY LAMMERS

DEPARTMENT: BIOCHEMISTRY AND
MOLECULAR BIOLOGY

Cytoplasmic dynein plays an important role in positioning the mitotic spindle at the site of cytokinesis in most eukaryotes. Since the spindle position can govern whether a cell divides symmetrically or asymmetrically, dynein function is important during development and tissue homeostasis. In budding yeast, dynein is delivered to the cell cortex – its site of activity – by a multi-step process whereby it is finally anchored at cortical Num1 receptor sites from where it produces forces to position the spindle. Our studies show that Num1 is responsible for activating dynein by dissociating Pac1, an inhibitor of dynein motility.

119 Activation of Nrf2 to Decrease the Anabolic Resistance of Aging

JAIME LAURIN

DEPARTMENT: HEALTH AND EXERCISE SCIENCE

Increased production of reactive oxygen species (ROS) promotes anabolic resistance to protein feeding and age-related sarcopenia. The transcription factor Nrf2 mediates the cellular endogenous antioxidant system, and in the present study we hypothesized that Nrf2 activation through Protandim supplementation would reduce ROS and restore the anabolic response to protein feeding in older adults. Thirty subjects were enrolled in our six-week dietary intervention consisting of milk consumption in combination with either placebo or Protandim. Pre and post intervention, participants underwent a blood draw to assess plasma markers of oxidative damage, followed by a muscle biopsy to determine cumulative muscle protein synthesis.

120 Identification of New Bacterial Genera and Species – Lechuguilla Cave

LEDDY LEDDY

DEPARTMENT: INTERDISCIPLINARY – CELL AND
MOLECULAR BIOLOGY

Until 1986, Lechuguilla Cave in New Mexico was a small, insignificant cave until explorers excavated the cave floor to discover what is now the seventh longest cave system in the world. Over 426 samples from the cave were isolated from which 4 new genera and 96 new species of bacteria were discovered. Falling within the Actinobacteria and Firmicutes phyla, these bacteria are known to be prolific natural product producers and may have great value to the pharmaceutical industry.

121 Fuzhuan Tea Reverses Western Diet-induced Arterial Stiffness in Mice

DUSTIN LEE

DEPARTMENT: FOOD SCIENCE AND
HUMAN NUTRITION

We examined the effects of modest weight gain, induced by a western diet (WD), on large artery stiffness in mice. We also examined whether Fuzhuan Tea (FT), which has been shown to protect against various metabolic insults, could reverse the hypothesized increase in stiffness. 7-months on WD caused modest weight gain (SD: 34.7 ± 4.1 g vs WD:

40.1 ± 2.4 g) and a significant increase (7.7%) in arterial stiffness. FT consumption during an additional 8-weeks of WD returned PWV to baseline levels. These results indicate modest weight gain increases arterial stiffness, and FT can reverse the vascular consequences of WD.

122 Pre-training RVM with State Dynamics Prediction for Faster Reinforcement Learning

MINWOO LEE

DEPARTMENT: COMPUTER SCIENCE

Recently deep learning research discovered that the multiple levels of network representation can lead state-of-the-art performance in classification problems by pre-training in unsupervised ways. In our previous research, we showed that pre-training the networks to predict the dynamics of an environment can improve the performance in reinforcement learning. We propose pre-training with a sparse Bayesian model, relevance vector machine (RVM) for better representation of acquired knowledge from environmental dynamics and improved performance in reinforcement learning with solid RV bases.

123 Spn1 is a Histone H3-H4 Chaperone Independent of Spt6

SHA LI

DEPARTMENT: BIOCHEMISTRY AND
MOLECULAR BIOLOGY

Spn1 is an essential elongation factor conserved from yeast to humans. Spn1 physically interacts with RNA polymerase II and Spt6, a histone chaperone with DNA and nucleosome-binding activities. Spn1 is known to genetically interact with a number of additional chromatin factors. Here, we report Spn1 is a histone H3-H4 chaperone. Spn1 is also multi-functional in that it binds DNA and nucleosomes. Deletion of regions containing these functions results in mutant phenotypes, indicating critical roles in vivo. The implications of these shared activities within the Spn1-Spt6 complex is still unclear, but our results illustrate Spn1 per se plays an important role.

124 Adjusting for Trial-to-trial Variation in Electroencephalographic Measures of Performance Errors

MEI-HENG LIN

DEPARTMENT: OCCUPATIONAL THERAPY

Error-Related Negativity (ERN) is a neurological indicator of response monitoring. ERN amplitude attenuation is greater in children than adults and, if due to trial-to-trial variability, confounds interpretation of ERN developmental trends. This study examined whether the Woody filter, a signal processing technique to reduce trial-to-trial variability, enhances signal synchronization and intensity. Electroencephalography data from 240 participants were processed by the Woody filter and time-frequency analysis. Results showed that the Woody filter effectively increased signal synchronization and intensity of ERN in both children and adults. Implement of this technique results in a more accurate interpretation of developmental changes of the ERN.

125 Photochemical Enhancement of Isocyanic Acid from Diesel Exhaust

MICHAEL LINK

DEPARTMENT: CHEMISTRY

Interest in the sources of isocyanic acid (HNCO) has increased recently as a result of increased awareness of the health effects including cataracts, rheumatoid arthritis, and cardiovascular disease initiated from exposure. In this study it was found that, up to a period of five days in the atmosphere, HNCO could be produced photochemically from diesel exhaust in similar abundances in which it was emitted directly. These results suggest that, for urban areas, diesel emissions can be effectively considered a source of HNCO that is twice as important as previously estimated.

126 Silent Information Regulator (Sirtuin) Proteins During *Gecarcinus lateralis* Molting Cycle

ALEJANDRO LOPEZ CERON

DEPARTMENT: BIOLOGY

A de novo transcriptome assembly of the blackback land crab *Gecarcinus lateralis* to quantify gene expression during three different stages of the molt cycle was built. Specific mRNA contigs for Sirtuin 1, Sirtuin 5 and Sirtuin 7 were identified and described. Amino acid sequences shared some residues in the core region but differed in structure of N- and C- terminal domains. Mean FPKM (Fragments Per Kilobase of transcript per Million mapped reads) exposed a decrease in expression of Sirtuin 1 but stable average fragments for Sirtuin 5 and 7, between early and late premolt.

127 Examination of Lipid Regulating Effects of Fuzhuan Tea

SHEN LU

DEPARTMENT: FOOD SCIENCE AND
HUMAN NUTRITION

Fuzhuan, a fermented tea, has shown positive lipid regulation functions historically. Our work explores the potential mechanisms underlying its health benefits. One of the reported outcomes is Fuzhuan can modulate expression of genes involved in lipid regulation and reverse cholesterol transport. Our previous work has also shown that Fuzhuan could changes to the intestinal microbiota, specifically by increasing *Lactobacillus*. Probiotic *Lactobacillus* species may also alter lipid metabolism parameters and therefore, some of the lipid regulating effects of Fuzhuan may be mediated through gut microbiota alterations.

128 Fostering International Mindedness and Education in the International Baccalaureate Program

KAITLYN MAINHART

DEPARTMENT: ENGLISH

In the 48 years since its creation, the International Baccalaureate program has grown rapidly with nearly 3,900 accredited IB World Schools in 159 countries, 40% (1,571) of which are in the United States. Due to this sudden and widespread growth issues have arisen that the pro-

gram, which highlights an emphasis on fostering international mindedness and intercultural understanding, is Eurocentric and westernized. The purpose of this study is to examine why this gap between the IB's Mission Statement and classroom execution exists and how the gap can begin to be closed through the use of an emotional theory framework.

129 IgnoreU Filters User's Social Media Accounts by Keywords

CARMELO MANNINO

DEPARTMENT: COLLEGE OF BUSINESS

IgnoreU aggregates an individual users's social media sites and allows the user to ignore and filter topics, people, or items based on keywords. We allow one location for an individual to view all of their social media and we allow the user to regain control over their social media. We in turn are able to build a profile indicating what users do not want to see based on their selection. We then use this information to better target users with online advertisements.

130 Understanding Synthetic Modifications to Control Crystallite Shape of Bone Mineral

MARY MARISA

DEPARTMENT: CHEMISTRY

There are many natural and synthetic bone grafts available, but many synthetic grafts are not remodeled by the body in the same way as natural bone. By changing the shape of the mineral crystallite, the number and identity of atoms exposed at the surface is changed potentially leading to increased remodeling of the material under biological conditions. Using chaotropic (structure breaking) or kosmotropic (structure making) ions during synthesis may alter the resulting particle shape due to water-mediated structuring of the material. Our understanding of atomistic changes to the structure and shape is advanced by using advanced synchrotron X-ray scattering techniques.

131 European Badger Capture Success for Vaccination Against Tuberculosis in Ireland

LAURA MARTIN

DEPARTMENT: INTERDISCIPLINARY – ECOLOGY

European badgers are a reservoir for *Mycobacterium bovis*, which causes bovine tuberculosis (TB). To control bovine TB in badgers, a vaccine is being evaluated as an alternative to culling. Trapping success is crucial to vaccinate the population, but varies considerably. We are investigating the effect of weather on trapping success by analyzing precipitation and temperature data from badger captures in the Republic of Ireland. Badger captures were significantly higher in drizzle, rain, and heavy rain. Our preliminary results could help wildlife managers to prioritize trapping based on weather, which facilitates both badger conservation and bovine TB control.

132 Molting Gland De Novo Transcriptome Assembly in *Gecarcinus lateralis*

LINDSAY MARTIN

DEPARTMENT: BIOLOGY

Molting is required for growth and development in crustaceans. In the crab *Gecarcinus lateralis*, molting is stimulated by ecdysteroids, hormones produced in the Y-organ (YO). In preparation for molting, the YO becomes activated; ecdysteroid levels increase and the YO undergoes physiological changes. To better understand these changes in gene expression, a YO transcriptome from four molt stages was generated. The transcriptome contains mature RNAs, precursors to proteins, present in the YO at each molt stage. By comparing the molt stage transcriptomes, we are able to identify differentially expressed genes in *G. lateralis* as the animal progresses through the molt cycle.

133 Reactivity, Polymorphism, and Kinetic Intermediates in Solid State Metathesis Reactions

ANDY MARTINOLICH

DEPARTMENT: CHEMISTRY

Understanding how solid state chemical reactions progress is difficult, due to the high temperatures required to induce reactivity and the intrinsic slow diffusion of solids into one another. Here, we study metathesis reactions with in situ X-ray diffraction, and are able to draw conclusions about the driving forces of the reactions as well as how they progress. Metathesis couples the formation of NaCl with the desired products MS₂ (M = Fe, Co, Ni) and lowers the temperatures necessary to allow the reactions to occur. These tools aid us in understanding how to rationally design solid state reactions.

134 Convincing Students to Space, Not Cram: An Attitudinal Classroom Intervention

VICTORIA MATTINGLY

DEPARTMENT: PSYCHOLOGY

Research shows that spacing one's studying, or the opposite of cramming, can significantly improve learning outcomes. However, students are reluctant to adopt this proven technique. The purpose of this study is to counteract student resistance to spacing with a classroom intervention based on the Theory of Planned Behavior. Exposure to the classroom intervention was the independent variable and the dependent variables were self-reported study behavior, exam score, and measured attitudinal change. The results found that student intentions to space, attitudes toward spacing, and exam scores were significantly enhanced by the intervention. Practical and theoretical contributions are discussed.

135 Cs₂Sn_{1-x}TeXI₆: Driving the Properties of Materials through Compositional Modification

ANNALISE MAUGHAN

DEPARTMENT: CHEMISTRY

Recently, perovskite materials have achieved photovoltaic efficiencies of 20% in functional devices, making them a competitive alternative to silicon-based solar cells. In this work, a series of perovskite-based

compounds was synthesized with the general formula Cs₂Sn_{1-x}TeXI₆, (where x can vary from 0 to 1). UV-visible spectroscopy measurements indicate an increase in magnitude of the band gap, ranging from 1.26 eV (x=0) to 1.60 eV (x=1). Additionally, resistivity measurement suggest that the presence of tellurium in any concentration within the compound serves to hinder electron transport in these materials, which we hypothesize come about by the presence of electronic trap states.

136 Understanding Oil and Gas Regulatory Scale Preferences Among Coloradoans

ADAM MAYER

DEPARTMENT: SOCIOLOGY

Colorado is a key state in the current oil and gas boom. Several cities have passed more stringent regulations or outright bans on hydraulic fracturing- the state government has challenged local efforts to regulate oil and gas development. In addition, the 2005 Energy Policy Act exempted oil and gas development from some federal regulations. Hence, the question of who should regulate is contested. Using novel data we find that Coloradoans generally believe that local governments should be able to relax or intensify oil and gas regulations little support for federal exemptions for the oil and gas industry.

137 US Government Expenditure Abroad: Base Building, Sanctions, and War

CHRIS MCCARTHY

DEPARTMENT: ECONOMICS

The goal of this paper is to show how foreign fiscal interpenetration impacts economic development for countries aligned with and against the United States. Existing international monetary models do not integrate the military spillover dimension of our global reality: one country's resources are used to build bases, weapons, and equipment physically located within the foreign countries' borders. Stock-flow consistent modeling using a two-country world under post-keynesian assumptions and a dollar exchange regime is used to formalize and explore the consequences of foreign fiscal spending.

138 Predictors of Sustainability among Colorado Ski Resorts: A Quantitative Study

PAVLINA MCGRADY

DEPARTMENT: HUMAN DIMENSIONS OF NAT RES

This study utilizes Diffusion of Innovation theory to explore factors affecting sustainability of Colorado ski resorts. As work-in-progress, findings based on a quantitative survey data (N = 322) reveal that the characteristics of the organization (ski resort) are the strongest predictor of sustainability. In regards to the innovation characteristics, compatibility and observability of the innovation (sustainability) were also significant predictors of sustainability of Colorado ski resorts. Government regulations were found to be the only factor from the external environment which significantly predicted sustainability. Implications for resort managers and society as a whole are highlighted.

139 Experimental Infection of Deer Mice with Maporal Hantavirus

AMANDA MCGUIRE

DEPARTMENT: MICROBIOLOGY, IMMUNOLGY
AND PATHOLOGY

We examined deer mice for susceptibility to Maporal virus (MAPV) in an effort to establish a biosafety level 3 (BSL-3) reservoir model of hantavirus disease. Following inoculation with MAPV, viral RNA was detected and animals generated both nucleocapsid-specific and neutralizing antibodies without developing signs of clinical disease. Cytokine gene expression profiles resembled those observed in deer mice infected with Sin Nombre virus (for which they are the natural reservoir). The development of this model will permit direct comparison of two BSL-3 rodent models with differential outcomes to MAPV infections, and may clarify how hantaviruses evade sterilizing immune responses.

140 Duct Taping Mental Health – Maladaptive Simulacrum in ManTherapy Campaign

KALIE MCMONAGLE

DEPARTMENT: COMMUNICATION STUDIES

In an attempt to reach the most suicidal of men, Colorado launched the ManTherapy campaign in 2012. The campaign told men that they couldn't fix their mental health with duct tape and that grilling animal meat was just aromatherapy for men. What the campaign failed to address was the way in which creating a separate branding of therapy for men exerted stigma, power, and control over the way that women, queer, and people of color experience mental health problems. ManTherapy didn't consider how medical insanity came to be. By ignoring its roots, tools for healing became simply tools of control.

141 Blane Island Remediation Project

CHARLIE MEEKS

DEPARTMENT: HORTICULTURE AND
LANDSCAPE ARCHITECTURE

Blane Island Remediation project is derived from Land 640 Major Landscape Change in the landscape architecture graduate program. The course discusses reclamation of sites contaminated by industrial or commercial uses. These areas are often referred to as "brown fields" and contain unsafe levels of hazardous waste and pollutions. The purpose of this project is to provide a time-based remediation process depicting the transformation of a current chemical manufacturing factory at Dow Industries in South Charleston, West Virginia. The process would be executed in three phases that attempt to extract hydro-carbons from the soils.

142 Realities and Constraints of Development in Tibet

SIERRA METHOD

DEPARTMENT: ANTHROPOLOGY

Using the knowledge gained from a six week internship spent working on launching a development-based enterprise in rural Tibet, this project seeks to identify and analyze the potential limitations and constraints that social entrepreneurs face when implementing international development projects. Within the confines of this research, many of the recognized constraints to development stem from 1) the influence

of a diverse network of stakeholders, 2) issues of finance and accountability, and 3) conditions within the cultural environment. By acknowledging these constraints and dissecting their underlying assumptions we may challenge inefficient development models and initiate new innovative approaches to international development.

143 Growth Substrate and Plant Genotype Influence Sorghum Root Exudation

ESBY MILLER

DEPARTMENT: BIOAGRICULTURAL SCIENCE AND
PEST MANAGEMENT

Plant roots release small molecules known as root exudates into the rhizosphere that contribute to plant health by facilitating nutrient acquisition and mediating plant-microbe interactions. Root exudates fluctuate with changes in the environment, microbial activity, and can vary due to plant genotype and growth stage. We evaluated the effect of different growth substrates on the root exudation of Sorghum bicolor using non-targeted metabolite detection. Root exudate composition and abundance varied by genotype and substrate, with an increased number of metabolites detected in sand substrate. Morpho-physiological traits including leaf area and fine root production were increased in soil and hydroponic systems.

144 Public Health Needs of the Tro Pang Cho Commune, Cambodia

TAVIA MIRASSOUWOLF

DEPARTMENT: CO SCHOOL OF PUBLIC HEALTH

The purpose of this collaborative public health research project is to improve the health status of community members living in the Tro Pang Cho Commune of the Kampong Speu Province in Cambodia. An emerging partnership between Colorado State University (CSU), Colorado School of Public Health (CSPH), and Sustainable Schools International (SSI) will assist in the establishment of basic public health infrastructure and health education that will assist in relieving digestive disorders and respiratory infections. Remediation of these health concerns will be addressed through a community service project involving local Cambodian nursing students.

145 Phenotypic Evaluation of Aegilops tauschii for Drought Improvement in Wheat

ANGIE MOORE

DEPARTMENT: SOIL AND CROP SCIENCES

Winter wheat (*Triticum aestivum* L.) is frequently grown under rainfed conditions and is thus particularly susceptible to yield reduction due to drought. *Aegilops tauschii* is the D-genome progenitor of modern hexaploid wheat and is a source of genetic diversity for root traits that may improve wheat performance under drought. Our objective is to characterize phenotypic variation among a diverse set of *Ae. tauschii* accessions for root traits related to drought responses. Fifteen accessions were phenotyped in the greenhouse under irrigated and water-limited treatments. Differences in root-to-shoot ratio, specific root surface area, and root system architecture were identified among the accessions.

146 Tunable Superomniphobic Surfaces for Surface Tension-based Droplet Self-Sorting

SANLI MOVAFAGHI

DEPARTMENT: MECHANICAL ENGINEERING

We fabricated TiO₂ nanoflower beds that are extremely repellent to a wide range of liquids. When these TiO₂ nanoflower beds are exposed to UV radiation, their surface energy and wettability increases due to the photocatalytic activity of TiO₂. By systematically varying the UV exposure time, we developed a simple device that employs a TiO₂ nanoflower bed with a series of precisely tailored surface energy traps that can sort liquid droplets in the order of their surface tension. To the best of our knowledge, this is the first ever demonstration of a simple, inexpensive and versatile surface tension-based droplet self-sorting device.

147 Intertextuality and Modern Chinese Science Fiction

KRISTEN MULLEN

DEPARTMENT: ENGLISH

This project explains how modern Chinese science fiction can serve as a cultural vista for China and America. Additionally, it explores how the influence of Chinese culture and literary techniques have brought on a metamorphosis for science fiction as a whole. Author Ken Liu's translations of Xia Jia's short stories and Cixin Liu's Three Body Problem will be used to discuss how science fiction's capitalization on uncertainty about the future can open discussion on foreign cultural exchanges in the twenty-first century and beyond.

148 The Vocabulary of the Maras

DULCINEA MUNOZ GOMEZ

DEPARTMENT: FOREIGN LANGUAGES AND LITERATURE

Maras in Central America – El Salvador and Honduras- represent one of the biggest social problems in those countries. These gangs use a different code when they communicate, whether to talk among themselves or threaten rival gangs without being recognized by the police. Throughout this project about their slangs and codes, we are going to show the different meanings of these words in a violent context and how a new vocabulary is born and developed as a result.

149 Microstructural Characterization to Assist Fabrication of High Efficiency CdTe Photovoltaics

AMIT MUNSHI

DEPARTMENT: MECHANICAL ENGINEERING

Thin film CdTe photovoltaics have been demonstrated to be sustainable, economical, green, reliable and renewable source of electricity at commercial scale. Efforts are being made to further improve conversion efficiencies of these photovoltaic devices without significant increase in production cost. Microscopic and nanoscopic materials characterization using SEM, TEM, EDS, XPS, etc. play a crucial role in understanding the effect of varying processing parameters on device performance and thin film microstructure. Change in film layers allowed deposition of CdTe thin films at high temperatures. Results presented here summarize these characterization results that allowed fabrication of high efficiency thin film CdTe cells.

150 Lethality of Salmonella, Escherichia coli O157:H7 in Rendered Cooking Oil

RACHEL MURPHY

DEPARTMENT: ANIMAL SCIENCES

Rendered used cooking oil was inoculated with five-strains of Salmonella or E. coli O157:H7, at approximately 8.0 log CFU/ml. Inoculated samples were heat treated at 62, 71, or 82°C using a water bath. At timed intervals, individual samples were removed from water bath and chilled in an ice bath. Six replicates were performed. Non-linear, thermal death curves were observed from the surviving populations. Segmented regression was used to calculate D-values, which ranged from 0.03-0.04 min at 82°C, 0.14-0.27 min at 71°C, and 0.77-1.49 min at 62°C. Critical limits were established to create timed heat treatment processes for use by renderers.

151 Understanding how Lactobacillus Reduces Salmonella Growth with Rice Bran Prebiotics

NORA JEAN NEALON

DEPARTMENT: VETERINARY MEDICINE AND BIOMEDICAL SCIENCES

Multi-drug resistance makes it difficult to treat Salmonella infections, and a natural route may involve using Lactobacilli and rice bran synbiotics. To evaluate the effect of these synbiotics on Salmonella growth, biochemically-distinct Lactobacillus species were grown with different rice bran extracts. Filtered probiotic supernatant was collected, added to Salmonella, and growth was recorded. Probiotic supernatant reduced Salmonella growth in a concentration, rice bran variety and probiotic species-dependent manner. pH was held constant, suggesting that differences were due to small molecules that varied between treatments. As a result, future studies will use a non-targeted metabolomics-based approach to evaluate supernatant compositions.

152 Immune Response Against Mycobacterium Tuberculosis after Acquisition of Isoniazid Resistance

LUISA NIETO RAMIREZ

DEPARTMENT: MICROBIOLOGY, IMMUNOLGY AND PATHOLOGY

In the last decade, INH resistant (INHr) Tuberculosis accounts for 9.5% of total cases. Mutations in katG gene drive INH resistance. Here, we evaluate differences in bacterial growth, immune response and pathology induced by INHr Mtb harboring mutations in katG gene. C57BL/6 mice were infected with clinical and laboratory isogenic pairs of Mtb. Colony forming units, cytokines and pathology were tested at 7, 14, 21, 28, 60, and 120 days post infection. Pathology scores were significantly decreased in the clinical INHr pair. We observed attenuation in the virulence, lower proinflammatory cytokines levels after acquisition of INHr in the two genotypes.

153 Shape Memory Properties of Sintered, Nickel-Titanium Foams

PETER NIVALA

DEPARTMENT: MECHANICAL ENGINEERING

To advance smart material systems toward the realization of multifunctional structures, this research effort seeks to demonstrate the self-healing potential of energy absorbing structures by combining the mechanical efficiency of a porous material with the properties of a shape memory alloy. Using the spark plasma sintering methodology, open and closed-cell foams will be created from nickel-titanium powders. Analytical techniques and mechanical characterization will be used to determine the processing-structure-property relationships. Realizing the full potential of the self-healing concept will allow the functionality of energy absorbing structures to be restored during operation and eliminate the need for replacement.

154 The Impact of Encoding Using the Self-Reference Effect

NICOLE OLIVAS

DEPARTMENT: PSYCHOLOGY

The study investigated the self-reference effect by analyzing how the self is utilized in processing and encoding personal information. Participants rated adjectives on four different tasks designed to promote various types of encoding: structural, phonemic, semantic, and self-reference. Participants completed a recall task to assess recall rate. Results showed that the number of words recalled was significantly greater in the self-reference condition compared to other conditions. These results indicate that self-reference is a superior encoding device, providing meaningful encoding and deep processing. These findings support previous studies which have found self-reference to be a powerful encoding device and memory strategy.

155 Novel Detection of PrPCWD on Plants Collected from RMNP

AIMEE ORTEGA

DEPARTMENT: MICROBIOLOGY, IMMUNOLGY AND PATHOLOGY

Chronic Wasting Disease (CWD) is the one of many transmissible spongiform encephalopathies which occur due to the accumulation of an abnormally folded, proteinase K resistant, form of the normal cellular prion protein PrPC. Spread of CWD occurs through direct and indirect or environmental routes. We chose to further explore the environmental aspect of CWD by sampling plants from an endemic CWD area – Rocky Mountain National Park (RMNP). Utilizing the Protein Misfolding Cyclic Amplification (PMCA) assay we have found evidence of PrPCWD on the surface of a number of plants collected.

156 Development of a Preliminary Measure of Underemployment

JAVIER OSPINA

DEPARTMENT: PSYCHOLOGY

The aim of this study was to develop and validate a preliminary three-dimensional measure of underemployment. Participants were recruited via social media (n=62) and responded to a survey that included an initial pool of 15 underemployment items along with existing scales of job involvement, job satisfaction, turnover intention, and several de-

mographic questions. A revised three-dimensional, nine-item model fit the data well and each dimension demonstrated acceptable reliability. As hypothesized, the dimensions of the underemployment scale were significantly negatively correlated with job involvement and job satisfaction and positively correlated with turnover intention.

157 Atomic Origins of Selective Nitrogen Adsorption Using Isotope-Contrasted Total Scattering

ARNOLD PAECKLAR

DEPARTMENT: CHEMISTRY

A host of societal challenges in energy and in health are limited by our understanding of solid-phase chemical reactivity. For instance, in heterogeneous catalysis, the identities, concentrations, structures, and roles of chemically reactive species remain elusive, because we do not have robust approaches to observe them at relevant atomistic length or time scales. To elucidate this information we are developing a technique that combines neutron scattering with steady state isotope transient kinetic analysis. Our proof-of-concept is to probe the structure of zeolites and understand the nature of N₂ adsorption in these materials using total scattering and pair distribution function analysis.

158 Thorstein Veblen, Silicon Valley, and the Practicable Soviet of Technicians

DANIEL PALMER

DEPARTMENT: ECONOMICS

Thorstein Veblen, writing in 1921, correctly predicted that the United States economy was not structured to have a revolutionary overturn. Rather, he envisioned an outcome in which technicians would begin to accumulate capital and themselves become what he termed “the captains of industry”. While this latter prediction may not have been true in its totality, capital accumulation by technicians has been apparent in the technological sector. This paper compares Veblen’s theoretical approach to the realities of the contemporary American technological sector, examining the hypothesis that a “practicable soviet of technicians” exists today.

159 Efficacy of a Social Skills Group Treatment for Children

MOLLY PARSONS

DEPARTMENT: PSYCHOLOGY

This study examined the effectiveness of an eight session, outpatient social skills group therapy treatment for children with significant social skills deficits. The curriculum was designed to teach nine specific social skills including: Eye Contact, Personal Space, Self-Emotions, Other-Emotions, Pedantic Speech, Greetings, Conversations, Friendliness, and Play Skills. Seven elementary aged children with an Autism Spectrum Disorder and/or Attention Deficit Hyperactivity Disorder participated. Results indicate that the treatment was partially effective. Pre to post changes in the domain of Self-Emotion were significant, helping substantiate the efficacy of social skills group therapy treatment for children with severe social skill deficits.

160 A Review of Convective Self-Aggregation in Simulations of the Atmosphere

CASEY PATRIZIO

DEPARTMENT: ATMOSPHERIC SCIENCE

In idealized simulations of the atmosphere, it has been observed that convection can spontaneously aggregate into one or more clusters. This is an important process because an atmosphere in which convection is diffuse has significantly different characteristics than that of one where convection is aggregated. Thus, convective self-aggregation can have significant effects on climate. In this review, I will outline some recent studies that describe some the mechanisms that control self-aggregation, and I will also discuss the results of study that relates convective self-aggregation to the largest intra-seasonal (30-60 day) oscillation in the tropical atmosphere, called the Madden-Julian Oscillation (MJO).

161 Mining a Weedy Genome for Traits of Agronomic Importance

ERIC PATTERSON

DEPARTMENT: BIOAGRICULTURAL SCIENCE AND PEST MANAGEMENT

Weedy plant species possess multiple traits that make them highly competitive and adapted to harsh environments. Many traits related to weediness, such as seed yield, drought and herbicide resistance, salt tolerance, and biomass yield, are also highly desirable in crop species. Additionally, weedy plants have much more genetic diversity than domesticated crops. To date, only one weedy plant genome (*Conyza canadensis*) has been assembled. In order to develop a source of novel genetic information for crop development, as well as a model species for weed biology, I am sequencing, assembling, and annotating the genome of the weedy species *Kochia scoparia*.

162 Benzoic Acid Penetration of Surfactant Interfaces

BEN PETERS

DEPARTMENT: CHEMISTRY

Without penetration of the membrane, a drug will not be able to reach its target and thus will not have a desired therapeutic effect. As a commonly used food preservative, benzoic acid's interaction with membranes is not well understood. A better understanding of the interaction of benzoic acid with membranes will allow us to predict which conditions benzoic acid will penetrate membranes to have a stronger biological affect. In this study, benzoic acid's interaction with model membranes were studied to better understand its interaction with a membranes.

163 Neonatal Mule Deer Survival and Natural Gas Development

MARK PETERSON

DEPARTMENT: FISH/WILDLIFE/CONSERVATION BIOLOGY

Extensive natural gas development on public lands has elevated concern among stakeholders, wildlife managers, and researchers about the impacts on mule deer (*Odocoileus hemionus*) populations. Estimates of survival and cause-specific mortality were derived from a sample of radio-collared neonates (newborns) captured in 2012, 2013, and 2014

using vaginal implant transmitters inserted in adult females. In 2012 - 2014, neonatal survival estimates were higher in undeveloped areas compared to developed areas and predation was the leading cause of mortality in the Piceance Basin, Meeker, CO. Overall, our goal is to provide results promoting improved energy development mitigation and wildlife management practices.

164 Less Affected Limb Contributes More in Standing Balance with MS

RICKY PIMENTEL

DEPARTMENT: HEALTH AND EXERCISE SCIENCE

Balance difficulties and unilateral motor dysfunction are two common ailments of Multiple Sclerosis (MS). However, it is unclear how one contributes to the other. We tested individual limb corrections and bilateral weight distribution during quiet stance in patients with MS. Standing balance trials with eyes open and closed were measured with each foot on a force platform. Anterior-posterior sway was greater on the less affected side with eyes open. Weight distribution shifted to more reliance on the less affected limb with eyes closed. In conclusion, the less affected lower limb appears to play a greater role in maintaining upright balance.

165 Role of Nitric Oxide in Neurosecretion in Decapod Crustaceans

NATALIE PITTS

DEPARTMENT: INTERDISCIPLINARY – CELL AND MOLECULAR BIOLOGY

Molting in decapod crustaceans is regulated by molt-inhibiting hormone (MIH), a neuropeptide released from the sinus gland (SG) located in the eyestalk ganglia. Release of MIH from the SG suppresses molting. The hypothesis is that a gaseous neuromodulator, nitric oxide (NO), depresses the frequency and/or amount of MIH released from the SG. The data indicates that NO in the SG is sequestered by an endogenous binding protein, allowing for prolonged release of the gas. To the best of our knowledge, this is that first experiment to quantify NO production and provide evidence of a NO binding protein in a crustacean.

166 Playing with Pastoral: Socio-Economic and Geographic Relations in Herrick's Hesperides

COURTNEY POLLARD

DEPARTMENT: ENGLISH

In *Hesperides*, Robert Herrick adapts the pastoral mode to fit his own poetic and political goals. Herrick's delineation of the differences in social class, particularly the emphasis on the agrarian labor and the uncivilized nature of country people, undermines the rural idyll. Yet, Herrick does not abandon pastoral values altogether; rather, by mapping socio-economic differences onto the geographic landscape, he uproots pastoral values – reciprocal community, the Golden Age, prosperity – from the country and relocates them to the city. This geographical transition of pastoral values expands the socio-economic differences between laborer and estate lord to differences between country and city.

167 The Response of Soil Biota to Fire: A Systematic Synthesis

YAMINA PRESSLER

DEPARTMENT: INTERDISCIPLINARY – ECOLOGY

Soil biota play a critical role in carbon (C) cycling via direct decomposition of organic C and indirect trophic interactions between species. Fire is the primary disturbance in many ecosystems and has direct implications for C dynamics. We conducted a meta-analysis of studies investigating the impact of fire on soil biota. We reviewed relevant peer-reviewed literature and extracted data directly from the selected papers. As fires are expected to become more frequent, a critical investigation into the response of soil organisms to fire may help predict how soils and the ecosystem processes they regulate will respond to changing fire regimes.

168 Increasing Knowledge About Slow Fashion Through An Educational Module

RACHEL PREUIT

DEPARTMENT: DESIGN AND MERCHANDISING

Many consumers are unaware of the environmental impacts of low-quality, inexpensive clothing, called “fast fashion.” An alternative is “slow fashion,” where quality and longevity are valued. This study aims to understand whether education about slow fashion regarding its environmental benefits and the negative environmental impacts of fast fashion will influence consumers’ attitude and purchase intentions toward slow fashion products. Using the Theory of Planned Behavior, this study will measure young adult consumers’ environmental values, shopping values, knowledge of slow fashion/fast fashion, attitudes, subjective norm, perceived behavioral control, and purchase intention by distributing surveys before and after an educational module.

169 In Vitro Effects of PI3K/mTOR Inhibition in Canine Hemangiosarcoma

ALEX PYUEN

DEPARTMENT: INTERDISCIPLINARY – CELL AND MOLECULAR BIOLOGY

Hemangiosarcoma (HSA) is an aggressive tumor of blood vessels that accounts for nearly 2% of canine neoplasia. With current surgical and chemotherapeutic interventions, median survival time is roughly 6 months. The PI3K/mTOR pathway is known to trigger a variety of cellular responses, including cell proliferation and survival, and thus is an excellent target for chemotherapeutic intervention. This study utilizes several in vitro assays to examine the effect of a novel anti-cancer drug (VDC-597) that inhibits this pathway. The results show that the drug is effective in reducing cell growth, proliferation, and migration in three canine HSA cell lines.

170 Evidence of Inflammaging and Gastrointestinal Bleeding in Old Dogs

LAUREN RADAKOVICH

DEPARTMENT: MICROBIOLOGY, IMMUNOLGY AND PATHOLOGY

There is a growing population of aging dogs in the United States. Thus, there is a great need for veterinarians to understand how aging affects routine screening tests such as the complete blood count and serum biochemical profile. We retrospectively identified clinically healthy

dogs of many breeds and allocated them to three age groups: adult, senior, and geriatric. Statistical tests comparing blood work variables amongst these three groups were performed. Notable findings included evidence of increased systemic inflammation and potential gastrointestinal bleeding in older dogs. Future prospective studies are warranted to investigate these findings further.

171 Improved Methods to Measure Nitrous Oxide Emissions from Agriculture

MATT RAMLOW

DEPARTMENT: INTERDISCIPLINARY – ECOLOGY

Improving agricultural production is critical to addressing climate change, as agriculture contributes 10 to 12% of global anthropogenic greenhouse gas emissions. Nitrous oxide (N₂O) emissions from application of synthetic fertilizers are a major source, but are difficult to quantify as they are subject to high temporal and spatial variability. New technologies such as cavity ring down spectroscopy (CRDS) can greatly improve the precision of N₂O measurements in field. This study evaluates a new protocol for combining dynamic CRDS measurements using automatic chambers and traditional gas chromatography (GC) measurements using static chambers to more accurately quantify N₂O emissions.

172 The Mini-Pig as a Neonatal TB Vaccine Efficacy Animal Model

LAYLAA RAMOS ARRIAZA

DEPARTMENT: INTERDISCIPLINARY – CELL AND MOLECULAR BIOLOGY

Progress towards decreasing the prevalence of Tuberculosis (TB) has been hampered by vaccine development. Vaccines show promise in adult animal models yet fail to protect infants from TB disease in clinical trials. In this study, we developed the mini-pig as a neonatal animal model for TB vaccines. We showed mini-pigs could be infected with *Mycobacterium tuberculosis* by monitoring for clinical signs and TB lesions in tissue. Further, neonatal mini-piglets were vaccinated with *Bacillus Calmette-Guerin* (BCG) to monitor the immune response until adulthood. Our findings suggest mini-pigs have the potential of serving as an effective neonatal animal model for TB vaccines.

173 The Role of Individual Nutritional Intake Target on Food Sharing

ABBIE READE

DEPARTMENT: BIOLOGY

Nutritional geometry is a state-spaced modeling approach used to examine how foraging animals combine foods to maximize fitness. The intake target represents an ideal balance of nutrients and can be calculated for any nutritional component of a diet. Differences among individuals in intake targets represent alternative behavioral strategies to maximize fitness. Using the honeybee colony as an experimental model we quantify the intake targets of individual honeybees and then measure food sharing by these bees with colony members. We investigate how variation in nutritional intake target influences cooperation and the role of individual nutrition in the evolution of sociality.

174 Effect of Nutraceutical Supplementation on Energy Expenditure and Weight Loss

TANYA REICHERT

DEPARTMENT: HEALTH AND EXERCISE SCIENCE

This study aimed to address the obesity-chronic disease risk issue by ascertaining the possibility of decreasing weight by increasing energy expenditure (through improved sympathetic nervous system (SNS) activity) via nutraceutical administration (a combination of green tea catechin flavonoids (40% epigallocatechin gallate (EGCG)), vitamin C, magnesium, and copper, each of which have shown positive effects on various aspects of these measures). Compared with a placebo control group, five weeks of daily nutraceutical ingestion did not affect energy expenditure or body mass/composition in this pilot study of six sedentary, overweight/obese adults.

175 Cyclic Nucleotide Phosphodiesterases Characterization in the Transcriptome Crustacean Molting Gland

NADA RIFAI

DEPARTMENT: BIOLOGY

Cyclic nucleotide signaling mediates the suppression of the crustacean molting gland (Y-organ or YO) by molt-inhibiting hormone (MIH). When MIH level drops the YO transitions from the basal to the activated state and the animal enters premolt. During mid-premolt, the YO transitions to the committed state, in which the YO becomes insensitive to MIH. Phosphodiesterases (PDEs) hydrolyze the phosphodiester bond in cAMP and cGMP to AMP and GMP, respectively, and can modulate the YO response to MIH. In some species, PDE inhibitors decrease molting hormone (ecdysteroid) biosynthesis by YOs in vitro, indicating PDE activity can keep cyclic nucleotide levels low.

176 Enabling Performance Optimization of CFD Applications with Source-to-Source Compiler Technology

JORDAN RILEY

DEPARTMENT: MECHANICAL ENGINEERING

A new programming approach utilizing source-to-source compiler technology is applied to parallelize a computational fluid dynamics flow solver. Translators based on a source-to-source compiler can optimize large scale applications for complex modern computer architectures. A translator, written with the ROSE compiler, is designed to replace sequences of instructions in a serial algorithm with QUARK tasks. QUARK is a dynamic run time system that executes tasks asynchronously while avoiding data hazards. The flow solver is a multi-stage multigrid finite-volume algorithm. The overall strategy is shown to increase the performance, programmability, and portability of CFD applications.

177 Muon Neutrino on Atomic Electron Scattering

PAUL ROJAS

DEPARTMENT: PHYSICS

NuMI Off-Axis Electron Neutrino Appearance (NOvA) experiment is designed to detect and measure neutrino oscillations and their properties. The neutrino beam is started in Batavia, IL at Fermilab, where our near detector resides, and sends neutrinos 500 miles away to our far detector in Ash River, MN. Interactions between muon-neutrinos and atomic electrons, contained in the detector active volume, are well understood. We plan to study this interaction in the NOvA near detector and use it to help constrain the incident neutrino beam flux.

178 Rhizosphere Priming of Cover Crop Decomposition

STEVE ROSENZWEIG

DEPARTMENT: SOIL AND CROP SCIENCES

Rhizosphere priming is a process in which plants stimulate soil organic matter decomposition through root and labile soil carbon inputs. Priming may be an important, overlooked mechanism in agricultural systems with potential applications for improving crop nutrient use efficiencies. We tracked the carbon and nitrogen from corn, clover and rye cover crop litter, and background soil organic matter in plots with different cover crop legacies in a 2-year study in an organic cropping system. We found evidence of greater corn belowground carbon allocation in the presence of nitrogen-rich clover, resulting in priming of clover litter and greater corn nitrogen uptake.

179 Understanding how Videogame Experience Influences Learning Outcomes in Training Simulations

DIANA SANCHEZ

DEPARTMENT: PSYCHOLOGY

This study investigated the impact of clear rules and goals on trainee performance in a videogame training simulation. When controlling for videogame experience, clear rules and goals was related to improved performance. Additionally, engagement mediated the relationship between rules and goals clarity and in game performance.

180 Modeling Dynamic Social Networks in Animals from Movement Data

HENRY SCHARF

DEPARTMENT: STATISTICS

Network modeling techniques provide a means for quantifying social characteristics of populations of animals. However, data used to estimate the social associativity are typically in the form of counts of interactions between individuals based on species-specific thresholds of physical proximity. In many applications, collecting these data is expensive, opportunistic, and potentially invasive. Telemetry data offer an alternative way of estimating the pairwise associativity among individuals in a group. We propose a Bayesian hierarchical model for animal movement in which an underlying dynamic social network drives movement in two ways: an attractive (repulsive) effect, and an aligning (anti-aligning) effect.

181 The Role of Leaky Expression in Biological Switches

KATHERINE SCHAUMBERG

DEPARTMENT: INTERDISCIPLINARY –
BIOENGINEERING

Leaky expression plays a role in balance of bi-stable switches, robustness of switches and functional roles (practical properties) of switches. Even though these properties of bi-stable switches are a key topic from fields such as synthetic biology to stem cell research, few have explored the role of leaky expression in circuit topologies. This poster aims to compare different circuit topologies in their effectiveness to handle leaky expression and should give us insight on how to design better circuits in synthetic biology while providing a platform for understanding the role leaky expression may play in nature.

182 Cinnamon Teal Breeding and Population Ecology

CASEY SETASH

DEPARTMENT: FISH/WILDLIFE/CONSERVATION
BIOLOGY

In order to maintain a stable continental population of cinnamon teal, it is essential to understand their vital rates and how they affect population trends over time. We conducted a pilot field season to estimate nest success, female survival, and duckling survival and how these birds' selection of resources within their breeding range influences these rates. From the cinnamon teal nests we located (n=40), we calculated an apparent nesting success of 22.5%. These results have important implications for cinnamon teal management and will be developed further over the next two field seasons.

183 Quantitative Analysis of Watershed Services Investments and Policy Influence

KAT SEVER

DEPARTMENT: FOREST AND RANGELAND
STEWARDSHIP

The number of investments in watershed services (IWS) programs is increasing rapidly in the United States. Research suggests that government policy is an important enabling condition for IWS initiatives. However, no known studies have quantitatively measured the relationship between the occurrence of IWS programs and underlying policy frameworks. This research investigates how state-level policies have affected the development of IWS programs in the U.S. The study first identifies and describes spatial patterns of IWS initiatives. Second, the study determines levels of correlation between the occurrence of IWS programs within states and the existence of state-level policies addressing watershed ecosystem services.

184 EAT! Expansion of Aging Adipose Tissue

KYLE SEVITS

DEPARTMENT: FOOD SCIENCE AND
HUMAN NUTRITION

Young and lean adults appropriately store fat in protective locations (hips and thighs) away from major organs. However, as adults age, fat begins to accumulate in muscle and liver, contributing to the development and progression of type 2 diabetes and cardiovascular disease. This fat redistribution may be due, in part, to age-related declines in the ability for stem cells in the fat (adipose tissue-derived stem cells;

ASC) to become fully functional fat cells. Our study will investigate fat deposition into muscle and ASC function with age and in response to 7 days of overfeeding in men from 18-70 years old.

185 Thermal Evolution of Continental Rifting in Corsica (France)

NIKKI SEYMOUR

DEPARTMENT: GEOSCIENCES

This study uses zircon, rutile, and apatite LASS-ICP-MS U-Pb geochronometry to constrain the thermal evolution of a fossil magma-poor rift margin in NE Corsica. Zircon reveal ~210-180 Ma overgrowths on 300-270 Ma cores, indicative of thermal activity during Mesozoic rifting. Cooling due to rapid exhumation is recorded by thermally-activated volume diffusion of Pb in rutile and apatite at T >400°C, with rutile showing a progression from ~170 Ma cores to 150-145 Ma rims and apatite showing 170 Ma cores grading to 140-135 Ma rims. Together, these data provide compelling evidence for rift-related reheating of the Corsican margin.

186 Hot Bugs, Cold Bugs: Assessing Vulnerability to Climate Change

ALISHA SHAH

DEPARTMENT: BIOLOGY

An understanding of thermal tolerance may be crucial in revealing which species are vulnerable to climate warming. We conducted thermal tolerance experiments in aquatic insects from mountain streams in Colorado and Ecuador. We found that tropical insects have narrower thermal breadths than their temperate counterparts. But while thermal maximum values indicate that mayflies show high heat tolerance, the metabolic rate experiments demonstrate that insects from both locations have a strong preference for colder temperatures. We therefore suggest that multiple experimental approaches should be used when assessing vulnerability to warming, as a single technique can lead to erroneous conclusions.

187 Algorithm-Based Scanning for Prion-Like Proteins in Yeast

JENIFER SHATTUCK

DEPARTMENT: BIOCHEMISTRY AND
MOLECULAR BIOLOGY

Prions are infectious proteins capable of self-propagating and transmitting between organisms. Even though there is no homolog to the mammalian prion protein in yeast, several soluble proteins can form heritable aggregates de novo. Using a prion prediction algorithm, we scanned the yeast proteome to select proteins that contain domains predicted to have prion activity (prion-like domains). These prion-like domains were tested in four prion activity assays to assess their activity in vivo as well as in vitro. Here we demonstrate our ability to predict prion activity of a select group of yeast proteins.

188 Dietary Intervention Alters Gut Bacterial Metabolism in Colorectal Cancer Survivors

AMY SHEFLIN

DEPARTMENT: FOOD SCIENCE AND
HUMAN NUTRITION

Dietary rice bran and cooked navy bean powder contain a variety of phytochemicals that are fermented by colonic microbiota and influence intestinal health. A randomized-controlled clinical trial was developed to investigate effects of eating 30g/day dietary rice bran or 35g/day cooked navy bean powder on the gut microbiome (NCT01929122). Twenty-two overweight/obese volunteers previously diagnosed and treated for colorectal cancer consumed a study-provided meal and snack daily for 28 days. Volunteers receiving rice bran or bean powder showed increased gut bacterial diversity and altered gut microbial composition. These changes were associated with increased anti-inflammatory and/or anti-tumorigenic gut microbial metabolites.

189 Average Daily Gain in Prewaned Dairy Heifer Calves

CHELSEY SHIVLEY

DEPARTMENT: ANIMAL SCIENCES

The objective was to evaluate the effects of liquid diets, health, and management practices on average daily gain (ADG) in dairy heifer calves. This was a yearlong longitudinal study focused on calf management from birth to weaning, and was conducted as part of NAHM's Dairy 2014 study. Proc Mixed in SAS was used to determine which factors significantly ($p < 0.05$) impacted ADG. This interim analysis is based on 1541 calves. The model, using initial results, included diet, disease, and season. Improving nutrition to calves increases weight gain and decreases disease occurrence, which improves animal welfare and decreases the use of antibiotics.

190 Physiological Regulation and Emotional and Behavioral Patterns in 3-Year-Old Children

MANDY SKORANSKI

DEPARTMENT: HUMAN DEVELOPMENT AND
FAMILY STUDIES

Proficient physiological regulation has been linked to emotional expression and self-regulation in young children. The current study is aimed at understanding the nature of this relationship through examining dynamic patterns of affect and behavior displayed by children during a challenging task. Results suggest that children who better regulate physiological arousal also show less fluctuation in behavioral patterns, are more drawn to a well-regulated behavioral state, and occupy a greater number of differentiated behavioral states over the course of a stressful task. Findings provide new insight into how the regulation of physiological mechanisms and behavioral patterns are linked in early development.

191 Perception of Management: Organizational Relationships Effect on Employee Behavior

JOEY SMITH

DEPARTMENT: PSYCHOLOGY

Since the advent of career study and workplace research numerous researchers have posited multiple variables and parameters that have advanced the appreciation of the psychology of work in the United States. The present study, to extend the understanding of the psychological, specifically the relational parameter of work, focused on relationships within the workplace. The researchers assessed subject responses relevant to their perception and attributions regarding key relationships where they were employed. Results indicated significance in areas of supervisor concern for the employee, intrinsic motivation and initiative, organizational relationships, as well as organizational communication in participant job satisfaction and organizational commitment.

192 Strength Testing of Geosynthetic Clay Liners for Mining Applications

SAMAN SOLEIMANIAN

DEPARTMENT: CIVIL AND ENVIRONMENTAL
ENGINEERING

The objective of this study is to develop a direct shear testing apparatus to measure the internal shear strength of geosynthetic clay liners (GCL). Innovative aspects of the apparatus include testing GCLs exposed to mine solutions (e.g., pH ? 1 or pH ? 12), high normal stresses (up to 2000 kPa), and elevated temperatures (up to 90 °C). The apparatus also will be capable for conducting displacement- and stress-controlled direct shear tests. Results from this study will aid in evaluating long-term stability of GCLs used in mining applications (e.g., heap leach pads, waste containment, etc.).

193 Pin It: Technology Advancements Increase Need for DIY Design App

LEAH STONE

DEPARTMENT: JOURNALISM AND MEDIA COMM

Social media sites, Houzz and Pinterest, show homeowners are interested in Do-It-Yourself (DIY) home projects and find design inspiration browsing internet. Current real estate research shows DIY home improvement market strongly parallels the housing market. The real estate industry is currently trending upwards; therefore, DIY home renovations are trending upwards. Through content analysis, surveys, and interviews a design app was created. Mint Designs Curb Appeal allows consumers to take a photo of the exterior of their home and utilize specific house templates integrated in the app to demonstrate how their specific house exterior could look based on personal style preferences.

194 Pressure to be Thin Predicts Body Weight and Fat Gain

CAITLYN SUELTER

DEPARTMENT: FOOD SCIENCE AND
HUMAN NUTRITION

Overweight (OW) adolescents report more sociocultural pressure to be thin than non-OW teens. We studied associations of pressure to be thin with weight and fat mass gain in 198 teens over 1 year. At baseline, pres-

sure to be thin was assessed by teen- and mother-report on the Pressure to be Physically Attractive Questionnaire. At baseline and 1 year, BMI and fat mass were measured. Pressure to be thin from mothers, fathers, and peers predicted BMI and fat, such that more pressure related to greater gain. We conclude parental and peer messages about thinness are associated with BMI and fat gain.

195 Improving Superconductors Through Interfacial Chemistry

MICHAEL TARNE

DEPARTMENT: CHEMISTRY

Iron-based superconductors began to attract a great deal of attention when LaFeAsO was discovered to have a superconducting transition temperature of 26 K in 2008. Fe_{1.01}Se is the simplest known iron-based superconductor with a transition temperature of ~8.4 K, which is elevated to greater than 100 K when prepared as a single unit cell thin film on strontium titanate substrates. Our efforts have focused on the use of solid state metathesis to epitaxially grow Fe_{1.01}Se films at low temperature on bulk SrTiO₃. If successful, this could result in a significantly higher transition temperature in bulk iron selenide.

196 A Probabilistic Approach for Quantification of Trading Ratios

ALI TASDIGHI

DEPARTMENT: CIVIL AND ENVIRONMENTAL ENGINEERING

Quantifying the nonpoint source pollutant loads and assessing the benefits of conservation practices (BMPs) are prone to different types of uncertainties which have to be taken into account when developing nutrient trading programs. Using carefully developed estimates of conservation practice effectiveness uncertainty can provide consistency and predictability when estimating nonpoint source credits. On the other hand, using overly conservative estimates could unnecessarily reduce trading volumes and reduce the expected efficiency gains. An integrated uncertainty analysis framework was developed for quantification of trading ratios under uncertainty. The framework was used to determine the bands of uncertainty around BMP efficiencies.

197 Kinetochore-Microtubule Attachment Silences the Spindle Assembly Checkpoint

ERIC TAUCHMAN

DEPARTMENT: INTERDISCIPLINARY – CELL AND MOLECULAR BIOLOGY

During mitosis, duplicated sister chromatids attach to microtubules emanating from opposite spindle poles via large protein complexes called kinetochores. At this time, a surveillance mechanism known as the spindle assembly checkpoint (SAC) produces and inhibitory signal preventing anaphase onset. Precisely how this signal is extinguished remains unresolved, but kinetochore-microtubule (K-MT) attachments and generated pulling forces have been attributed. To address this question, we induced hyper-stable K-MT attachments using a non-phosphorylatable version of Hec1, a core component of the attachment machinery. We find that these hyper-stable attachments are sufficient to satisfy the SAC without bi-orientation or pulling forces.

198 Phases of Systematic Brain Processing Successfully Predict Task-Specific Behaviors

BRITTANY TAYLOR

DEPARTMENT: HUMAN DEVELOPMENT AND FAMILY STUDIES

Researchers are attempting to develop biomarkers of development and dysfunction using neural processing measures called event-related potentials (ERPs). However, current investigations are limited mainly to univariate analyses, yielding weak brain-behavior relationships that are inadequate for use as biomarkers. The current study utilized ERP data collected from 51 children to establish a model of phases of systematic stimulus-response processing which then predicted task-specific behaviors. Results indicated that ERPs can be modeled as systematic phases of brain processing, and that the full stream of processing can successfully predict task-specific behaviors. The model serves as a promising foundation for future ERP biomarker identification.

199 A Lab-on-a-Chip Design of 128x128 Ultra-Microelectrode Array Electrochemical Biosensor

WILLIAM TEDJO

DEPARTMENT: ELECTRICAL AND COMPUTER ENGINEERING

The vision of biosensor interdisciplinary research project is to sense, process, and interpret chemical activity in a living being, or often called in-vitro measurement. The technique enables us to sense early sign of diseases and biological anomalies without disruptive side effect to the individual earlier than current modern medical method. In tandem with optical imaging, this biosensor microchip is designed to obtain chemical gradient image of a living tissue cells. This silicon based microchip employs 16,384 two dimensional sensing point that covers 3.5mm x 3.5mm area in order to achieve of high spatial and temporal resolution.

200 An Essential Chromatin Factor in DNA Repair and Genome Stability

ALISON THURSTON

DEPARTMENT: BIOCHEMISTRY AND MOLECULAR BIOLOGY

The pathways and proteins involved in the repair of DNA and the proteins involved in maintaining the architecture of DNA are conserved from yeast to humans. In this study I will utilize the simplicity of the yeast model to examine how the machinery in charge of maintaining “healthy” DNA works with the machinery in charge of maintaining its architecture. The information gained about the relationship between DNA architecture and repair may open a new field of target for therapeutics.

201 Gendered Social Norms Impact Reported Attitudes Towards Intimate Partner Violence

CARLIE TROTT

DEPARTMENT: PSYCHOLOGY

This study draws on a social norms framework to examine the influence of interview context – specifically the presence of other women and men – on women's reported attitudes towards intimate partner violence (IPV) in Ethiopia, where IPV rates are among the highest in the world. The sample (16,349 women, ages 15 to 49) was taken from Ethiopia's 2011 Demographic and Health Survey. Results showed the odds of women "justifying" IPV to be nearly twice as great when other women were present during the interview, and nearly half in the presence of men. Implications for more sensitive interview methodology are discussed.

202 Colocalization of Corticotropin-Releasing Hormone with Transcriptional Repressors in the Hypothalamus

ASHLEY TURNIDGE

DEPARTMENT: BIOMEDICAL SCIENCES

Crh transcription in the hypothalamic paraventricular nucleus (PVN) is negatively regulated by glucocorticoids. Accordingly, recent in vitro evidence suggests glucocorticoids recruit a repressor complex associated with chromatin and histone modifications to the crh promoter. In vivo support for this observation, however, is necessary to ascertain its physiological relevance. To facilitate identification of all PVN CRH neurons in vivo, we utilized mice that express in these neurons a tdTomato fluorophore. Brain sections were immunostained for CRH and tdTomato. We determined the percent colocalization of CRH:tdTomato for each. Our results support in vitro observations regarding CRH negative regulation.

203 The Role of Genetic Diversity in Colonization

MEGAN VAHSEN

DEPARTMENT: INTERDISCIPLINARY – ECOLOGY

A fundamental goal in ecology is understanding why certain colonizing populations successfully establish and why others fail. Genetic diversity is crucial to long-term persistence of most populations. However, genetic diversity may be important even during initial establishment. Using *Bromus tectorum* L. as a model system, we conduct a common garden experiment manipulating the level of genetic diversity of founding populations of seeds. We will use a Bayesian hierarchical framework to address how increasing genetic diversity influences the performance of founding populations. Understanding the immediate effects of genetic diversity is crucial in both conservation and management of invasive species.

204 PEACE PLATE: Nutritional Training for Nepali Females of Childbearing Age

JAIME VALENCIK

DEPARTMENT: CO SCHOOL OF PUBLIC HEALTH

Unanticipated conception frequently occurs in rural Nepal as does the prevalence of child stunting and malnutrition. With female nutritional status at the moment of conception largely influencing life-long health/growth/nutritional potentials for children – as a Peace Corps Volunteer – I addressed this global health problem through the development, conduction, and distribution of a unique, culturally-specific training highlighting the importance of optimal nutrition for Nepali females of childbearing age now in the growing of strong, healthy, happy families in the future. Culturally-sensitive and community-favored, the PEACE PLATE concept/training materials are currently utilized by Peace Corps Nepal.

205 Phonetic Transfer Issues between English and Spanish

ANABELA VALERIOTI

DEPARTMENT: FOREIGN LANGUAGES AND LITERATURE

Pronunciation can be a problematic and frustrating aspect of language acquisition and this presentation will specifically address the difficulties that learners frequently face when developing phonetic skills: English to Spanish and Spanish to English. The presenters draw upon personal second language learning, graduate level research, and a wide variety of professional Spanish and English classroom experience in the second language context. They will highlight these possible phonetic areas of difficulty, while modelling pedagogical techniques that educators can immediately use to improve the pronunciation of their language learners.

206 5-Hydroxymethylcytosine Impacts Holliday Junction Structure and Stability

CRYSTAL VANDER ZANDEN

DEPARTMENT: BIOCHEMISTRY AND MOLECULAR BIOLOGY

Epigenetic modifiers play vital roles in directing DNA structure, regulating gene expression, and determining disease-states. The epigenetic marker 5-hydroxymethylcytosine (5hmC) has recently gained interest in the scientific community, and little is known about this marker despite its presence on one percent of cytosines in the mammalian genome. One observation is that high local genomic concentrations of 5hmC have been linked to DNA recombination, a process vital to repairing damaged DNA. Using biophysical laboratory techniques, this project aims to explore the mechanism behind 5hmC's connection to DNA recombination.

207 Interseeding Cool-Season Forages into Corn for Fall Grazing

LUIS VILLALOBOS

DEPARTMENT: SOIL AND CROP SCIENCES

Six forage species/mixtures were interseeded into grain corn to evaluate their yield and nutritional quality. Annual ryegrass and a brassica mix had the highest yields. Crude protein and digestibility of all treatments were higher than cornstalks while fiber content was lower. Annual

ryegrass and the brassica mix had the lowest costs per unit of dry matter and protein, having values similar to good quality alfalfa hay. Interseeding cool-season forages can increase the quantity and quality of forage offered to beef cattle grazing cornstalks during the fall while reducing supplementation costs for producers.

208 Exploring the Relationship between Exercise and Memory in Aging Adults

EMILY WADDINGTON

DEPARTMENT: SCHOOL OF SOCIAL WORK

This study examines the association between exercise and memory. The purpose of this study is to determine if there is a relationship between having a regular exercise routine and reported trouble remembering. The study utilizes secondary data from the National Health Interview Survey. Independent, dependent and control variables were recoded into categorical variables. Chi-square analysis was then conducted using this data. There is a statistically significant association between a regular exercise routine and reported trouble remembering. Findings indicate that there is a relationship between exercise and memory. Exercise could potentially be an effective intervention to prevent or slow memory loss.

209 Transcription Termination in the Third Domain

JULIE WALKER

DEPARTMENT: BIOCHEMISTRY AND MOLECULAR BIOLOGY

RNA polymerase (RNAP) carries out the essential process of transcription in all domains. Transcription is a highly regulated, complex process that is modulated by conserved and disparate factors in each domain of life. Regulation is imposed at each stage of the transcription cycle. Transcription factors involved in initiation and elongation have been characterized in all domains. Transcription termination factor(s) have only been characterized in bacteria and eukarya. They have been proposed to exist in archaea, but no one has characterized a termination factor in archaea. Presented are supportive experimental results for factor-dependent transcription termination in the archaeal organism *Thermococcus kodakarensis*.

210 A Sensitive Capacitive Biosensor for Fast Pathogens Nucleic Acids Detection

LEI WANG

DEPARTMENT: INTERDISCIPLINARY – BIOENGINEERING

The growing concerns in infectious diseases leads to the need for fast, low-cost and portable devices that reveal genetic profiles easily and sensitively. To this direction, ideas avoiding the classical methods to realize fast and label-free systems emerged. Capacitive biosensor is proposed to address these requirements. In this study, we present a rapid and low-cost capacitive sensor system, with high sensitivity and reproducibility to efficiently detect capacitance changes due to binding of target DNA/molecules on functionalized electrodes. The functionalization of gold electrode surface was carefully characterized.

211 Undermining Student Behavior: Differences in Study Choice

HILLARY WEHE

DEPARTMENT: PSYCHOLOGY

Rewards can have detrimental impacts on students' motivation to engage in learning tasks, affecting study choices and consequent test performance. We tested the hypothesis that rewards have no effect on short-term test performance, but affect choices to voluntarily spend time studying, and ultimately affect long-term test performance. Participants studied a set of Swahili-English word pairs. Half were offered a reward based on test performance and half were not. After the initial study phase, subjects were permitted to continue studying the words during two optional study periods: once before test (i.e. before reward removal) and after test (i.e. after reward removal).

212 Methods for Testing Isotropy Properties of Spatial Data

ZACH WELLER

DEPARTMENT: STATISTICS

In this work, we provide insights into the process of creating statistical models for spatially-referenced data. We review methods that can be used to test second order properties of spatial processes and develop informative graphics that illustrates the process of choosing an appropriate statistical model. We also create software that implements several of the reviewed methods and demonstrate its utility on a data set of rainfall amounts.

213 Enhancing Production of a Nitrogen-Fixing *Anabaena* sp. Cyanobacteria Based Biofertilizer

JOSHUA WENZ

DEPARTMENT: SOIL AND CROP SCIENCES

A local strain of the nitrogen-fixing cyanobacterium *Anabaena* sp. has been successfully scaled up in on-farm open raceways for use as a nitrogen fertilizer for horticultural crops. We looked at three methods for cost effectively increasing productivity. Supplementing CO₂ into the culture could realize the greatest improvement in biomass and nitrogen. Understanding the photosynthetic efficiency of *A. sp.* in response to diurnal changes in sunlight can enhance survival and growth rates throughout a production period. Use of deltas to improve vertical mixing of the raceway cultures may improve mass transfer of nutrients and lead to more efficient production of nitrogen.

214 Lin28B Regulation of Mammalian Trophoblast Cells

RACHEL WEST

DEPARTMENT: BIOMEDICAL SCIENCES

LIN28A and LIN28B are RNA-binding proteins that are essential in the maintenance of embryonic stem cells. These proteins inhibit the let-7 miRNA family to prevent differentiation. As cells begin to differentiate, LIN28A and LIN28B decrease, allowing let-7 levels to increase. Abundant expression of LIN28A and LIN28B has been reported in the trophoblast of the placenta; however, LIN28's role has yet to be fully understood. We hypothesize that Lin28B acts as an important regulator of trophoblast cell proliferation the placenta. In the current study, we investigate the role of Lin28B in the development of both the human and ovine placenta.

215 Multi-Functional Electrolyte for Internal Thermal Management of Li-Ion Batteries

KEVIN WESTHOFF

DEPARTMENT: MECHANICAL ENGINEERING

Lithium-ion batteries (LIB) are inherently thermally limited due to the current state-of-the-art electrolyte chemistry. The common organic solvents used in LIB electrolytes have low flash points and are the main source of fuel during a thermal runaway event. Current LIB thermal management for large battery packs entails significant cooling external to the individual cells to prevent thermal runaway from occurring. A more effective approach to managing cell temperature would be with an internal, phase-change thermal management system (PCTMS). A potential working fluid for a PCTMS, that is also native to a LIB, is the electrolyte.

216 Which Reporting Verbs Characterize Successful Academic Writing? A Teachers' Tool

JOHN WHALEN

DEPARTMENT: ENGLISH

Text books for English as a Second Language vary widely on the reporting verbs that they choose to teach to students. Normally, those chosen are not justified according to research. This poster outlines a recent study that determined which reporting verbs are actually most characteristic to academia, as compared to spoken English and pop publications. For the first time, it offers teachers a definitive list of the reporting verbs most crucial for improving the academic writing of English language learners. The study was based off of a 300-million word body of academic texts, pop publications, and transcripts of spoken English.

217 Improving Prostheses in India through Engineering Education

BEN WHEATLEY

DEPARTMENT: MECHANICAL ENGINEERING

The Jaipur foot is a cheap and simple prosthesis or artificial limb commonly used in India to replace the lower limb below the knee. While this product is simple and effective, it has a number of drawbacks such as patient comfort, long term use, and consistency. These can be addressed with engineering methods commonly taught in undergraduate studies. Thus, the combination of real world applicability, engineering design and analysis, and socioeconomic impact make this an ideal project for undergraduate students with graduate student mentorship.

218 Mitochondrial Functional Differences as Determinants of Species Longevity

MILES WHEDBEE

DEPARTMENT: HEALTH AND EXERCISE SCIENCE

Characterizing differences in mitochondrial function will likely lead to insights into respiratory chain function and its role in aging. The purpose of this study was to measure ETS excess capacity, (ExP) in CR and CL mouse models, to determine if ExP is increased compared with average longevity. High resolution respirometry was utilized to determine respiration rates with specific substrate additions in human and

long lived mouse skeletal muscle. ExP was calculated as the difference between ETS and OXPHOS capacity. If ExP is correlated with longevity the expected results would indicate a positive relationship, i.e. greater ExP would predict longer lifespans.

219 Dapagliflozin: Interactions with Exercise Training and Caloric Intake

JESSIE WILBURN

DEPARTMENT: HEALTH AND EXERCISE SCIENCE

Dapagliflozin, a type 2 diabetes medication, selectively inhibits Sodium-Glucose Transport Protein 2 (SGLT2) in the kidneys, leading to decreases in plasma glucose concentrations, but also a small but clinically significant degree of weight loss. The purpose of these investigations is to examine the following hypotheses: 1) Dapagliflozin will improve physiological adaptations to endurance exercise training; 2) Dapagliflozin will cause health benefits independent of weight-loss; and 3) the typical increase in hunger and appetite following weight-loss will be attenuated by a daily dose of Dapagliflozin.

220 They Talk to Others About Us: APA Discourse and Agency

MICHELLE WILK

DEPARTMENT: ENGLISH

Through discourse analysis, I look at American Psychological Association presidential addresses in order to explore the question: how does the discourse in these addresses reveal the amount of agency afforded to people who use their services? With the current commonplace medical expectation for patient agency, I study a limited corpus of these addresses to see how mental health situations may complicate this expectation. My research attempts insight for both psychologists and patients alike with an interest in providing and/or receiving more ethical care. As such, there is an intentional advocacy and social justice lens within this research.

221 Bison Reintroduction Effects on Grassland Birds, Mammals, Vegetation, and Recreationists

KATE WILKINS

DEPARTMENT: INTERDISCIPLINARY – ECOLOGY

North American grasslands provide ecosystem services, including carbon storage and habitat for diverse plant and animal communities. These services have been lost over time due in part to the loss of native grazing animals, namely the Plains bison (*Bison bison*). Reintroducing bison to their native range can help restore grassland function and habitat quality for wildlife, while also catalyzing the public to engage in grassland conservation. This interdisciplinary study has two primary objectives: 1) assess changes in bird, mammal, and vegetation communities in response to bison reintroduction, and 2) evaluate visitor experiences and place attachment before and after bison reintroduction.

222 ex vivo Health of Human Breast Cancer Mouse Xenograft Tumors

STACY WILLETT

DEPARTMENT: INTERDISCIPLINARY –
BIOENGINEERING

Most studies on xenograft tumors are conducted in vivo with growing utility for examining chemotherapeutic efficacy. However, such studies are time consuming. Ex vivo xenograft experiments could provide an added degree of accessibility for diagnostic imaging and capacity for a quicker determination of response to treatments. Second harmonic generation (SHG) imaging has high specificity for collagen in a biological sample, which may provide valuable information regarding tumor progression or metastatic potential. The current study was conducted to establish the characteristics of ex vivo xenograft tumor slices with SHG imaging and doxorubicin (Dox) treatment and measurements of cell proliferation (5-ethynyl-2'-deoxyuridine; EdU).

223 Assessing Maternal Transmission of CWD Using a Transgenic Mouse Model

KASSI WILLINGHAM

DEPARTMENT: MICROBIOLOGY, IMMUNOLGY
AND PATHOLOGY

Chronic wasting disease (CWD) is a prion disease characterized by its facile spread throughout cervid populations. Recently it's been recognized that maternal transmission might contribute to this rapid spread. We aim to explore CWD maternal transmission using a transgenic mouse expressing cervid PrPc. We have shown that CWD+ females successfully breed and bear offspring, PrPCWD deposition within their reproductive tissue, and conversion competent prions in brains of offspring born to mothers late in CWD infection. We are currently analyzing in utero tissues from pregnant CWD+ females. These studies will provide insight into the biological significance of maternal transmission of prions.

224 Mere Imagination: Mind and Material

MEAGAN WILSON

DEPARTMENT: ENGLISH

If, as William Carlos Williams wrote, a poem is a “small (or large) machine made out of words,” then how does the imagination enter into that machine? My project sifts through several poetic practices in an attempt to locate the role, or perhaps the mechanism, of the imagination within the writing process. By specifically considering the radical--and radically different--work of poets Alice Notley and George Oppen, I consider the relationship of imagination to the writer her- or himself, to memory, and to the process of making a unique art object.

225 Skeletal Muscle Protein Translation During Energetic Stress

CHRIS WOLFF

DEPARTMENT: HEALTH AND EXERCISE SCIENCE

Protein translation is energetically costly and tightly regulated, especially during times of energetic stress. The purpose of this study was to assess protein translation and identify potential mechanisms regulating mitochondrial protein translation during energetic stress signaling. Skeletal muscle cells in culture were treated with buformin, rapamycin, or metformin+rapamycin to induce energetic stress signaling prior to

assessment of cellular protein synthesis. Data from both methods will be analyzed with an emphasis on mitochondrial protein synthesis, as our laboratory has demonstrated that maintained or increased mitochondrial protein translation is a shared characteristic of slowed aging models that also exhibit energetic stress signaling.

226 CMOS Capacitive Sensor to Detect the Presence of Target Molecules

SAM WRIGHT

DEPARTMENT: ELECTRICAL AND COMPUTER
ENGINEERING

Modern advancements in semiconductor technology allows for unique applications in diverse fields. Development of ‘lab-on-chip’ in collaboration with medical, chemistry, and microbiology departments has tremendous potential to accelerate each field. High speed, low power capacitive sensors, with properly prepared electrode arrays can detect the presence of target molecules within a sample. Such a device can simplify test protocol, improving safety and throughput. Development of a sub-1fF CMOS capacitive sensor in 600 nm technology is discussed.

227 Highways, Tourism, and the “Great Acceleration” towards Unnatural Disaster

WILL WRIGHT

DEPARTMENT: HISTORY

Scientist Paul Crutzen proclaimed the arrival of a new geologic epoch – the Anthropocene – to capture the idea that humans have become a global geophysical force. The Anthropocene, which underscores global changes over local ones, humanity over individuals, presents challenges for historical inquiry in regards to scale: how can historians reconcile people and place when they write about the human species and the planetary whole? My interpretation of the 1976 Big Thompson Flood provides a case study in examining a local event within broader global-change systems – namely, the “Great Acceleration” of the Anthropocene – in order to reveal the interconnections between scales.

228 Understand the Designing Principles of Robustness in Wuschel System

WENLONG XU

DEPARTMENT: CHEMICAL AND BIOLOGICAL
ENGINEERING

WUSCHEL (WUS) plays central roles in plant stem cell maintenance, which is necessary for continuous growth and differentiation. Given the fluctuations in natural environments, the designing principle of robustness of WUS system is of interests for various fields. Using mathematical modeling as an elemental method becomes necessary due to increasing complexity of this system. Here, we focus on influences of different biomolecular interactions on system robustness, like molecule binding and internalization. Different behaviors were observed arise from different cases. The robustness will be further tested in more biological realistic environments. Knowledge learnt from WUS system will impact other fields too.

229 Bit-Serial FFT Engine for Implantable Biomedical Applications

LANG YANG

DEPARTMENT: ELECTRICAL AND COMPUTER ENGINEERING

Implantable biomedical devices are typically battery operated. Therefore they normally have stringent constraints on power consumption and size. This approach presents a low power 64-point, 16-bit fixed-point Fast Fourier Transform (FFT) processor design. Bit-serial logic was used in the design to achieve low power while maintain sufficient performance for biomedical applications. The proposed FFT design was implemented in a commercial 0.18 μ m CMOS process with a power supplier of 1.8V and running at 50MHz clock rate. The power consumption of 14mW with 0.55Mpoints/set signal throughput is achieved.

230 Aortic Valve Calcification: Geometric and Biomechanical Analysis

BANAFSHE ZEBHI

DEPARTMENT: MECHANICAL ENGINEERING

Cardiovascular disease is a leading cause of death accounted for 17.3 million people annually. Aortic valve calcification (AVC) and stenosis is one of the most common diseases among valvular heart disease. Aortic valve calcification is a multiscale process in which various mechanical and biological factors are involved in its initiation and development. Study of patient-specific anatomical and geometrical features of aortic valve along with molecular and hemodynamic investigations helps us to better understand the mechanism of calcification and assessing AVC helps predicting paravalvular leak.

231 Localization and Stability of a Toxic mRNA in Myotonic Dystrophy

ANNIE ZHANG

DEPARTMENT: INTERDISCIPLINARY – CELL AND MOLECULAR BIOLOGY

Myotonic Dystrophy 1 (DM1) is an autosomal dominant, multisystem disease triggered by CTG repeat expansions in the 3'UTR of the DMPK gene. The encoded RNAs are toxic to the cell and accumulate in nuclear foci where they sequester RNA-binding proteins. Little is known about the natural pathways of decay for the mutant transcript, thus our goal is to use a cell culture based system to characterize how mutant and wild-type DMPK mRNA degrade in muscle cells. We have determined that DMPK mRNAs decay surprisingly quickly and our data suggests that at least some of the transcript degrades in the cytoplasm.

232 Two Sample Inference in a Factor Model for CIDR's

BEN ZHENG

DEPARTMENT: STATISTICS

This article proposes a two sample statistical inferential test to compare betas in a functional dynamic factor model. The test is applied to the evaluation of the impact of curve-valued factors on the shapes of intraday price curves over any two pre-specified periods of time. The main empirical findings pertain to the impact of the 2007-2009 financial crisis on betas of US blue chip stocks and electronically traded funds. The asymptotic theory shows that the test statistic has a chi-square limiting distribution under the null hypothesis and diverges to infinity under the alternative.

233 Strain Engineering Tool Development for Improved Biofuel Production in Cyanobacteria

ALLI ZIMONT

DEPARTMENT: INTERDISCIPLINARY – CELL AND MOLECULAR BIOLOGY

More now than ever, oil price volatility and petroleum spills negatively affect global environment and economy. Biofuels hold great promise to remedy these problems. Photosynthetic cyanobacteria are one of the most attractive candidates for third-generation biofuel generation. This work focuses on developing strain engineering tools optimized for use in cyanobacteria biofuel generation. Published datasets were re-analyzed to identify promoter candidates, which were cloned into a luxAB probe and inserted into the *Synechocystis* genome. Seven engineered strains were produced. Future work will identify bioluminescent expression profiles and apply these control strategies toward biochemical production.

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November 11, 2015
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9:30 a.m. to 12:30 p.m. Poster Presentations, Artwork, and Performances

9:30 a.m. to 11 a.m. **GREEN** Presenters

11 a.m. to 12:30 p.m. **GOLD** Presenters

Odd numbered abstracts are in the **GREEN** presenting group.
Even numbered abstracts are in the **GOLD** presenting group.

10 a.m. to 12:20 p.m. Performing Arts

12:30 p.m. to 2 p.m. Lunch on Your Own

2 p.m. to 5 p.m. Professional Development Workshops for Graduate Students

2 p.m.	382 LSC	Career Center Resources for Graduate Students
2:30 p.m.	386 LSC	Becoming a Researcher in Industry
3 p.m.	382 LSC	Utilizing the Sponsored Programs Information Network at CSU
3:30 p.m.	386 LSC	Finding Your Perfect Post-Doc
4 p.m.	382 LSC	International Experiences in Graduate School

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