CELEBRATING HONORS SYMPOSIUM OF RESEARCH & CREATIVE PROJECTS

April 11, 2013
4:00 - 5:30 p.m.
Barrett Honors College
Tempe Campus

barretthonors.asu.edu/events
Celebrating Honors Symposium of Research and Creative Projects

Thursday, April 11, 2013
Barrett, The Honors College
4:00-5:30 p.m.

Program

4:00 pm  View Projects
4:45 pm  Welcome, Dean Mark Jacobs
         Remarks, Vice Dean Peggy Nelson
5:30 pm  Event Conclusion

An event dedicated to highlighting the many exceptional thesis and creative projects of our graduating seniors. Over 160 honors students representing all ASU colleges and campuses display their work.

barretthonors.asu.edu
A Word from the Deans...
Welcome to Celebrating Honors, one of the premier events of Barrett, The Honors College at Arizona State University. This is our opportunity to feature many of the best efforts of the 700 honors students graduating this academic year. Honors theses and creative projects range across the colleges and schools at ASU; you will see projects about obesity, forensic pathology, healthcare, business and innovation, and sustainability to name a few. The 2013 Symposium features final projects by students across many disciplines; this year’s event highlights over 135 different projects within the Honors College. All have been made possible by the tremendous support of faculty who have guided these honors students throughout the process of defining and implementing their projects. Barrett staff, parents, and alumni have also provided opportunities and support for these students.

For the students, the thesis or creative project is not the finale to their education but a key to a new beginning. Students have used the ideas from their theses and creative projects to win national awards, enter top ranked graduate schools, law schools, and medical schools, and to capture outstanding jobs and internships.

We are proud of their accomplishments and invite you to enjoy viewing them.
Sincerely,

Mark Jacobs, Vice Provost and Dean
Barrett, The Honors College

Margaret Nelson, Vice Dean
Barrett, The Honors College

Celebrating Honors through the Years
Celebrating Honors began as a suggestion from a committee within the Barrett Faculty Honors Council in 2001. Originally held in the Irish Hall Center Complex courtyard, the first event honored the students whose directors had nominated them for their excellent projects, called ‘Theses of Distinction’.

“Celebrating Honors” Thesis Symposium was observed for several years in the Carson Ballroom in Old Main; until it was moved to the Barrett Academic Court in 2009 when the new Tempe Barrett campus opened. Celebrating Honors has always featured and recognized the special relationship between faculty and students in accomplishing outstanding research and creative work. The event has grown steadily over the years, from 62 selected students in 2008 to 135 students in 2013.

We welcome our many guests from across ASU, and especially recognize the Barrett students, who attend the Symposium to see the culmination of all the education, research, and passion of their peers. This event provides the opportunity for friends and guests of Barrett to see a visual representation of scholarly research, as well as an opportunity to talk with the graduating students about the research process and how the experience benefited them. We are proud to exhibit the work of students and their mentors in this signature event.
## 2013 Symposium Snapshot

**135 Projects • 4 Campus • 12 Colleges**

**166 Students • 157 Thesis Directors**

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Abstracts

Process Evaluation of Employee Implementation of Action Plans
By: Cherylene Abalos; Faculty Directors: Robert Bradley, Larry Dumka

VALLEYLIFE (VL) is a non-profit striving to help people with disabilities. VL develops Action Programs for each of its members to improve their independent or social skills. This research project conducted a process evaluation of the staff and their implementation of the Action Programs. This involved observation of employee-member and an interview of staff. Implications: VL performs periodic reviews of the program implementation and VL involves staff in program development and revision.

Narratives of Eritrean Refugee Women’s Resettlement Experiences
By: Nesima Aberra; Faculty Director: Maria Cruz-Torres

This thesis examines the resettlement experiences of nine Eritrean refugee women living in Phoenix through personal narratives to understand their struggles to achieve economic empowerment from a gender and cultural lens. By incorporating the women’s voices and personal stories, relevant, culturally-appropriate and sustainable programs can be built to address the refugee women’s needs and empower them for the future.

Gender Non-Normative Behaviors in the Predictors of Peer Victimization
By: Lauren Aboud; Faculty Director: Becky Ladd

This thesis explores the predictors and factors that render particular children more susceptible to bullying and victimization. Factors such as race, age, and the activities that the children participated in were considered. Boys and girls in first through third grades were given a questionnaire regarding the activities they liked or frequently did. These were gender-categorized as male or female dominant. It was determined that participation in gender-normative activities indicated a higher victimization incidence.

Detecting Oligomeric Forms of Alpha-Synuclein in Cell and Mouse Tissue
By: Now Bahar Alam; Faculty Director: Michael Sierks

Misfolding and aggregation of alpha-synuclein (a-syn) has been strongly correlated with the pathogenesis of Parkinson’s disease (PD). Reagents such as single chain antibody fragments (scFv) that can interact with specific aggregate forms of a-syn can be very useful to study how different aggregate forms affect cells. Here we utilize two scFvs, D5 and 10H, that recognize two distinct oligomeric forms of a-syn to characterize the presence of different a-syn aggregates in animal models of PD.
LLAMBDA: Estimating Indel Rates from a Multiple Sequence Alignment
By: Jessica Albanese; Faculty Director: Reed Cartwright

Indels (insertions and deletions) are a fundamental but understudied process in molecular evolution. In order to study the evolution of indel rates and length distributions across the tree of life, accurate and efficient methodologies are necessary. As input, our new software, LLAMBDA, takes a multiple sequence alignment and a phylogenetic tree with branch-lengths. It outputs maximum-likelihood estimates of the per-substitution rates and length distributions of insertion and deletions.

The Wedding Dress
By: Heba Albasha; Faculty Director: Diane Facinelli

"The Wedding Dress" is a creative project investigating the history of wedding dress design that led to the design and construction of a wedding dress with historical inspiration. The project details the process of creating the wedding dress.

Beauty and Brains: Redder Rural House Finches Have It All
By: Stacy Arnold; Faculty Director: Kevin McGraw

This study investigates the ability of house finches (Haemorhous mexicanus) from urban and rural populations to solve a foraging task, sliding a lid open to obtain food. Since it is thought that plumage color in house finches may be an honest signal used by females to determine a male’s ability to obtain resources, we compared plumage color with ability to solve the foraging task as well. We found no site differences, but among rural birds, redder males were more likely to solve the task.

The Role of Personality, Submissiveness & Ego Depletion on Obedience
By: David K. Bakardjiev; Faculty Directors: Justin Ready, Michael White

Most research on citizen-police encounters is centered on factors that influence police actions. Consequently, factors associated with citizen actions in police encounters have generally gone unexamined. What factors are associated with citizen compliance and cooperation with the police? Are certain personality characteristics more likely to make citizens behave submissively and obediently toward the police? This gap in scholarly literature may expose major implications related to civil liberties.

Novel Cement Replacement Materials for Sustainable Infrastructure
By: Kingsten Banh; Faculty Director: Narayanan Neithalath

Alkali-activated aluminosilicate, commonly known as “geopolymer”, is being studied as a potential replacement for ordinary Portland cement. The scope of this thesis is to understand the synergistic effects of fly ash, industrial by-product, in combination with different alkaline solutions, sodium hydroxide, and sodium silicate (waterglass) on the mechanical properties and the early-age behavior, and the underlying pore structure of cementitious systems.
### Sustainable Packaging in the Fast Food Industry
By: Taylor Barker; **Faculty Director**: Richard Filley

The level of sustainable packaging used at 12 Tempe restaurants was evaluated based on factors that demonstrate sustainability. ASU college students were surveyed regarding what factors they believed constituted sustainability and how sustainable packaging influenced their decision to go to a particular restaurant. The most important factors were identified using Six Sigma analysis. Barriers preventing the three lowest ranked restaurants from being more sustainable also were identified.

### Multiple-Channel Detection in Active Sensing
By: Kaitlyn Beaudet; **Faculty Director**: Douglas Cochran

The problem of detecting the presence of a known signal in many channels of additive noise is addressed via coherent multiple-channel techniques. An example is active radar where a transmitted signal replica is treated as one channel in a detector with data from receivers on the remaining channels. An invariance result for the eigenvalues of a Gram matrix is derived that implies thresholds for detectors based on functions of the eigenvalues are not affected by the presence of a signal replica.

### Deep Sequencing Analysis of Extracellular RNA Fractions Isolated from Human Biofluids
By: Taylor Alexandria Beecroft; **Faculty Directors**: David Capco, Kendall Jensen

This research sought to identify the ideal isolation protocol for studying RNA contained in exosomes, newly discovered extracellular microvesicles found in human biofluids. Exosomes transfer DNA, RNA, proteins, and lipids between cells and are implicated in disease pathogenesis. There is currently little known about RNA transcripts within exosomes and whether current exosome isolation protocols can be used to study RNA. This project analyzed RNA transcripts found by four distinct isolation methods.

### The Land of Living Memory: Faërie and the Consolation of Things Lost
By: Andrew Roos Bell; **Faculty Director**: Caisja Baldini

Faërie exists in the mythology and literature of northwestern Europe as a spiritual Otherworld, a land of immortal beauty just tangential to our own. This project explored multiple conceptions of Faërie and their common association with things that have been lost. The pattern that emerged is one in which the Otherworld is not merely linked to lost things, but becomes a way of preserving and rediscovering them. Faërie embodies the hope that things lost live on, and can be found again.

### Effects of Blood Proteins on Condensation on Surgical Lenses
By: R.B. Bennett-Kennett, A.M. Murphy, A. J. Acharya, B. W. Hughes, E. R. Morgan, A.J. Orr, A. S. Benitez, T. T. Kutz, D.A. Sell, N. Herbots, C.F. Watson **Faculty Director**: Nicole Herbots

Surgical lenses in laparoscopes and arthroscopes "fog" during surgery, increasing by up to 40% its duration, infections, and scarring due to repeated withdrawals for wiping fog, bodily fluids, and blood. Classical thin film nucleation and growth theory predicts that condensation occurs via three
mechanisms: 2-D (transparent), 3-D (fog) or mixed. This guided our solution: applying to the lens a polymeric hydrated nanomesh we call VitreOx, with a Thin Fluid Film Device (TFFD™) including blood proteins.

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**Charge Separation in Titanium Dioxide Photocatalysts**

By: Zachariah Berkson; Faculty Director: Jean Andino

The conversion of carbon dioxide to value-added fuels occurs in the presence of water and a light-activated photocatalyst. To further understand and improve this reaction, electron paramagnetic resonance spectroscopy, a powerful tool for the study of charge transfer, has been utilized to observe the separation of charge carriers within novel brookite and oxygen-deficient titanium dioxide photocatalysts. Results illuminate the mechanisms of this separation, and further progress toward optimization.

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**Bi-Articulated Buses in Phoenix: A Future Transit Solution?**

By: Michael A. Bochnovic; Faculty Director: David Pijawka

Public transportation in Phoenix is a nightmare. The city's sprawling development has made it difficult and costly to plan for and incorporate efficient modes of public transit. Yet hope is not lost. The city of Curitiba, Brazil, employs a revolutionary bus system that has the potential to be a real game changer. The bi-articulated bus may provide an avenue for a future Phoenix that is less auto-dependent and more accessible for all.

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**Development of a Control System for Autonomous Quadcopter Flight**

By: Taylor C. Bolton; Faculty Directors: Valana Wells, Fred Garrett

Security through autonomous flight is a prime objective in military applications. To achieve this, the equations of motion for a quadrotor aircraft or "quadcopter" were derived and expressed in terms of the quadcopter's state variables, which can be controlled by a control system. This control system was then created by the programming language C++ and provided the capabilities for autonomous quadcopter flight. The results can be used for future implementation of control systems for flight.

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**The Predictors of School Engagement and Implications for Intervention**

By: Emily A. Bovee; Faculty Director: Tracy Spinrad

The predictors of school engagement in early childhood were examined, and mechanisms to improve classroom engagement levels were proposed for interventionists to consider. Literature was reviewed on the relations of child characteristics (i.e. effortful control, negative emotionality) and environmental characteristics (i.e. teacher-child relationship quality, classroom environment) to children's school engagement. Finally, a logic model was developed to guide future intervention work.
The Soil Microbial Loop in the Urban, Arid Soils of Phoenix, Arizona
By: Erin M. Brechbiel; Faculty Directors: John Sabo, Karl Wyant

We investigate the soil microbial loop in urban, arid soils of Phoenix, Arizona. This detrital food web may play a major role in nutrient and energy cycling. At four landscape types, the biomasses of bacterial and protozoan loop constituents were quantified. Carbon and nitrogen fluxes were estimated using a dynamic systems model. Microbial loop structure and function was greatly enhanced in a lawn system versus dry sites, presenting novel information on urban soil processes in the arid West.

Changes in Quality of Life among Obese Latino Adolescents
By: Elizabeth Brito; Faculty Director: Gabriel Shaibi

The purpose of this study is to increase Latino adolescent's weight-specific QOL through a culturally-grounded, community-based lifestyle intervention. 15 obese Latino adolescents completed a 12-week intervention. They completed weight-specific QOL measures at baseline, post-intervention, and one-year follow-up. The results indicate that a community-based diabetes prevention program can result in sustained improvements in weight-specific QOL among obese Latino youth.

An Approach to Linking LCMV Epidemiology and Immunology in Field Mice
By: Courtney Bruce; Faculty Directors: Joseph Blattman, Susan Holechek

Understanding how a virus transmits through a population is a multi-scale problem. Current attempts to understand this problem include a between-host epidemiological approach and a within-host immunological approach. Using Lymphocytic Choriomeningitis Virus as a model, this thesis proposes a new method, which combines the mathematics of compartmental modeling and immunological laboratory experimentation. This method is used to analyze disease transmission in a population of field mice.

Cognition and Personality in Male Veiled Chameleons
By: Sarah A. Bruemmer; Faculty Director: Kevin McGraw

Historically, cognitive studies have ignored individual variation and deemed the success of a subset of individuals as suggestive of the cognitive capacity of the entire species. Recently, there has been a surge in interest regarding this variation. This interest has emerged concomitantly with studies of variation in personalities. Cognition may be closely tied to personality, but empirical support is lacking. To fill this gap we examined variation in cognition and personality in chameleons.

Temperature Measurement in Microfluidic Devices
By: Kathleen Bush; Faculty Director: Alexandra Ros

An investigation into how temperature sensitive dyes and fluorescence can be used to non-invasively determine the temperature within microfluidic devices.
Developing YZO Thin Films via Novel Ink Jet Printing
By: Joe V Carpenter III; Faculty Director: Terry Aford

Yttrium-doped zinc oxide (YZO) is a new n-type semiconductor with electrical properties compatible with channel layers in thin film transistors. Inkjet printing techniques were used to deposit the YZO films on glass substrate. The thickness of each layer is around 15nm. The five layered YZO films had RMS roughness of 7 nm and had lower transparency in the 550-900 nm range than the three layered YZO films, which had RMS roughness of 3.69 nm. The resistivity of the films is 0.144Ω-cm.

Early Life Factors as Predictors of Cardiovascular Outcomes
By: Steven Carter; Faculty Director: Linda Luecken

Cardiovascular disease is the leading cause of death in the United States, and classic risk factors only predict half of the variance of cases. In this study, parental overprotection and temperamental negative affectivity both significantly correlated with blood pressure and heart rate, which suggests the importance of examining early life factors when determining one’s risk for CVD.

Role of Oxytocin on Social Reward and Anxiety-Like Behaviors
By: Kayla N. Chandler; Faculty Director: Janet Neisewander

The neurohormone oxytocin is involved in anxiety reduction and pro-social behaviors. Little research has focused on the effects of social interaction and oxytocin on the initiation of drug use, despite the fact that human adolescents most often begin taking drugs in a social setting. The current study tests the hypothesis that oxytocin is involved in same-sex adolescent social reward and functions as an anxiolytic under the influence of nicotine.

In Vitro Display of Major Histocompatibility Complex-Tetramers
By: Peter S. Chang; Faculty Director: Karen Anderson

The Major Histocompatibility Complex (MHC) encodes cell-surface antigen presenting proteins which interact with T cells and form the basis of an immune response. Only the extracellular portion of a protein MHC complex along with β2 Microglobulin and antigenic peptide are needed to induce refolding of the complex. Our goal is to use the Luminex multiplexed bead assay platform and attach 15 different MHC protein complexes to Luminex magnetic beads in order to test various antigenic peptides.

Training School-Aged Children in CPR Using Short, Animated Videos
By: Joseph Choppi; Faculty Director: Carol Johnston

Hands-only CPR is a relatively new lifesaving technique that was created in an effort to encourage more bystanders to take action during witnessed cardiac arrest events. The American Heart Association has created a one-minute instructional video that teaches individuals the steps of hands-only CPR. Our research looked into the effectiveness of this video in training school-aged children hands-only CPR as they have long been a sought after population for CPR training.
More than Magic and Mockingjays
By: Kimberly Condoulis; Faculty Director: Joel Hunter

J.K. Rowling and Suzanne Collins purposefully chose elements of their fictional societies, including the governments of these worlds, so the Harry Potter and Hunger Games books can serve to educate their readers as well as entertain them. This project analyzes the wartime governing structures in these two series to show that popular teen literature can provide more than just entertainment value.

Gender and Animacy in L2 Acquisition: Processing Evidence from Hindi
By: Lauren Covey; Faculty Director: Claire Renaud

In grammatical gender, all nouns are assigned an inherent, but unrelated gender. For example, in Spanish, "chair" is la "silla," and is feminine. English does not have such a system, and there is much debate about what happens when a native English speaker attempts to learn a language that has a gender system. This thesis was guided by the following research question: Can learners of Hindi acquire sensitivity to grammatical gender if the feature is not present in their native language?

Resveratrol-mediated Activation of Vitamin D Receptor Signaling
By: Angelika Dampf Stone, Shane F. Batie, G. Kerr Whitfield, Mark R. Haussler and Peter W. Jurutka
Faculty Director: Peter Jurutka

Our study reveals the ability of resveratrol to modulate vitamin D receptor (VDR) signaling. Resveratrol and vitamin D are nutritionally derived lipids, and based on experiments with mutant VDR, resveratrol likely stimulates SIRT1, an enzyme known to deacetylate and activate other receptors. Transcriptional activity in target cells containing VDR in the absence and presence of SIRT1 have supported findings of a novel pathway of transcriptional “crosstalk” between resveratrol and vitamin D action.

Examining and Improving Protection Orders in Arizona
By: Lauren Elise Davis; Faculty Director: Alesha Durfee

Protection orders are the most widely used remedy for victims of domestic violence in Arizona, but problems of access and unnecessary complexity can prevent these orders from achieving their full potential impact. This analysis of interviews with court officials and advocates, data collected from victims of violence and firsthand observation of court proceedings takes a comprehensive look at how to solve these problems and make protection orders as effective and accessible as possible.

U.S. Immigration Law and the Public Charge Doctrine
By: Luis A. De La Cruz; Faculty Director: Evelyn H. Cruz

Public Charge is the oldest and most venerated component of U.S immigration law and, for over 100 years has served as a ground for inadmissibility and deportation. Flexible by design, the law evaluates each immigrant as an economic entity and often as a financial burden. My research will discuss the evolution and application of public charge from colonial to modern times.
A Clash of Metaphors: An Examination of Nahua and Spanish World Views
By: Samantha De Palo; Faculty Director: Ted Humphrey

Western consciousness relies on polarized social metaphors (e.g., science versus poetry) to apprehend reality. Polarity conflicts with the dual consciousness of the Nahua ("Aztecs"), whose behaviors and practices reveal an overarching belief in oneness in duality. To illuminate the ways this clash of metaphors influenced the events of the encuentro, I interpret the self-constituted metaphor of Nahua identity, the performed metaphor of human sacrifice, and the duality inherent in Nahuatl syntax.

Leg Asymmetries in Ground Reaction Forces Among Dancers
By: Alex Diamond; Faculty Director: Richard Hinrichs

The study aims to show if there are asymmetries in ground reaction forces between legs, comparing dancers to non-dancers, to see if there is a correlation between ground reaction forces and external rotator (hip) strength.

American Vice: Enforcement and Issues in Sex Trafficking
By: Shelby Doyle; Faculty Director: Dominique Roe-Sepowitz

The investigation of sex trafficking and prostitution related offenses is primarily handled by local police. Despite this, state and city level responses vary widely. This paper will examine the local law enforcement response in 11 geographically diverse police departments, focusing on their operational policies, investigative priorities, community connectedness, and the impact of the local economy on investigations. Implications for further research and policy recommendations will be given.

Assessing the Referral Sources of a Non-Profit Health Clinic
By: Brittany Ebbing; Faculty Directors: Tracy Spinrad, Larry Dumka

The referral sources of the WellCare Foundation were assessed in order to find additional eligible patients. Data were analyzed from medical records and interviews with known referral agencies. The results indicated that the most common referral source was word of mouth. The results also indicated that the WCF appears to have served a unique niche that is not served by other non-profit health clinics. These results led to implications for action and direction for future applied research.

BABA ARUKI: A Walk Down Baba Lane
By: Rebecca Evans; Faculty Directors: Elizabeth Wong, Joel Hunter

"BABA ARUKI: A Walk Down Baba Lane" will introduce the viewer to scenes from my study abroad at Waseda University in Tokyo, Japan. The viewer will experience the whirlwind nature of study abroad, Japanese culture, and vicarious nostalgia for a place, time, and group of people now far removed from my daily life. I invite you to join me on this brief journey into my time in a different world.
**Electroactive Pressure Sensor for Haptic Interfacing of Devices**  
*By: Austin Feldman; Faculty Director: Jeffrey La Belle*

Many signals pass through a medium by means of pressure, and a need has been realized to interface with the signals. Electrochemically active materials can sense changes in pressure indirectly by means of analysis of current readings. A compressible, conductive device has been created that is capable of acquiring precise readings. Both one-shot pressures and sustained holds were acquired, allowing for the amount of pressure and the time at which pressure was applied to be extracted.

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**Standard Protocol to Virtopsy: The Advancement of Forensic Pathology**  
*By: Jesse Fitzgerald; Faculty Directors: Dawn McQuiston, Nick Schweitzer*

Forensic pathologists investigate unnatural or suspicious deaths in medico-legal cases and must be accurate and thorough in their analyses so that justice can prevail. This occupation, however, is immensely difficult, and mistakes can occur. These challenges are discussed here with suggestions for improvement. Implementing new technologies, better quality control, more research, and standardization of procedures are just a few of the multiple changes that can enhance forensic pathology.

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**REACH**  
*By: Mona Dixon, Kira Hoover, and Brett Fitzgerald; Faculty Directors: Michael Mokwa, John Eaton*

REACH is a club and community action project that Mona Dixon, Kira Hoover, and Brett Fitzgerald turned into their Barrett creative thesis project. The group volunteered at the Boys and Girls Club, specifically with the Teen's Center every week. The group members facilitated discussion on leadership development based on John Wooden’s Pyramid of Success among the teens, getting them to think about the qualities and characteristics of effective leaders and how they use those same qualities/skills in their everyday life.

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**Entrepreneurship in Mobile Application Development: Flem LLC**  
*By: Billy Fleming; Faculty Director: Sidnee Peck*

My thesis is a creative project in which I design, develop, market, and sell a mobile application for the iOS (iPhone) platform. In addition to developing a mobile application, I also formed a Limited Liability Company, Flem LLC. My first application, Derpy Calc, is a basic calculator, but is unique because before it will output an answer, Derp, the calculator's personality, will make a remark that is factual, random, or silly.

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**Comparing Extremism, Martyrdom & Symbolic DNA of Terrorism in Twitter**  
*By: Katlin Forster; Faculty Directors: Scott Ruston, Tom Taylor*

Within communications and mathematics, I have learned background information pertaining to martyrs and terrorists along with recent methods of searching modes of mass communications. Questions relating to Symbolic DNA of Terrorism and martyrdom within Twitter are answered by searching Twitter
using Mathematica. Determining the communication around martyrs, a connection is made between communication of martyrdom and the presence of patterns of Symbolic DNA of Terrorism in Twitter.

Differences in Mental Health Stigma  
By: Joseph Frankl; Faculty Director: Deborah Hall

Stigma has been identified as a primary barrier to mental health treatment. Participants recruited from ASU’s West Campus and on Amazon Mechanical Turk, a crowdsourcing Internet marketplace, were asked about their perceptions of a vignette character suffering from depression or alcoholism. Significant differences between illness conditions were seen in beliefs about etiology, appropriate treatment, and barriers to treatment as well as in stigma levels.

Role of Proprioceptive and Tactile Feedback in Size Discrimination  
By: Darcy Frear; Faculty Directors: Stephen Helms Tillery, Cynthia Overstreet

Tactile and proprioceptive feedbacks contribute to interaction and discrimination of objects. A series of experiments was designed to identify the contribution of proprioceptive sensation and tactile feedback to performance in discrimination of small size differences. Subjects correctly identified large size differences with only proprioceptive feedback; discrimination was most accurate with tactile feedback.

The Obesity Epidemic: An Examination of Eating Tendencies in Students  
By: Andrea M. Garza; Faculty Director: Carol Johnston

A total of 36% of Americans are obese and 33% percent are overweight; obesity has become a known killer in the U.S. Yet its prevalence continues to increase (Obesity and Overweight). A survey looking at consumption past satiation and after fasting revealed only emotional cues (not physical nor external cues) had an influence on consumption in these situations. Anger and sadness were the leading emotional cues triggering consumption. This information will be useful in prevention programs.

Context Dependent Sensorimotor Memory of Dexterous Manipulation  
By: Nathan Benjamin Gaw; Faculty Director: Marco Santello

This study examined the effect of time on humans' ability to plan dexterous manipulation in different task contexts (where the object is grasped). When subjects learned to manipulate an object, the learning curve of dexterous manipulation two weeks later was relatively flat for the first block of trials, indicating that the previously observed interference lasts a very short time. However, upon switching to the other context, sensorimotor memories again interfered with visually-based planning.

Henna: Yemenite Bridal Traditions  
By: Sophia Gibly; Faculty Directors: Muriel Magenta, Mary Hood

"Henna: Yemenite Bridal Traditions" depicts a young bride preparing for a traditional Yemenite wedding ceremony. The video illustrates the familial dynamic based upon Yemenite cultural norms, and shows
how the women of the older generation literally transform the young woman to a bride. This transformation is symbolic of the role women have in shaping future generations of women. The work was created to raise awareness of the role of women in Yemenite culture and promote conversation.

The Insanity Defense- Defending Its Necessary Place in Law
By: Lindsey E. Gilman; Faculty Directors: Mary Sigler, Jeffrie Murphy

By looking specifically at the insanity defense, my thesis rests on the notion that the plea is relevant and necessary to maintain fairness in the courtroom. From a retributive perspective, the insanity defense ensures that blame and punishment towards the defendant is handled appropriately, while successfully blending the psychiatric and legal definitions of insanity. Upholding the defense also helps prevent the possibility of violating the Eighth Amendment of the Constitution.

Dance and Public Engagement
By: Paul Giordano; Faculty Director: Philip Horton

In contemporary society, do dance spaces truly engage the public sector and encourage participation on both an experiential and cultural level? In this thesis, I propose an urban dance center that engages the public sector and city of Tucson through three major precepts: engage the audience in an active manner; integrate the diverse dance subcultures of Tucson geographically and spatially; and design a space that heightens interaction between the dancers and the audience.

Religious Rhetoric and Human Rights in Latin America
By: Amanda Glass; Faculty Director: Mark Montesano

In the U.S., an increasing number of charitable organizations use religious language to garner support. This study addresses the question of whether religious rhetoric is used similarly in other countries, specifically, in Argentina. Following an analysis of the discourse surrounding human rights development and the presentation of secondary case-studies, this investigation analyzes the rhetoric of primary materials from a religious Argentine organization called Centro Conviven.

Nicotine and Social Rewards Induces Fos Expression in Adolescent Rats
By: Julianna Goenaga; Faculty Director: Janet Neisewander

Studies suggest that social context plays a role in initiation of smoking and subsequent nicotine addiction in adolescents. The purpose of this study was to investigate the neural mechanisms underlying the combination of nicotine and social reward by quantifying Fos protein in select brain regions within the reward circuitry, such as the nucleus accumbens, amygdala and ventral tegmental area. The results indicate different pathways for processing nicotine, social reward, and their combination.
Detection of Antibodies to HPV16-Associated Oropharyngeal Cancer
By: Alison Goulder; Faculty Director: Karen Anderson

Oropharyngeal cancer (OPC) is the world's sixth most common cancer and, in many cases, is associated with human papillomavirus (HPV) type 16. Antibodies (Abs) to HPV16 are potential diagnostic and prognostic biomarkers of HPV-associated OPC. HPV16 E1, E2, E4, E6, E7, and L2 Ab levels were elevated in OPC patients compared to controls (p<0.0001). CE2, NE2, E6, and E7 were identified as a potential biomarker panel for early detection of HPV OPC.

The Use of Brown Adipose Tissue as a Tool for Fat Loss in Humans
By: Neenah Grade; Faculty Director: Lisa Morse

Obesity is now an epidemic in the United States, and scientists must work to approach it from a unique angle. The focus of my thesis is the application of brown adipose tissue as a combatant for fat loss in the body. Unused as adults, brown adipose tissue increases metabolism and mitochondrial function to burn more fat in individuals that cannot lose weight conventionally. Current research works to introduce safe hormonal pathways in the sympathetic nervous system to generate more of this tissue.

Latino Immigrants in South Phoenix and Perceptions of Health
By: Laurel Gray; Faculty Director: Amber Wutich

Interviews with community members of the Latino immigrant population living in South Phoenix were analyzed for perceptions of health in communities in country of origin versus communities in the United States. Analysis explored dominant themes including food quality, emotional fulfillment, personal responsibility in health, and basic survival.

Inspiring the Transition from Plastic to Reusable
By: Daniel Guerithault; Faculty Director: Ted Humphrey

Plastic bags are an increasing problem in our society. Making the switch from plastic to reusable will not only help the environment, it will save money and energy.

Epithelial-Mesenchymal Transition and Invasion in MCF10A-TP53 Mutants
By: Mayra Guzman; Faculty Director: Joshua LaBaer

High-throughput sequencing has confirmed a prevalence of somatic TP53 mutations in breast cancer (~35% overall), frequently associated with high-grade tumors and worse clinical outcomes. Protein expression and immunofluorescent staining (EMT) showed that some TP53 mutants exhibited more mesenchymal and invasive states compared to Wt-p53 even in the absence of TGF-β. TP53 mutations may result in distinct cellular programs whose role is involved in breast carcinogenesis.
Pursuing Exceptional Education: Honors Education Majors
By: In-Hye Han; Faculty Director: Margarita Jimenez-Silva

The thesis identifies the factors that contribute to students’ choice of pursuing an education degree while continuing enrollment in Barrett, the Honors College. There is a lack of honors students pursuing an education degree. The three focus areas are the students’ past experiences with teachers, the perception of a career in education, and the education major at ASU. By identifying the main factor, the Mary Lou Fulton Teacher’s College may be able to use it to best recruit the honors students.

Display of DIII from Dengue 2 on HBsAg Vectored by a Recombinant MV
By: Indira Harahap; Faculty Director: Jorge Reyes del Valle

Dengue virus (DV) is the most important arthropod-borne virus worldwide. To explore the viability of a subunit vaccine strategy, domain III of the DV major envelope protein antigen (the main target for neutralizing immune responses) was displayed as an antigenic determinant. We use the hepatitis B small surface antigen (HBsAg) as a scaffold to display DV 2 DIII on a sub-viral particle, vectored by a recombinant Measles Virus (MV).

The Club is a Battlefield
By: Jenna Heitlinger; Faculty Director: Karen Adams

MTV’s Jersey Shore has become a cultural phenomenon, spreading the behaviors of its “guido” and “guidette” cast to a broad and diverse audience. This thesis examines the diffusion of Jersey Shore slang in the American lexicon. A survey investigating 13 of the identified slang words was distributed among ASU students. Despite the difficulty in testing for accommodation of words from media, findings show that participants recognized the slang definitions though not many used the words in speech.

The Nonprofit Evaluation Application Template: LISC Phoenix as a Case Study
By: Joe Hennessy; Faculty Directors: Rhonda Phillips, Laurie Mook

LISC Phoenix as a case study, The Nonprofit Evaluation Application Template serves as a framework for nonprofits to measure the effectiveness of their programs.

Transcriptome Gene Expression Analysis of Breast Cancer Using RNA-Seq
By: Fernando P. Hernandez; Faculty Directors: Karen Anderson, Marco Mangone

Breast cancer is the most frequently diagnosed cancer and the leading cause of cancer deaths in females worldwide, accounting for 23% of all new cancer cases and 14% of all total cancer deaths in 2008. Five tumor-normal pairs of primary breast epithelial cells were sequenced and analyzed. RNA-Seq analysis was completed using Tophat and Cufflinks. The data was then used to see how the genotype correlates with the phenotype of breast carcinoma.
Creation of Evaluation Survey for Habitat for Humanity of Central Arizona

By: Shela Hidalgo; Faculty Directors: Joanna Lucio, Ariel Rodriguez

Effective programs are those that can demonstrate the achievement of results. Results are derived from good management, decision making and good information. Good information requires good data and careful analysis of the data, all of which are critical elements of evaluation. This project consisted of developing and pilot testing an assessment tool for Habitat for Humanity of Central Arizona, which has already been implemented in order to evaluate their programs.

Identification of Differentially Expressed Genes as Biomarkers for IBS

By: Maryam M. Hockley; Faculty Director: Peter Jurutka

The diagnosis of IBS is currently based on gastrointestinal symptomatic criteria. The absence of diagnostic approaches for IBS places a financial burden on the patient and the health care system due to direct and indirect costs of care. The lack of IBS-specific biomarkers, as well as variation in symptoms and disease course, creates additional uncertainty during diagnosis. This project involves screening tissue samples from IBS-affected patients to identify genetic biomarkers associated with IBS.

Sustainability and Identity: The Case of Costa Rica

By: Kalyn M. Howard; Faculty Director: Thomas Puleo

This study examines sustainable development concerns as an essential part of the Costa Rican national identity. Interviews with ecotourism industry workers and an analysis of pertinent news articles shine light on the Costa Rican citizen’s perspective of sustainable development, showing that in spite of current initiatives, industry workers still have unmet environmental and economic concerns, and that the general public is both passionately interested and personally invested in the topic.

Profile Mapping of Phosphorous-Doped Silicon Solar Cell Emitter Layers

By: Sebastian Husein; Faculty Director: Dr. Stuart Bowden

Solar cells have garnered attention as a viable replacement for fossil fuels. To truly compete with current energy sources, solar cells must achieve record efficiencies. One barrier to this competition is reduced absorption of blue light caused by phosphorous in the emitter layer. Electrochemical Capacitance-Voltage (ECV) profiling was used to first characterize, then optimize the emitter layer to obtain a more desirable phosphorous concentration gradient, leading to efficiency increases of Si solar cells.

Functional Materials for Sustainable Energy Technologies

By: Zahra Hussaini; Faculty Director: Peter Crozier

Understanding the functionality of materials for sustainable energy technologies is essential for their continued improvement. Titania is an important model material for artificial photosynthesis. Its electronic structure can be studied using electron energy loss spectroscopy (EELS). FEFF software was
used to model changes in surface structure and oxygen vacancy concentration in titania. The FEFF calculations provide a deeper understanding of the experimentally observed changes in the spectra.

**Second Chance: A Mobile Literacy Application for Unschooled Adults**

**By:** Aziza Ismail; **Faculty Director:** Daragh Byrne

This project seeks to improve the literacy skills of preliterate adults by designing and developing an interactive tablet application for unschooled adults who are passionate about learning to read. Very often in developing countries, the success rates of the literacy courses are overwhelmingly low. The proposed application aims to address this challenge by providing an easy to use media environment for independent language learning on a lightweight portable device.

**Circular Drawing as an Objective Indicator of Handedness**

**By:** Aaron Ivanhoe; **Faculty Director:** Natalia Dounskaia

This study aimed to determine if statistical trajectory analysis of circular drawing patterns could be used as an objective indicator of handedness. Subjects filled out handedness questionnaires and performed circle drawing movements in both arms at two different speeds. Results of statistical analysis indicate that, with future research to confirm trends and obtain stronger statistical significance, this test could potentially be used as an objective measure of handedness.

**Paint Sole: An Honors Thesis Exhibition**

**By:** Mariel Jacobs; **Faculty Director:** Ellen Meissinger

A series of marketable and unique hand painted shoes.

**TWEAK Functions as Chemotactic Factor for Gliomas via Lyn Activation**

**By:** Nathan Jameson; **Faculty Director:** Karen Anderson

In this study we demonstrate that TWEAK can act as a chemotactic factor for glioma cells as a potential process to drive cell invasion into the surrounding brain tissue. We hypothesize that TWEAK secretion by cells present in the glioma microenvironment induce invasion of glioma cells into the brain parenchyma via Lyn activation. Understanding the function and signaling of the TWEAK-Fn14 system may lead to development of novel therapies to therapeutically target invasive glioma cells.

**Discrimination, Social Support, and Cortisol Levels in Hispanic Women**

**By:** Shannon L. Jewell; **Faculty Director:** Linda Luecken

Although discrimination is implicated in health disparities, social support may buffer against its negative effects on health. This study investigated whether prenatal maternal discrimination and social support would predict postpartum cortisol in low-income Hispanic women and infants. Among infants whose
mothers reported high discrimination, low maternal social support was associated with high infant cortisol ($\Delta Y = -0.293, p = 0.03$). This provides evidence for the social buffering hypothesis.

**Abuse Potential of the Synthetic Cathinones: Methylone and Alpha-PVP**  
*By: C. Trevor Johnson; Faculty Directors: Foster Olive, Clark Presson*

In recent years the abuse of synthetic cathinones, "Bath Salts," has been on a rise. The purpose of this project was to analyze both synthetic cathinones, methylone and alpha-pvp, for hedonic properties or the potential to be abused. This was tested using an intracranial self-stimulation paradigm, a robust measurement for reward. It was found that methylone shows an abuse potential similar to that of MDMA, ecstasy. Moreover, it was found that alpha-pvp possesses a high liability for abuse.

**Vowel Normalization in Dysarthria**  
*By: Hanna Jones; Faculty Director: Julie Liss*

In this study, the Bark transform and Lobanov method were used to normalize vowel formants in speech produced by persons with dysarthria. The computer classification accuracy of these normalized data were then compared to the results of human perceptual classification accuracy of the actual vowels. These results were then analyzed to determine if these techniques correlated with the human data.

**Differences in Relationships Between Intimacy and Marital Satisfaction**  
*By: Kali M. Kenar; Faculty Director: Mary Burleson*

It is no secret that sex is an important part of marriage. With nearly half of all Americans' marriages ending in divorce, it is well worth researching how sex can improve relationship satisfaction. The current study uses survey and daily diary data collected from an ongoing study of married couples to answer the following questions: How do frequency, enjoyment, and the meaning associated with sex relate to marital satisfaction ratings? Are there gender differences in these relationships?

**Inhibitory Action of Cmk1p on Yeast Vacuolar Calcium Exporter**  
*By: Jennifer L. Kepler; Faculty Director: Pamela Marshall*

We are interested in identifying key proteins involved in the intracellular calcium homeostasis of the budding yeast, *Saccharomyces cerevisiae*. Deletion mutation analysis of cells transformed with a cytosolic aequorin reporter gene identifies the inhibitory action of calmodulin kinase 1 (Cmk1p) on the vacuole calcium exporter, Yvc1p.

**BookMeetups.com: A More Versatile Book Club**  
*By: Matthew Knudsen; Faculty Director: Altaf Ahmad*

If friends have not read the same books as us, our options to share our thoughts about a book are limited mainly to book clubs, which limit control over which books are read, and online posts, which offer no face-to-face contact for a discussion. BookMeetups.com allows readers to find fellow readers of
a book in their area and to set up an in-person meeting to exchange their thoughts on the book. This website was created with no prior coding experience using HTML, CSS, PHP, and JavaScript.

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**Diurnal Cortisol Rhythms and Sleeping Patterns in Adolescents**

*By: Devon Lathrop; Faculty Director: Leah Doane*

This study examined the cross-sectional and longitudinal associations among diurnal cortisol rhythms and sleeping patterns in adolescents. Participants completed the study over three days during their senior year in high school, and again over three days during their freshman year in college. Results suggest associations between concurrent sleep duration and cortisol patterns, and may have a significant impact on understanding adolescents' physiological response to stress.

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**An Analysis of Youth Prescription Drug Use**

*By: Melissa Wilkinson Lewis; Faculty Director: Mark Roosa*

This study evaluated existing data from the Arizona Youth Survey to give representatives from the Arizona Criminal Justice Commission some insight into the high rates of youth prescription drug abuse. This study examined trends in prescription drug consumption among Pima County, Arizona adolescents, as well as consequences of use and contextual factors. The results of this research informed state officials on effective methods of prescription drug abuse prevention and intervention.

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**Autism Spectrum Disorder, Assisted Exercise and Performance**

*By: Katrin C. Lichtsinn; Faculty Director: Shannon Ringenbach*

Assisted Cycle Therapy (ACT) has the potential to increase motor and cognitive functioning and decrease stereotypic behaviors in individuals with autism spectrum disorder (ASD). Adolescents with ASD completed three 20-minute interventions on a stationary bicycle: assisted pedaling with a motor (ACT), voluntary pedaling, and no exercise. Following ACT inhibition, cognitive planning and set switching ability improved. Results are discussed with respect to neurological structures and functions.

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**Evaluation of Inflammatory Response and Lipid Concentration after High Fat Diet**

*By: Tyler J Liss; Faculty Director: Karen Sweazea*

Prior research has shown that feeding rats a high fat diet (HFD) results in hyperglycemia, oxidative stress, and inflammation, all of which may cause tissue damage and impaired vasodilation leading to high blood pressure and the various complications of obesity and diabetes. Therefore, my project was designed to further characterize the effects of high fat feeding on markers of inflammation and oxidative stress that have the potential to contribute to the impaired vasodilation.
**Assembling Inheritance**  
**By:** Gabrielle Llovet; **Faculty Director:** Clare Verstegen

My abuela made the difficult decision to send her then nine-year-old son, my dad, to the United States from Cuba in the wake of the Cuban Revolution. My Granny Virginia left behind a legacy of compassion in the small town of New Iberia, Louisiana when she prematurely passed away; my mom was only ten years old. Using textiles, tamale wrappers, and indigo, my work explores the imprint of their absences on my family and assembles the inheritance they left for us, namely, their recipes.

**Assessing Climate Impacts of Projected U.S. Urban Expansion**  
**By:** Danielle Lorenz; **Faculty Director:** Matei Georgescu

Roughly half of the global population lives in urban areas and the UN expects this figure to surpass 60% by 2050. Potentially adverse effects of urbanization on climate have already been shown for Arizona’s rapidly expanding Sun Corridor, highlighting the importance of further research. Here, EPA-developed U.S. urban expansion scenarios are incorporated into a model to run multi-year simulations. Climatic impacts of 2100 U.S. urbanization are compared to a modern-day baseline scenario.

**Infant Gender Label Assignment**  
**By:** Echo S. Love; **Faculty Director:** Alyson Shapiro

How adults assign gender labels to infants in the absence of gender stereotypical clothes.

**Limb Anatomy, Locomotion, and Genetics: a Comparative Study in Lizards**  
**By:** I. Maayan, T.B. Ritzman, E.D. Hutchins, J. Stapley, E. Lasku, W.L. Eckalbar, J. Wilson-Rawls, M.J. Huentelman, E. Bermingham, S.T. Hsieh, R.E. Fisher, K. Kusumi; **Faculty Directors:** Kenro Kusumi, Rebecca Fisher

Anole lizards are exemplars of adaptive radiation in Neotropical islands, but less is known about their evolution on the mainland. To describe the morphology and locomotion of mainland anoles and the genetic basis of phenotypic variations, we analyzed the limb bones and predator evasion of *Anolis apletophalleus*, *A. auratus* and *A. poecilopus*, three Panamanian anole species. *A. apletophalleus and A. auratus* genome builds were used in comparisons with *A. carolinensis* for key limb development genes.

**Solar Photovoltaic-Powered Cooling with Ice Thermal Storage**  
**By:** Beth Magerman; **Faculty Directors:** Patrick Phelan, Stephen Goodnick

An investigation is done of a prototype solar photovoltaic-powered thermal storage ice tank and air conditioning unit. The study revises previous thermodynamic and economic conclusions and provides a more thorough analysis. A parameterized model was created for optimization of the system under various conditions. The model was used to evaluate energy and cost savings to determine the system’s viability in several circumstances, such as a residence in Phoenix with a typical cooling demand.
Effective Marketing Strategies for Residential Photovoltaic Modules
By: Hayley Evonne Magerman; Faculty Directors: Nicole Darnall, Kirsten Parrish

How do you sell a solar panel to a homeowner? My challenge was evaluating effective strategies to market solar panels to average homeowners. I decided to conclude my project with a physical marketing plan and marketing materials specifically relevant to solar sales.

Simulating Kinetics of a Novel Hypoxia-Binding Contrast Agent
By: Jonathan Martin; Faculty Director: Vikram Kodibagkar

The goal of our research this semester has been to produce a model, used to analyze MR image data, that will improve cancer diagnostics by successfully identifying hypoxic regions of tissue, a trait common to tumor tissue. We have developed, and will continually work to refine, a model that yields a hypoxia parameter. The next step in our research will be to expand upon this work and determine tissue oxygen levels from this parameter.

Head Posture and Its Relationship to Occlusion
By: Felicia M. Martinez; Faculty Directors: Kenneth Mossman, Peter Rez

The T-Scan II computerized occlusal analysis system (Tekscan Inc., Boston, MA) was used to evaluate the impact of head posture on the force patterns of participants in two postural positions - sitting upright and laying flat in a dental chair. The objective was to discover if the adjustments made by dentists during treatment while the patient is in the supine position hold while the patient is upright, such as when eating. A difference was found between habitual and skeletal T-scans.

Origins | An Honors Thesis Exhibition
By: Nora McGinnis; Faculty Director: Clare Verstegen

Origins is a creative project consisting of an independently developed body of artwork and a joint exhibition of that art with fellow fiber artist Gabrielle Llovet. My own work approaches the question of origins from a scientific viewpoint, visually investigating the intriguing stories of microbiological growth, decay, and evolution. I use color, texture, and shape to describe these narratives while also examining the ways in which humans can see these organisms.

Local Religious Organizations and the Protests Against SB 1070
By: Haley McInnis; Faculty Director: Mary Ingram-Waters

This project is a social movement analysis of local religious groups’ response to the SB 1070 legislation that was passed in April 2010, focusing on the role of local churches and faith coalitions. Through interviews, their motivation to protest, framing of arguments, mobilization tactics, and perceived success and failures were investigated to determine what role these individuals and the religious organizations they represent played in blocking SB 1070 and affecting public perception of the law.
A Theory of Political Capital
By: Ryan McKenna; Faculty Director: Nancy Roberts

In order to better understand how the national legislative body works, this research examines the factors that influence the level of productivity in the U.S. Congress. By mapping these characteristics into the classical framework of an economic production function, this model serves to produce a more transparent image of the aspects of members of Congress that are desirable to form a productive legislative body.

Conditioning Vegetable Preferences Through Texture Pairing in Children
By: Eric Miller; Faculty Director: Elizabeth Phillips

Neophobia is a sensory phenomenon common in children that makes novel foods taste unpleasant. Our study tested exposure and pairing effects on neophobia in children by exposing them to novel vegetables paired with varying textures. Results showed a significant increase in liking for all subject groups after six exposures, which is less exposure than required in other studies. Except in one case, texture was not related to a change in liking that differed significantly from other groups.

Searching for Superman: the Language of Corporate Education Reform
By: Victoria Morrow; Faculty Director: Jory Brass

This thesis examines media rhetoric promoting neoliberal education reform, including the advancement of school-choice systems and movements towards privatization. Films like “Waiting for Superman” and “Won’t Back Down” have ushered in new, markedly “progressive” narratives that show neoliberal reform as both a model for a consumer-led culture in education and as a path towards educational equity, a goal typically associated with public schools promoted as a public interest.

Six Minute Walk Test and Fitness of Young Adults with Down Syndrome
By: Lauren Moss Hunt; Faculty Director: Shannon Ringenbach

The aim of this study is to evaluate whether or not fitness can be determined using a well-researched six minute walk test (6MWT) in a young adult population with Down syndrome (DS). Fourteen participants with DS performed one 6MWT at a self-selected rate during an exercise intervention study to assess physical fitness. This holds importance in today’s health industry because this particular target group is at high risk for several factors that contribute to their well-being and longevity.

Assessing Environmental Impacts of Transit-Oriented Developments in LA
By: Matthew Nahlik; Faculty Director: Mikhail Chester

Transit-oriented developments (TODs) are a promising strategy to increase public transit use and, as a result, reduce personal car travel. By using TOD infill to increase urban population density and encourage transportation mode-shifting, the potential exists to reduce life-cycle per capita energy use and environmental impacts of the interdependent infrastructure systems. This project specifically examined the Gold Line of light rail and Orange Line of bus rapid transit in Los Angeles, CA.
**Sticks and Stones: A Devised Performance**  
*By:* Valentin Navarro, Britney Elizabeth; *Faculty Directors:* Rachel Bowditch, Pamela Sterling

"Sticks and Stones" is an original play about the universal issue of bullying. The play follows the life of a student named Nick, who faces bullying on a daily basis. Through the hardships of life, Nick experiences despair and dysfunction which causes him to lose control of himself. Without being able to conform to his surroundings, how much longer will Nick be able to handle being a victim? This powerful play gives a voice to those who have been bullied and chosen to take a stand against it.

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**Nutrient Limitation of Decomposers in the Huachuca Mountains**  
*By:* Nicole Nevarez; *Faculty Director:* James Elser

Nutrient limitation of decomposers was investigated in four travertine streams in the Huachuca Mountains that form a natural gradient of CaCO₃ deposition. As CaCO₃ precipitates, phosphorus (P) is known to co-precipitate as well. Therefore, those streams with higher CaCO₃ deposition were expected to have lower P concentrations, likely imposing P limitation on decomposers. We are developing techniques to quantify the responses of decomposers (fungi and bacteria) to nutrient amendments.

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**ASU4Food: Raising Awareness and Donations in Arizona**  
*By:* Elana Niren; *Faculty Director:* John Eaton

ASU4Food's objective is to increase the visibility of the statewide hunger crisis among Arizona State University’s campuses and to raise monetary and food donations to alleviate this issue. By collaborating with a multitude of organizations both on and off-campus, we aim to become a well-known, powerful, and stable student organization.

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**Asymmetries in the Lower Limbs and Potential Risk of Injury**  
*By:* Megan Oberbillig; *Faculty Director:* Richard Hinrichs

This study addresses jumping and landing patterns, as well as strength and range of motion measures in dancers compared to non-dancers. The aim of the study is to determine if dancers exhibit lower limb asymmetries and how that might affect their risk for injury.

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**Reproductive Cloning and the Perception of Individuality**  
*By:* Lindsey O’Connell; *Faculty Directors:* Jane Maienschein, Karin Ellison

Reproductive cloning is the duplication of genetic material to reproduce a living organism. The sheep Dolly was the first adult mammal to be cloned, and her birth unveiled a multitude of questions about the potential for cloning humans and how that might threaten human individuality. Given those questions, my project delves into how reproductive cloning relates to the idea of individuality across three subgroups: humans, utility animals such as those used for research or agriculture, and pets.
fMRI-Based Validation of Penfield Diagram  
By: Gabe Oland; Faculty Directors: David Frakes, Leslie Baxter

The purpose of this project is to validate Wilder Penfield's motor cortex homunculus using functional magnetic resonance imaging (fMRI). Subject data has been gathered for various motor tasks to locate the sites of neurological control for specific motor functions. Volumetrically quantifying the motor cortex distribution can allow for a more accurate representation of motor cortical function, and aid neurologists and neurosurgeons during preoperative evaluations of their surgical patients.

Volunteer Recruitment Effectiveness of Nonprofits in Phoenix  
By: Kalah Marie Polsean; Faculty Director: Dawn Lambson

This study researched the current volunteer recruitment strategies of nonprofit organizations from all sectors in Phoenix, Arizona. The results showed that volunteer recruitment is influenced by initial recruitment, training, and retention. The effectiveness of each is based on relationships between the organization, potential volunteers, and other volunteers within the organization. The results were then developed into a resource guide to help nonprofit organizations.

Perceived Barriers and Facilitators of Physical Activity in Hispanics  
By: Blanca Jennifer Quezada; Faculty Directors: Cheryl Der Ananian, Joana Pabedinskas

The purpose of this study was to qualitatively explore Hispanic perceptions about factors that influence physical activity among participants of the “Fit and Strong!” program. Specifically, perceived benefits, social support, barriers and motivators as well as physical activity preferences in this population were studied. Information was obtained from a focus group conducted in Spanish. The focus group results were then used to create a series of tip sheets in both Spanish and English.

A Hero for the Ages: How Batman Has Transformed as a Hero  
By: James Quinn; Faculty Director: Diane Facinelli

A literary analysis of how the character of Batman has changed since his creation in 1939 to the present day. Strictly a literary analysis, this thesis used comic books and graphic novels to assess how Batman has changed as a hero. By comparing Batman to the hero archetypes established by Joseph Campbell and Carl Jung, this thesis sought to find out how well Batman still adhered to those hero archetypes after analyzing the many stygian stories that have helped shape his hero's journey.

Reinventing the Design Process: Branding and Sustainability  
By: Paris Rachford; Faculty Directors: James Shraiky, Beverly Brandt

This thesis explored the implications that both sustainability and branding have on the built environment in order to develop a health and wellness center that promotes a balanced lifestyle for two target users, which are of entirely different demographics.
The Canvas
By: Zion Andrew Rempel; Faculty Directors: Adam Collis, Mary Ingram-Waters

"The Canvas" is a film both compellingly honest and relevant. Spanning five countries, we find ourselves in three unique stories, each reflecting the reality of pain: a humanitarian, a grieving mother, and a pondering musician. Immersed in these narratives is a vulnerable truth to which all can relate. We begin to see the colors of a painter at work. Stroked in both suffering and healing, can we learn to trust our artist? "The Canvas" tells a story that can touch us all.

Antibody Response to High-Risk Human Papillomaviruses using ELISA
By: Jack Resnik; Faculty Director: Karen Anderson

The human papillomavirus (HPV) is the cause of all cervical cancer, with 520,000 new cases and 275,000 deaths annually. There are many HPV strains, but only the "high-risk" (hrHPV) types may progress to cancer. Antibodies to hrHPV oncoproteins hold promise as new biomarkers of cervical neoplasia and its progression to carcinoma. To better profile the immune response, we have designed an ELISA protein array to measure antibody expression to 11 IVTT expressed hrHPV types and two low-risk controls.

Novel Gel Completely Composed of Salts
By: Mariela Robledo; Faculty Director: Lenore Dai

Room temperature molten salts, or ionic liquids, are novel materials that have received heightened attention due to their unique molecular nature and wide range of applications. They are salts with irregularly shaped ions that resist crystalline packing and thus remain liquid at room temperature. Recent testing shows compelling gel behavior and formation of emulsions that has encouraged future testing for industrial applications.

Tattoos and the Body
By: Emilio Santellan; Faculty Director: Forest Solis

My field of study is Art, Drawing. My Honors thesis explores the relationship between the human body and tattoos. I am interested in the idea of using the human figure as a canvas, and creating artwork that has an image within another image. My intention is to promote a dialogue about what the tattoos mean and why the model received them. I aim to challenge some of society's stereotypes about tattoos and show them as a personal form of art. My thesis includes 11 charcoal and ink drawings.

Elite Ants Regulating Emigration and Foraging in Temnothorax Rugatulus
By: Gage Schaper; Faculty Director: Stephen Pratt

Foraging and emigration are colony tasks that depend on similar behaviors. It remains unclear, however, whether ants maintain the same roles in both contexts. We are investigating this in Temnothorax rugatulus by examining their behavior. Preliminary evidence shows heterogeneity among nest-movers, with a small elite dominating recruitment. We are determining whether a similar elite is found in foraging and, if so, whether it consists of the same ants that dominate recruitment in emigration.
**Does Daphnia Feeding Rate Underpin the "Stoichiometric Knife Edge"?**

*By*: Sarah Schimpp; *Faculty Director*: James Elser

Recent empirical data has shown that excess nutrients can reduce animal growth. To test for the mechanism of this “stoichiometric knife edge” phenomenon, feeding rates of the crustacean zooplankter Daphnia on algae differing in C:P ratio (phosphorus content) were determined. There was a significant effect of food P content on feeding rate with higher rates for P-rich, low C:P food, in contradiction of earlier findings. Follow-up experiments are needed.

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**Documenting the Development of ASU’s Green Bin Program**

*By*: Katie Marie Schumacher; *Faculty Directors*: Michael Schoon, Katja Brundiers

My project is an examination of the process ASU Tempe campus took to institute an organics collection program. Working from a sustainability science perspective, I demonstrate the structural and logistical barriers faced during program creation and expansion. My examination led to the creation of a manual designed as a tool for other organizations. The manual documents ASU's process and provides information on key steps and procedures necessary to implement a unique organics collection program.

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**Forgotten Voices: The Lives and Works of Four Theresienstadt Composers**

*By*: Jack Schwimmer; *Faculty Director*: Hannah Creviston

During World War II, the Nazis set up a model concentration camp at Theresienstadt. Here, a Jewish musical community developed unparalleled in Nazi territory. Viktor Ullmann, Pavel Haas, Gideon Klein, and Hans Krása were successful composers before the war who continued composing in Theresienstadt and were sent to Auschwitz on the same day. This thesis explores their lives, deaths, and music, and music historians' tendency to underrepresent them in analyses of the German classical music lineage.

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**High Stakes: Jazz, Hip-Hop, and the Story**

*By*: Ben Scolaro; *Faculty Director*: Mark Montesano

As an English major and aspiring jazz musician, I set the ambitious goal of composing and recording an album of original music in one year's time and documenting the process through narrative form. Along the way, I ended up starting a live hip-hop band, and losing a good deal of my naivety as well. My project documents the music and stories which emerged throughout this endeavor.

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**Learning of Concepts Through Array Training**

*By*: Jessica Shropshire; *Faculty Directors*: Donald Homa, Clark Presson

Understanding categories and the way in which individuals classify and distinguish between these categories is vital to a number of cognitive functions. The present study introduced a new approach to dimensional identification by using identifiable properties rather than ill-defined patterns. Although replication of studies that utilize well-defined features is necessary, the results of the study could potentially indicate some interesting findings regarding learning.
What the Dragons Know
By: Justine Silving; Faculty Director: Claudia Brown
The goal of this project was to write, illustrate, and self-publish a short children's book based around Chinese wildlife. My objective was to create a fun and interesting book for children that gave a broad introduction to the majesty of Chinese wildlife and the style of Chinese art.

Transborder Sustainability, Law and Activism in Ambos Nogales
By: Amelie Christine Simons; Faculty Director: LaDawn Haglund
The project follows a recent conflict between the U.S. and Mexico concerning the shared use of the transborder Santa Cruz River. The situation remains unresolved and the long-term sustainability of the river is unknown. The study is based on an analysis of scholarly research and interviews pulling from three fields: law, social science, and the environment. The project explores potential legal solutions, and contextualizes the issue in terms of the people affected on both sides of the border.

The Effects of Framing on Support for Local Sustainability Issues
By: Mary Hannah Smith; Faculty Director: Nicole Darnall
This thesis examines how the wording of proposed government policies can affect the level of public support that a given policy generates. By surveying Phoenix residents, this study tested the differing degrees of support that voters would have for a policy that encouraged the use of native desert plants in residential landscaping, depending on whether the policy was framed as a self-governance issue or a water conservation issue.

Physical Fitness, Obesity, and Mental Health within Down Syndrome
By: Michelle Snow; Faculty Director: Shannon Ringenbach
The aim of this study is to understand the relationship among physical fitness, leisure-time activity levels, measures of body composition, and assessments of emotion toward physical activity in individuals with Down syndrome (DS). This is important because it could help individuals understand the importance of physical activity in this population.

Development of a Liquid TVC System for a Hybrid Rocket Motor
By: Ryan Stoner; Faculty Director: Iman Alizadeh
Building upon recent advancements in hybrid technology, the team has designed, manufactured, and successfully tested a regeneratively cooled nozzle, throttling valve, high-pressure regulator, pressure vessel, and a 2DOF test stand. Thrust vectoring will be accomplished with liquid injection, which is currently being optimized for a maximum deflection angle of the exhaust plume.
33 Buckets: Distributing Clean Water in Bangladesh
By: Pankti Shah, Varendra Silva, Paul Strong, Mark Huerta, Connor Wiegand; Faculty Directors: Mark Henderson, Jeffrey LaBelle

Bangladesh is facing one of the worst water crises in history, and many existing solutions are unable to solve the problem in the long run. 33 Buckets is aiming to change the way these water projects are implemented and scaled by using schools as a backbone for water distribution in rural Bangladesh. By using education, locally-sourced technology, and an innovative microbusiness model, we can inspire and empower people to become self-reliant and live healthier, more fulfilling lives.

Coming Home: Understanding Sense of Place through Fictional Depiction
By: Amanda Nicole Strusienksi; Faculty Director: Kristin LaCroix

The elements that connect humanity to the corresponding environments that we inhabit are diverse and complex. These connections are central to understanding human interaction, our environment, and ourselves. The purpose of this thesis is to establish how connection (or lack thereof) to a region, in this instance New England, is found through environment and family. The complication of four short stories demonstrates environmental connections via technology and familial interactions.

Mesoamerican Macaws and Copper Bells in the American Southwest
By: Rebeca Beatriz Suarez Ferreira; Faculty Director: Ben Nelson

This paper contributes to an understanding of the connections among indigenous societies in pre-Columbian Mesoamerica and the American Southwest by investigating the depositional contexts of two items of Mesoamerican origin, copper bells and macaws. The analysis shows that Southwestern peoples emulated Mesoamerican ritual practices imperfectly; macaw iconography and the use of copper bells are similar in both regions, but the ritual burial of sacrificed macaws is a solely Southwestern practice.

The Role of Word Complexity in Assessing Consonant Correctness
By: Katherine Sullivan; Faculty Director: David Ingram

Children’s speech and language development is measured by performance on standardized articulation tests. Test items on these assessments are designed to include each sound in the English language. However, the test items vary in word length and complexity, which may affect the child’s ability to correctly produce the target consonant sounds. This project determines the distribution of test items by word complexity across prominent articulation tests, and examines the effects on performance.

The Effects of Chronic Stress on Gene Transcription in the Male Rat Brain
By: Heather C. Tompkins; Faculty Director: Miles Orchinik

Organic cation transporter (OCT) 3 is a monoamine transporter found in the mammalian brain whose activity is inhibited by a primary stress hormone. We hypothesize that stress hormone-mediated inhibition of OCT3 transport causes increased extracellular monoamine concentrations, which triggers a
number of responses necessary to react to the stressor(s). In this study, I evaluated the effects of chronic restraint stress on OCT and monoamine receptor mRNA levels in the male rat brain.

**Relations of Empathy to Anger, Gender, and Parenting in Toddlers**
*By: Katherine E. Travis; Faculty Directors: Nancy Eisenberg, Tracy Spinrad*

This longitudinal study examines relations of anger, gender, and intrusive maternal parenting to empathy. Toddlers were assessed in a laboratory at 18, 30, and 42 months of age. At 18 months, a relation between observed anger and reported empathy was found for boys, but not for girls. At 30 months, maternal intrusiveness positively predicted empathy in boys, but negatively predicted empathy in girls. These findings provide insight about sex differences in empathic development in early childhood.

**Solar Power Purchase Agreements: Evaluating Performance**
*By: Natasa Vulic; Faculty Directors: Stuart Bowden, Harvey Bryan*

The majority of photovoltaic installations at ASU are governed by power purchase agreements (PPAs) that set a fixed per kWh rate that ASU purchases from the system owner. Accurate predictions of power output are needed to determine the financial viability of system installations. Research was conducted using historical solar power production data for ASU. Results indicate that better system monitoring can lead to increased reliability and decreased cost of solar energy.

**Sustaining Hope: Integrating Sustainability into the James 1:27 Trust**
*By: Allison Weidemann; Faculty Director: James Eder*

On behalf of the James 1:27 Trust, a social enterprise based in South Africa that works to scale care of orphans and vulnerable children, research was undertaken to ascertain how sustainability can be integrated into the conduct of the organization. From the literature reviewed, five key practices for a sustainable Third Sector organization emerged. Recommendations for context-specific application are offered to assist the James 1:27 Trust in engendering organizational sustainability.

**Plant Community Composition in a Wastewater Treatment Wetland**
*By: Nicholas Weller; Faculty Director: Dan Childers*

I examined the impact of plant community composition on nutrient retention in an aridland constructed wastewater treatment wetland. Direct plant uptake of nitrogen by various plant species was dependent on the species' biomass density (kg/m²) within the wetland. This relationship may be important to system managers to control nutrient retention in the future. Continued monitoring will further quantify nitrogen and phosphorus retention mechanisms within the system.
Wada Basins of Attraction in Diffeomorphic Maps
By: Ryan Whitehurst; Faculty Director: Eric Kostelich

Dividing the plane in half leaves every border point of one region a border point of both regions. Can we divide up the plane into three or more regions such that any point on the boundary of at least one region is on the border of all the regions? In fact, it is possible to design a dynamical system for which the basins of attractions have this Wada property. In certain circumstances, both the Hénon map, a simple system, and the forced damped pendulum, a physical model, produce Wada basins.

Weight Loss Intervention in a Young Adult with Down Syndrome
By: Berlin Wright and Julie Brennan; Faculty Director: Shannon Ringenbach

This case study was aimed to help MH, a male adult with Down syndrome, lose weight and improve his health with an exercise and nutrition plan. MH went from morbidly obese, 276 lbs. to 217 lbs. in four months, his lowest weight being 201 lbs. This is a 75 lb. weight loss and BMI reduction of 13.7 kg/m2. This is significant, but should be continued to reach a healthy weight. It was crucial to consider aspects that affect weight gain and loss such as motivation, family life, diet and lifestyle.

Python Conformal Predictor: A Machine Learning Toolkit
By: Matthew M. Yanez and Aaron J. Baker; Faculty Director: Vineeth Balasubramanian

Python Conformal Predictor (PyCP) is an extension for the Scikit-Learn machine learning toolkit to support conformal prediction. Recently introduced by Vovk et al, the conformal prediction framework is a unique approach to classification and regression that produces a valid prediction region containing the correct label for a new instance with guaranteed error frequency. PyCP is the first open-source implementation of the framework with support for a variety of user options.

A Practical Method for Single Cell Isolation and Analysis
By: Colleen Ziegler; Faculty Director: Joseph Chao

Single cell heterogeneity plays an important role in a variety of diseases. Current methods for single cell studies often require specialized or expensive equipment that may be prohibitive to labs wishing to perform such analyses. We have developed a method for the isolation and gene expression analysis of single cells that requires readily available, inexpensive materials, is compatible with phase and fluorescent microscopy, and allows for tracking of specific cells throughout all measurements.
Kevin Kelly ‘08
Barrett Alumni Speaker

Thesis Title:
Real Estate Investment Fund Formation

Kevin Kelly, a Barrett graduate, earned a degree in finance in 2008 from the W.P. Carey School of Business. He currently is the Managing Partner and Portfolio Manager at Recon Capital Partners. In New York, Kevin focuses primarily on the equities and options securities market. In his previous role, Kevin served as a Portfolio Manager for Tontine Capital, a hedge fund, from 2008 – 2011. Before joining Tontine Capital, Kevin Kelly was Vice President of Investments for Source Capital Group, Inc. based in Westport, Connecticut. Kevin has also worked at Deutsche Bank on its US Private Placement’s Debt Team in London. He also worked for Goldman, Sachs & Co. in San Francisco, for a wealth management team with $6 billion assets under management. He performed due diligence on companies, assets, and investment managers while at Goldman.

In school, Kevin was the Vice President of Finance for the Business School Council, a founding member of the Investment Banking Industry Scholars, and President of the Undergraduate Student Investment Fund.

This year marks Barrett’s 25th anniversary as an honors college at Arizona State University. As part of the Barrett community, join us throughout the year at our celebratory programs.

For more information on upcoming events visit barretthonors.asu.edu/anniversary
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Acknowledgements

This event was made possible by the following:

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Barrett Events Office
Bianca Lucero, Michelle O’Donnell
Vanessa Lao, Carissa Pappas

Barrett Writing Center Tutors
Dr. Thomas Martin, Advisor

BLAST Events Team
(Barrett Leadership and Service Team)

Development & Communications Office
Lexi Killoren, Jessy Schott

Honors Thesis, Research and Creative Project Directors

Information Technology Office
Rebecca Viles

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Thank You to the Quesada Family for supporting Barrett student research through the Jose Franco and Francisca Ocampo Quesada Research Award