AGS
SYMPOSIUM

UC IRVINE
APRIL 18, 2014
CELEBRATING GRADUATE AND PROFESSIONAL STUDENT RESEARCH
The AGS Symposium is open to the public. Registration is necessary, but day-of registrations are welcome and encouraged!

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00a - 9:00a</td>
<td>Registration</td>
<td>Crystal Cove Auditorium Lobby</td>
</tr>
<tr>
<td>9:00a - 9:45a</td>
<td>Guest Speaker - Arthur Riggs</td>
<td>Crystal Cove Auditorium</td>
</tr>
<tr>
<td>9:50a - 10:40a</td>
<td>Session 1</td>
<td>Emerald Bay DE, Moss Cove A &amp; B, Pacific Ballrooms A &amp; B</td>
</tr>
<tr>
<td>11:00a - 11:55a</td>
<td>Session 2</td>
<td>Emerald Bay DE, Moss Cove A &amp; B, Pacific Ballrooms A &amp; B</td>
</tr>
<tr>
<td>11:55a - 1:05p</td>
<td>Lunch Break</td>
<td>--</td>
</tr>
<tr>
<td>1:05p - 2:00p</td>
<td>Session 3</td>
<td>Emerald Bay DE, Moss Cove A &amp; B, Pacific Ballrooms A &amp; B</td>
</tr>
<tr>
<td>4:20p - 6:00p</td>
<td>Reception (open to public)</td>
<td>Doheny Beach AB</td>
</tr>
<tr>
<td>6:00p - 8:00p</td>
<td>Awards Banquet (by invitation only)</td>
<td>Pacific Ballroom D</td>
</tr>
</tbody>
</table>
Featured Sponsors

Microsemi

Edwards

Google
## Contents and Talk Schedule

Map and Schedule Overview  
Featured Sponsors  
Welcome to the AGS Symposium  
AGS Symposium Sponsors  
Acknowledgements  
Keynote Speaker  

### Abstracts  

**Session 1 - 9:50 AM**  

**Emerald Bay DE**  
- Positive Social Exchanges Moderate Associations of Subjective Socioeconomic Status with Cardiovascular Functioning  
- Tackling a Global Challenge on Domestic Ground: Geographic and Demographic Analyses of TB in Orange County, CA

**Moss Cove A**  
- Virtual Inclusion Via Telepresence Robots In The Classroom  
- Patterning Information in the Extracellular Matrix during Salamander Limb Regeneration  
- Using Participatory Action Research to Address Middle School Lunch Issues

**Moss Cove B**  
- Perceptions of National Identity in Eastern Europe  
- Dance As A Form of black Queer Activism in South Africa  
- Unsolved murders, neighborhood context, and police-community relations

**Pacific Ballroom A**  
- Developing New Chemical Reactions Powered By Light  
- The role of consumer electronic technologies in field measurements for ecological applications  
- Developing a Global High-Resolution Flash Flood Forecasting System Using Multiple Sources of Precipitation Data

**Pacific Ballroom B**  
- College Enrollment Goals For the Year After High School: Costs of Failure and Benefits of Ambition  
- Surviving the Millennium Drought: An analysis of Melbourne’s 50% reduction in per capita consumption  
- Students as Researchers of Their Own Language Learning Progress

**Session 2 - 11:00 AM**  

**Emerald Bay DE**  
- EEG is a powerful brain marker of motor status in patients with chronic stroke  
- Handheld Platform for the Rapid Measurement of C-Reactive Protein for the Risk Assessment of Obesity-Related Diseases  
- The impacts of exposure uncertainty on the reported association between perfluorooctanoate and preeclampsia

**Moss Cove A**  
- Full Duplex Wireless Transmission: Challenges and Opportunities  
- A Sixth Sense: How Animals can perceive Earth’s Magnetic Field
Can the Ontological Models Framework Accommodate Bohmian Mechanics? .......................................................... 17
Single Molecular Tuning Fork - Developing a microscope that can see the structure of nano-world ........................................ 17

Moss Cove B ......................................................................................................................................... 18
Reducing Recidivism through Interactive Journaling: An Evaluation of Hawaii’s Probation Program ....................................................... 18
Swimming with or against the tide: Cultural differences in children’s conformity to others ................................................................. 18
Who’s in My Bed: Strange Bedfellows in the American pro-Israel Movement ................................................................. 18
The Way It Ought to Be: The Non-Independence of Moral Intuition and Factual Belief ................................................................. 19

Pacific Ballroom A ......................................................................................................................................... 19
Device for the Detection and Characterization of Single Biological Cells ........................................................................... 19
Hydrogen Refueling Infrastructure for the Commercial Deployment of Zero-Emission Fuel Cell Electric Vehicles ................................... 19
Mapping Risk: Geographic Information Systems as Disaster Media ........................................................................... 19
Using Depression Analytics to Reduce Stigma via Social Media: BlueFriends ........................................................................... 20

Pacific Ballroom B ......................................................................................................................................... 21
Motivational Predictors of Math Course Persistence ....................................................................................... 21
Paper Shrines: Movie Scrapbooks Assembled by American Girl Fans in the 1910s .................................................. 21
Investigation of Representation in the Human Medial Temporal Lobe ........................................................................... 22
Coming Full Circle: Chiastic Structures and Ring Composition in Suetonius’ De Vita Caesareum ...................................................... 22

Session 3 - 1:05 PM ......................................................................................................................................... 22
Emerald Bay DE ......................................................................................................................................... 22
Viruses and Electronics for Early Prostate Cancer Detection ....................................................................................... 22
The piRNA pathway and transposon control in the human malaria vector, Anopheles stephensi .................................................. 23
The history of shell shock and what it tells us about mental injuries of war ........................................................................... 23

Moss Cove A ......................................................................................................................................... 24
Flat Polarizing Lenses: Design, Synthesis and Applications ....................................................................................... 24
Rapid Physiological and Performance Changes in a Newly Herbivorous Lizard ........................................................................... 24
Shrink-Induced Wrinkled Composite Structures for Enhanced Fluorescence Sensing .................................................. 25

Moss Cove B ......................................................................................................................................... 25
Becoming Shameful: Between the human and the non-human in Measure for Measure .................................................. 25
Public Defenders: Zealous Advocacy in a Judgmental Environment ........................................................................... 25
Criminalizing Pregnancy: Exposing the practices of regulating pregnant women ........................................................................... 26

Pacific Ballroom A ......................................................................................................................................... 26
Biofuel Formation by Nitrogenase ......................................................................................................................................... 26
Improving online privacy with a better form auto-completion tool ....................................................................................... 26
Advising and optimizing the deployment of sustainability-oriented technology and management options in the integrated electricity, transportation, and water supply context ........................................................................... 27

Pacific Ballroom B ......................................................................................................................................... 27
Facilitating Young Children’s Recognition Reports ....................................................................................... 27
Less is Core: Consumer Debt Repayment and the Budget Constraint Paradox ........................................................................... 28
Access to Cash, Access to Court: Unlocking the Courtroom Doors with Third-party Litigation Finance .................................................. 28

Session 4 - 2:20 PM ......................................................................................................................................... 29
Emerald Bay DE ......................................................................................................................................... 29
Natural Product Synthesis ......................................................................................................................................... 29
Health Code Violation Prediction via Yelp Keyword Cluster Analysis ........................................................................... 29
Addressing HIV-stigma through PhotoVoice: A Qualitative Approach ........................................................................... 29

Moss Cove A ......................................................................................................................................... 30
Developing Danger: Risk, Disability, and Development in the Land of a Million Bombs .................................................. 30
<table>
<thead>
<tr>
<th>Session 5 - 3:35 PM</th>
<th>36</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Emerald Bay DE</strong></td>
<td>36</td>
</tr>
<tr>
<td>Healthcare economics: Cost effectiveness of commonly performed procedures in medicine</td>
<td>36</td>
</tr>
<tr>
<td>Lessons from Wolverine: Multiphasic Self-healing Polymers</td>
<td>36</td>
</tr>
<tr>
<td>Prenatal Exposure to Traffic Related Air Pollution and Risk of Birth Defects</td>
<td>36</td>
</tr>
<tr>
<td><strong>Moss Cove A</strong></td>
<td>37</td>
</tr>
<tr>
<td>Visualization of Intra and Extra Molecular Bonding Structures</td>
<td>37</td>
</tr>
<tr>
<td>Single molecule enzymology using high-bandwidth nanoscale electronics</td>
<td>37</td>
</tr>
<tr>
<td>The Cosmic Frontier</td>
<td>37</td>
</tr>
<tr>
<td><strong>Pacific Ballroom A</strong></td>
<td>38</td>
</tr>
<tr>
<td>Life in Plastic: Celluloid Acetate, Taxidermic Preservation, and the Photo-cinematic Arts</td>
<td>38</td>
</tr>
<tr>
<td>All hands on deck: using microbes to battle global change</td>
<td>38</td>
</tr>
<tr>
<td>Utility of Augmented Reality in Relation to Virtual Reality in Stroke Rehabilitation</td>
<td>38</td>
</tr>
<tr>
<td><strong>Pacific Ballroom B</strong></td>
<td>39</td>
</tr>
<tr>
<td>Do Kindergarten Common Core Standards Domains Predict Later Math Achievement?</td>
<td>39</td>
</tr>
<tr>
<td>The effects of interval-magnitude and frequency region on melodic pitch-interval discrimination</td>
<td>39</td>
</tr>
<tr>
<td>The benefit of being a social butterfly: communal roosting deters predation</td>
<td>39</td>
</tr>
</tbody>
</table>
Welcome to the AGS Symposium

When people think of the University of California, they often think of the education many undergraduates receive here. They may also think of the scholarly and scientific research that the University produces. What may not come to mind is the large community of graduate students who work at UC Irvine. Graduate students are the backbone of the university; they design and sustain the intellectual knowledge and scientific research the university produces. From neurobiology to educational development, graduate students solve real world problems by designing and conducting cutting edge research.

As members of the graduate student community, we want to celebrate our research – our groundbreaking, thought-provoking forays into the broadening of human knowledge – and it is for that reason that we’ve put this Symposium together. We hope that members of the UCI and Orange County communities gain an opportunity to learn about the valuable contributions made by our students. We also hope that the students participating will think more broadly about their own research, reaching beyond the narrowness of academia to consider the impacts their ideas can have on the world around them. We are very grateful for the support and enthusiasm of the UCI community for our idea, without which this event would have been impossible. We hope you find this experience as rewarding as we have.
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Claire Trevor School of the Arts | Dean’s Prize

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School of Social Sciences | Dean’s Prize

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Student Center Event Services | Venue
Acknowledgements

In addition to the individuals listed below, AGS would like to thank the judges from all departments and campus units for their invaluable time and for their core contribution in the judging process. Additionally, we thank all of the volunteers who helped out with various logistics on April 18th to ensure the AGS Symposium ran smoothly. The help of both of these groups enabled the AGS Symposium to be a great success. We also thank all of the UCI faculty who support graduate education through teaching and mentoring graduate students and provide the groundwork and inspiration for students to undertake these innovative research projects. We’d like to give a special thanks to everyone in the Graduate Division who lent us their advice and support.

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Special Thanks

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Keynote Speaker

Arthur Riggs
Chair, Department of Diabetes and Metabolic Disease Research
Professor of Cancer Biology
Beckman Research Institute of the City of Hope, Duarte, CA

April 18th, 9:00 AM
Crystal Cove Auditorium
All students and other attendees are welcome!

A molecular biologist and pioneer in the field of DNA methylation epigenetics, Arthur Riggs was elected to the National Academy of Sciences in 2006. Dr. Riggs has built his career on exploring unknown fields and laying the groundwork for discoveries which have shaped the way we understand molecular biology today. Riggs and his colleagues were the first to produce human insulin in Escherichia coli. He is also known for his work on mammalian DNA replication, protein-DNA interactions, and the production of recombinant antibodies.

Riggs has spent most of his career as a researcher, and later the director, at the Beckman Research Institute of the City of Hope National Medical Center, a National Institutes of Health sponsored cancer center in Duarte, California. His current work focuses primarily on mammalian epigenetics.
Abstracts

Session 1 - 9:50 AM

Emerald Bay DE - 9:50 AM

Positive Social Exchanges Moderate Associations of Subjective Socioeconomic Status with Cardiovascular Functioning

Emily Hooker, School of Social Ecology
Co-authors: Sally S. Dickerson, Belinda Campos

Abstract: The current study examined the moderating role of positive social exchanges (i.e., perceived social support) on cardiovascular functioning in young adults of low socioeconomic status (SES). Young adults (N=124; M age=19.5; 56% female) completed a 15-minute stress task that was preceded by a 45-minute rest period. Systolic and diastolic blood pressure (SBP/DBP) were assessed intermittently throughout the study. Controlling for age and BMI, those who reported low subjective SES and high positive social exchanges had lower baseline DBP than those low on SES who reported low positive social exchanges, $\beta=1.007$, $t(105)=13.424$, $p=.001$. Controlling for BMI and baseline DBP, those who reported low subjective SES and high social exchanges had lower DBP during the stress task than those who report low SES/low social exchanges, $\beta=.181$, $t(94)=1.837$, $p=.069$. These findings offer preliminary evidence that social support may be protective of cardiovascular health among those from lower socioeconomic backgrounds.

Speaker Bio: Emily Hooker is a graduate student in the School of Social Ecology at UC Irvine. Her research focuses on the intersection of social support and cardiovascular health in young adults from low SES backgrounds.

Tackling a Global Challenge on Domestic Ground: Geographic and Demographic Analyses of TB in Orange County, CA

Amruta Dixit, Program in Public Health
Co-authors: Ming-Chieh Lee, Guiyun Yan

Abstract: Geographic and demographic analyses were conducted on all tuberculosis cases from 2005 to 2009 reported to the County of Orange Health Care Agency and all TB hospitalizations of Orange County residents reported to the Office of Statewide Health Planning and Development from 2005 to 2008. The overall case rate for Orange County in 2008 was 6.7 per 100,000 population. This is substantially higher than the national average, 4.2, and on par with the California state average, 7.0. Westminster had the highest case rate by city with 23.76 per 100,000 population and a per capita income of $23,331. Santa Ana, with the lowest per capita income ($16,891) in the county, had a case rate of 9.65 per 100,000 population. Foreign-born patients in the Program represented 87.2% of all TB cases. Relative risk ratios calculated from the case data indicated that males [RR 23.46], and seniors (65 yrs+) [RR 14.39] were at greatest risk. The relative risk ratio for a TB infection in an Asian male senior is 24.22. The total charges from 2005-2008 associated with TB-related hospital stays for patients insured by Medicare or Medi-CAL and others exceeded $29.4 million. These data suggest that the high burden of TB in Orange County warrants continued attention and resources. The research explores the economic and public health issues of TB in OC before the implementation of the Affordable Care Act (ACA); future analyses can be conducted to determine the impact of ACA on TB rates in OC.

Speaker Bio: Amruta Dixit earned her MPH from UCI in Epidemiology from UCI in 2010 and spent the next 2 years working on different infectious diseases in Irvine, Kenya, and Georgia. She is currently in her second year of her PhD and is continuing her research on malaria in Africa and southeast Asia.

Moss Cove A - 9:50 AM

Virtual Inclusion Via Telepresence Robots In The Classroom

Veronica Ahumada Newhart, School of Education
Co-authors: Mark Warschauer

Abstract: The recent development of telepresence robots provides the opportunity for virtual inclusion to students who are not able to attend school due to medical conditions. Every year, large numbers of K-12 students are not able to attend class due to illness. Extended absence from the classroom has negative and overlapping educational, social, and medical consequences as students may fall behind in instruction, feel isolated from their peers, and experience difficulties in their recovery due to loneliness and depression. The recent development of telepresence robots provides a possible means for addressing this situation. Preliminary results from a local case study on the use of these robots in a public school system indicate that virtual inclusion may provide significant improvements in the educational, social, and healthcare experiences of this vulnerable population.

Speaker Bio: Veronica Ahumada Newhart is a Ph.D. student in the School of Education at UC Irvine with a specialization in Language, Literacy, and Technology (LLT). She received her M.Ed. in Adult Education with an emphasis on distance/online learning from the University of Georgia. Her research project, Virtual Inclusion via Telepresence Robots in the Classroom, was re-
recently selected for the student research competition at the 2014 Computer Human Interaction (CHI) conference in Toronto. Her research interests include emerging technologies to facilitate teaching and learning, virtual inclusion, use of robots in the classroom, online/distance learning, student health and educational achievement, and community and family education.

**Patterning Information in the Extracellular Matrix during Salamander Limb Regeneration**

**Anne Phan, Francisco J. Ayala School of Biological Sciences**

**Abstract:** Salamanders are unique among adult vertebrates in their ability to regenerate complex body structures after traumatic injury. Many steps remain before regeneration can be enhanced in humans, including understanding how to accurately recreate the pattern and function that was lost. In salamander regeneration, the cells maintain a memory of their original position and use this positional information to precisely recreate the missing patterned structure. The goal of this research is to elucidate the molecular mechanism of positional information in salamander limb regeneration and determine if it is conserved in mammals. A gain-of-function assay for positional information was used to determine the ability of components of the extracellular matrix (ECM) to induce pattern formation when grafted into a site of ectopic blastema induction by deviation of a nerve into a lateral wound in the salamander limb. It was determined that positional information is a property of the heparan sulfates in the ECM, and is established by differential expression of heparan sulfate sulfotransferases across the anterior/posterior axis. Grafts of artificial matrix containing heparan sulfates are sufficient to induce pattern formation. Similar anterior/posterior heparan sulfate sulfotransferase expression patterns were discovered in the mouse. Mouse ECM grafts into the salamander limb induced pattern formation, implying that the role of ECM heparan sulfates in positional information is conserved in mice.

**Speaker Bio:** Anne Phan is a Ph.D Candidate in the research laboratory of David M. Gardiner and Susan V. Bryant in the Department of Developmental and Cell Biology.

**Using Participatory Action Research to Address Middle School Lunch Issues**

**Grace Lin, School of Education**

**Co-authors:** Joseph Kay

**Abstract:** Students from a Southern California middle school in which 100% of students are eligible for free or reduced lunch conducted a Participatory Action Research (PAR) project to identify and address a school issue important to them. PAR fosters empowerment and builds a sense of community through this process. Students decided to address school lunches and worked to improve food quality and reduce food waste in their cafeteria. School lunch quality and food waste are significant issues nationally. Over $1 billion of food is estimated to be discarded at lunch annually in public schools in the US (Cohen et al., 2013); perceived poor quality or palatability of the food is a major factor contributing to waste. The significance of improving school lunches is two-fold: Not only are substantial resources wasted, but students may receive inadequate nutrition, which has negative consequences for their health (Gleason & Suitor, 2001) and academic achievement (Murray et al., 2007). In order to address school lunches, the UCI research team helped students explore the issue, develop strategies to improve lunch quality and reduce waste, collect evidence, analyze data, and present the findings to key decision-makers from the district’s Food and Nutrition Services. Overall, the PAR project led to a menu change and fostered students’ sense community, critical awareness, and empowerment by enabling them to work towards a school improvement that was meaningful to them.

**Speaker Bio:** Grace Lin is a second year doctoral student specializing in Learning, Cognition, and Development at the School of Education. Her bio can be found at http://gse.uci.edu/person/lin_grace/lin_g_bio.php?lin_g_bio. Joseph Kay is a third year doctoral student in the Department of Psychology and Social Behavior at the School of Social Ecology. His bio can be found at https://socialecology.uci.edu/students/grad/jskay.

**Moss Cove B - 9:50 AM**

**Perceptions of National Identity in Eastern Europe**

**Katelyn Finley, School of Social Sciences**

**Abstract:** Much of the recent research on Eastern European nationalism has used survey data to examine whether Eastern Europeans have a civic or ethnic national identity. A civic identity is flexible and allows individuals to choose whether they belong to a national community, while an ethnic identity is rigid and based primarily on ethnic ancestry. Although some of the literature acknowledges that the dichotomous civic/ethnic typology fails to capture the ways in which identities may be both civic and ethnic, many scholars nevertheless assume that there is a common Eastern European identity that lies somewhere along the civic/ethnic spectrum. In doing so, they have failed to account for important cross-country variation in the factors that shape Eastern Europeans’ national identity. Furthermore, by relying on survey data from only one time point, scholars have largely ignored the ways...
Dance As A Form of black Queer Activism in South Africa

Zondi Mlondolozi, Claire Trevor School of the Arts

Abstract: My paper sheds light on two South African choreographers/performance activists Albert Khoza and Mamela Nyamza who both use radical dance performance and the human body as a site for resisting homophobia. I analyse Albert Khoza’s piece titled “Influences of a Closet Chant” created in 2012 and Mamela Nyamza’s “SHIFT” created in 2009. Both pieces reflect on the Black queer community in post-1994 South Africa, a community that still experiences homophobic violence and ‘corrective/curative’ rape, despite the country’s liberal constitution that is meant to protect the rights and safety of every citizen. The paper poses questions such as: can dance function as activism in society? How do South African choreographers address Black queer issues in their work? What are the points of intersection between South African homophobic rhetoric and issues of race, class, economy, nationalization, and religious/ traditional ideology? I argue that Black queer choreographers, despite their marginalization, create avenues for agency and decolonization. They do this through subversive performance that disrupts heteronormativity, patriarchy, and racism.

Speaker Bio: Mlondolozi ‘Mloni’ Zondi is a multimedia artist/performance activist who works mainly in dance, drama, and performance/live art. He is currently an MFA Dance candidate and Fulbright scholar at the University of California, Irvine (USA). He studied at the University of Kwa-Zulu Natal (South Africa) where he obtained a BA Honours (cum laude) with a concentration in Drama and Performance Studies as well as Media and Cultural Studies.

Unsolved murders, neighborhood context, and police-community relations

Nick Petersen, School of Social Ecology

Abstract: Each year roughly 5,000 murders go unsolved in the U.S. (Riedel 2008). Two contending theories are commonly invoked to help explain this pattern - devaluation and solvability. Drawing from Donald Black’s (1976) work, the devaluation thesis contends that homicide investigations are shaped by victim/offender characteristics (e.g., race, class, etc.). Alternatively, the solvability perspective posits that arrest outcomes depend on factors related to the “solvability” of the crime (e.g., weapon, location of the crime, victim/offender relationship, etc.) (Gottfredson & Hindelang 1979; Klinger 1997). While the devaluation and solvability perspectives are useful for explaining individual variations in homicide arrests, they cannot fully account for neighborhood arrest disparities. This paper expands the devaluation theory to the neighborhood level by analyzing data on homicide victims from a large southern California county. Multi-level regression models will estimate the effects of offense characteristics and victim/neighborhood demographics.

Speaker Bio: Nick Petersen is a Ph.D. candidate at the University of California, Irvine. His current research focuses homicide, capital punishment, racial disparities within the criminal justice system, and media representations of race and crime. His work has been presented at various conferences and published in the Journal of Criminal Law and Criminology.

Pacific Ballroom A - 9:50 AM

Developing New Chemical Reactions Powered By Light

Greg Lackner, School of Physical Sciences

Abstract: The broad appeal of harnessing solar energy has significantly transformed the way that scientists in all fields develop green and sustainable technology. While engineers have successfully implemented several techniques to make use of solar power over the last few decades, the application of sunlight to powering chemical reactions remains a largely unexplored area of study. Our research in the Overman group has focused on the use of such light-mediated reactions to synthesize complex molecules with interesting biological and medicinal properties. We have recently demonstrated that sunlight is capable of replacing toxic metal reagents and explosive free radical initiators in certain reactions, thereby reducing hazardous chemical waste and providing safer alternatives to traditional reactions involving free radicals. Because many organic molecules are predominantly carbon-based, the use of our light-mediated reactions to form carbon-carbon bonds gives synthetic chemists considerable power in constructing these molecules of interest.

Speaker Bio: I was born in South Bend, Indiana, and attended Indiana University where I obtained a bachelor’s degree in chemistry and a minor in mathematics. While in college, I conducted research with Professor Michael VanNieuwenhze, reproducing the total synthesis of macrocyclic peptide Patellamide A. In 2011, I began my graduate studies at UC Irvine where my research with Professor Larry Overman focuses on the development of light-mediated reactions and application to the synthesis of complex molecules. In my spare time I enjoy writing music and cooking.
The role of consumer electronic technologies in field measurements for ecological applications

George Azzari, School of Physical Sciences
Co-authors: Michael Goulden

Abstract: Ecosystem-climate interactions play a fundamental role in determining local and global climate, but they are understood only at a general level. A deeper understanding of these interactions would improve climate models, as well as assessments of mitigation and adaptation strategies. It is particularly important to quantify energy and mass exchanges between soil, vegetation, and the atmosphere, and to investigate how these fluxes are controlled by ecosystem dynamics, including disturbances such as fires and deforestation. Ground measurements of vegetation are critical in this type of study, but they also are labor and cost intensive, which reduces their availability and geographical extent. The availability of consumer electronics has markedly decreased the cost of advanced technology and potentially provided inexpensive tools for ecological applications and field measurements. I will present some of our projects involving consumer electronic technology, including 3-dimensional measurements of vegetation using Microsoft Kinect sensors, and near-infrared aerial imagery of vegetation with commercial cameras mounted on UAVs.

Speaker Bio: George obtained his bachelor’s degree in physics and his master’s degree in geophysics from Universita’ degli Studi Roma Tre (Rome, Italy). After graduation, he worked for the Italian Institute for Atmospheric Sciences and Climate, where he contributed in designing and realizing a new micro-lidar for vertical atmospheric sounding. George joined the UCI Earth System Science Department as a graduate student in 2009, and he has been conducting his research on ecosystem-climate interactions under the supervision of Dr. Michael Goulden. His research is based on integrating field measurements with remote sensing imagery. Once he graduates from UCI, George is looking for a job that would allow him to work right at the border where technology development meets important scientific questions in earth sciences.

Developing a Global High-Resolution Flash Flood Forecasting System Using Multiple Sources of Precipitation Data

Phu Nguyen, The Henry Samueli School of Engineering
Co-authors: Andrea Thorstensen, Kuolin Hsu, Amir AghaKouchak, Brett Sanders, Soroosh Sorooshian

Abstract: Flash floods are among the most devastating natural hazards in terms of number of people affected and economic loss. Better simulation of flash floods, especially in flash flood forecasts/warnings is very important in order to prevent/mitigate losses and damages caused by this type of natural hazard. The objective of this research is to design a coupled system which has both advantages of a distributed hydrologic model and a high resolution hydraulic model for better simulation of flash floods. The National Weather Service’s Hydrology Laboratory’s Research Distributed Hydrologic Model (HL-RDHM) is employed as a rainfall-runoff generator then runoff flow is dumped into BreZo (developed by the UCI Irvine’s Computational Hydraulics Group) as input of this model. BreZo will simulate flow in the river/channel system as it is or very close to the reality. Once the coupled system has been developed and tested for some selected catchments in the United States and shown promising results, it will be implemented for global scale using the UC Irvine’s Precipitation Estimation from Remotely Sensed Information using Artificial Neural Networks - Cloud Classification System (PERSIANN-CCS) real-time data and Global Forecast System (GFS) data for flash flood nowcast/forecast purposes. Some recent experiments of this system will be reported in this presentation.

Speaker Bio: Phu Nguyen is a PhD candidate at the Center for Hydrometeorology & Remote Sensing at UC Irvine. He finished a bachelor degree in civil engineering at Bachkhoa University HCM City, Vietnam in 2003. He completed his master degree in water resources management at the University of Melbourne, Australia in 2008. His current research focuses on coupling a hydrologic model (HL-RDHM) with a hydraulic model (BreZo) for flash flood modeling at high resolution. His research interests are flash flood warnings, satellite precipitation estimation and object-based algorithms for extreme events. Phu Nguyen is a UC Irvine Chancellor’s Club for Excellence 2014 Fellow.

Pacific Ballroom B - 9:50 AM

College Enrollment Goals For the Year After High School: Costs of Failure and Benefits of Ambition

Brandilynn Villarreal, School of Social Ecology
Co-authors: Jutta Heckhausen, Ph.D.

Abstract: Rosenbaum (2001) identified a “college-for-all” mentality among today’s youth such that the majority of high school students have high educational expectations despite variations in educational performance, resources, and opportunities. Unfortunately, many youth will fail to reach their educational goals. The present study investigated the trade-offs between ambitious goal setting and the consequences of failing to meet such goals for adolescents in the year following high school gradu-
tion. Both paths have risks; youth can: (1) under-aspire and forgo the myriad benefits of further education and post-secondary degrees, or (2) over-aspire and possibly fail to attain one’s educational goals and experience negative consequences. In this longitudinal study, an ethnically and socioeconomically diverse sample of over 1,000 high school seniors (54% female) were surveyed about a variety of education-related motivational factors, with follow-up surveys conducted one year and four years following high school graduation. Having ambitious short-term educational goals, even if failing to achieve these goals, produced greater positive outcomes than having less ambitious educational goals. Failure to achieve short-term educational goals was associated with psychological compensatory mechanisms. The results of the study suggest that despite the risk of failure, it is beneficial to have ambitious short-term educational goals, especially when guided by high long-term educational expectations.

Speaker Bio: Brandilynn Villarreal is a fourth year graduate student in the Department of Psychology and Social Behavior. She earned a master’s degree in Clinical Psychology in 2009 and is currently pursuing a Ph.D. in Developmental Psychology. Her research interests include lifespan psychology, motivation, and self-regulation, with a special emphasis on the transition to adulthood.

Surviving the Millennium Drought: An analysis of Melbourne’s 50% reduction in per capita consumption

Kathleen Low, The Henry Samueli School of Engineering

Co-authors: Stanley Grant, Amir AghaKouchak, David Feldman, Jean-Daniel Saphores, Ashmita Sengupta

Abstract: As Governor Brown has declared California’s drought in a State of Emergency, managing water sustainably is vital. Learning from Melbourne’s experience with drought management could give us another perspective on how to better manage our water. During the Millennium Drought from 1997-2010, Melbourne faced drastic water shortages as total reservoir levels eventually dropped to below 30% of full capacity. Targeting water demand reduction was an effective strategy for Melbourne in surviving the multi-year drought, whereby the average water use per capita decreased by almost 50% over twelve years. These reductions could be attributed to public education, pricing, restrictions, and substitution targets. The purpose of this project is to evaluate the relative effectiveness of Melbourne’s water management practices during the Millennium Drought. This project demonstrates the influence of water policy on municipal water demand, which can inform planning for future droughts and in other urban communities. This project also suggests the importance of collective action in achieving a goal when faced with an environmental crisis and the ability of people to change behavior to meet the challenge.

Speaker Bio: Kathleen Low is a graduate student in Environmental Engineering at the University of California, Irvine. Her research is interdisciplinary in studying urban water resiliency. She received her bachelor’s of science degree in Civil & Environmental Engineering and a minor in Peace and Conflict Studies from the University of California, Berkeley and a master’s of science degree in Environmental Engineering & Science from Stanford University.

Students as Researchers of Their Own Language Learning Progress

Christopher Stillwell, School of Education

Abstract: It is a central tenet of modern language instruction that students learn best through tasks that approximate real world communication, in which communication breakdowns naturally provide opportunities for students to improve by attempting to better express themselves. Still, the popularity of such tasks may arise partly from what Dewey described as “an enthusiastic belief in the almost magical educative efficacy of any kind of activity” (1910, p. 43), for it is often possible for students to complete such tasks without attending to and learning from the language they use or encounter. This study explores a way of enhancing the value of tasks by adding several layers of analysis and reflection. After recordings are made of language students conducting poster presentations, the students make transcriptions of their conversations, identify mistakes, and make improvements, all of which are then checked by the teacher. Students then have an opportunity to repeat the poster task with new partners, including new transcriptions and corrections. Students next compare their transcriptions across the two stages in the interest of finding evidence of progress as well as consistent problems. Finally, student questionnaires are given to assess perceived benefits of the tasks. The results of such investigation indicate that students make progress enhancing the accuracy and complexity of their speech, and that they find the activity worthwhile.

Speaker Bio: Christopher Stillwell is a second year Ph.D. student in the School of Education. He has an M.A. in TESOL from Teachers College, Columbia University and a B.A. in Psychology and Theatre Arts from the University of Pennsylvania. He has worked as an English as a Second/Foreign Language educator for over 18 years, and he is listed on the U.S. Department of State’s database of English Language Specialists. Prior to coming to UCI, he was most recently assistant director of a large university language program in Japan. He is the editor of two books for TESOL International on Language Teaching Insights from Other Fields, and he has
Session 2 - 11:00 AM
Emerald Bay DE - 11:00 AM

**EEG is a powerful brain marker of motor status in patients with chronic stroke**

Jennifer Wu, School of Medicine

**Co-authors:** Steven C. Cramer, MD, Ramesh Srinivasan, PhD, Lucy Dodakian, MA, Nikhita Kathuria, Erin Burke, BS

**Abstract:** In the setting of stroke, brain imaging can be used to demonstrate how differences in brain function are related to post-stroke motor impairment. Previous studies show measures of brain structure after injury are modest markers of motor status after stroke. The current study tested the use of EEG as a marker of brain function after stroke. EEG and structural MRI data were collected prior to behavioral exam. The EEG measure brain function correlated with a behavioral measure of motor impairment with good strength (R2=0.78). In contrast, the MRI measure of brain structure after injury correlated with motor impairment scores with reduced correlation strength (R2=0.52). Furthermore, both EEG and MRI measures retained significance as markers of motor status in a partial correlation analysis. The current results demonstrate both structure and functional measures of brain state together contribute to motor impairment status after stroke. Given that EEG is relatively inexpensive and easy-to-use in clinical settings, EEG demonstrates significant promise as a brain marker of motor status in populations that are traditionally difficult to measure, including acute stroke.

**Handheld Platform for the Rapid Measurement of C-Reactive Protein for the Risk Assessment of Obesity-Related Diseases**

Arlene Doria, The Henry Samueli School of Engineering

**Co-authors:** Nicholas Martin, Dr. Dhonam Pemba

**Abstract:** About 35.7% of Americans are obese including 12.5 million children. Obesity is associated with a number of diseases including stroke, heart disease, type 2 diabetes, and certain types of cancer. It is estimated that the annual cost of obesity-related medical care was $147 billion in 2008. Persistent, systemic inflammation has been positively correlated with obesity related diseases. An inflammatory marker of interest is C-reactive protein (CRP) which has been shown to decrease with weight loss and exercise. Here we present a low powered and low cost platform that can measure CRP in minutes from just a drop of blood. The enabling technology is a novel microfluidic technology called SoundStream that uses ultrasound to perform biological assays on tiny chips. SoundStream entails the use of oscillating microbubbles to perform various assay steps including cell lysis, cell separation, particle size separation, pumping, DNA shearing, and mixing. SoundStream enables the processing and analysis of microvolume samples in analyzers that fit in the palm of your hand. This translational research has led to the formation of a biotech startup called Defineqa, a company currently incubated at UC Irvine. Defineqa is developing, Fitqa, a novel smartphone enabled device that can be used as a low cost, health monitoring tool at home.

** Speaker Bio:** Arlene Doria is an engineer and an avid promoter of preventative health, early diagnosis and decentralized patient care. Early monitoring saves lives! Early diagnostics preclude the high costs from treating advanced stages of diseases. Faster, more accurate, and lower cost diagnostics will make healthcare more accessible to everyone! Arlene is motivated to innovate in diagnostics because of the tragic loss of her mother to gastric cancer in 2007 which resulted from misdiagnosed symptoms in 2004. From that experience, Arlene quit her stable job in 2008 and went back to grad school to learn, develop, and commercialize next generation diagnostics in preventative health. Born in Zambia and raised in Honduras, Arlene also knows the clinical significance of field deployable healthcare in the developing world. She is the lead engineer in developing SoundStream applications in sample preparation and analyte detection. Her research focuses in the area of microfluidics for use in wellness and medical applications. Arlene has more than five years work experience as a senior process analyst in manufacturing of point-of-care diagnostics for Alere (formerly Biosite, one the top cardiac diagnostics company for point of care). She also has extensive experience in web/app development, web analytics, and statistics. Arlene is close to conferring a PhD in Biomedical Engineering. She has a B.S. in Chemical Engineering, and a B.S. in Biological Sciences from the University of California, Irvine.

**The impacts of exposure uncertainty on the reported association between perfluorooctanoate and preeclampsia**

Raghavendhran Avanasi, School of Medicine

**Co-authors:** Hyeong-Moo Shin, Veronica Vieira, Scott Bartell

**Abstract:** Perfluorooctanoate (PFOA), a chemical used in the manufacture of consumer products such as Gore-Tex, Scotchgard etc., has become a ubiquitous environmental contaminant. Based on the C8 Health Project, a study of 69,030 people who were exposed to PFOA through the emissions of a PFOA production facility in
West Virginia, the C8 Science Panel concluded that Pregnancy Induced Hypertension/Preeclampsia (PIH/P) may be linked to PFOA exposure. The C8 Science Panel exposure assessment uses predicted participant PFOA exposures based on a suite of environmental fate and transport models, and a dose-reconstruction model built at UCI (Shin et al., 2011a, b). The aim of the present study is to assess the impact of the uncertain PFOA water concentration predictions on the association between PFOA exposure and preeclampsia (Savitz et al., 2012). Using Monte Carlo simulation, we changed the individual PWD-PFOA water concentration for every year by randomly sampling from lognormal (uncertainty) distributions for the total PFOA release rate, the PWD-specific water concentrations, and auto-correlated annual water concentrations within each PWD using the original predicted concentrations as medians and a range of 2, 5 and 10-fold uncertainty. We find that exposure uncertainty (i.e., coefficient of variation of the log odds ranging from 11.3% to 39.2%) may contribute almost as much as the original sampling variability (47.8%) to overall uncertainty in the association between PFOA and preeclampsia.

**Speaker Bio:** I earned my bachelor’s degree in Biotechnology from VIT University, India and a master’s degree in Environmental Toxicology at Texas Tech University, TX. I am currently a Ph.D. candidate in the Environmental Health Science program (Exposure Science and Risk Assessment track) in the School of Medicine. My research interests include using quantitative methods to better estimate human exposure to chemical contaminants and analyzing the risk posed by the exposures. I aim to pursue a career focused on assessing the health risks of emerging contaminants and chemicals.

**Links between Mothers’ Perceptions of Neighborhood Disorder and Children’s Home Environments**

**Joyce Lin, School of Education**

**Abstract:** The environments mothers create for their children are critical to their children’s developmental outcomes, yet little is known about how low-income neighborhoods relate to the structure of children’s home environments. Therefore, this study examines the associations between low-income mothers’ perceptions of their neighborhoods and the home environments they provide for their children. Since different women may perceive the quality of the same neighborhood differently, this study uses subjective, rather than typical objective measures of neighborhood disadvantage. Further, since poor neighborhood quality affects maternal mental health and maternal mental health affects home environment quality, these analyses consider the mediational role of maternal mental health. Results show that the more women perceive their neighborhood to have physical disorder (e.g., graffiti, litter, vandalism) and social disorder (e.g., burglary, drug dealing, assault), the less likely they are to provide high-quality home environments and be responsive to their infants, regardless of their mental health. Given recent findings regarding early childhood disparities persisting and exacerbating into adolescence and adulthood, these results have significant long-term implications for young children’s developmental trajectories.

**Speaker Bio:** Joyce Lin is a third-year Ph.D. student in the School of Education, specializing in Learning, Cognition, and Development (LCD). She received her Bachelor of Arts in Sociology and minor in Education Studies from the University of California, Los Angeles prior to coming to UCI. Her research has focused on the associations between parental perceptions and children’s home environments. Her research interests also include early childhood socio-emotional development, parenting, early childhood parenting interventions, and the influence of different environmental contexts on these areas.

**Moss Cove A - 11:00 AM**

**Full Duplex Wireless Transmission: Challenges and Opportunities**

**Elsayed Ahmed, The Henry Samueli School of Engineering**

**Co-authors:** Ahmed Eltawil, Ashutosh Sabharwal

**Abstract:** Due to the tremendous increase in wireless data traffic, one of the major challenges for the future wireless systems is the utilization of the available spectrum to achieve better data rates over limited spectrum. Currently systems operate in what is termed “Half Duplex Mode”, where they are either transmitting or receiving, but never both using the same resources. Full-duplex transmission promises to double the efficiency where bidirectional communications is carried out over the same resources. The main limitation impacting full-duplex transmission is managing the strong self-interference signal “literally screaming in ones’ ear” imposed by the transmit antenna on the receive antenna within the same transceiver. Several recent publications have demonstrated that the key challenge in practical full-duplex systems is un-cancelled self-interference power caused by a combination of hardware imperfections. In this work, we consider the problem of self-interference cancellation in full-duplex systems. We study several aspects in full-duplex transmission, focusing on developing different self-interference cancellation techniques to maximize the amount of cancelled self-interference power. The ultimate goal of this project is to design and build a complete, real time, full-duplex system that is capable of
achieving wireless full-duplex transmission in real wireless environments using practical hardware platforms.

**Speaker Bio:** Elsayed Ahmed received his B.Sc. and M.Sc. degrees with honors from the Electronics and Communications Department, Cairo University, Egypt in 2006 and 2010 respectively. He worked as a Senior System Design Engineer at Newport Media Inc. from 2006 to 2010. He is currently working towards his PhD degree at the EECS department at the University of California, Irvine. His research interest includes wireless communication, digital signal processing, and algorithm design for wireless communication systems.

**A Sixth Sense: How Animals can perceive Earth’s Magnetic Field**

**Timothy Ma, School of Physical Sciences**  
**Abstract:** A wide range of organisms have the ability to sense Earth’s magnetic field and use it as a method of orientation. The biophysical mechanism of this sixth sense is not well understood yet, but a leading theory is the radical pair mechanism. The energy levels of this pair of correlated electrons are affected by quantum interactions. Earth’s magnetic field can affect these energy levels which leads to different chemical products created and the ability to get a neural response based off of the animal’s orientation with respect to a magnetic field. Here, we present results from experimental setups testing the effect of magnetic fields on fruit flies, Drosophila Melanogaster. We are investigating Canton-S wild type fruit flies as well as two genetically modified strains that naturally like to fly up and fly down. We test the decisions that flies make through a maze while in the effect of a strong inhomogeneous magnetic field. Lastly, we present a model for how the magnetic photoreceptors could be arranged in the retina of the eye. This could lead to the ability to possibly “see” the magnetic field, and with environmental cues, they can use Earth’s magnetic field to navigate themselves.

**Speaker Bio:** Tim is a 4th year Ph.D student in physics at UCI. He is currently the Legislative Liaison for the Associate Graduate Students where he likes to lobby and promote graduate student issues at the state level. He enjoys playing and watching sports, Starcraft II, and playing his harmonica.

**Can the Ontological Models Framework Accommodate Bohmian Mechanics?**

**Benjamin Feintzeig, School of Social Sciences**  
**Abstract:** When one looks closely at quantum mechanics (QM), our best physical theory of the micro-world, one finds not one, but many competing theories or interpretations of a shared mathematical formalism. The standard formulation of QM models physical systems as waves, or mathematical objects called wavefunctions, which evolve continuously when not being measured but collapse discontinuously when measured. However, there are other “no collapse” theories such as Bohmian mechanics, in which physical systems are composed of particles with definite positions which always evolve continuously as they are pushed around by the wavefunction, or “guiding wave”. Some have proposed a unified mathematical framework, called the ontological models framework, for asking foundational questions about all competing quantum theories at once. The framework is supposed to allow one to formalize important questions about, for example, locality, determinism, and the objectivity of the wavefunction. If the ontological models framework is to accomplish its task of providing a general arena for investigations of QM, then it had better capture at least the most well known quantum theories as ontological models. I prove a mathematical proposition to show that the aforementioned Bohmian mechanics is not an ontological model. Thus, the framework does not allow one to investigate all quantum theories at once. I conclude that we should move beyond the ontological models framework.

**Single Molecular Tuning Fork - Developing a microscope that can see the structure of nanoworld**

**Chi-Lun Jiang, School of Physical Sciences**  
**Co-authors:** Chen Xu, Zhumin Han  
**Abstract:** Since the invention in 1711 by British musician John Shore, the tuning fork has been one of the most versatile devices. With a pure pitch in answer to a gentle knock, it is a standard for acoustic calibration and an inspiring demonstration in Physics lectures. Miniature crystal clear tuning forks made of quartz can be found in numerous electronic gadgets, regulating every bit and byte of our digital life. It also plays an important role in nanotechnology as an extremely sensitive force sensor. In this talk, we would like to introduce the simplest form of a “tuning fork” - a single molecule, and discuss how the vibration(pitch) of a single molecule, in response to the “knocking” from energetic electrons, can make an impact on atomically resolved microscopy.
Reducing Recidivism through Interactive Journaling: An Evaluation of Hawaii’s Probation Program

Stephanie Clark, School of Social Ecology
Co-authors: Jennifer L. Skeem

Abstract: Approximately 57% of offenders in the criminal justice system are on probation (Glaze, 2011) and re-arrest rates for these offenders are high (CDC, 2010). Standard probation programs have focused on rule compliance and law enforcement. However, literature has demonstrated that focusing on factors that place probationers at risk for re-arrest, such as antisocial attitudes, can significantly reduce re-arrest rates (Andrews & Bonta, 2007). In response there is an exciting movement to “reinvent” probation by shifting the focus from rule compliance to reducing offenders’ risk of re-arrest. The U.S. Probation District of Hawaii has been at the forefront of this effort implementing an intensive, interactive journaling system. During probation sessions, offenders and officers work through a series of journals, each of which focus on a risk factor, such as antisocial attitudes. Interactive journaling systems have been implemented in several agencies across the U.S., however, little is known about whether their use actually reduces re-arrest risk. Our research team is currently assessing whether this program protects against re-arrest by examining re-arrest data from 66 probationers assigned to the journaling program to 70 matched controls who received “supervision as usual”.

Speaker Bio: Stephanie Clark is a doctoral student in the Department of Psychology and Social Behavior at the University of California, Irvine. She graduated from John Jay College of Criminal Justice with a Masters of Arts in Forensic Psychology in 2008. Her research interests include procedural and distributive justice judgments, restorative justice conferencing, juvenile justice, psychopathy, and risk assessment in forensic populations.

Swimming with or against the tide: Cultural differences in children’s conformity to others

Elizabeth Kim, School of Social Ecology
Co-authors: Chuansheng Chen

Abstract: When faced with misleading information from others, do children trust their own judgment or do they trust others? Moreover, does the degree of conformity to others vary by age, cultural group, or type of task? Recent research has found that in the face of conflicting visual evidence, children as young as 3 years-old are sensitive to social pressure by peers and adults. Moreover, cultural differences among Asian American and Caucasian American children were found in relative rate of conformity, suggesting that cultural differences in parenting style might account for some of these differences. The present study explores how cultural norms - particularly those that value collectivism over individualism - impact children’s ability to make visual, moral, and conventional judgments under social pressure. Implications of this study’s findings include helping prepare parents and educators of early childcare centers to better understand their children’s sensitivity to social pressures when dealing with moral and social conflicts. Understanding why preschool children might be sensitive to their peers and others as a key social reference groups can help us to prevent poor social learning and peer pressure issues, such as bullying in primary school.

Who’s in My Bed: Strange Bedfellows in the American pro-Israel Movement

Rottem Sagi, School of Social Sciences

Abstract: Coalitions are an important vehicle for claims making, yet most social movement research focuses on individual organizations. Despite a renewed interest in coalition research in recent years, the literature on coalition formation and maintenance remains underdeveloped. Scholars have found that coalitions tend to grow in response to threats and fragment in response to opportunities. However, the underlying causal mechanisms that drive these relationships remain unclear. Are these patterns of coalition growth and fragmentation driven by changes in access to resources, issue salience, or political opportunities? An inability to identify the underlying causal mechanisms that drive these observed relationships and patterns of behavior muddies our understanding of coalition formation, growth, and fragmentation. By exploring variation in the American pro-Israel movement 1945-2010, I will test and refine existing theories about the relationship between coalitions and exogenous factors. Drawing on archival research and an original data set containing information on over 700 national American Jewish organizations, I use an event-history analysis to evaluate
organizations’ risks of joining a pro-Israel coalitions. This research will advance our theoretical understanding of social movements and is of substantive interests to scholars in Jewish studies, political science, and international relations.

**Speaker Bio:** I am a Ph.D. candidate in the Department of Sociology at the University of California, Irvine. I earned my M.A. in Sociology (2012) from the University of California, Irvine. I am an affiliate of the Center for the Study of Democracy (awarded June 2011 & 2012). My research interests include social movements/collective behavior, political sociology, organizational theory, sociology of culture, and statistics. I use a combination of qualitative and quantitative methods to understand organizations, political structures, and policy outcomes. My dissertation will test and refine existing theories about coalition formation and maintenance. Exploring changes in American pro-Israel movement coalitions from 1945 to 2010 will provide a more nuanced understanding of how coalitions respond to exogenous factors (i.e. threats, opportunities, structure of the organizational field) and address endogenous issues (i.e. organizational independence, coalition structure, and inter-personal ties between group leaders). For more information, visit my website: www.rottensagi.webpaper.co

**The Way It Ought to Be: The Non-Independence of Moral Intuition and Factual Belief**

*Eric Chen, School of Social Ecology*

**Co-authors:** Professor Peter Ditto

**Abstract:** In our daily lives, some decisions we face are moral, while others are pragmatic. For some, decisions about actions such as whether to smoke a joint of marijuana, eat a piece of steak, or have a one-night stand are moral decisions. For others, these are pragmatic decisions. This research examined the process of moral coherence by which people shape facts to fit their moral intuitions and thus blur the line between these two types of decision-making processes. Specifically, we investigated the relations between moral judgments and cost-benefit factual beliefs about marijuana use, meat-eating, and casual sex. The costs and benefits included health (e.g. does marijuana damage cognition), social (e.g. casual sex breaks down family values), and economic or environmental dimensions (e.g. meat production pollutes the environment). Analyses showed that, even when participants claimed that a behavior was not a moral issue, their moral evaluations of it were significantly associated with factual beliefs. The more participants held that an action was morally unacceptable, the more they believed it to have greater costs and fewer benefits, and vice versa. When considering whether to regulate certain behaviors, debate often centers on ostensibly objective facts. Our research suggests that we would be well-advised to have a healthy dose of humility about what we think we know. We see the world the way we want it to be, the way we feel it ought to be, and not always the way it really is.

**Pacific Ballroom A - 11:00 AM**

**Device for the Detection and Characterization of Single Biological Cells**

*Laura Innes, School of Physical Sciences*

**Co-authors:** Jennifer Chen, Luke Theogarajan, Zuzanna Siwy

**Abstract:** Current technologies for the detection of biological cells, e.g. the Coulter-Counter technique for complete blood cell count, distinguish cells by size but do not give any information on the cell’s shape or mechanical properties. Cells that have an abnormal shape might be indicative of disease, as seen in sickle cell anemia. Changes in mechanical properties of cells, such as stiffness, can be used to differentiate malignant cancer cells from benign cells. There has been a lot of interest in developing technologies capable of high throughput characterization of physical properties of cells without compromising their viability. Such technologies could be applied for the detection of abnormal cells in a patient’s blood and for use in personalized medicine. Blood-borne cancer cells, called circulating tumor cells, are shed from primary tumors and circulate in the blood from where they can invade other organs. The cells are very rare - it is estimated there are only a few circulating tumor cells amongst billions of red blood cells, and millions of white blood cells. We are developing a technology capable of detecting these rare cells by characterizing several of their physical properties, instead characterizing them only based on their size. The approach is based on a single micropore whose geometry is optimized to create local pressure gradients to probe cell softness. I will present our preliminary results with a model system consisting of single pores, particles and mice cells.

**Hydrogen Refueling Infrastructure for the Commercial Deployment of Zero-Emission Fuel Cell Electric Vehicles**

*Kersey Manliclic, The Henry Samueli School of Engineering*

**Co-authors:** Dr. Tim M. Brown, Dr. Shane D. Stephens-Romero, Professor G. Scott Samuelsen

**Abstract:** California is currently leading the nation to deploy hydrogen refueling infrastructure for Fuel Cell Electric Vehicles (FCEV) through the support of the California Energy Commission, the California Air Resources Board, and numerous other government agencies. Using
the Spatially and Temporally Resolved Energy and Environment Tool (STREET) in conjunction with input from various automakers, it was found that 68 stations would be needed in California to ensure sufficient coverage for early market regions in preparation for the 2015 commercial release of FCEVs. Moving forward, the infrastructure roadmap for California can be leveraged to provide guidance in planning out hydrogen infrastructure in the Northeastern U.S. Moreover, the STREET methodology has been further improved through the utilization of high resolution land use data, improved computational algorithms, and access to alternative vehicle sales data. It is these 2 factors that will help to expedite the deployment of FCEVs. Thus far, preliminary results indicate that anywhere from 96 to 313 hydrogen refueling stations would be needed to serve New York, New Jersey, Connecticut, and Massachusetts, depending on whether we target hybrid vehicle owners or electric vehicle customers. Next steps in the research include further refinement of the market areas and identifying possible renewable sources of hydrogen such as from the biogas generated by wastewater treatment plants.

**Speaker Bio:** Kersey is currently an environmental engineering doctoral student in the Advanced Power and Energy Program conducting research on hydrogen refueling infrastructure to enable the commercial deployment of zero-emission fuel cell electric vehicles. He graduated from UC Irvine in 2011 with degrees in mechanical engineering and materials science. Prior to his graduate studies, his undergraduate research work encompassed an energy and greenhouse gas life-cycle assessment of various transportation fuels. In his spare time, he enjoys hip-hop dancing, singing, and watching documentaries.

**Mapping Risk: Geographic Information Systems as Disaster Media**

**Laura Beltz Imaoka, School of Humanities**

**Abstract:** From Google Maps on Facebook profile pages to Bing mapped traffic reports on the local morning news, digital maps and the geographic information systems (GIS) that construct them are inundating society’s electronic screens and devices. Their convergence with social media is changing how and when we consume and communicate information about the Earth’s surface. In particular, they have dramatically altered how we deal with disasters. My research evaluates the sociopolitical implications of GIS as a promising disaster communication technology. As media, GIS functions within a commercial environment making the data which has been collected, manipulated, and visualized by a GIS not simply a utilitarian map presented on public electronic screens. Instead, it is a (disaster) story to be read, speech to be heard, or a database with which to interact. Drawing from the theoretical and methodological positions of risk and media studies, science and technology studies, and critical geography, I consider the ongoing development and use of GIS for public risk communication by examining digital map use across diverse media outlets in the wake of past disasters. The globally circulated geodata, visuals, and narratives of radiation risk emanating from the 2011 Fukushima disaster provide my main case study. I hope to complicate the “fix” the technology promises in order to push future applications to be more sensitive to the social relations that emerge through its media use.

**Speaker Bio:** Laura Beltz Imaoka is a doctoral candidate in the Ph.D. Program in Visual Studies at the University of California, Irvine, with a Graduate Specialization in the Anthropologies of Medicine, Science, and Technology. She holds a M.A. in Anthropology from California State University, Northridge. Her dissertation research analyzes geographic information systems as a means by which risks are produced, defined, and mediated in contemporary culture. In particular, she is interested in how radiation risk was and continues to be physically and socially constructed following the 2011 Fukushima disaster.

**Using Depression Analytics to Reduce Stigma via Social Media: BlueFriends**

**Simone Simpson, Donald Bren School of Information and Computer Sciences**

**Co-authors:** Chris Wolf, Oliver Haimson, Kate Ringland

**Abstract:** Stigma associated with depression and mental illness is a widespread problem, often leading to negative health outcomes and discrimination for people with these conditions. Common stigma reduction interventions focus on two strategies: education (increasing basic understanding of the condition) and social contact (humanizing or ‘putting a face’ to the condition). These interventions have been explored in various formats, but little is known about the potential of leveraging online social media outlets to reduce stigma. BlueFriends is an application that seeks to reduce stigma by displaying a shareable information visualization graphic aimed at increasing both education and social contact. This application employs a predictive model of depression detection on Facebook. It visualizes the potential proportion of depression in a user’s online social network and displays a comparison of depression prevalence with other common prevalence levels in the US. BlueFriends expands current stigma reduction interventions by leveraging online social environments. By creating customized visualizations that users can share within their network, we hypothesize that BlueFriends will prompt collective stigma reduction and societal depression awareness.

**Speaker Bio:** PhD student in Informatics.
Motivational Predictors of Math Course Persistence

Marcela Martinez, School of Education

Co-authors: Thurston Domina

Abstract: One might expect nearly all U.S. high school students to take as many academic courses given the large and rising returns to education. Currently, however, nearly 40 percent of all U.S. high school students opt out of one or more years of high school mathematics. We are interested in how students’ motivation affects their decisions to take additional mathematics courses. This study focuses on students’ decision to take four years of math while accounting for a web of influences such as social background, math track, prior performance, and state policies. We expect students decision to take additional years of math courses in high school will depend on the students’ view of their math abilities, the value they place on learning math (Eccles, 2007; Wigfield & Eccles, 2000) and their college expectations (Eccles’ et al., 2004). Results indicate that the relationship between motivational elements and the number of math courses students take differ by math track. Students’ college expectations predict low- and on-track students to take additional years of math. For above-track students, self-efficacy and interest in mathematics predicts their decisions.

Speaker Bio: Marcela Martinez is a Ph.D. student in the School of Education with a specialization in Educational Policy and Social Context. In 2009, she earned a master’s degree in Social Research Methodology at UCLA. In 2005, she earned a bachelor’s degree in Sociology with a minor in mathematics from Mount St. Mary’s College. Prior to coming to UC Irvine, Marcela had accumulated seven years of quantitative and qualitative research experience working at the following research institutions: Mount St. Mary’s College, Los Angeles Unified School District, RAND Corporation, UCLA Center for Health Policy Research, and National Center for Research on Evaluation, Standards & Student Testing at UCLA. Currently Marcela has several research interests and looks forward to exploring how they intertwine. As a sociologist, she has a focus on the multiple macro- and micro-level factors that contribute to individuals’ academic success. At the same time how students’ social environment impacts the individual psychological state. Currently she is working on three projects. First, she investigates how students’ class-based motivation (i.e., motivational beliefs about their current math course) associate differently with students’ mathematics standardized test scores based on the personal stakes of the exam. Second, she examines the pipeline in science, technology, engineering, and mathematics (STEM) that begins for most students in high school and how the pipeline differs by gender. Third, she investigates how students’ motivation influence students’ decision to take additional math high school courses. In the future, Marcela plans to continue to research and contribute to understandings of adolescents’ experiences and the influence these experiences have on individuals’ academics. Specifically, she will focus on social and psychological factors that contribute to students’ educational outcomes.

Paper Shrines: Movie Scrapbooks Assembled by American Girl Fans in the 1910s

Diana Anselmo-Sequeira, School of Humanities

Abstract: For the last fifty years, contemporary American culture has bombarded us with images that show girls as both irrational and unruly fans: girls crying for James Dean, fainting for Elvis, screaming for Brad Pitt, and stalking Justin Bieber. This paper explores the origins of such lasting, biased representation of young female affect by focusing on film scrapbooks assembled by middle-class girls during the 1910s. The 1910s witnessed the birth of America’s mass culture, the development of a star-driven film industry, and the invention of adolescence. Therefore, girls coming of age in the 1910s were the first generation of mass consumers, movie lovers, and adolescents the United States ever produced. Throughout that decade, girls also compiled image-based scrapbooks that now can be read as time-capsules, three-dimensional artifacts that preserve a fan’s consumer tastes, spectatorial desires, and youthful anxieties. This talk focuses on two scrapbooks: Margaret Harroun’s “Picture Book,” crafted in 1916 when the Missourian girl was fourteen; and Thelma Major’s “Gish Scrapbook”, compiled by the Seattle high-schooler in the late 1910s. Illustrated by an image-based keynote, my presentation invites attendees to discover never-before-seen archival materials which offer a unique peak at the private world of early-twentieth-century girlhood, but also present us with a testimony of unmediated fandom - unpublished artifacts that have not been edited, nor censored, by the popular press.

Speaker Bio: Diana Anselmo-Sequeira is a Fulbright scholar and a PhD candidate in the Visual Studies program at UCI. She is currently finishing her dissertation on American silent film and adolescent girl fans. Her work on cinema, literature, and girl culture has appeared in the anthology “Transnational Horror Across Visual Media”, the journals “The Luso-Brazilian Review” and “Spectator,” and is forthcoming in “Cinema Journal.”
Investigation of Representation in the Human Medial Temporal Lobe

Derek Huffman, Francisco J. Ayala School of Biological Sciences

Co-authors: Craig Stark

Abstract: Previous theoretical accounts (McClelland et al., 1995, Norman and O’Reilly, 2003) suggested that the brain has complementary learning systems - one that is specialized for learning general tendencies across multiple events (mnemonic generalization) and another that is specialized for forming distinct memories of similar events (pattern separation). Mnemonic generalization is useful for making predictions about novel situations that are similar to previously encountered situations and pattern separation is useful for avoiding interference between similar memories. These learning systems have been posited to depend on different brain structures that operate on competing computational principles - namely, the cortex and the hippocampus, respectively. My research utilizes multivariate techniques to analyze functional magnetic resonance imaging (fMRI) data to investigate representations in the cortex and hippocampus. Our results suggest that the cortex represents the category structure of the stimulus set while the hippocampus does not, thus supporting the notion that the cortex is involved in mnemonic generalization and the hippocampus is involved in pattern separation.

Speaker Bio: I obtained my B.S. degree in 2008 with a major in Psychology and a minor in Chemistry at the University of California, San Diego. I then served as a Research Assistant at the University of Southern California, where we investigated age-related memory change. I am currently a 4th year Ph.D. student in Neurobiology and Behavior, and I am interested in the neurobiology of learning and memory. I utilize multivariate techniques and functional neuroimaging to investigate representation in the human medial temporal lobe.

Coming Full Circle: Chiastic Structures and Ring Composition in Suetonius’ De Vita Caesarum

Matthew Ferguson, School of Humanities

Abstract: While ordinary narrative paradigms often oblige readers to interpret works from start to finish, new methods of literary criticism have revealed that many ancient works were composed instead through ring composition. Through this narrative structure, corresponding content in a narrative is represented symmetrically, rather than linearly, through a chiastic structure (e.g. c-b-a-a-b-c) working from the outside to the center of a work. Identified in Homeric to Biblical literature, ring composition likewise can be found in historical prose, particularly in ancient biography. The human life is often understood in stages; for example, life can be represented as a progression from one’s ancestry, birth, and childhood to one’s adulthood, death, and legacy. The parallel nature of these stages can provide a basis for representing a biographical subject through a chiastic structure. This paper proposes that the biographer Suetonius narrated the Lives of the Roman emperors through such a chiastic paradigm. In the specific case of Suetonius’ Nero, the parallel structure and material of the Life demonstrate how the subject’s lifespan is understood and interpreted through corollary stages, with the beginning of the biography foreshadowing the end, and the end echoing the beginning, essential to understanding the complete view of the emperor’s character.

Speaker Bio: Matthew Ferguson is a Ph.D. student in the UC Tri-Campus graduate program in Classics. His research interests include ancient biography, Greek and Latin historiography, and the Early Roman Empire. Matthew also completed an M.A. in Classics at the University of Arizona with a master’s thesis examining ring composition and chiastic structures in the Latin biographer Suetonius’ De Vita Caesarum. Matthew will be discussing his research on ring composition in Suetonius here today.

Session 3 - 1:05 PM

Emerald Bay DE - 1:05 PM

Viruses and Electronics for Early Prostate Cancer Detection

Kritika Mohan, School of Physical Sciences

Co-authors: Keith C. Donavan, Jessica A. Arter, Prof. Gregory A. Weiss, Prof. Reginald M. Penner

Abstract: The sensitive detection of cancer biomarkers in urine could revolutionize cancer diagnosis and treatment. An estimated 29,000 men in the US will succumb to prostate cancer in 2014. Unfortunately, the lack of validated clinical diagnostic markers complicates efforts to develop tests for early detection. For example, a recent report concludes that the PSA test used for prostate cancer diagnostics is more harmful than beneficial due to the high percentage of false positives, which arise as PSA is over-expressed in non-cancer cases, and levels also increase gradually with age. The positive predictive value of this test is around 35, implying that out of every 100 cases tested positive, only 35 are true positives. Our project describes a bioaffinity matrix of viruses integrated into PEDOT (conductive polymer) films for electrochemical sensing of PSMA, a prostate cancer biomarker. The viruses used in this case are M13 bacteriophage, these serve as scaffolds for receptors in the biosensor. High sensitivity
to PSMA resulted from the synergistic action of two different ligands present on the same virus particle. One ligand was genetically encoded, and the other was chemically synthesized to wrap around the virus. This resulted in a bidentate binder with dense ligand display for enhanced PSMA detection. PSMA are reported to be in the 0.5-5 nM range. Our aim is to design a non-invasive, real-time, and affordable test as a point-of-care device, for the early detection of the disease.

**Speaker Bio:** Kritika Mohan was born and raised in India. She earned her bachelor’s degree in Chemistry (Hons.) from St. Stephen’s College, Delhi University, New Delhi, and her Master’s in Chemistry from Indian Institute of Technology, New Delhi. Next, Kritika undertook a summer project at Akums Drugs and Pharmaceuticals Ltd. studying the process of drug manufacturing and the analysis of stability and dissolution parameters. She then worked at Reliance Life Sciences going deeper into designing a diagnostic test for colorectal cancer based on BRAF gene mutation. She is currently enrolled in the chemical biology Ph.D program. She joined Prof. Gregory A. Weiss’s lab in 2011, and is currently investigating prostate cancer diagnostics. Her main focus lies in the development of a point-of-care device for the early and sensitive detection of prostate cancer biomarker from urine samples.

**The piRNA pathway and transposon control in the human malaria vector, Anopheles stephensi**

*Vanessa Macias, Francisco J. Ayala School of Biological Sciences*

**Co-authors:** Judy Coleman, Anthony James

**Abstract:** Novel control approaches are being developed to genetically-engineer mosquitoes to control transmission of the pathogens that cause human diseases such as malaria and dengue. Malaria alone infected more than 200 million people in 2010. A gene-drive system will likely be necessary to replace current mosquito populations with pathogen-resistant mosquitoes. Such a system has the potential to contribute significantly to abatement of these diseases, since the pathogens require mosquitoes to complete their life-cycle. Transposons are mobile DNA elements that may be able to carry anti-pathogen effector genes into wild mosquito populations and so are being investigated for a role in anti-pathogen gene-drive. The mobility of transposons has recently been shown to be restricted by an RNA interference pathway, called the piRNA pathway in the germline of Drosophila melanogaster. The function of this pathway has not yet been demonstrated in any mosquito species and we have characterized the major gene players in this pathway, Ago3, Aubergine and Piwi, in the human malaria vector, Anopheles stephensi. Mosquitoes mutant for these genes will be tested to identify the role of these piRNA pathway genes in regulating a self-moving and traceable transposon in a transformed mosquito line.

**Speaker Bio:** After earning a Bachelor of Science degree in Microbiology from New Mexico State University, I began graduate work under the advisement of Dr. Jiannong Xu working on elucidating the reproductive role of TOR kinase in the malaria mosquito Anopheles gambiae. This was my first experience doing research and it was during this work that I developed a deep interest in vector biology and became confident that I wanted to pursue a career in research in this area. In Dr. Xu’s laboratory, I began developing bench technique and learning to develop experiments to address important biological questions in the mosquito, a most important organism to human health. After earning a Master’s degree in Microbiology from NMSU, I was accepted to the Cellular and Molecular Biology program at the University of California, Irvine, a bridge program which led my into my current work with Dr. Anthony James in UCI’s department of Microbiology and Biochemistry. I am continuing to work with an important malaria vector, characterizing the role of the piRNA pathway in transposon regulation in Anopheles stephensi as a contribution to one of the laboratory’s overall goals of developing a transposon-based gene drive system for driving anti-pathogen effector gene constructs into current malaria-transmitting mosquito populations.

**The history of shell shock and what it tells us about mental injuries of war**

*Annessa Stagner, School of Humanities*

**Abstract:** My research investigates how the United States defined the medical diagnosis of “shell shock” and handled its treatment among U.S. soldiers and veterans from 1917-1925. It examines the individuals who helped to construct policy, the policies they helped to implement, and how those policies changed throughout the war and into the postwar era. My research shows the extent to which policy makers prepared to treat mental injuries of war. They were confident in their ability to cure soldiers, and only after the war discovered shell shock’s lasting effects. As suicide rates and homelessness among veterans rose, policy makers recognized the true difficulty of “healing” mental wounds of war.

**Speaker Bio:** Annessa Stagner is a PhD candidate in the Department of History at the University of California, Irvine. She graduated with a Bachelor of Arts in History summa cum laude from West Texas A&M University in 2001, and completed a Master of Arts specializing in U.S. Foreign Relations at Ohio University. Her dissertation is entitled “Defining the Soldier’s Wounds: U.S. Shell Shock in International Perspective, 1915-1940.” She has presented her research at national and international con-
Moss Cove A - 1:05 PM

Flat Polarizing Lenses: Design, Synthesis and Applications

Mehdi Veysi, The Henry Samueli School of Engineering

Co-authors: Ozdal Boyraz, Filippo Capolino

Abstract: The concept of polarizing lens is presented and its generalization to design novel lenses is examined. We first demonstrate a novel single layer metalens design that can have both light focusing and polarization manipulation capability simultaneously. The designed metalens enables us to integrate two important categories of optical components, i.e., circular polarizer and lens, into a thin flat metasurface. This will significantly reduce the cost, volume, loss, and complexity of optical systems. Second, the methods here developed also allow to design a flat lens with a needle-like focus beam with a small spot size and an extended depth of focus. The idea of extending the depth of focus while keeping the focal spot small increases the interaction of the source field with the object as well as simplifies the alignment procedures for many optical systems. A 2D array of newly-shaped optical antennas with polarization dependent and spatially varying phase response can imprint such compact polarizing lenses. The idea of polarizing lens is expected to lead to the further development of optical components, due to its groundbreaking implications in integrated optics, most notably the possibility of having focused beam with a long depth of focus and metalenses with birefringent behaviors.

Speaker Bio: Mr. Veysi received the B.S. degree in biomedical engineering from the Isfahan University, Isfahan, Iran, in 2007 and the M.S. degree (ranked 1st) in electrical engineering from the K. N. Toosi University of Technology, Tehran, Iran, in 2010. He is currently working toward the Ph.D. degree at the University of California Irvine (UCI), Irvine, CA. From 2010 to 2012, he was the principle investigator on the contour beam reflector and reflectarray antennas projects. He has authored or coauthored more than 15 journal articles and 5 book chapters. Mr. Veysi was a recipient of USNC/URSI Travel Fellowship Grant Award in 2014, AGS Travel Grant Award in 2014, UCI’s Department Fellowship in 2012, and the “distinguished researcher” award in 2011. He has also got the first place in the “13th Kharazmi Youth Festival in Basic Science” in Nov. 2011. He has been engaged in various research works on development of satellite-born antenna. His research interests include myoelectric hand prosthesis, numerical methods in electromagnetic, left-handed metamaterials and electromagnetic band-gap structures, contoured-beam reflectors and reflectarray antennas, non-foster elements and their applications in antenna engineering, on-chip antennas, THz antennas, THz lens and Polarizers.

Rapid Physiological and Performance Changes in a Newly Herbivorous Lizard

Beck Wehrle, Francisco J. Ayala School of Biological Sciences

Co-authors: Donovan P. German

Abstract: Knowing what an animal digests vs. ingests has been little studied, but is necessary to understand if physiology and morphology are optimized for nutritional source. According to the Adaptive Modulation Hypothesis, dietary specialization should lead to gut specialization. We investigated potential digestive specializations in lizards that have shown rapid evolution of diet and gut morphology. A population of Italian Wall Lizards in Croatia has become mostly herbivorous and morphologically distinct from its insectivorous source population in <30 generations. It is unknown if their gut function has shifted with these changes. We compared gut morphology, diets, digestive enzyme activities, and fermentation in both groups of lizards and a third population. In the lab, we measured digestive efficiency in lizards from the herbivorous and source populations. We found no differences in food transit time, but did see differences in digestive efficiency by population and experimental diet. Analyses of morphology, enzyme activity, and fermentation are underway, but so far have found no differences in gut histology or digestive enzyme activities. Thus, we are still searching for the mechanisms that produce this difference in efficiency. Overall, this study will test whether rapidly evolving morphological features can translate into changes in animal performance.

Speaker Bio: Beck Wehrle is a 2nd year Ph.D. student in the Department of Ecology and Evolutionary Biology. He earned his MS at CSU Northridge where he studied the gut microbes of Green Iguanas. He completed his BS at UC Davis. He enjoys conducting international field work, discussing social justice in the sciences and at large, and baking cakes.
Shrink-Induced Wrinkled Composite Structures for Enhanced Fluorescence Sensing

Himanshu Sharma, The Henry Samueli School of Engineering

Abstract: Infectious diseases claim 14 - 17 million lives each year and remain among the leading causes of death in the world. If detected early, most infectious diseases are treatable. One of the greatest challenges in global health is to develop inexpensive technologies that are highly sensitive, rapid in readout, and selective for particular agents. Fluorescence is widely used in biomedical diagnostics due to its sensitivity and specificity, but an ongoing challenge is to improve the fluorescence sensitivity limit to detect and quantify low concentrations of target biomolecules by significantly and specifically amplifying the fluorescence signal. In order to enhance the fluorescence signal, various metallic nanostructures have been developed. The phenomenon behind these enhancements has been attributed to metal enhanced fluorescence which occurs due to the localization of surface plasmons at the metal surface. This can lead to strong electric field enhancements close to the surface of the metal. A fluorophore in close proximity can have its physical properties modified so that its fluorescence signal is enhanced. We have developed a simple approach to pattern metal films onto commodity shrink wrap and leverage the stiffness mismatch during the shrinkage to create nano to micro scale structures. We demonstrate that our metallic structures can enhance the fluorescent signal relative to a planar surface by more than 700 fold, which could enable the possibility of early detection.

Speaker Bio: Himanshu Sharma is a Ph.D. student in Chemical & Biochemical Engineering at University of California, Irvine (UCI) under the supervision of Professor Michelle Khine. He received his B.S. in Chemical & Biological Engineering from University of Wisconsin, Madison and M.S. from UCI. Himanshu’s current research is focused on developing and characterizing shrink-induced metallic structured surfaces for applications in fluorescence based bio-sensing.

Moss Cove B - 1:05 PM

Becoming Shameful: Between the human and the non-human in Measure for Measure

Sam Kolodezh, Claire Trevor School of the Arts

Abstract: Performance is movement through time and space; it is a function of speed, a rate of change, but it is simultaneously experience and therefore negotiates affect. Affects, in other words, are the sensibilities and emotions that guide our daily lives. In this paper I examine how the performance of shame moves through the articulatory space of Shakespeare’s Measure for Measure in order to provide one example of the larger implications of performance. I argue that the Duke acts as a mediator between the part and the whole in representation (law, society, gender, religion, power, language, sense) and between representation and non-representation (affect, physiology, neurology, paradox, nonsense). Mediating between sense and nonsense, the Duke becomes a paradox simultaneously representing and un-representable. He is always in the process of becoming someone/something else. I argue that his performance interrogates boundaries between human, animal, and technology. My reading of Measure for Measure dialogues with research on mirror-neurons and behavior-perception links, contemporary psychological studies of shame, histories of shame, and continental philosophy. In doing so, I make the implicit argument that performance provides valuable opportunities for interdisciplinary research that would not otherwise be available.

Speaker Bio: Sam Kolodezh is a doctoral student in the Joint Ph.D Program in Drama and Theatre at the University of California, Irvine and University of California, San Diego. He is interested in the intersection between technology and identity, affect studies, and performance philosophy, alongside Shakespearean drama, theatre and performance.

Public Defenders: Zealous Advocacy in a Judgmental Environment

Matthew Fritz-Mauer, School of Law

Abstract: The Supreme Court’s 1963 decision in Gideon v. Wainwright made major changes to the criminal justice system, creating or expanding indigent defense systems in every state. Public defenders are immensely important to our legal system, yet not since the mid-1980s has any researcher completed an in-depth examination of the work lives of public defenders. Instead, articles about these lawyers largely focus on the problems which plague indigent defense systems, including a lack of time, money, and in some cases, motivation. Through semi-structured interviews with 15 former public defenders from a single county in Southern California, this paper attempts to fill this gap in our knowledge by examining what the work lives of public defenders are like today, and how their specific beliefs and motivations are shaped by and reflected in their community of practice. The data show that public defenders highly value their autonomy, and perceive themselves as having more freedom and discretion than district attorneys. They feel, however, that their level of autonomy has decreased as their office has grown in size and scope. Furthermore, public defenders showcase great devotion to their clients, and attempt to cultivate this quality through a variety of formal and informal means. On the whole, public defenders showcase great devotion
to their clients and their cause, while acknowledging that they are, at times, little respected.

**Speaker Bio:** Matthew Fritz-Mauer is pursuing a JD from the University of California, Irvine School of Law, as well as a PhD in Criminology, Law and Society. His research focuses on public defenders as well as employment law. Upon graduation, he hopes to practice law for several years before becoming a law school professor.

**Criminalizing Pregnancy: Exposing the practices of regulating pregnant women**

Laura Brennankane, School of Social Ecology

**Abstract:** Regulation of pregnant women is now a practice in America. Criminal and civil courtrooms have become battlegrounds where pregnant women fight to retain their freedoms as well as autonomy to make decisions about their health. The criminal justice system has become an important mechanism for managing women who are seen as threats to their own fetuses. For example, regulation includes an Alabama law that makes it a felony for a pregnant woman to ingest a substance if it causes the death of a child. Likewise, women who suspect that a doctor will call authorities under mandatory reporting laws due to suspicion of drug use or attempted illegal abortion may avoid prenatal care. Also, regulation is performed in civil court where the rights of the woman are in conflict with the rights of the fetus so that the rights of one must trump the rights of the other. This presentation seeks to explore the cases of real women who have had to face legal battles based on their status of pregnant and expose their struggles to the public.

**Speaker Bio:** Laura Brennankane is a doctoral candidate in the department of Criminology, Law and Society in the School of Social Ecology at the University of California, Irvine. Laura’s dissertation focuses on the processes by which pregnant women come under the supervision of law enforcement and how those processes interact with complex systems that also affect pregnant women (i.e., legal, medical, resources, family concerns, etc.). In addition to research, Laura enjoys teaching. She has taught one introductory course on her own at UCI and is currently teaching her second solo course on the topic of family law. She holds an MA from the University of Pennsylvania in Criminology and an AB from Bryn Mawr College in Mathematics and French Studies.

**Pacific Ballroom A - 1:05 PM**

**Biofuel Formation by Nitrogenase**

Johannes Rebelein, Francisco J. Ayala School of Biological Sciences

**Abstract:** The world is facing the problem of rising energy demands and decreasing oil reserves. Nitrogenase, a metalloenzyme, may provide some answers to this problem. This enzyme is known to reduce dinitrogen to ammonia, a bio-accessible form of nitrogen that is essential for all life forms on Earth. Recently, our research group demonstrated that nitrogenase could also reduce the toxic gas, carbon monoxide (CO), to hydrocarbons, a combustible carbon fuel source. Building on this discovery, my recent work revealed that nitrogenase could reduce the greenhouse gas, carbon dioxide (CO2), to the same hydrocarbon mixture under ambient conditions. Moreover, my work demonstrated that this reaction could occur in an ATP-independent manner, making it even attractive from the perspective of energy conservation. These findings suggest the possibility to adapt nitrogenase-based reactions for future industrial-scale production of biofuels from CO and CO2. Given that these nitrogenase-based reactions do not tap into our food supply like the first- and second-generation, crop-based approaches to biofuel production, nitrogenase may serve as a promising template for the development of an energy-efficient and eco-friendly alternative to the current Fischer-Tropsch Synthesis of liquid carbon fuels.

**Speaker Bio:** Johannes Rebelein was born and raised in Coburg, Germany. He received a B.S. degree and a M.S. degree in Biotechnology from the TU Braunschweig, Germany. He came to the United States in 2012 and is now pursuing a Ph.D. degree under Prof. Markus Ribbe’s supervision in the Department of Molecular Biology and Biochemistry at the University of California, Irvine.

**Improving online privacy with a better form auto-completion tool**

Bart Knijnenburg, Donald Bren School of Information and Computer Sciences

**Co-authors:** Alfred Kobsa, Hongxia Jin

**Abstract:** Modern browsers offer an auto-completion feature that automatically fills out forms. Privacy scholars warn that this may counteract users’ objective privacy decisions: it becomes so easy to submit a fully completed form that users skip weighing the benefits and risks of disclosing a certain piece of info in a specific situation. We conducted an online user experiment where participants entered a wide range of personal info into an auto-completion tool. They tested the tool on one of three websites. Each website corresponded to a particular subset of the provided personal info (a blogging community personal interests; a job search website job...
skills; a health insurer health record), but actually requested all three types of info. We found that participants were more likely to disclose the items that matched the purpose of the website. We feared that users of a conventional auto-completion tool would forego this selective purpose-specific behavior. We therefore tested three different auto-completion tools: AutoFF automatically fills the form. Users can remove entries manually. RemoveFF is like AutoFF, but has buttons to remove each entry. AddFF does not fill the form automatically, but has buttons to fill each field. We found that RemoveFF and AddFF users made purpose-specific disclosure decisions, while AutoFF users were more likely to just disclose everything. RemoveFF and AddFF thus make people more considerate of a website’s purpose in deciding what to disclose.

**Speaker Bio:** Bart is a PhD candidate in Informaties. He holds a B.S. degree in Innovation Sciences and Master degrees in Human-Technology Interaction from both Eindhoven University of Technology and Carnegie Mellon University. Bart is a leading advocate of user-experience research in recommender systems, and studies the (ir)regularities of privacy decision making. His academic work lives at http://www.usabart.nl. Bart’s goal in life is to infect others with his fascination with the way people navigate a maze of social and personal decisions in a world full of mind-boggling technology that never ceases to change.

**Advising and optimizing the deployment of sustainability-oriented technology and management options in the integrated electricity, transportation, and water supply context**

**Brian Tarroja, The Henry Samueli School of Engineering**

**Abstract:** My research is aimed at carrying out a comprehensive effort to determine the preferred role and scale of current and emerging sustainability-oriented technologies in serve in simultaneously meeting different sustainability goals, with dynamic consideration of the effects that these technologies have on the co-dependent infrastructures which must accommodate them. This effort focuses on the resource sectors of electricity, transportation, and water supply, carried out in a number of phases. The first phase is to characterize and model the operations of key infrastructure components (i.e. electric grid, vehicle fueling, etc...) and the performance of promising sustainability oriented technologies (solar photovoltaic, electric vehicles, etc...) from a sound, technical standpoint. The second phase involves developing an integrated modeling platform that captures the co-dependencies of the infrastructure operations and technology options in different resource sectors. Next, the sensitivity of infrastructure performance to isolated and mixed technology deployment is determined with respect to progress towards satisfying sustainability goals and economic impact, taking into account synergies and interferences between options. These results will form the basis for guiding the direction of legislation and economic investment into sustainability-oriented technologies, as well as helping to identify areas of fundamental research of key importance to the satisfaction of sustainability goals.

**Speaker Bio:** Brian Tarroja is a PhD candidate in the Henry Samueli School of Engineering. He is involved in developing an integrated framework for evaluating the performance of available and emerging options for meeting sustainability goals in major resource sectors. This work is aimed at identifying the synergies or interferences between these options for the purpose of coherently coordinating option deployment policy and investment to most effectively satisfy sustainability goals. This work has currently been used to advise the AB 32 Scoping Plan, containing the state’s outlook for meeting short and long-term greenhouse gas reduction goals. He was awarded an NSF Graduate Research Fellowship in 2010, an Association of Energy Engineers Dennis Acton Memorial Scholarship in 2013, and a UCI Distinguished Public Impact Fellowship in 2014.

**Pacific Ballroom B - 1:05 PM**

**Facilitating Young Children’s Recognition Reports**

**Kyndra Cleveland, School of Social Ecology**

**Co-authors:** Jodi Quas, Thomas Lyon

**Abstract:** A long-standing challenge in the field of children’s eyewitness testimony has been to identify techniques that may increase the comprehensiveness and accuracy of children’s reports, without increasing errors. One such technique that might be effective in improving children’s forensic interview reports is the use of facilitators, such as vocatives (i.e., name use) and back-channel utterances (e.g., “uh-huh” “Oh ok”), which focus children’s attention and encourage conversation. Another technique, the putative confession (i.e., telling children that a perpetrator has already confessed to the interviewer what happened at a to-be-remembered event, and now wants the child to tell the truth about what happened) may also be useful, particularly in increasing accuracy. The utility of these techniques was tested by exposing 3-8-year-olds (n=158) to a classroom activity. A week later children were questioned about the activity and received facilitators or no facilitators and putative confession or control instructions. Analyses revealed that, in their recognition reports, children provided more correct information with age F(5,134) = 3.84, p = .003. Children’s incorrect state-
ments about the event were reduced when facilitators and the putative confession were used in conjunction $F(1,153) = 4.07$, $p = .046$. Thus, the combination of facilitators and the putative confession, rather than their use in isolation, may positively influence children’s reports.

**Speaker Bio:** The goal that drives my research is to improve the plight of youth involved in the Criminal Justice System as suspects, victims, or witnesses of crime. As a lead researcher on a study funded by the National Science Foundation, I have been examining children’s eyewitness testimony and techniques that may help to increase accuracy without also increasing suggestibility. The American-Psychology Law Society has also funded this research as well as provided grants to allow me to travel and present the research to psychologists and legal professionals. My work within the Dependency Division of the Juvenile Justice system involving parents’ motivation to reunify with their children has been recognized by the Dean of Social Ecology, Valerie Jenness, as possessing elements that involve strong community engagement. Overall, I am passionate about conducting research that will make a difference in the lives of the children and adolescents in our society.

**Less is Core: Consumer Debt Repayment and the Budget Constraint Paradox**

**Russel Nelson,** *The Paul Merage School of Business*

**Co-authors:** Mary Celsi, Stephanie Dellande, Mary Gilly

**Abstract:** How do financial constraints affect debt repayment behavior? Popular personal finance gurus such as Suze Orman instruct debtors to cut up their credit cards but does restricting borrowing actually improve the likelihood of debt repayment? When a consumer who has credit card debt receives income, they face a trade-off between the immediate reward of spending the money versus the delayed reward of paying off debt. Continuing to borrow allows consumers to prioritize immediate rewards over delayed rewards. We propose that taking away the ability to borrow leads to improved focus on the goal of debt repayment and that this effect is greater for consumers under higher levels of financial constraint (or with less discretionary income). Using a unique longitudinal dataset consisting of a sample of 10,755 clients of a non-profit debt management program (DMP), we find that 1) higher levels of financial constraint are predictive of meeting short-term financial goals and 2) higher levels of financial constraint leads to an increased likelihood of successfully completing the multi-year DMP and meeting the long-term goal of repaying debt. These findings suggest that, paradoxically, consumers with less money are more likely to repay their debts.

**Speaker Bio:** Russel Nelson is a doctoral candidate in marketing at UC Irvine. His research focus is on technology and behavior change within the contexts of new markets and debt management programs. He is a 2013 Kauffman Dissertation Fellow. He recently taught Strategic Brand Management at the Paul Merage School of Business, the first undergraduate course on the branding and marketing of food trucks.

**Access to Cash, Access to Court: Unlocking the Courtroom Doors with Third-party Litigation Finance**

**Sasha Nichols,** *School of Law*

**Abstract:** Litigating a claim in the United States is expensive. The accumulation of fees and costs for plaintiffs has created a “liquidity problem” in civil litigation; potential plaintiffs lack the cash necessary to pursue a claim. This liquidity problem has, in turn, caused an access to justice problem. Traditionally, the contingency fee lawyer has solved this problem. But new rules have increased litigation costs, making this arrangement more difficult. My article suggests that, in light of decreased access to justice, plaintiffs’ lawyers need to search for new ways to finance litigation. Such a fix may be at hand. Over the last several years, a new model of third party litigation finance (TPLF) has developed. In exchange for a portion of any settlement, financiers offer attorneys cash to fund litigation. This practice is largely unregulated and rare in the United States. Despite its newness, parties are pushing for it to be banned. My article argues that this new form of TPLF could be expanded to help increase access to justice. But expanding TPLF is not without risks. Because of these risks, my article further proposes regulations that should be adopted to ensure that this new form of TPLF can benefit all classes of plaintiffs.

**Speaker Bio:** Sasha grew up in Minneapolis where he attended Minneapolis public schools for much of his life. After completing a B.A. in History at the University of Minnesota (where he received a research award for his senior thesis), he enrolled in a Ph.D. program through the History department as part of the Center for Economic History where he worked under Naomi Lamoreaux, Jean-Laurent Rosenthal, and Ken Sokoloff. While at UCLA, Sasha received numerous fellowships and awards for his research and writing from various institutions including Harvard College, the Harvard Business School, the Peabody-Essex Museum, the Gilder-Lehrman Institute, and the Business History Society. Sasha also received the Gary Nash Dissertation Year Fellowship from UCLA. While at UCI Law, his note, entitled “Access to Cash, Access to Court: Unlocking the Courtroom Doors with Third-party Litigation Finance”, was accepted for publication through the UC Irvine Law Review.
Session 4 - 2:20 PM

Emerald Bay DE - 2:20 PM

Natural Product Synthesis
  Carl Vogel, School of Physical Sciences
  Co-authors: Dr. Chris Vanderwal
Abstract: Plolyhalogenated monoterpenes from the red algae Plocamium cartilagineum have been known for 40 years. They have a common carbon framework, but vary in the position and quantity of chlorine and bromine. Along with their simple yet interesting structures, they also exhibit interesting biological activity. Many show promising anticancer activity, but more importantly, they seem to target solid tumors, which are some of the most difficult types of cancer to treat. Despite their promising activity, few of these compounds have been the focus of research. This is due to several factors, including difficulty obtaining the desired material from the natural source, and inconsistencies in compound composition based on the season and location of the algae. If these molecules are to be studied and used in treatment, synthesis may be the only viable means of acquiring material. Our goal of developing a synthesis that is applicable to this family of molecules has been accomplished, with four representative members completed. Additionally, our collaborations with Dr. Fred Valeriote at the Henry Ford Medical Center to study the treatment of solid tumors, as well as researchers at the City of Hope, are underway.

Health Code Violation Prediction via Yelp Keyword Cluster Analysis
  John Schomberg, School of Medicine
  Co-authors: Oliver Haimson
Abstract: Yelp is a review site that allows any user to create free text reviews and scores for any restaurant, store, or service in any given town or city. This allows yelpers to create any number of reviews for a restaurant, store or service in any geographic area. Yelp has millions of users creating reviews for restaurants every day. Useful information regarding health risks related to restaurants and other food vending operations can be found within pooled Yelp reviews. Aggregated, yelpers anecdotal opinions can be transformed into a screening device that can identify potential risks for health code violations. In this study, we examine the use of aggregated Yelp data to: 1. Create a process for identifying keywords related specifically to health code violations. 2. Identify the best possible method of extracting data from reviews. 3. Validate the relationship between keywords found in yelp reviews and health code violations for those restaurants reviewed. Results indicate that the detective power of Yelp is highly reliant upon the number of reviews for any given restaurant. Further research is needed utilizing Yelp datasets from geographic areas with higher yelper density.

Speaker Bio: John Schomberg is currently pursuing his graduate studies at the UCI department of epidemiology. His background is in nutrition and public health. John graduated with a BS in Nutrition from Iowa State University. He received his MPH from UCLA. John has over a decade of work experience in both the private and public sectors in the healthcare industry. His research interests are focused upon public health screening methods using crowd sourced data. His current research focuses on melanoma screening and food safety screening.

Addressing HIV-stigma through PhotoVoice: A Qualitative Approach
  Mariam Davtyan, Program in Public Health
  Co-authors: Brandon Brown, MPH., PhD, LaShonda Spencer, MD, Andrea Kovaes, MD
Abstract: Background: HIV-Stigma remains a powerful impediment to prevention efforts. The current study invited women of color living with HIV to describe their experiences with stigma through PhotoVoice, a Community-based Participatory Research methodology involving documentary photography. Methods: Ten (N=10) HIV infected women of color (N=4 African American, N=6 Hispanic/Latina) were recruited from a Los Angeles-based HIV specialty clinic and trained in PhotoVoice. Participants were asked to reflect on experiences with HIV stigma and to take photographs that captured those reflections. Photographs were discussed during audio-recorded focus groups and structured interviews. Results: Stigma led to diminished self-care, depression, lack of motivation, doubts in abilities, fear of dating, and loss of hope. HIV-Stigma was attributed to poor education, misdirected/misplaced shame, cultural myths, social conditioning, and lack of accountability by public officials. To reduce stigma, participants recommended intensive education of healthcare service providers, dissemination of HIV facts through social media and technology, participation of HIV positive individuals and religious leaders in anti-stigma initiatives, and youth outreach. Conclusions: The current study asked women of color with HIV to share their experiences with stigma through documentary photography. To address HIV-Stigma appropriately, community mobilization, empowerment, and education are necessary.

Speaker Bio: Mariam Davtyan is a second year PhD student at University of California Irvine’s Program in Public Health. Since 2005, she has also worked as a Researcher/Program Manager of HIV/AIDS protocols at LAC+USC Maternal Child and Adolescent Center (MCA). Mariam is the liaison for MCA’s Community Advisory Board (CAB), a forum consisting of women of color...
who represent the comprehensive needs of communities highly impacted by HIV/AIDS in Los Angeles County. Her work with HIV-infected women of color has inspired her research interests in Community-Based Participatory Research (CBPR), empowerment and mobilization, and public health ethics. In 2013, she received a fellowship from the University of California Global Health Institute (UCGHI) to study stigma in women of color using PhotoVoice, a CBPR methodology involving documentary photography. This novel methodological tool to address HIV/AIDS-related stigma has gained quite a lot of attention and praise at conferences around the country. Most recently, Mariam shared her research findings at the Pediatric HIV/AIDS Cohort Study (PHACS) Network Meeting in Baltimore, MD, the 4th Annual International Conference on HIV Stigma at Howard University in Washington, DC, and at the Southern California Sexual Health Summit in Los Angeles, CA. Her study results have also been exhibited by the NIH, Harvard School of Public Health, and the REACH Coalition in Boston, MA.

Moss Cove A - 2:20 PM

Developing Danger: Risk, Disability, and Development in the Land of a Million Bombs

Leah Zani, School of Social Sciences

Abstract: In the Lao People’s Democratic Republic (Laos), the land has been leveled and leavened with bombs, landmines, and other war wastes. Sometimes called the Land of a Million Bombs, over half of the country remains heavily contaminated with unexploded ordnance from the Vietnam War. Four decades after conflict, roughly half of the world’s unexploded ordnance accidents continue to occur in Laos. And yet, only recently have bomb clearance and victim assistance been identified as topics of national development and post-conflict reconstruction in Laos. For this presentation, I use ethnographic data collected at a number of sites including World Education Laos, the country’s premier war victim assistance provider, and Mines Advisory Group, a Nobel-prize winning bomb clearance operator, to examine the production of danger and disability in postconflict Laos. As explosions and other maiming events become more survivable, people with maimed, missing, and prosthetic body parts are now common in even very remote areas. These newly possible kinds of bodies and ways of life may be subject to novel forms of care and recognition. How might stakeholders paradoxically use danger and disability in order to acquire political influence and attract development aid? This project examines the sociopolitical and religious significance of embodiment in contemporary Laos, with particular regard for changing concepts of disability.

Speaker Bio: Leah Zani is a third-year PhD student in the Department of Anthropology. She studies how people learn to live with war wastes, such as bombs, in post-conflict Lao PDR. She is particularly fascinated by the ways that concepts of disability may be changing in areas contaminated by dangerous war wastes. Leah is a National Science Foundation Graduate Research Fellow and Human Rights Center Fellow. Her research has been supported by the National Science Foundation, the Human Rights Center, the Center for Asian Studies, and the Center for Global Peace and Conflict Studies.

The role of a novel epigenetic mechanism in long-term memory formation

Annie Vogel-Ciernia, Francisco J. Ayala School of Biological Sciences

Co-authors: Dina Matheos, Pierre Baldi, Gary Lynch, Marcelo Wood

Abstract: Gene expression is considered a key step for long-term memory processes. Transcription does not occur on naked DNA, but rather in the context of chromatin, the protein complex that condenses and organizes genomic DNA. The repeating unit of chromatin is called a nucleosome, and nucleosome positioning along the DNA can be altered by nucleosome remodeling complexes to regulate gene expression. Recent human exome sequencing studies found that patients with several specific intellectual disability disorders including autism carry mutations in components of the nBAF complex, a nucleosome remodeling complex found only in neurons. However, it was unknown how mutations in BAF complexes result in impaired cognitive function. nBAF contains a unique subunit that is only found in neurons (BAF53b). We found that mice harboring mutations of BAF53b show severe defects in long-term memory and long-lasting forms of synaptic plasticity. Reintroducing BAF53b in the adult rescues memory impairments in BAF53b mutant mice, suggesting a role for BAF53b beyond neuronal development. The defects in BAF53b mutant mice appear to derive from alterations in gene expression that produce abnormal spine structure and function. Our findings indicate a critical role for nBAF mediated nucleosome remodeling in regulating long-term memory formation, and provide new insight into the role of BAF complexes in human intellectual and cognitive disorders.

Speaker Bio: Annie’s primary research focus in graduate school at the University of California, Irvine has been to understand the role of nucleosome remodeling in regulating gene expression required for long-term memory formation. Nucleosome remodeling is one of the three main epigenetic mechanisms by which chromatin structure is
regulated in the service of controlling gene expression in a coordinate manner, ultimately to guide specific cell functions. Over the past two years, Annie has been working with Dr. Marcelo Wood on a project aimed at understanding the role of a neuron-specific component of the nBAF nucleosome remodeling complex called BAF53b. She is currently extending this line of research to explore the role of nBAF in intellectual disability disorder. Annie's long-term goal is to expand this work during a postdoctoral fellowship on her way to becoming an independent principle investigator.

**Anomalous Heat Transfer at Nanometric Distances**

Robert Joachim, *School of Physical Sciences*

**Abstract:** Radiative heat transfer between objects on a nanometric scale differs drastically from heat transfer on a macroscopic scale. We have probed this phenomenon, known as anomalous radiative heat transfer, for separations of a few microns down to 100nm and for temperatures ranging from room temperature down to 100K (-280 °F). Thermal radiation between objects on a macroscopic scale varies only with the temperature of the objects. This radiation has a characteristic wavelength which varies inversely with temperature. For the temperatures studied this wavelength was on the order of 10-20 μm. When the separation distance between two objects becomes less than this wavelength we enter the regime of anomalous heat transfer which depends not only on the temperature of the objects but also on their separation distance, a crucial departure from standard radiation. In order to probe this phenomenon we constructed a custom atomic force microscope (AFM). Using a bimaterial AFM cantilever as a thermal probe we successfully measured anomalous transfer between various materials. By making observations over a wide temperature distribution we were able to verify that the effective range of this enhanced heat transfer depends on the thermal wavelength and therefore on the temperature of the radiating object.

**Speaker Bio:** Robert Joachim is currently a PhD candidate in the Chemical and Material Physics (ChaMP) program. He enrolled at UC Irvine after graduating from SUNY Binghamton with a bachelor’s in both physics and history in 2010. His research takes place in Professor Peter Taborek’s low temperature physics lab. He recently earned a master’s degree, in part for the research presented at this symposium.

**Moss Cove B - 2:20 PM**

**DDF Seeks Same: Sexual Health-Related Language in Online Personal Ads For Men Who Have Sex With Men**

Oliver Haimson, *Donald Bren School of Information and Computer Sciences*

**Co-authors:** Jed Brubaker, Gillian Hayes

**Abstract:** The HIV/AIDS crisis of the 1980s fundamentally changed sexual practices of men who have sex with men (MSM) in the U.S., including increased usage of sexual health-related (SHR) language in personal advertisements. Analyzing online personal ads from Craigslist, we found a substantial increase in SHR language, from 23% in 1988 to over 53% today, echoing continuing concern about rising HIV rates. We argue that SHR language in Craigslist ads can be used as a sensor to provide insight into HIV epidemiology as well as discourse among particular communities. We show a positive significant relationship between prevalence rate of HIV in an ad’s location and use of SHR language in that location. Analysis highlights the opportunity for SHR information found in Craigslist personal ads to serve as a data source for HIV prevention research. More broadly, we argue for mining large-scale user-generated content to inform HCI design of health and other systems, and explore use of such data to examine temporal changes in language to facilitate improved user-interface design.

**Speaker Bio:** Oliver L. Haimson is a PhD student in Informatics at the University of California, Irvine’s Bren School of Information and Computer Sciences, and a recipient of a Eugene Cota-Robles fellowship. He works with Dr. Gillian Hayes in the Social and Technological Action Research (STAR) Group. Oliver’s research interests include social media and networks, social computing, online identity, information visualization, and LGBT and gender issues. Oliver received his B.S. in Economics at Carnegie Mellon University, and also participated in the iSchool Inclusion Institute (i3) at the University of Pittsburgh.

**“Spectacles of Slavery Unwilling to Die”: Racial Stereotypes and Self-Defense**

Jonathan Markovitz, *School of Law*

**Abstract:** Defendants claiming self-defense admit to having committed an act of violence, but seek sanction for having done so. They are, in effect, asking the legal system to mark their actions as socially acceptable, if not actually desirable. Self-defense inquiries often turn on the question of whether a defendant reasonably believed he or she was faced with a genuine threat. Because fears of violent crime are so deeply entwined with “commonsense” understandings of race and gender in American society, there is a danger that determinations of what counts as
Globalization, Natural Resource Dependency, and Income Inequality: Are They Related?

**Tamer ElGindi, School of Social Ecology**

**Abstract:** Contrary to predominant neoclassical thought that argued higher economic growth rates would eventually lead to better results in terms of income distribution, the last three decades have witnessed high economic growth rates accompanied by rising income inequalities in most countries worldwide. Globalization manifested in increased foreign direct investment and trade openness along with natural resource dependency have definitely transformed and impacted world economies particularly those in the developing world. This study examines the effects of neoliberal globalization, natural resource dependency, political-institutional factors alongside with the internal development model on income inequality in a set of 28 Muslim-majority countries for the period 1960-2010. Models for ordinary least squares with panel corrected standard errors show that globalization factors do not exhibit robust effects across different model specification; a finding that is pretty inconsistent with previous findings that showed a highly positive association between FDI and income inequality. On the other hand, natural resource dependency exhibits a strongly robust positive association with income inequality. Finally, political factors did not reveal any significant results while government effectiveness exhibited a negative association reaffirming earlier research that emphasized the importance of accountability and transparency in government institutions in addressing income inequality.

**Speaker Bio:** Tamer ElGindi is a Ph.D. candidate in the Department of Planning, Policy, and Design at the University of California, Irvine. He holds a B.A. and M.A. in Economics from the American University in Cairo. He recently published his book Islamic Finance: A Study of Malaysian Banks from 1999-2006. In addition, he published several other articles in the realm of Islamic finance vis-a-vis conventional finance featured in the Review of Radical Political Economics along with others. Before coming to the USA, he worked as a Technical & Economic Analyst for the Cairo Air Improvement Project funded by the USAID, and as a Research Economist in the Japan External Trade Organization. His current doctoral research focuses on the effects of neoliberal globalization and natural resource dependency on income inequality in developing countries with special emphasis on Egypt. He hopes to extend his research on ways to reduce income inequality and how to address the issue of income inequality within the realm of public policy. Tamer is married and has two boys, and enjoys traveling and hiking.

These Divided States: Theatre and Split Consciousness in Early American Urban Society

**Katie Turner, Claire Trevor School of the Arts**

**Abstract:** The epic transformations of the nineteenth century posed a quandary for elite citizens of the United States, who, fresh from the Revolutionary War, had the triple task of keeping pace with a changing world, carving out a presence as a competing power in that world, and fixing notions of a uniform American identity. The urban areas, however, resembled a patchwork of class, ethnic, and social values not easily reconciled under a single mien. Many Americans experienced the heterogeneous character of the United States as intolerable disorder and turned to media outlets to establish a moral and social hierarchy. One of the first major subjects for a public discourse on decency, morality, and American identity was the newly legalized theatrical economy. The antitheatrical rhetoric of the early United States, populated with terminology of contagion, excess, and control, reflects a high degree of anxiety surrounding the chaotic character of urban centers following the Revolutionary War. By the late 1830s, this fear of disorder, and the means employed to “contain” it, escalated into a widespread performance of hysteria acted on, in, and through women’s bodies. By analyzing representations of women in popular theatrical genres, my presentation examines not only the hysteroid character of early American identity, but the role the theatrical economy played in this frenetic strategy of nation building.
Compound Specific Radiocarbon Analysis of Black Carbon in Marine Dissolved Organic Carbon

Alysha Coppola, School of Physical Sciences

Abstract: Compound specific radiocarbon analysis is a powerful tool for understanding the cycling of individual components, such as black carbon produced from biomass burning and fossil fuel combustion, within bulk pools, like the marine dissolved organic carbon pool. Radiocarbon measurements of black carbon provide its average residence time in the ocean, as well as insights into its role as a missing sink in the marine carbon pool. Most of the black carbon produced from fossil fuel and biomass burning will end up in the ocean, and it’s critical to improve our understanding of carbon’s long-term storage. The ocean’s dissolved organic carbon pool is one of Earth’s major reservoirs containing as much carbon as the atmosphere, but little is known about the composition of this pool and how it will be affected by a changing climate. Therefore, this work addresses fundamental gaps in our knowledge of the global carbon cycle and the dynamic nature of black carbon cycling. Here, we use a solid phase extraction method and a wide range of solvent polarities to concentrate dissolved organic carbon from seawater. Then we isolate black carbon in sufficient quantities for radiocarbon analysis. We report the radiocarbon age of black carbon, concentrations and its relative structure, from coastal sites to open ocean surface and deep samples. We will discuss our progress towards measuring these quantities in dissolved organic carbon collected from the Pacific, Atlantic and Arctic Ocean from 2010-2013.

Speaker Bio: Katie Turner is a third year PhD student in the Drama Department at UC Irvine. She holds a Master of Arts degree in Theatre History from California State University at Northridge and a Bachelor of Arts degree in Theatre and Philosophy from Fort Lewis College in Colorado, both awarded with honors. She is a member of the Phi Kappa Phi and the Golden Key honor societies. Katie is a theatre practitioner as well as a scholar, acting as President and Artistic Director of Clairemont Act One Players in San Diego since helping to found the company in 2011. Most recently, Katie served as dramaturg for UCI’s production of Angels in America: Millennium Approaches by Tony Kushner. Katie is proud to represent her department in this inaugural event.

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US Winter Responses to El Niño Diversity: Is the Emerging Central Pacific El Niño Responsible to the Recent US Winter Temperature Anomalies and the Drought?

Yuhao Zou, School of Physical Sciences

Co-authors: Jin-Yi Yu

Abstract: We conducted statistical analyses with observational data, numerical experiments with a forced atmospheric general circulation model (AGCM), and case studies with major El Niño events since 1950 to show that the impacts produced by the recently emerging Central-Pacific (CP) and the traditional Eastern-Pacific (EP) types of El Niño on US winter climate are very different. Coupled Model Intercomparison Project Phase 5 was also used for in-depth study. Our analyses show that, during EP El Niño events, positive winter temperature anomalies are concentrated mostly over the northeastern part of the US (particularly over the Great Lakes region) and negative anomalies are most obvious over the southwestern states. During CP El Niño events, the warm anomalies are located in northwestern US and the cold anomalies are centered in the southeastern US. The US temperature impact patterns are rotated by about 90 degrees between these two types of El Niño. As for the winter precipitation, the CP El Niño increases the dry anomalies in the north and decreases the wet anomalies in the south caused by the EP El Niño over the US. This enhanced drying effect is most severe in the Ohio-Mississippi river valley. Based on these findings, the increasing occurrence of the CP El Niño in the recent decades may have contributed to the US drought conditions.

Speaker Bio: Mr. Yuhao Zou joined UCI’s Earth System Science Department in 2010 from Nanjing University of China where he received a BS degree in Atmospheric Science. At Nanjing University, Yuhao received solid training in mathematics, physics, meteorology, programming languages (C, Fortran and Matlab) and actively participated in research projects that examined extreme weather events in the semi-arid parts of China. That work has resulted in a publication on an international journal. He gained hands-on experience in numerical modeling and data analysis from these projects. At UCI’s Earth System Science Department, graduate students are required to complete an intense and multidisciplinary curriculum during the first year covering climate change and dynamics, oceanography, hydrology, ecosystem, biogeochemical cycles, and other physical, chemical, and biological aspects of the Earth System. This is a unique graduate program that aims to train scholars to address the rapidly growing concerns of global change. The coursework is designed to develop a mechanistic understanding of the Earth System, and to provide the conceptual and analytical tools needed for research in this field. Yuhao did well with the first-year coursework and successfully passed the quali-
Biased Estimation of Symbol Timing Offset in OFDM Systems

Rohan Ramlall, The Henry Samueli School of Engineering

Abstract: Orthogonal frequency division multiplexing (OFDM) is a popular multicarrier modulation method that has been adopted in many of today’s wireless communications standards. However, OFDM is sensitive to time and frequency offsets, which need to be estimated in order for the data to be received correctly. Recent work has focused on estimating these offsets without the use of training data. However, the data in the OFDM signal is usable only if the estimated timing error lies within a certain interval called the lock-in region. Previously proposed estimators have been designed to accurately estimate the symbol time offset (STO), but not necessarily designed to lock-in with high probability (i.e., the probability that the timing error lies inside the lock-in region). The contribution of this presentation is the investigation of adding a bias term to non-data-aided (NDA) STO estimators, and analyzing its influence on the lock-in probability. An optimal value for the bias term is derived for unbiased NDA STO estimators. It is shown through simulation that the estimator with the bias term achieves a significantly higher lock-in probability than the estimator without the bias term.

Speaker Bio: Rohan Ramlall is a Ph.D. student in the Electrical Engineering and Computer Science department at the University of California, Irvine. He received his B.S. in Electrical Engineering and Computer Sciences with High Honors from the University of California, Berkeley in 2007 and his M.S. in Electrical Engineering from the University of Southern California in 2011. Since 2007, he has been working at Space and Naval Warfare Systems Center Pacific. His research interests include signal processing for navigation systems and synchronization in wireless communication systems.
ments. One therapeutic approach involves the use tools including objects with various tactile sensations and mirrors in multisensory environments. However, each child has a unique prescription for the amount of stimulation they require for the therapy to be effective. Designed to augment current therapies, SensoryPaint is a multimodal system with the capability of superimposing the user’s reflection on a projected surface and “painting” this surface with balls of different textures and colors. To investigate the three modes in SensoryPaint children with neurodevelopmental disorders played with each of the modes and were interviewed about their experience with the system. The results demonstrate that using whole body interactions with a large display and interactive audio feedback can balance children’s attention towards their own body and sensory stimuli, augment existing therapies, focus body awareness, and promote socialization. Caregivers also perceived an improvement in sensory skills and motor coordination. These results offer implications for the design of other natural user interfaces for children with neurodevelopmental disorders and for their integration in therapeutic interventions.

Speaker Bio: Kathryn Ringland received her B.S. in Psychology from Washington State University Vancouver. As a Distributed Research Experience for Undergraduate (DREU) student, she designed assistive technology to aid the visually impaired with Dr. Amy Hurst at the University of Maryland, Baltimore County. Kathryn is currently conducting research in the area of assistive technology for children and young adults with Autism Spectrum Disorder under the advisement Dr. Gillian Hayes at the University of California, Irvine where she is pursuing a Ph.D. in Informatics.

Activity in the medial temporal lobe decreases with age during performance of a learning and memory task

Veronique Boucquey, Francisco J. Ayala School of Biological Sciences

Co-authors: Shauna Stark, Michael Yassa, Craig Stark

Abstract: The medial temporal lobe (MTL) is thought to subserve memory processes that are known to decline with age. The current study used blood oxygenation level dependent (BOLD) functional magnetic resonance imaging (fMRI) to determine if activity during performance of a recognition memory task changed with healthy aging in the MTL (N=122, age=20-87 years). FMRI data was collected while participants studied pictures of scenes, followed by a brief delay and then a test phase in which participants were shown both studied pictures and novel pictures and asked to indicate if the pictures were old or new. Participants were then given a surprise post-test outside of the MRI scanner to assess for incidental learning of these novel pictures during the test phase. We found negative correlations between age and activity during memory conditions at both study and test. In the study phase this included activity during: 1) pictures that were later remembered, 2) pictures that were later forgotten, and 3) during rest. During the test phase this included activity during: 1) hits (correctly saying “old” to old pictures) and 2) pictures that were correctly identified as “new” and incidentally learned (on the posttest correctly identified as “old”). Taken together, the findings indicate that activity during learning and remembering decreases with age in the MTL. These decreases in activity with age may contribute to some of the declines seen in memory processes with age.

Speaker Bio: In 2008 I graduated from UC San Diego Magna Cum Laude with a Bachelor of Science with Highest Distinction in Psychology. For the next several years I performed research in the laboratory of Dr. Susan Tapert examining longitudinal effects of alcohol use in youth, utilizing functional MRI and neuropsychological evaluation. During this time I became very interested in how we learn and remember, and so I pursued the opportunity to join the laboratory of Dr. Craig Stark as a Ph.D. student in the Department of Neurobiology and Behavior. Now in my 3rd year, I am investigating the brain and behavioral changes that occur with healthy aging using behavioral paradigms that tap into declarative memory processes coupled with cerebral blood flow and BOLD functional MRI studies.

The Relationships Between Procollege Counseling and Students’ Postsecondary Preparation and Plans

Chenoa S. Woods, School of Education

Abstract: Teachers are the focal point of academic preparation, whereas school counselors often spearhead the college guidance process. High school counselors, although often overburdened, remain responsible for assisting students with various aspects of course registration, college admissions testing, and applications. The present study uses data from one district’s high school seniors’ surveys to answer the research question “How is a comprehensive counseling model related to students’ participation in college preparatory activities and their postsecondary plans?” A composite variable, composed of several measures of student-school counselor meetings, is the key independent variable. Outcome variables include preparing for college, filing for financial aid, applying to college, and postsecondary plans. Findings indicate that the comprehensive counseling model is positively related to multiple steps of preparing for college, submitting college applications, and postsecondary plans.

Speaker Bio: Chenoa S. Woods is a doctoral candi-
Emerald Bay DE - 3:35 PM

Healthcare economics: Cost effectiveness of commonly performed procedures in medicine

Asghar Haider, School of Medicine
Co-authors: Marlon Maducdoc, Viraat Patel, Alex Nguyen

Abstract: Background: Cost effectiveness analysis can assess the value of specific medical procedures. With the numerous changes in healthcare payment and delivery, reanalyzing common medical procedures in specific specialties may prove beneficial to practitioners and patients when deciding treatment and shaping national healthcare policy. The aim of this economic review is to analyze the cost effectiveness of the three most common procedures in ophthalmology, otolaryngology, dermatology, radiology and internal medicine. Methods: We will use publicly available data to perform a cost effectiveness analysis on the three most common procedures in several medical specialties. Additionally, we will engage economic experts, healthcare providers, and the general public to understand perceptions, perform economic analysis, and augment understanding of our healthcare system. Significance of Study: Our goal is to clarify the current state of several medical specialties and to determine if the procedures performed are cost effective.

Speaker Bio: Asghar “Abbas” Haider is in his fourth year of the combined MD/MBA curriculum here at UCI. Abbas was born in Karachi, Pakistan and immigrated to the United States at an early age. He has lived in Southern California for most of his life. After graduating from John. F. Kennedy High School (Granda Hills, CA), Abbas attended the University of California, Los Angeles where he majored in Neuroscience and minored in Political Science. He is passionate about community outreach and aspires to a leadership role in academic medicine.

Lessons from Wolverine: Multiphasic Self-healing Polymers

Davoud Mozhdehi, School of Physical Sciences
Co-authors: Sergio Ayala, Prof. Zhibin Guan

Abstract: Biological systems have developed excellent mechanisms for repairing damages and wounds. These repair mechanisms have inspired chemists and material scientists to create “self-healing” materials that are capable of recovering from mechanical damages. Advances in this field can dramatically influence the consumer products lifetime while reducing the rate of fatigue related catastrophic failures. We are using simple monomers to develop polymers with remarkable mechanical properties that are capable of self-healing and recovering their mechanical properties after damage infliction.

Prenatal Exposure to Traffic Related Air Pollution and Risk of Birth Defects

Mariam Girguis, Program in Public Health
Co-authors: Scott Bartell, Veronica Vieira

Abstract: We investigated the relationship between maternal exposure to traffic related air pollution, as measured by modeled exposure to PM2.5 during the first trimester of pregnancy and proximity of maternal residence to the nearest major roadway at time of birth, on risk of congenital anomalies (cardiac, oral cleft, and neural tube) for the entire state of Massachusetts. Our analyses included 3,683 cardiac defect, 351 neural tube defect, and 873 oral cleft defect cases. We used geocoded addresses of each birth to calculate the shortest distance between each address and the nearest major roadway, in addition to average PM2.5 concentrations. We applied logistic regression models to individual level data using 9,000 common controls to calculate odds ratios (OR) and 95% confidence intervals (CI). No association was observed between modeled PM2.5 and cardiac (OR: 1.0, 95% CI: 0.9, 1.1), oral cleft (OR: 1.0, 95% CI: 0.9, 1.0) and neural tube defects (OR: 1.0, 95% CI: 0.9, 1.0). There is inconsistent evidence for the effect of residential distance to major roads and risk of birth defects. The risk for birth defects does not appear to be affected by exposure to PM2.5 during the first trimester of pregnancy. There is also evidence to support that mothers living closer to major roadways may have a decreased risk of neural tube defects. Strengths of this study are complete case ascen-
tainment, a known study population, and novel exposure estimates.

**Speaker Bio:** Mariam is a PhD student in the Department of Public Health studying environmental epidemiology and is being advised by Dr. Veronica Vieira. Her research is focused on the use of spatial and temporal modeling methods to understand the relationship of exposure to ambient air pollutants (ex. PM2.5 concentrations) and risk of birth outcomes and infant morbidity. Mariam completed her BA in Environmental Studies/Geography from University of California, Los Angeles. She then completed her Masters of Public Health from Yale University with a concentration in chronic disease epidemiology. Mariam has previously worked on issues of maternal-child nutrition domestically and abroad.

**Moss Cove A - 3:35 PM**

**Visualization of Intra and Extra Molecular Bonding Structures**

Chen Xu, *School of Physical Sciences*

Co-authors: Chihuan Chiang, Zhumin Han, Wilson Ho

**Abstract:** Accurate modeling is of great significance for the visualization and understanding of single molecular bonding structures. Textbook images of ball-and-stick model of individual molecules helps students to grasp the essential concepts of chemical bonding and molecular structures. A further question on whether such a ball-and-stick model reflects the real bonding formation opens up a new perspective into the nano-world. With a low temperature Scanning Tunneling Microscope (STM), we designed a new functionalized probe and resolved the skeleton of a single complex organic molecule CoPc, with the individual nuclei showing as dots and the bonds between them showing as streaks. Not only the single molecular structure of CoPc is resolved, but also the intra-molecular bonding formation between the lone pair and C-H bond is revealed. The bonding mechanism is further investigated with two adjacent CoPc molecules and a single CoPc with a nearby Xe atom where inter and extra molecular bondings are visualized respectively.

**Single molecule enzymology using high-bandwidth nanoscale electronics**

Maxim Akhterov, *School of Physical Sciences*

Co-authors: Yongki Choi, Patrick C. Sims, Twioli J. Olsen, Gregory A. Weiss, Philip G. Collins

**Abstract:** Biological molecules called enzymes are responsible for the thousands of processes that sustain life in a human body. Enzymes have evolved into sophisticated biological machines that are highly specialized for detecting a particular microbe, a type of bacteria, or rare molecules that can constitute disease markers. As enzymes perform their function (catalysis) they can change shape, but the interplay between enzyme dynamics and catalysis is not well understood. Recently we developed a technique to monitor protein motions using nano-electronic circuits. The solid-state electronic technique used single-walled carbon nanotube (SWNT) transistors to monitor conformational motions of a single molecule of lysozyme while processing peptidoglycan which makes up bacteria cell wall. As lysozyme performs its function it undergoes a hinge-bending motion that generates an electronic signal in the SWNT transistor. Our high-bandwidth electronic recordings directly resolve not just transitions between open and closed conformations but also microsecond long durations for those transition events. The high resolution technique can be readily applied to other complex biomolecules to gain insights into their kinetic parameters and functions.

**Speaker Bio:** Max is passionate about designing innovative sensing platforms. He worked with various kinds of sensors in UC Berkeley, the Air Force Research Laboratory, and UC Irvine where he is now pursuing a PhD. in physics. In his research, Max builds electronic biosensors and develops algorithms for analyzing complex time-varying signals. Outside the laboratory, Max enjoys working with scientists and engineers on translating new ideas into innovative products. Max and his teams won awards in the UCI Business Plan Competition for a portable PET scanner technology and in Orange County Startup-End competition for a concept of a data-driven career planning web-service.

**The Cosmic Frontier**

Daniel Margala, *School of Physical Sciences*

**Abstract:** Since the dawn of civilization, humans have looked to the night sky to understand their world, their origin, and their eventual fate. Today, we know that the universe is about 14 billion years old and that galaxies are flying away from each other! In order to account for this cosmic expansion, physicists have suggested that over two-thirds of the universe is made up of an omnipresent substance called dark energy, but what that dark energy is remains an enigma. My research aims to learn more about this mysterious dark energy by revealing patterns in the distribution of matter in large three dimensional maps of the universe.
Pacific Ballroom A - 3:35 PM

Life in Plastic: Celluloid Acetate, Taxidermic Preservation, and the Photo-cinematic Arts

Meghan Chandler, Claire Trevor School of the Arts

Abstract: On July 30 1928, George Eastman hosted a lavish garden party at his estate in Rochester, NY, to celebrate the release of Kodak’s latest innovation in cinematic technology: Kodacolor. Eastman heralded Kodacolor as the first celluloid acetate film stock capable of producing 16mm motion pictures in color. During the party, Eastman passed a Kodacolor loaded camera amongst his guests; circulating hand-in-hand, however, was another strange object: a taxidermied gazelle head. While this taxidermic relic may seem an odd inclusion alongside Eastman’s latest tech triumph, its presence denounces a forgotten link between cinematic technology and taxidermic preservation. This presentation will discuss the material and technological connections existing between early photo-cinematic technology and taxidermic preservation: specifically, how both utilized celluloid acetate plastic materials to create lasting records and visual representations of ephemeral life. Bringing together chemistry, the biological sciences, technology studies, and film/media discourses, my interdisciplinary project reveals a deeper understanding of plastics by showing how celluloid acetate was historically used to preserve life and replace fragile biomatter.

Speaker Bio: Meghan Chandler is a Ph.D. candidate in Visual Studies at UC Irvine. Her dissertation focuses on histories of cinematic materials and scientific imaging technologies. Her previous work has appeared in Visual Culture & Gender, as well as Theorizing Visual Studies: Writing Through the Discipline (edited by Jim Elkins); forthcoming essays will also appear in The Doll Collection: The Many Meanings of Girls’ Toys (edited by Miriam Forman-Brunell), and the inaugural issue of Porn Studies.

All hands on deck: using microbes to battle global change

Kristin Matulich, Francisco J. Ayala School of Biological Sciences

Co-authors: Jennifer B.H. Martiny

Abstract: A central goal of global change biology is to predict the impact future environmental change will have on ecosystems. However, global climate change is extremely complex and predicting its course is challenging. It’s much like playing the game Battleship™. During the game, a player does their best to predict where their opponent’s battleships are placed. If their predictions are correct, they sink the ships quickly and win the game. Scientists have developed computer models to win this battle and predict the course and impact of future environmental change. However, the current models are far from perfect. My research explores what additional parameters are needed to fine-tune these models and improve their predictive power. More specifically, I study the effect of environmental change on microbial communities and how this might impact one ecosystem function, leaf litter decomposition. By doing this, I can determine what microbial parameters to incorporate into these computer models and ultimately help scientists and policy makers better predict how ecosystems will respond to future environmental change.

Speaker Bio: Holding BS degrees in Environmental Studies and Ecology, Evolution, and Marine Biology from the University of California, Santa Barbara, Kristin is now pursuing a Ph.D. in Ecology and Evolutionary Biology with Professor Jennifer Martiny. Joining the program 2010, she studies how microbial communities and their environments will respond to current and future global change. She has served in numerous academic committees and is currently a graduate student representative for the Department of Ecology and Evolutionary Biology.

Utility of Augmented Reality in Relation to Virtual Reality in Stroke Rehabilitation

Maryam Khademi, Donald Bren School of Information and Computer Sciences

Co-authors: Hossein Mousavi, Professor Alison McKenzie, Lucy Dodakian, Professor Cristina V. Lopes, Professor Steven C. Cramer

Abstract: Virtual Reality (VR) has been found useful for numerous rehabilitation applications, but has some intrinsic constraints such as the need for a visuospatial transformation when guiding movements. Augmented Reality (AR) is a new approach to human-computer interaction that enables patients to interact directly with virtual objects. The current study compared AR and VR in a stroke rehabilitation setting. Of the 10 patients, age = 59±10 yr (mean±SD), FMA score = 57±11 (range 31-66), Hand/Wrist FMA subscore = 22±3 (range 15-24), and B&B score = 41±13 (range 16-58), all of them scored significantly (p<0.0001) higher in the AR setting (60±9 targets, range 48-78) as compared to the VR setting (48±8 targets, range 37-64) setting. Also, AR scores were stronger correlates of FM Hand/Wrist (rho=0.68, p<0.04) and B&B scores (rho=0.70, p<0.03) than were VR scores. This study shows promising results with use of Augmented Reality in a patient-computer interface. Results also suggest advantages as compared to use of a Virtual Reality approach, possibly due to the fact that moving the hand requires a visuospatial transform in the VR setting but not in the AR setting.

Speaker Bio: Maryam Khademi is a PhD candidate in
The effects of interval-magnitude and frequency region on melodic pitch-interval discrimination

Carolyn McClaskey, School of Social Sciences

Abstract: The current study investigated the extent to which relative pitch processing differs between intervals of the western musical system and whether these differences can be explained by either an interval’s integer-ratio or semitone magnitude. Pitch-interval discrimination thresholds were measured using adaptive psychophysics for sequentially presented pure-tone intervals with standard distances of 1 semitone (minor second, 16:15), 6 semitones (the tri-tone, 45:32), and 7 semitones (perfect fifth, 3:2) at both high (1500 - 8000 Hz) and low (100 - 1000 Hz) frequency regions. Subjects were classified into three groups based on musical experience: nonmusicians (less than 3 years instruction), amateur musicians (at least ten years experience with no formal music theory training), and expert musicians (at least 15yrs experience and 2yrs of formal ear training with undergraduate music degree). Thresholds were lowest in the 1-semitone condition for all subjects in both frequency ranges, with no significant difference between 6- and 7-semitone conditions. Threshold differences between frequency regions were determined by the degree of musical expertise of the subjects. Consistent with previous studies, thresholds were lower for musicians than for nonmusicians. Data support enhanced pitch-interval perception by musicians but argue against an effect of frequency-ratio simplicity in the case of pure-tone melodic intervals.
UCI, under advisor Dr. Adriana Briscoe. Susan received her B.Sc. degree in Entomology from Cornell University in 2009. She is a current NSF Graduate Research Fellow, Smithsonian Tropical Research Institute Fellow, and National Geographic Young Explorer. Her research focuses how natural and sexual selection work together to favor the evolution of specific animal phenotypes, how aposematic signaling may drive the evolution of social behavior in the context of visual ecology, and how specialized visual systems coevolve with specialized visual cues. Her dissertation work examines these aspects using Heliconius butterflies.
Index of Speakers

Ahmed, Elsayed, 16  
Akhterov, Maxim, 37  
Anselmo-Sequeira, Diana, 21  
Avanasi, Raghavendhran, 15  
Azzari, George, 13  
Beltz Imaoka, Laura, 20  
Boucquey, Veronique, 35  
Brennankane, Laura, 26  
Chandler, Meghan, 38  
Chen, Eric, 19  
Clark, Stephanie, 18  
Cleveland, Kyndra, 27  
Coppola, Alysha, 33  
Davtyan, Mariam, 29  
Dixit, Amruta, 10  
Doria, Arlene, 15  
ElGindi, Tamer, 32  
Feintzeig, Benjamin, 17  
Ferguson, Matthew, 22  
Finkbeiner, Susan, 39  
Finley, Katelyn, 11  
Fritz-Mauer, Matthew, 25  
Fuller, Elliot, 34  
Girguis, Mariam, 36  
Haider, Asghar, 36  
Haimson, Oliver, 31  
Hooker, Emily, 10  
Huffman, Derek, 22  
Innes, Laura, 19  
Jiang, Chi-Lun, 17  
Joachim, Robert, 31  
Khademi, Maryam, 38  
Kim, Elizabeth, 18  
Knijnenburg, Bart, 26  
Kolodezh, Sam, 25  
Lackner, Greg, 12  
Lin, Grace, 11  
Lin, Joyce, 16  
Low, Kathleen, 14  
Ma, Timothy, 17  
Macias, Vanessa, 23  
Manlicic, Kersey, 19  
Margala, Daniel, 37  
Markovitz, Jonathan, 31  
Martinez, Marcela, 21  
Matulich, Kristin, 38  
McClaskey, Carolyn, 39  
Mlondolozi, Zondi, 12  
Mohan, Kritika, 22  
Mozhdehi, Davoud, 36  
Nelson, Russel, 28  
Newhart, Veronica Ahumada, 10  
Nguyen, Phu, 13  
Nichols, Sasha, 28  
Petersen, Nick, 12  
Phan, Anne, 11  
Ramllall, Rohan, 34  
Rebelein, Johannes, 26  
Ringland, Kathryn, 34  
Sagi, Rottem, 18  
Schomberg, John, 29  
Sharma, Himanshu, 25  
Simpson, Simone, 20  
Stagner, Annessa, 23  
Stillwell, Christopher, 14  
Tarroja, Brian, 27  
Turner, Katie, 32  
Veysi, Mehdi, 24  
Villarreal, Brandilynn, 13  
Vogel, Carl, 29  
Vogel-Ciernia, Annie, 30  
Watts, Tyler, 39  
Wehrle, Beck, 24  
Woods, Chenoa S., 35  
Wu, Jennifer, 15  
Xu, Chen, 37  
Zani, Leah, 30  
Zou, Yuhao, 33