

Welcome to Grad Expo 2016!

We would especially like to thank William Kepler Whiteford Professor and Vice Provost for Research Mark S. Redfern and Provost and Senior Vice Chancellor Patricia E. Beeson. From the Kenneth P. Dietrich School of Arts and Sciences, we thank the Bettye J. and Ralph E. Bailey Dean of Arts and Sciences, N. John Cooper; Associate Dean for Graduate Studies and Research Kathleen Blee; and Assistant Dean Linda Rinaman. These administrators have been extraordinarily generous in their continuing and increasing support for this conference. We also extend our thanks to Carol Mullen, director of communications for the Dietrich School, for supporting the marketing and advertising efforts for this year's Expo. Thanks also to the Department of Communications Services for its hard work in coordinating the creation of the wonderful printed materials. The Grad Expo Committee is indebted to the advocacy of the department representatives serving on the Arts and Sciences Graduate Student Organization (A&S GSO) Council. Without their commitment, this event would not be possible. We extend our appreciation to the student and faculty judges who have taken time out of their busy schedules to help moderate this event and share their feedback with presenters.

This interdisciplinary exposition and conference is a unique opportunity for graduate students from the humanities, social sciences, and natural sciences to develop presentation skills and engage with research from students across the Dietrich School. The Grad Expo Committee is grateful to have the opportunity to coordinate this event.

And of course, we thank the presenters for sharing their research and work with the University of Pittsburgh community. Enjoy the day!

Sincerely,

The 2016 Grad Expo Committee

Erin Pfeil-McCullough, *Geology and Environmental Science*, Cochair
Allison Cullen Doyle, *Anthropology*, A&S GSO Administrative Assistant, Cochair
Dervla M. Kumar, *Geology and Environmental Science*
Kassia Groszewski, *Geology and Environmental Science*
Sylvia M. Grove, *French and Italian*
Kenrick Fernandes, *Computer Science*
Vicki Lynette Hoskins, *Theatre Arts*
Jonathan Wei-Chen Yu, *Statistics*

Schedule of Events

8:30 a.m.–3 p.m.

Check in—all day, William Pitt Union (WPU),
Room 527

9 a.m.

Podium presentations, Room 538
Podium presentations, Room 539

10:30 a.m.

Podium presentations, Room 538
Podium presentations, Room 539

Noon

Lunch, Room 527
Noontime Data Blitz, Room 527

1 p.m.

Poster presentations, Room 548
Podium presentations, Room 538
Podium presentations, Room 539

2:30 p.m.

Poster presentations, Room 548
Podium presentations, Room 538
Podium presentations, Room 539

4–5 p.m.

Roundtable Discussion and Workshop, Room 527
Your Brain on Grad School

5–7 p.m.

Reception
Bridges Restaurant, Wyndham Hotel,
100 Lytton Ave., Pittsburgh, PA 15213

Noontime Data Blitz

Noon, Room 527

Graduate students will have 30 seconds to “sell” their research in our version of the elevator pitch. This is a unique and fun opportunity for graduate students to hone their public speaking skills in front of a general audience.

Be sure to stop by and vote for your favorite pitch!

Roundtable Discussion and Workshop:

Your Brain on Grad School—Mental Health
Resources for Graduate Students

4 p.m., Room 527

Hosted by **Linda Rinaman**, *Assistant Dean
for Graduate Studies and Research*

Featuring **Kym Jordan Simmons, PhD**,
*Training Director and Licensed Psychologist,
University of Pittsburgh Counseling Center*

Graduate school presents many unique mental and emotional challenges that can lead to high rates of mental health issues among graduate students. Though mental health issues are prevalent in graduate students, it remains a problem that is largely unaddressed. This workshop will serve as an educational forum on existing mental health resources and strategies, as well as a platform for graduate students to voice concerns and suggestions as to how the University can better accommodate the mental health needs of its students.

Paper Presentations

9 A.M.

Room 538

Sagnika Chanda, *Immigrant Motherhood and Diasporic Colonialism in The Brief Wondrous Life of Oscar Wao*

Diego Villada, *Heartwarming Stories Make Refugees the Object of Spectacle*

Christian Gineste, *From Protection to Persecution: the Determinants of State Violence against Refugees*

Ognjen Kojanic, *Countering the Exclusion of the Working Class through Worker-Ownership in Neoliberal Croatia*

Room 539

Scott Crawford, *Ligand-Mediated “Turn On,” High Quantum Yield Near-Infrared Emission in Small Gold Nanoparticles*

Zitao Liu, *Learning Adaptive Forecasting Models from Irregularly Sampled Multivariate Clinical Data*

Angela Mullins, *Evaluation of Infiltration-Based Green Infrastructure Response to Storm Events in Pittsburgh, Pa., and Implications for Metal Flux*

10:30 A.M.

Room 538

Ching-Chung Ko, *Learning from Your Enemy’s Enemies: Analyzing the Toxic Proteins Encoded by Mycobacteriophage*

Ho-Ching (Angela) Mak, *Does School Starting Age Matter? The Impact of School on Childhood Obesity*

Laura Samuelsson, *Objectively-Assessed Snoring is Associated with Increased Risk for the Metabolic Syndrome and Its Components in a Community Sample of Midlife Women*

Kelsey West, *Examining the Relation between Walking and Receptive Language in Infants at Heightened Risk for Autism Spectrum Disorder*

Room 539

Katie Jo Black, *When Externalities are Taxed: The Effects and Incidence of Pennsylvania’s Impact Fee on Shale Gas Wells*

Xiaolong Cui, *Leaping Shadows: Adaptive and Power-aware Resilience*

Kassia Groszewski, *Collection of Nitrogen Atmospheric Deposition Using Ion Exchange Resins—Development and Applications for National-Scale Environmental Monitoring*

Hector Martinez Rodriguez, *Neutronization during Carbon Simmering In Type Ia Supernova Progenitors*

1 P.M.

Room 538

Sara Gulgas, *Memories of an Imagined Past: Baroque Rock’s Postmodern Nostalgia*

Michael Neureiter, *Evaluating the Effects of Immigrant Integration Policies in Western Europe Using a Difference-in-Differences Approach*

Meredith North, *What’s Goethe Got to Do with IT: Mapping Networks of Artistic Exchange in the Digital Environment*

Emily Thompson, *The Nameless Man of Many Names: The Performative “Un-naming” of Jean Valjean in Les Misérables*

Room 539

Adeetee Bhide, *Introducing Students to Research during Introduction to Psychology*

George Borg, *On the Application of Science to Science Itself: Chemistry, Instruments, and the Scientific Labor Process*

Sandra Nelson, *Digital Dating, Digital Deconstruction: Affect and the Reinforcement and Complication of Heteronormativity in Online Dating Environments*

Jeffrey Tienes, *It's Like Crabs in a Barrel: Making a Scene in Pittsburgh Underground Hip-Hop*

2:30 P.M.

Room 538

Jamie Amemiya, *Teacher Theory of Math Ability, Instructional Style, and Student Math Outcomes during High School*

Xiaoping Fang, *Perturbation of Old Knowledge Precedes Integration of New Knowledge*

Chloe Hansen, *'How to Talk about Dying': Contemporary U.S. Discourses on Death, Dying, and End of Life*

Steven Moon, *That's Not Our Music: Negotiating Identity and Mediterraneanism in Turkey and Egypt*

Room 539

Yuning Cao, *Investigating Addressing Terms in Japanese University Student Clubs*

Christiana Harkulich, *Protest/Performance: Strategic Protest and Decolonial Action in the American Indian Movement*

Shane Redman, *Ideas or People? The Relationship between Feminist Values and Representation*

Poster Presentations

1–4 p.m.
(Judging is 1–1:30 p.m.)

Room 548

Poster 1

Ilona Ambartsumyan, *A Multipoint Stress Mixed Finite Element Method for Elasticity*

Poster 2

Amber Griffith, *Regulation of Cytokinesis in the Presence of Lagging Chromatin*

Poster 3

Alicia Grosso, *Femoral Fracture Patterns from Gunshot Wounds in a U.S. Civil War Skeletal Sample*

Poster 4

Charmgil Hong, *Conditional Outlier Detection in Multivariate Responses*

Poster 5

Eldar Khattatov, *A Lagrange Multiplier Method for Flow in Fractured Poroelectric Media*

Poster 6

Lisa Limeri, *The Origin and Maintenance of the 'alba' Polymorphism in Sulfur Butterflies*

Poster 7

Jihe Liu, *Optical Control of Protein Function by Genetically Encoded Photocaged Unnatural Amino Acids*

Poster 8

Bryce Lunt, *Brujita Integrase: A Simple, Armless, Directionless, and Promiscuous Tyrosine Integrase System*

Poster 9

Ji Luo, *Optical Control of DNA Recombination in Mammalian Cells*

Poster 10

Caitlin Rice, *The Role of Word Frequency and Number of Senses in Word Recognition Speed*

Poster 11

Sarah Smith, *Dissecting the Novel Deployment of a Signaling Pathway during the Evolution and Morphogenesis of an Anatomical Structure*

Poster 12

Michelle Elise Spicer, *Advocate, Adversary, or Bystander: Are Lianas a Driver of Tropical Epiphyte Diversity?*

Poster 13

Michael Washington, *The Effects of Sequence and Stereochemistry on the Physical Properties of Biodegradable Devices Composed of Poly(lactic-co-glycolic acid)*

Poster 14

Yusan Yang, *Oophaga pumilio Males Bias Aggression towards Similar Color Morph When in Allopatry but Not in Sympatry*

Poster 15

Fernando Zago, *Inflationary Dynamics Reconstruction via Inverse-Scattering Theory*

Abstracts (in alphabetical order)

Ambartsumyan, Ilona

Room 548, 1 p.m.

A Multipoint Stress Mixed Finite Element Method for Elasticity

We develop a new mixed finite element method for linear elasticity model with weakly enforced symmetry on both simplicial and quadrilateral grids. Motivated by the multipoint flux mixed finite element method for flow in porous media, we consider a special quadrature rule that allows for elimination of stress and rotation variables and leads to a cell-centered system for the displacements. Theoretical results indicate the stability of method and predict first-order convergence for all variables in the natural norms, numerical experiments confirm the theory for both types of meshes.

Amemiya, Jamie

Room 538, 2:30 p.m.

Teacher Theory of Math Ability, Instructional Style, and Student Math Outcomes during High School

Student math achievement and interest decline over the school years, with the highest levels of disengagement occurring during the high school years. Low math achievement and interest, together, have been identified as culprits of the decreasing number of students pursuing science, technology, education, and mathematics (STEM) degrees and careers. Emerging evidence suggests that teachers who hold an incremental theory of math ability (i.e., believing that math ability is malleable, rather than fixed) may be effective in improving student math outcomes, with some theorizing that this mindset facilitates developmentally appropriate instruction. In the present study, I examined (a) if teachers' incremental theory of intelligence related to student math grades and interest, and (b) if teachers' use of student-centered and teacher-centered instruction (with student-centered instruction being more developmentally appropriate than teacher-centered) mediated these associations. Participants were 1,026 high school students nested within 53 classrooms and 15 teachers. Results indicated that teachers with an

incremental theory had students who improved in their math grades and reported higher levels of interest in math. These associations were fully mediated by instructional style, such that teachers with an incremental theory engaged in more student-centered instruction and less teacher-centered instruction, and student-centered instruction was related to improved student math grades and higher math interest. Teacher-centered instruction was not associated with either math outcome. Findings suggest that, in order to improve student math outcomes during high school, teacher beliefs and instruction should fit the developmental needs of high school students.

Bhide, Adeetee

Room 539, 1 p.m.

Introducing Students to Research during Introduction to Psychology

Large introductory classes are often lecture based, and students do not have the freedom to explore topics that interest them or to learn about original research. For my study, I inserted a project into the curriculum of one section of Introduction to Psychology at the University of Pittsburgh. For the project, students read one popular press article about psychology (e.g., from *The New York Times*) and one empirical article cited within it. They then gave group presentations in which they summarized both articles and critiqued how accurately the science was explained in the popular press article. The goals of the project were to: 1) increase interest in psychology by having students read interesting articles on topics of their choice; 2) increase their self-efficacy and ability to read empirical articles; and 3) help students see the value in empirical articles and make them more critical consumers of information. We measured the efficacy of the project using a pre/post-test design that compared sections of Introduction to Psychology that did and did not deploy the project. We found that students in general found the popular press articles interesting and the project helped them to see the value in reading empirical articles. Furthermore, classes that deployed the project showed greater gains in terms of interest in psychology, self-efficacy when reading empirical articles, and ability to read and critique popular press/empirical articles. Limitations, future directions, and applications of this project to other content areas are discussed.

Black, Katie Jo

Room 539, 10:30 a.m.

When Externalities are Taxed: The Effects and Incidence of Pennsylvania's Impact Fee on Shale Gas Wells

Drilling in shale formations rich in oil and gas has caused the U.S. to become the global leader in hydrocarbon production, but the growth has come with environmental and public infrastructure costs. States have been slow to introduce taxes to pay for impacts, fearing a decline in drilling-related investment. An exception is Pennsylvania, which introduced a per-well impact fee in 2012. Using a difference-in-difference quasi-experimental design and data that nearly cover the universe of leases and wells in Pennsylvania and West Virginia, we find that the fee reduced drilling and leasing but slightly increased well productivity. Drilling companies passed a quarter of the fee onto subsurface owners through a reduced royalty rate. The findings support the notion that taxes on externalities can drive firms to lower-tax jurisdictions.

Borg, George

Room 539, 1 p.m.

On the Application of Science to Science Itself: Chemistry, Instruments, and the Scientific Labor Process

The "Instrumental Revolution" in chemistry refers to a transitional period in the mid-20th century during which sophisticated instrumentation based on physical principles was introduced to solve chemical problems. Historical reflection on whether the revolution was a scientific one has been dominated by general models of scientific revolution, in particular those proposed by Thomas Kuhn, I. B. Cohen, and Ian Hacking. In this article I propose that the Industrial Revolution is a useful model for understanding the transformation wrought by the increasingly important role of machines in chemical research. Drawing on Marx's analysis of that event, I argue that the use of physical instrumentation was accompanied by a radical reorganization of the labor process in at least one kind of chemical research, the study of molecular structure. That reorganization permitted a rapid flourishing of methods in structural chemistry. Previous work on the Instrumental Revolution

has focused on the institutional and individual pathways permitting the transfer of technology from physics to chemistry. In light of this case study, however, I argue that the dynamics of technical progress following the transfer of technology from one scientific field to another depend, in addition to the pathways connecting the fields, on the distribution of functions within the labor process of the importing field. I thus demonstrate the utility of the conception of science as a labor process for understanding its historical development.

Cao, Yuning

Room 539, 2:30 p.m.

Investigating Addressing Terms in Japanese University Student Clubs

The honorific language is a crucial aspect in Japanese that reflects interlocutors' relative social status. Although some argue that its usage is predetermined by the static hierarchy, further scrutiny of conversation data suggests that speakers also actively adjust their honorific language to construct a fluid and dynamic relationship. In Japanese universities, students consciously practice honorific language usage in order to convert themselves to capable "members of society." Addressing conversation interlocutors, the first stage of communication, is already influenced by various factors such as hierarchy, occasion, gender, and intimacy, to name a few. The study investigates the inner rules that dominate appellation choices in Japanese clubs by examining these factors. Findings indicate that students tend to choose more respectful appellations when addressing seniors, such as surname with "-san" or "sempai." Members generally use given names only to address intimate peers, whereas for juniors, they usually choose last names to indicate distance and formality, implying that the generation gap in Japanese student clubs is insurmountable. Furthermore, in formal occasions, appellation variations are highly limited, whereas in private occasions, addressing terms differ considerably according to intimacy. Gender is another determinant, with people presenting different patterns when addressing members of the same gender and those of the opposite gender. In practice, these factors are consistently intertwined and work as an integrity. The study not only bridges language theories and their usage in reality, but also broadens our horizon on honorifics as a flexible index in sociolinguistic domain.

Chanda, Sagnika

Room 538, 9 a.m.

Immigrant Motherhood and Diasporic Colonialism in The Brief Wondrous Life of Oscar Wao

In my paper, I examine the immigrant woman of color's fraught relationship to mothering children within an overtly white diaspora that serves to erase the struggles she faces as part of the global, capitalistic work force. In *The Reproduction of Mothering*, Nancy Chodorow posits that mothers and daughters share a unique identificatory relationship that is narcissistic in nature. The daughter identifies with the perceived lack of the mother and it triggers a negative identification with the mother as a continuation of herself. I argue that the relationship between the subjugated mother of color, her daughter, and the figure of the father is doubly oppressed owing to a negative relation to the male hypersexual colonizing authority in her homeland and the white male master once she migrates and tries to assimilate into the white diaspora.

I investigate the relationship between the adverse effects of the daughter's negative identification with the mother and colonialist discourses of racism and sexism that informs the mother-daughter relationship by examining the ideas of hyperfemininity, ideals of whiteness, assimilation, and motherhood as performed by a third world immigrant woman of color. For this purpose, I focus on the relationship between Belicia Cabral and her daughter Lola in Junot Diaz's novel *The Brief Wondrous Life of Oscar Wao*. I conclude by showing how it is through a display of decolonizing practices of mothering and rejection of the scripts of hypermasculinity and hyperfemininity imposed by White and Dominican modes of colonialism that Diaz envisions a feminist decolonization.

Crawford, Scott

Room 539, 9 a.m.

Ligand-Mediated "Turn On," High Quantum Yield Near-Infrared Emission in Small Gold Nanoparticles

Small gold nanoparticles (~1.4–2.2 nm core diameters) exist at an exciting interface between molecular and metallic electronic structures. These particles have the potential to elucidate fundamental physical principles driving nanoscale phenomena and to be useful in a wide range of applications, including bioimaging, sensing, and telecommunications. Here, we study the optoelectronic properties of aqueous, phosphine-terminated gold nanoparticles (core diameter = 1.7 ± 0.4 nm) after ligand exchange with a variety of sulfur-containing molecules. No emission is observed from these particles prior to ligand exchange, however the introduction of sulfur-containing ligands initiates photoluminescence. Further, small changes in sulfur substituents produce significant changes in nanoparticle photoluminescence features including quantum yield, which ranges from 0.13 to 3.65% depending on substituent. Interestingly, smaller ligands produce the most intense, highest energy, narrowest, and longest-lived emissions. Radiative lifetime measurements for these gold nanoparticle conjugates range from 59 to 2590 μ s, indicating that even minor changes to the ligand substituent fundamentally alter the electronic properties of the luminophore itself. These results isolate the critical role of surface chemistry in the photoluminescence of small metal nanoparticles and largely rule out other mechanisms such as discrete (Au(I)—S—R)_n impurities, differences in ligand densities, and/or core diameters. Taken together, these experiments provide important mechanistic insight into the relationship between gold nanoparticle near-infrared emission and pendant ligand architectures, as well as demonstrate the pivotal role of metal nanoparticle surface chemistry in tuning and optimizing emergent optoelectronic features from these nanostructures.

Cui, Xiaolong

Room 539, 10:30 a.m.

Leaping Shadows: Adaptive and Power-aware Resilience

As our reliance on Information Technology (IT) continues to increase, the complexity and urgency of the problems our society will face in the future will increase much faster than our abilities to understand and deal with them. Future IT systems are likely to exhibit a level of interconnected complexity that makes them prone to faults and exceptions.

To tackle these challenges, we propose an adaptive and power-aware algorithm, referred to as Lazy Shadowing, as an efficient and scalable approach to achieve high levels of resilience through forward progress. Lazy Shadowing associates with each process a “shadow” (process) that executes at a reduced rate, and opportunistically rolls forward each shadow to catch up with its leading process during failure recovery. Compared to existing fault tolerance methods, our approach can achieve 20% energy savings with potential reduction in solution time at scale.

Fang, Xiaoping

Room 538, 2:30 p.m.

Perturbation of Old Knowledge Precedes Integration of New Knowledge

The importance of offline consolidation in integration of new knowledge has received much recent research attention. Less examined is the adaptive change of existing knowledge as a result of learning, which possibly occurs even prior to the opportunity for consolidation. The current study addressed the question by associating new meanings with known words and observing ERPs associated with original and new meanings. After learning new meanings for known words and novel words, participants performed a one-back task on a list of words that contained successively presented words that were related through original meanings, new meanings, or unrelated, during which EEG was recorded. Words related to new meanings of words (or to novel words) did not show a reduction of N400 immediately after learning; however, words related to original meanings of known words showed more negativity when the words had been paired

with a new meaning, especially in the time window of 550–750 ms. The findings suggest that although the new meanings themselves have not become integrated with the word form, they perturb the word form’s connection with its original meaning.

Gineste, Christian

Room 538, 9 a.m.

From Protection to Persecution: the Determinants of State Violence against Refugees

Transnational refugee flows continue to be one of the most pressing issues of today. While most states are signatories to international treaties recognizing the rights of refugees, we see a significant variance in the way host governments treat refugee groups in their territory. This paper examines why some states use violence against refugees while others do not. I consider a number of alternative causal mechanisms explaining the use of violence against refugees, such as institutional constraints, state of the economy, culture/xenophobia, and international dependence. To adjudicate between these competing explanations, I use a novel dataset on different types of violence that governments use against refugee groups between 1996 and 2008. The findings of this research contribute to the literatures on consequences of civil wars, one-sided violence, and forced migration.

Griffith, Amber

Room 548, 1 p.m.

Regulation of Cytokinesis in the Presence of Lagging Chromatin

Cytokinesis occurs after successful segregation of genetic material from the cleavage plane. Cytokinesis in the presence of trapped chromatin leads to DNA damage and cleavage furrow regressions, which result in tetraploid cells. Yeast has developed a mechanism to protect trapped chromatin from the forces exerted by the ingressed cleavage furrow. This pathway, termed NoCut, uses Ipl1 kinase activity to delay cytokinesis if chromatin is left in the cleavage plane. Recently, work done in mammalian systems has found a pathway similar to the NoCut pathway found in yeast. A key factor to this pathway is the mitotic kinase Aurora B.

Under normal conditions, the completion of cytokinesis, also known as abscission, relies on the inactivation of Aurora B. Cells with trapped chromatin in the cleavage plane demonstrate a prolonged activation of Aurora B. This prolonged activation allows Aurora B to phosphorylate substrates like MKLP1 and CHMP4C to delay the onset of abscission. There is a general understanding on how the downstream steps of this pathway affect the timing of abscission when chromatin is left behind in the cleavage plane. The factor linking prolonged Aurora B activation is yet to be determined. I hypothesize that Aurora B is differentially modified post-translationally during cytokinesis in cells containing trapped chromatin in the cleavage plane. I have developed a protocol to enrich cells in specific stages of mitosis and conducted immunofluorescence microscopy and immunoprecipitations to determine the modification that is important for the activation of the abscission delay pathway via Aurora B in mammalian cells.

Grosso, Alicia

Room 548, 1 p.m.

Femoral Fracture Patterns from Gunshot Wounds in a U.S. Civil War Skeletal Sample

Fracture patterns from gunshot wounds were analyzed in the distal femora of 34 individuals housed within the Civil War Skeletal Collection (Silver Spring, MD). Variables collected include: fracture counts and lengths, location, timing of injury and death, and intrinsic variables related to the individual (age, sex, and stage of epiphyseal fusion of the joint). The morphology of fracture patterns is discussed in regard to entry and exit wounds, as well as to the location of fractures near unfused epiphyseal ends. These ends house a cartilaginous plate in youth, allowing for growth of the long bone, and fuse in adolescence.

Given the time period (1860s), war conditions, and severity of the injuries, all wounds resulted in amputation (typically around the femur midshaft) on the same day or within several days of sustaining the injury. Therefore, fractures were unhealed and complete lengths could be measured, with the exception of those fractures extending above the line of amputation. Bone specimens were reconstructed with wire by the museum and often times included the associated conoidal bullet.

The broader impact of this study lies in its wide-ranging contribution to the understanding of bone strength and improving standards of fracture analysis in forensic anthropology. Most gunshot studies focus on the propagation of fractures on the cranium or the midshaft of a long bone. Bone at the long bone joint is structurally different from that of the shaft and must also be studied to fully understand how the complete long bone responds to high velocity impacts.

Groszewski, Kassia

Room 539, 10:30 a.m.

Collection of Nitrogen Atmospheric Deposition Using Ion Exchange Resins—Development and Applications for National-Scale Environmental Monitoring

Ion exchange resins (IERS) are polymer resin beads that have been treated to contain exchange sites for either anions (negatively-charged ions) or cations (positively charged ions). When water containing free ions passes over the resins, the desired cations or anions are bound to the IER until extraction. Although primarily used in water treatment and conditioning facilities to remove undesirable ions from water, IERS have been recently adapted for use in environmental and air quality monitoring to capture and retain atmospherically deposited ions. Nitrate (NO₃⁻), nitrite (NO₂⁻), and ammonium (NH₄⁺) are three forms of nitrogen that may be targeted by IERS, and each form may be important to, or detrimental to, different human and environmental systems. In this talk, I will discuss the importance of studying atmospherically derived nitrogen, the challenges involved with adapting IERS for field and laboratory studies involving charged nitrogen species, and results from my research involving IERS. I will also discuss how IERS may be used in conjunction with existing national monitoring programs (NADP, CASTNET) to passively measure nitrogen atmospheric deposition across a wide range of ecosystems.

Gulgas, Sara

Room 538, 1 p.m.

Memories of an Imagined Past: Baroque Rock's Postmodern Nostalgia

Some of the biggest rock bands of the 1960s—The Beatles, The Left Banke, Procol Harum, The Doors— took a nonlinear approach to history by utilizing stylistic representations of an imagined past. Baroque rock blended the sound of string quartets, harpsichord ostinatos, and contrapuntal techniques with rock instrumentation. These artists cultivated “postmodern nostalgia,” a detached engagement with history that references an unexperienced past, in order to create awareness about how our remembrance of the past affects our present. Baroque rock’s juxtaposition of past/present and high/low art was designed to highlight the irony inherent in these false cultural dichotomies that represented even deeper issues in society. Artists called attention to the “high/low” division not necessarily to democratize the classical canon but to comment on the hegemonic struggles created by the dividing structure that perpetuates the bourgeois domination of socialization. Drawing from research conducted at the Rock and Roll Hall of Fame Library and Archives, I examine how baroque rock artists drew on familiarity with J.S. Bach’s music, venerated to the point of sonically representing the entire Baroque period, to critique canonization’s perpetuation of uncritical dominant narratives. I argue that baroque music’s juxtaposition with rock highlights the politics inherent in memory, warning its listeners that an uncritical acceptance of history’s construction allows those in power to impose cultural unity. Baroque rock asks us to think about the fluidity rather than the fixity of time as well as the social and political motivations involved in the ever-changing relationship between memory and history.

Hansen, Chloe

Room 538, 2:30 p.m.

‘How to Talk about Dying’: Contemporary U.S. Discourses on Death, Dying, and End of Life

Citing a variety of publications on end-of-life issues, *The Washington Post* declared 2014 “the year we finally learned to talk seriously about dying.” This declaration is part of an ongoing national conversation about death that is coming to fore as life spans continue to increase and baby boomers age. It would seem that Americans are exposed to and discussing end-of-life issues more often than in times past, signaling an erosion of modernity’s “denial” of death. What is not yet clear amid this increase in public discourse is what exactly is being talked about and in what ways. In this paper, I conduct rhetorical analyses of articles in *The New York Times* Op-Ed series on end-of-life issues, *The End*, looking at word choice, arrangement, and uses of figurative language, in order to shed light on how people understand and come to terms with their mortality. I argue that these articles describe death as a life process—rather than as sharply distinct from life—that necessitates the involvement of others and is primarily concerned with the timing of death and decision-making at end of life. As the meanings of death are not fixed or natural, but instead are contingent upon broad social and historical contexts, this analysis reveals perspectives on death and dying circulated by one of the largest U.S. newspapers, indicating a contemporary mainstream world view of end of life, amid shifting demographics and technological and ideological changes in health care and medicine.

Harkulich, Christiana

Room 539, 2:30 p.m.

Protest/Performance: Strategic Protest and Decolonial Action in the American Indian Movement

Protest can be read as a performance, one that strategically creates an audience out of bystanders in volatile and meaningful spaces. How can protest work to make meaning? This paper argues that meaning is made in the relationship between space, time, and representation. The American Indian Movement (AIM), a civil-rights organization from the late 1960s and early 1970s, utilized strategic protest to make its voice and issues heard.

This paper examines the possibilities for decolonial thinking and action inherent in the AIM's 1970 Thanksgiving Day protest at Plymouth Rock. In 1970, AIM was beginning to find ways to publicly decry the violence of the U.S. justice system on indigenous people. By marking Thanksgiving Day as "A National Day of Mourning" and making their contemporary lives visible in a space of colonial history, their protest was inherently tied to the value and labor of their bodies as always already tied to the space where they stood. What is the value of which bodies stand where in making meaning in the protest movement and how might this change historical narratives? How does the dissent of people who have been denied justice in the courts bear out in the demonstrations in the street? Through a lens of performance studies and coloniality, this paper works toward an understanding of the strategic value of the body to protest, and call for and make change on social justice issues.

Hong, Charmgil

Room 548, 1 p.m.

Conditional Outlier Detection in Multivariate Responses

Outlier detection aims to identify unusual data instances that deviate from expected patterns. It is particularly challenging when outliers are context (input) dependent and are defined by unusual combinations of multiple response values (output). We develop and study a novel conditional outlier detection approach for multivariate response space that works by (1) transforming a multi-

variate conditional outlier detection problem to a conditional probability space and (2) evaluating outlier scores by analyzing the data in the new space. Our approach relies on the chain decomposition of the multidimensional data models that let us transform the response space into a probability vector, one probability for each dimension of the response space. Outlier scores applied to these transformed vectors are then used to identify outliers. Experiments with two outlier detection settings show that our methodology is robust and able to effectively detect outliers when they are either sparse (manifested in one or very few dimensions) or dense (affecting multiple dimensions).

Khattatov, Eldar

Room 548, 1 p.m.

A Lagrange Multiplier Method for Flow in Fractured Poroelastic Media

We study the finite element computational model for solving coupled problem arising in the interaction between a poroelastic material and a fracture filled with fluid. The fluid flow in fracture is governed by the Stokes equation for an incompressible fluid, while the poroelastic material is modeled using the Biot system. The appropriate equilibrium and kinematic conditions are imposed on the interface. The focus is made on the approximation of the interface conditions, are imposed on the interface. The focus is made on the approximation of the interface conditions, which feature the interaction of different variables. The Lagrange multiplier method is used to enforce these nonstandard interface conditions. After performing the stability and error analysis, a series of numerical experiments was done in order to study the convergence rates, the applicability of the method to modeling physical phenomena, and sensitivity of the model with respect to its parameters.

Ko, Ching-Chung

Room 538, 10:30 a.m.

Learning from Your Enemy's Enemies: Analyzing the Toxic Proteins Encoded by Mycobacteriophage

According to the World Health Organization's *Global Tuberculosis Report 2015*, 1.5 million people died from tuberculosis in 2014. Moreover, 123,000 people were infected with multidrug-resistant tuberculosis and 9.7% of those people had extensively drug-resistant tuberculosis. Therefore, advancing our understanding of *Mycobacterium tuberculosis*—the causative agent of tuberculosis—is important. Here, I utilize mycobacteriophages—viruses that infect the genus of *Mycobacterium*—to look for phage-encoded genes that are detrimental to bacterial growth. A total of 202 mycobacteriophage genes were individually over-expressed in *Mycobacterium smegmatis* mc(2)155, a fast growing relative of tuberculosis-causing bacteria. Twenty-one genes were found to be toxic to *M. smegmatis* and an additional 24 were inhibitory. Using this approach, gene 52 of mycobacteriophage Fruitloop was identified as a toxic gene.

To understand how the protein product of Fruitloop gene 52 (gp52) kills *M. smegmatis*, a co-immunoprecipitation assay was performed followed by mass spectrometry analysis to identify Fruitloop gp52's interacting target(s). As a result, Wag31 of *M. smegmatis*—an essential protein involved in cell shape and cell wall integrity—was identified as a target. Interestingly, over-expression of Fruitloop gp52 results in a change in mycobacterial cell morphology from rod to round. Moreover, over-expressing Wag31 allows mycobacteria to survive in the presence of Fruitloop gp52. Further elucidating the mycobacteriophage-encoded toxic proteins' mechanisms will advance our knowledge about mycobacterial machineries. It also creates opportunities to discover anti-tuberculosis drug targets at a time when drug-resistant tuberculosis is becoming a severe concern.

Kojanic, Ognjen

Room 538, 9 a.m.

Countering the Exclusion of the Working Class through Worker-Ownership in Neoliberal Croatia

Ownership has proven to be crucial in the processes of neoliberal transformation because it functions as a cornerstone of economic relations and the basis for political action. The expansion of private ownership into domains previously owned and managed collectively brought about the erosion of the basis for working-class politics. In this paper, I focus on the way emphasis on ownership can play a role in countering the economic and political exclusion of the working class in neoliberalism. In 2007, the workers of the Croatian company ITAS Prvomajska managed to take over the company from the private owner who had been downsizing it. ITAS has been developing a viable economic model since then, remaining the only company in Croatia owned and run exclusively by its workers. The case of ITAS poses the question of whether grassroots working-class politics has the potential to use ownership as a basis for novel economic relations and political action. The economic success of ITAS and its model of worker-ownership provide the material basis for the cultivation of alternative capitalist relations within the company that allows the expansion of workers' access to resources and their inclusion in decision-making structures. ITAS workers foster political alliances formed around worker-ownership by maintaining connections with other workers and leftist activists to pass on their model. The workers thus bolster their struggle against dispossession, countering the exclusion of the working class from the political-economic sphere in post-socialist neoliberalism.

Limeri, Lisa

Room 548, 1 p.m.

The Evolutionary History of the 'alba' Polymorphism in Sulfur Butterflies

How the diversity of life arose and is maintained has captivated both scientists and the public alike throughout human history. Diversity can manifest as different species, or as differences among individual members of the same species. When individuals of a species differ in traits, such as color, the species is called polymorphic. Polymorphic species have been studied in depth and have revealed important discoveries about some of the most exciting and controversial topics in biology, including how new species are formed, mimicry among species, and how individuals compete for mates. Despite this work, there remain many open questions surrounding the origin and maintenance of multiple different forms within a species. My research explores a deeper understanding of the factors sustaining polymorphisms by investigating a color polymorphism in the sulfur butterflies (Coliadinae). I conducted a comparative analysis, which utilizes data about the evolutionary relationship and traits of current species to trace the history of the polymorphism. My analyses revealed that the polymorphism arose only once in history (the ancestral species was polymorphic) and that the polymorphism is relatively unstable (it has been lost in approximately half of the species in the Coliadinae). This evidence indicates that variable selective pressures may be acting on this group of butterflies. Understanding the evolutionary forces that act to maintain or reduce color diversity within these species can help us understand the maintenance or loss of biodiversity in general.

Liu, Jihe

Room 548, 1 p.m.

Optical Control of Protein Function by Genetically Encoded Photocaged Unnatural Amino Acids

To better understand human physiology and disease state, novel molecular tools that can perturb intricate cellular mechanisms are needed. Light is an excellent external stimulus to manipulate and study living systems

in a highly spatio-temporal manner. Here, we report that protein function could be optically controlled through genetic incorporation of a photocaged unnatural amino acid. To activate a protein function by light, a photocaged lysine is incorporated at a crucial position in the TGF- β receptor Alk5. The activity of Alk5 is blocked by the photocaging group. Upon UV irradiation, the photocaging group is removed, and the activity of Alk5 is restored. Conversely, to deactivate a protein function by light, a photocaged lysine was incorporated on an ubiquitin-protein conjugate. The photocaging group shields the protein of interest from recognition by E3 ligase, thus rendering it stable in cells. The removal of the photocaging group by UV light exposes the protein to E3 ligase, resulting in subsequent protein degradation by the proteasome. In summary, through genetic incorporation of photocaged unnatural amino acids, a protein of interest could be either activated or deactivated by light. This provides a powerful tool to precisely manipulate protein function in live cells.

Liu, Zitao

Room 539, 9 a.m.

Learning Adaptive Forecasting Models from Irregularly Sampled Multivariate Clinical Data

Building accurate predictive models of clinical multivariate time series is crucial for understanding of the patient condition, the dynamics of a disease, and clinical decision making. A challenging aspect of this process is that the model should be flexible and adaptive to reflect well patient-specific temporal behaviors and this also in the case when the available patient-specific data are sparse and short span. To address this problem, we propose and develop an adaptive two-stage forecasting approach for modeling multivariate, irregularly sampled clinical time series of varying lengths. The proposed model (1) learns the population trend from a collection of time series for past patients; (2) captures individual-specific short-term multivariate variability; and (3) adapts by automatically adjusting its predictions based on new observations. The proposed forecasting model is evaluated on a real-world clinical time series dataset. The results demonstrate that our approach is superior on the prediction tasks for multivariate, irregularly sampled clinical time series,

and it outperforms both the population based and patient-specific time series prediction models in terms of prediction accuracy.

Lunt, Bryce

Room 548, 1 p.m.

Brujita Integrase: A Simple, Armless, Directionless, and Promiscuous Tyrosine Integrase System

In most temperate phages, lysogeny and immunity to superinfection are determined prior to integration into the host chromosome. However, mycobacteriophage Brujita is an unusual phage in which establishment of immunity is dependent on chromosomal integration. Brujita integration is mediated by a non-canonical tyrosine integrase lacking an N-terminal domain typically associated with binding to arm-type sites within the phage attachment site (attP). This raises the questions of how these integrases (Ints) bind their DNA substrates, and how site selection and recombinational directionality is determined. Here we show that Brujita Integrase is a simple tyrosine recombinase, whose properties more closely resemble those of recombinases FLP and Cre than it does the canonical phage tyrosine integrases. Brujita Int uses relatively small DNA substrates, fails to discriminate between phage and bacterial attachment sites (attP and attB), cleaves attachment site DNA to form a 6-base overlap region, and lacks directional control. Brujita Int also has an unusual pattern of binding to its DNA substrates. It binds to two half sites (B and B') in attB, although binding to the B half site is strongly dependent on occupancy of B'. In contrast, binding to the P half site is not observed. However, an additional Int binding site (P1) is displaced to the left of the crossover site in attP, is required for recombination, and is predicted to facilitate binding of Int to the P half site during synapsis. This simple tyrosine phage integrase system may reflect ancestral states of phage evolution.

Luo, Ji

Room 548, 1 p.m.

Optical Control of DNA Recombination in Mammalian Cells

The Cre-loxP recombination system has emerged as an important and reliable site-specific recombination tool, and thus has a wide range of biological applications in genome engineering. In order to conditionally control the Cre/loxP system, a genetically encoded light-activated Cre recombinase was engineered through the site-specific installation of light-responsive caged amino acids using an engineered pyrrolysyl tRNA synthetase/tRNA system. The critical residues for regulation of Cre recombinase were identified as caging sites to optically control of DNA recombinase function in live cells in a spatiotemporal fashion. Therefore, temporal and spatial control with high precision over DNA recombination is achieved.

Mak, Ho-Ching (Angela)

Room 538, 10:30 a.m.

Does School Starting Age Matter? The Impact of School on Childhood Obesity

While there has been extensive research that estimates the effect of attending school on cognitive test scores in early childhood, little is known on health outcomes. The common approach uses school starting age cutoffs in a regression discontinuity (RD) design, taking advantage of the fact that the cutoffs determine whether a child is eligible to begin school in a year. In health economics, Anderson et al. (2011) uses the age cutoffs in the United States to address the question of whether starting school earlier can lead to childhood obesity. Using a similar approach, I focus on Australian children and estimate a causal relationship between school entry age and childhood obesity in Australia. My study also offers a link between the literature of how unhealthy school environments can lead to worse weight outcomes of children, and the literature of whether earlier school entry in general can affect weight outcomes. It is unclear that whether schools in general indeed provide a weight-worsening environment. In particular, in terms of policy concern, it is important to study not just the weight

outcomes, but also the factors associated with the results. My research questions are as follows: (1) Does starting school early contribute to childhood obesity? (2) Does entering school in general lead to a change in children's diet and physical activity levels, the two main contributors to the weight status of children? (3) Does starting school early lead to any significant long-term effect on the weight outcomes of children as they reach teenage years?

Martinez Rodriguez, Hector

Room 539, 10:30 a.m.

Neutronization during Carbon Simmering in Type Ia Supernova Progenitors

When a Type Ia supernova (SN Ia) progenitor first ignites carbon in its core, it undergoes $\sim 10^3$ - 10^4 yr of convective burning prior to the onset of thermonuclear runaway. This carbon simmering phase is important for setting the thermal profile and composition of the white dwarf. Using the MESA stellar evolution code, we follow this convective burning and examine the production of neutron-rich isotopes. The neutron content of the SN fuel has important consequences for the ensuing nucleosynthesis, and, in particular, for the production of secondary Fe-peak nuclei like Mn and stable Ni. These elements have been observed in the X-ray spectra of SN remnants like Tycho, Kepler, and 3C 397, and their yields can provide valuable insights into the physics of SNe Ia and the properties of their progenitors. We find that weak reactions during simmering can at most generate a neutron excess of $\approx 3 \times 10^{-4}$. This is $\approx 8 \times 10^{-4}$ lower than that found in previous studies that do not take the full density and temperature profile of the simmering region into account. Our results imply that the progenitor metallicity is the main contributor to the neutron excess in SN Ia fuel for $Z \gtrsim 1/3 Z_{\odot}$. Alternatively, at lower metallicities, this neutron excess provides a floor that should be present in any centrally ignited SN-Ia scenario.

Moon, Steven

Room 538, 2:30 p.m.

That's Not Our Music: Negotiating Identity and Mediterraneanism in Turkey and Egypt

Since the appearance of French historian Fernand Braudel's *La Méditerranée et le Monde Méditerranéen à l'Époque de Philippe II*, Mediterranean studies has helped scholars across disciplinary boundaries to decenter the Atlantic as the primary locus of ocean studies. This global repositioning arose in music studies during the 1990s, aided by the International Council on Traditional Musics' new study group, The Anthropology of Music in Mediterranean Cultures. It is taken for granted in scholarship that "Mediterranean music" exists, but few scholars can agree on parameters for this ontological "Mediterraneanness."

This Mediterraneanness, however, has largely focused on Western and Central-Southern Europe; few writing on the Eastern Mediterranean address the notion of Mediterranean connectivity. However, contemporary examinations of music in Turkey and Egypt, once connected by the Ottoman Empire and now separated by land and sea, demonstrate a relationship of borrowed songs and rhetorical likeness that demonstrates a Mediterranean conception of collective identity.

Engaging with several Mediterranean music texts, this paper's argument is twofold. First, connectivity through migration and empire has created a reciprocal relationship between Turkish and Egyptian popular media, both of which reify nationalist cultural claims. Second, a singular "Mediterranean music," as is seen in several texts of the field, fosters a counterproductive essentialism that undermines the Mediterraneanist notion of a deeply fragmented, highly connected sea. Demonstrating the ways in which nationalist discourse promote political and social differentiation, this paper argues for a translocal approach to the study of music in the Mediterranean.

Mullins, Angela

Room 539, 9 a.m.

Evaluation of Infiltration-Based Green Infrastructure Response to Storm Events in Pittsburgh, Pa., and Implications for Metal Flux

By 2030, urban land cover is projected to increase by 180% globally with the most land conversion occurring in underdeveloped regions. Urbanization disrupts the hydrologic cycle globally and increases local hazards such as flooding and erosion. Infiltration-based green infrastructure is designed to decrease storm water runoff in urban areas by allowing precipitation to penetrate into the groundwater. However, little is known about the impacts that roadside green infrastructure might have on groundwater quality. Specifically, this study focuses on the changes of water volume in infiltration trenches installed in Pittsburgh, Pa, on the seasonal and individual storm level to understand the flux of water transported and stored in the trenches. Seasonal changes and storm responses act as drivers of geochemical fluxes from road runoff to the trenches.

Nelson, Sandra

Room 539, 1 p.m.

Digital Dating, Digital Deconstruction: Affect and the Reinforcement and Complication of Heteronormativity in Online Dating Environments

The applicability of affect studies has allowed it (what is “it” referring to, online dating?) to permeate a variety of established academic areas such as the digital humanities (Kuntsman, Papacharissi) and gender studies (Berlant, McGlotten). Likewise, as online dating has gained popularity as a social practice, it has garnered attention from scholarly sources—particularly in communications (Frohlick and Migliardi, Rosenfeld and Thomas) and sexuality studies (McWilliams and Barrett, Tziallas)—and mainstream media (Sales) alike. However, little research has been done regarding the influence of affect on gendered social interactions in digital environments. My paper, “Digital Dating, Digital Deconstruction: Affect and the Reinforcement and

Complication of Heteronormativity in Online Dating Environments,” addresses this gap by utilizing the medium of online dating websites to examine the affective elements common to digital spaces and consider the ways in which heteronormative systems are reproduced and complicated in these environments. Constructing my theoretical framework from the writings of affect theorist Brian Massumi and queer theorist Lauren Berlant, I explore the interplay between affect and the Internet, detail the history of and features common to online dating websites, and discuss how these sites both perpetuate traditional gender roles and societal expectations and queer (is this the correct word? You are using queer as a verb here) these notions by providing a platform for the expression of queer desire and the development of alternative relationship structures. To do so, I analyze anecdotal evidence from communications studies conducted by scholars such as Ellison, Heino, and Gibbs, big data provided by Christian Rudder in his book *Dataclysm*, and the interfaces of sites like OkCupid and eHarmony.

Neureiter, Michael

Room 538, 1 p.m.

Evaluating the Effects of Immigrant Integration Policies in Western Europe Using a Difference-in-Differences Approach

Over the past 20 years, several Western European countries have adopted more restrictive integration policies, making entry, settlement, and citizenship for immigrants contingent on language acquisition, civic training, and liberal value commitment. The idea behind these new integration policies, which have largely replaced older integration models centered on multicultural ideals and practices, is that they will lead to improved integration outcomes. The question whether restrictive integration policies are actually successful in achieving their desired outcomes, however, is still contested among both policy makers and academicians. I contribute to this ongoing debate by examining immigrants’ responses to the European Social Survey (2002–2013) in 15 Western European countries. Using a difference-in-differences approach, I find that restrictive integration policies have a strong and positive effect on immigrants’ level of economic integration and, to a lesser extent, their level of social

and political integration, but no impact on their degree of cultural integration. Therefore, this study suggests a differential impact of integration policy across different dimensions of immigrant integration, but overall supports the notion that restrictive integration policies produce better integration results than multiculturalist policies.

North, Meredith

Room 538, 1 p.m.

What's Goethe Got to Do with IT: Mapping Networks of Artistic Exchange in the Digital Environment

Travel was a dynamic force in the shaping of intellectual and artistic cultures of eighteenth- and nineteenth-century Europe. Although capital cities such as Rome, Paris, and London served as major attractions for travelers, an interest in “national” landscapes and antiquities made infrequently trafficked local regions the focus of new forms of cultural tourism. The resulting international network of intellectual associations provided a conduit for the exchange of artistic and literary ideas in geographically specific contexts. Although Johann Wolfgang von Goethe has been primarily regarded for his literary production, his intellectual travels put him in contact with artists, architects, antiquarians, and aristocrats. While some of his multifaceted associations have been the subject of scholarly writings, this presentation uses an innovative digital platform, Itinera, to investigate Goethe’s travels alongside the objects of his study and his own creative output.

Developed by the Visual Media Workshop in the Department of the History of Art and Architecture at Pitt, Itinera is a digital environment that “has been designed to collect and present historical data within a visual context.” Of primary significance are the possibilities that social network associations, map-based visualizations, and object-centered cultures can offer to scholars and students. Using Goethe’s travels as a touchstone, this presentation will therefore address broader prospects for the digital environment in advancing humanities scholarship today.

Redman, Shane

Room 539, 2:30 p.m.

Ideas or People? The Relationship between Feminist Values and Representation

Are feminist values overpowered by party identification when evaluating female candidates for political office? On the one hand, it seems intuitive that individuals holding feminist values would want to increase the absolute number of female representatives. On the other hand, if the females running for office do not represent the policy interests of those individuals, it is possible that they are willing to give up increased descriptive representation for greater substantive representation. In this paper, I explore the question of whether representation has more to do with candidates’ ideas or the candidates’ ascriptive characteristics. To do this, I use data from the ANES to examine the extent to which party identification moderates the relationship between feminist values and female candidate evaluations. Given the limited time devoted to and interest in becoming informed about politics, individuals often rely on cues, such as stereotypes related to gender and party identification, to inform their political evaluations of candidates. Focusing on female candidate evaluations given by a group of people who are most likely to hold opposing views to traditional gender stereotypes (i.e., individuals holding feminist values) provides a unique opportunity to understand the relationship between feminist values and representation.

Rice, Caitlin

Room 548, 1 p.m.

The Role of Word Frequency and Number of Senses in Word Recognition Speed

Word recognition, which is fundamental to skilled reading, is the process in which we engage when we see a string of letters and have to decide if what we are seeing is a word. Many word features influence speed of recognition, such as how often words occur in language, the number and relatedness of a word’s senses, and the amount of prior real-world knowledge a reader has for a particular word. This study examined the speed of recognition of words that have more and fewer senses

as a function of whether they occur in language more or less often and whether they call to mind a relatively rich amount of prior knowledge about the contexts in which they can appear. We hypothesized, based on prior research (see Tokowicz & Kroll, 2007) that words that were both high in number of senses and bring to mind greater amounts of prior knowledge would be recognized most quickly. Surprisingly, this was not the case. Instead, words that were high in number of senses and occurred more often in language were recognized most quickly. These findings further our knowledge of how words are recognized and retrieved from memory. Understanding factors that influence word recognition speed contribute to our understanding of reading comprehension—a skill critical to academic success.

Samuelsson, Laura

Room 538, 10:30 a.m.

Objectively-Assessed Snoring is Associated with Increased Risk for the Metabolic Syndrome and Its Components in a Community Sample of Midlife Women

Snoring prevalence increases in midlife women and may increase the risk for cardiometabolic disease, although previous studies rely exclusively on self-reported snoring measures collected at a single visit. This study is the first to examine whether objectively-assessed snoring is cross-sectionally and prospectively associated with increased risk of the metabolic syndrome and its components in a community sample of midlife women.

Snoring was measured in 205 SWAN Sleep Study female participants (age=50.9±2.2yrs, 45% Black) with metabolic measures at T1 and T2. Total snores (TS) were summed. Metabolic syndrome criteria were measured at the SWAN visit closest to sleep night (T1) and again 8.55±0.47yrs later (T2). Metabolic components included hypertension, elevated fasting glucose and triglycerides, central adiposity, and low HDL; participants with ≥3 components were given metabolic syndrome designation. Logistic regression models were created (adjusting for age, race, depression, sleep duration, menopausal status, alcohol, exercise; apnea-hypopnea index); prospective models also adjusted for T1 metabolic syndrome and component measures.

In adjusted cross-sectional models, TS was associated with increased risk for the metabolic syndrome and all components ($p < .05$). TS was prospectively associated with metabolic syndrome in univariate analysis, although the association was attenuated in adjusted models, and with increased risk for hypertension, elevated glucose, and increased adiposity in adjusted models.

Objectively-assessed snoring is associated with increased cross-sectional metabolic risk and may also be a modest prospective risk factor, although studies using longitudinal measures of objective snoring are needed. Snoring represents an understudied yet important risk factor outside of traditional risk factors for cardiometabolic disease.

Smith, Sarah

Room 548, 1 p.m.

Dissecting the Novel Deployment of a Signaling Pathway during the Evolution and Morphogenesis of an Anatomical Structure

Development of complex anatomical structures is multifaceted, starting with the patterning events that determine where transcription factors and signaling pathways are spatially and temporally expressed. These patterning events then lead to the activation of cellular effectors and ultimately the adoption of a unique morphology for each cell. While much is understood on how patterning and cell morphogenesis is achieved individually, not much is known on how these two events are connected. To investigate this complex question a recently evolved morphological structure, the posterior lobe, will be investigated. Underlying the development of the posterior lobe is an important signaling pathway, the JAK/STAT pathway, which is initiated by the secretion of, unpaired (upd). upd has a temporally expanded expression pattern in species with a lobe. We have found that two separate enhancers contribute to this expanded pattern. Once enhancer is utilized to drive gene expression in two ancestral tissues, the eye and wing imaginal discs, but cis changes have occurred to allow for its activity in the posterior lobe. A second enhancer appears to remain intact between lobed and non-lobed species, indicating a trans change has occurred. This work has led to an understanding of how an important signaling factor is patterned,

but in order to understand how this leads to unique morphogenic changes we must first understand how the posterior lobe develops. Ongoing work is testing the possibility that tubulin is causing cells to elongate along their apical/basal axis and driving much of posterior lobe development.

Spicer, Michelle Elise

Room 548, 1 p.m.

Advocate, Adversary, or Bystander: Are Lianas a Driver of Tropical Epiphyte Diversity?

Tropical forests harbor over half of the world's biodiversity and sequester a disproportional amount of global carbon. However, human activities, especially deforestation and anthropogenic environmental change have caused dramatic shifts in the distribution and abundance of tropical flora and fauna. There is little doubt that these large-scale changes in tropical ecosystems have implications for biodiversity conservation as well ecosystem services, yet the mechanisms and intricacies of these processes remain unclear. One of the most recently observed trends in tropical forest dynamics is that lianas (woody vines) are increasing in global abundance. Because these structural parasites displace trees via competition and allocate more of their biomass in short-turnover leaves rather than long-term woody trunks, lianas can decrease forest-wide carbon sequestration by up to 34%. However, our understanding of plant diversity implications of lianas is entirely restricted to liana-tree interactions. In fact, a third of tropical vascular plant species are herbaceous epiphytes (air plants), yet liana-epiphyte interactions are completely unexplored. Epiphytes are likely to respond to liana presence since they use the same trees as substrate and share a climbing life history strategy. Further, epiphytes and their diverse faunal dependents are particularly sensitive to microclimatic conditions because they lack a root connection to the soil. Here, I use large-scale field experiments from the Barro Colorado Nature Monument, Panama to 1) experimentally evaluate the net effect of lianas on the diversity and abundance of epiphyte communities as a whole and 2) identify epiphyte life history strategies that are particularly sensitive to liana presence.

Thompson, Emily

Room 538, 1 p.m.

The Nameless Man of Many Names: The Performative "Un-naming" of Jean Valjean in Les Misérables

In Victor Hugo's *Les Misérables*, names play a key role for Jean Valjean, a criminal and ex-convict whose constant assumption of new names reflects a central drama of the story. As Valjean dies at the end of the novel, impoverished by a life lived on the margins of society, he asks that no name be written on his tombstone. In this paper I will argue that Valjean's choice at the end of his life culminates a performative act of "un-naming" initiated at the beginning of the book, an act which frees him from the constraints of incomplete identities. At the beginning of the novel, rather than reject Valjean on the basis of his criminal status like the rest of society, the bishop welcomes Valjean into his home, calling him "my brother." With this moment in mind, the reader can understand that it is this unnamed identity that Valjean chooses with his dying wish. The final relinquishing of names altogether signals Valjean's understanding of his own identity as including both the noble and the abject actions which have shaped him, the totality of which cannot be contained by any one name. In Valjean's dying moments the bishop reappears in the text, reminding the reader of his function in redirecting Valjean and bringing closure to his lifelong effort to become an "honest man." Freed of the names that characterized only fragments of his life, the reader can understand the nameless—but comprehensive—title of "brother" as the resting place of Valjean's identity.

Tienes, Jeffrey

Room 539, 1 p.m.

It's Like Crabs in a Barrel: Making a Scene in Pittsburgh Underground Hip-Hop

In this paper, I analyze changes in the local underground rap music scene in Pittsburgh, Pa. I describe how this music scene calls attention to two gaps in research on music scenes. First, research suggests that music scenes create bonds among scene members. Conflict in music scenes is characterized as being over behavior and

belonging, or, establishing an insider/outsider dichotomy and differentiating one scene from another. The Pittsburgh rap scene suggests a different kind of conflict where artists engage in horizontal hostility over access to limited resources within the scene. As aspiring artists in Pittsburgh attempt to use the local scene as a stepping-stone to achieve success in the commercial rap music industry, they see other artists as obstacles in the way of their success. Second, research on music scenes suggests that scenes succeed or fail based on a combination of two factors: members must remain dedicated to participating in the scene and the local infrastructure must support, or be amenable to, the scene's existence. Again, Pittsburgh provides an interesting case because while it seems that the local infrastructure is responsible for the perceived weakness of the underground rap scene, artists suggest that it is this competition that keeps the scene from reaching its full potential. They liken this competition to the imagery of "crabs in a barrel," where artists work to keep others in the scene from escaping the "barrel" of Pittsburgh rather than working together make the scene impossible to overlook by the commercial rap music industry.

Villada, Diego

Room 538, 9 a.m.

Heartwarming Stories Make Refugees the Object of Spectacle

Variety can be a byproduct asylum. When nation-states accept refugees' requests for asylum in order to begin the process of resettlement, variety is embodied in the people that nation-state has allowed to enter. The xenophobic response that sometimes comes from segments of the population within and without that nation-state are a response to the variety that the presence of the asylum seekers represents, both actual and perceived. In countering xenophobic responses, organizations and individuals sympathetic to the plight of the refugee's experiences (of uprootedness, transience and difficulties in adjusting to their new locale), sometimes perform their support publicly. The recent Syrian refugee crisis in Europe demonstrates this. Two examples of public performances of support for refugees are the cases of Osama Abdul Mohsen and Ferenc Gyurcsany. Osama Abdul Mohsen is a Syrian football coach who was

tripped (while carrying his 7-year old son) by a Hungarian camerawoman and later invited to live and work in Spain. Ferenc Gyurcsany, Hungary's prime minister from 2004 to 2009, invites refugees to eat in his home, take showers, and sleep. Both these instances of public support are heartwarming examples of human kindness in direct opposition to blatant xenophobia during a humanitarian crisis. That being said, if we examine both instances as performances of what Julie Salverson calls the "aesthetics of injury," I argue that the presentation of these heartwarming stories of Syrian refugees only serve to make them "objects of spectacle."

Washington, Michael

Room 548, 1 p.m.

The Effects of Sequence and Stereochemistry on the Physical Properties of Biodegradable Devices Composed of Poly(lactic-co-glycolic acid)

Poly(lactic-co-glycolic acid) (PLGA) and its copolymer derivatives have been exploited for a variety of clinical applications including controlled drug release, tissue engineering and medical implants that employ a random, unsequenced form of PLGA. Our group has developed a segment assembly polymerization (SAP) approach for controlling the sequence and stereochemistry within PLGA and is currently investigating a synthetic methodology to obtain new PLGA-derived sequenced copolymers. PLGAs synthesized by SAP contain exact repeating sequences whose components are interchangeable, allowing for tailoring towards specific therapeutic applications. In this study, changes in sequence, stereochemistry, and monomeric ratios were shown to have a profound effect on such properties as in vitro erosion and swelling in implantable pellets. Two-photon microscopy studies of PLGA microparticles dramatically illustrate the profound influence of backbone sequence on the hydrolysis profile and acidic microclimate within PLGA microparticles. These discoveries establish a greater understanding of the role of sequence in controlling properties as well as having important implications for the use of sequence in tuning the properties of PLGA used in bioengineering applications.

West, Kelsey

Room 538, 10:30 a.m.

Examining the Relation between Walking and Receptive Language in Infants at Heightened Risk for Autism Spectrum Disorder

Research has shown that the onset of walking is accompanied by an increase in receptive language acquisition in typical development (e.g. Gamliel, Yirmiya & Sigman, 2007; Walle & Campos, 2013). The present study set out to examine whether this pattern may be disrupted in the infant siblings of children with autism spectrum disorder (ASD; High Risk; HR)—particularly among infants who go on to receive an ASD diagnosis—given that there is ample evidence of substantial variability in language and motor development in HR infants (e.g. Iverson & Wozniak, 2007).

To test this, Hierarchical Linear Modeling was used to examine changes in the Words Understood measure of the MacArthur-Bates Communicative Development Inventory (CDI; Fenson et al., 1993) longitudinally across the transition from crawling to walking in three outcome groups of HR infants (No Diagnosis, Language Delay, and ASD; N=81) and in a control group of infants with no family history of ASD; N=25.

Results revealed that for infants with no eventual diagnosis—regardless of biological risk—walk onset corresponded to a substantial increase in receptive language growth. However, infants who went on to receive an ASD diagnosis did not show this increased pattern of receptive language growth. These findings have implications for understanding the transactional relation between communication and motor development in typical development, and how these processes may diverge in atypical development. Results suggest that cross-modal discontinuity may be characteristic of development in ASD.

Yang, Yusan

Room 548, 1 p.m.

Oophaga pumilio Males Bias Aggression towards Similar Color Morph When in Allopatry but Not in Sympatry

Male competition has been suggested to have a strong influence on the processes of population divergence. Asymmetric dominance relationships between phenotypes might prevent divergence driven by assortative mating when nonpreferred males are better competitors. Biased aggression toward a similar phenotype, however, can promote population divergence via negative-frequency dependent selection. Sexual selection has played an important role in population divergence in the highly polymorphic strawberry poison dart frog (*Oophaga pumilio*) in the Bocas del Toro Archipelago, Panama. We investigated whether the pattern of male aggression varies with a divergent male color and the social environment. Male aggressiveness was characterized using a plastic model frog coupled with call playback simulating an intruding male in the field. We tested the relative aggressiveness of males toward a red or a blue opponent in a red monomorphic population, a blue polymorphic population, and a contact zone where red and blue phenotypes interbreed. Males in the monomorphic populations biased their aggression towards the local color morph; males in the red monomorphic population are more likely to attack the red model, while males in the blue monomorphic population are more likely to attack the blue model. In the polymorphic population, however, males of both color morphs did not show aggression bias toward a certain color, nor did they differ in the level of overall aggressiveness. Our results suggest that in *Oophaga pumilio* male competition can contribute to maintaining phenotypic diversity among allopatric populations, but the pattern is disrupted when the red and blue phenotypes are in sympatry.

Zago, Fernando

Room 548, 1 p.m.

Inflationary Dynamics Reconstruction via Inverse-Scattering Theory

Despite the concordance between cosmological observations and the predictions of an early period of inflationary expansion in our universe, the physics responsible for driving inflation is still a subject of debate and remains largely speculative. This research project aims at shedding light on the stress-energy that drove the inflationary expansion by exploring the connection between inflation and inverse-scattering theory. I show that this approach to inflationary cosmology can successfully recover the Universe's expansion history during inflation to a reasonable accuracy provided enough data is available. These results constitute the first step in building a data driven approach for recovering the properties of inflation

