

**Gender, Women's, and Sexuality Studies I:
Women Working for Social Justice**

12:30-1:30 (Session 1)

Big Ten Theater (348)

Presenter	Department	Title
Christopher Thomas	<i>Communication Studies</i>	The Mothers of East Los Angeles: (Other)mothering for Environmental Justice
Kacie Rubalcava	<i>American Studies; Women, Gender and Sexuality Studies</i>	The Hands that Touch the Oranges: The Marginalization of Women's Labor History in Historic Preservation
Dellyssa Edinboro	<i>Education Policy and Leadership Studies (EPLS)</i>	Patterns, Rhythms, and Quilting: Black Women's Interweaving of Politics and Education in the Civil Rights Era (1954-1965)

The Mothers of East Los Angeles: (Other)mothering for Environmental Justice

Christopher Thomas, *Communication Studies*

This essay explores the Mothers of East Los Angeles (MELA)—an environmental justice group started and led by older Mexican-American women—and the organization's campaign to prevent the construction of a state prison in their neighborhood. The women enact motherwork that protects the wellbeing of the neighborhood's children, in addition to crafting motherwork into a communal responsibility to look after the neighborhood as a mother would their child. MELA's maternal appeals rely on and eclipse identification with traditional gender categories, suggesting new ways for motherhood to function as an organizing principle to mobilize collectives. More broadly, this essay contributes to scholarly discussions on rhetorical agency by considering motherhood as a means for women's collaborative and collective empowerment.

The Hands that Touch the Oranges: The Marginalization of Women's Labor History in Historic Preservation

Kacie Rubalcava, *American Studies; Women, Gender and Sexuality Studies*

Before Anaheim, CA was the home of Disneyland, it was the home to orange and lemon groves, citrus agriculture workers, and citrus-packinghouses that provided citrus fruit to the whole country. One packinghouse in particular was renovated, historically preserved, and turned into an upscale food court with eateries and bars. While the packinghouse utilizes pastoral-themed décor, it erases the actual history of Anaheim and Orange County's agricultural past, especially the workers that picked and packed the oranges and lemons. The packinghouse its self was overwhelmingly worked by women, who packed each

and every orange by hand. These women were also active in the agricultural labor movements, including one very bloody but forgotten strike that is part of Anaheim's history. The historical preservation processes as well as the recent changes to city redevelopment agencies in California, lead to the further erasure of local history, especially women's history.

Patterns, Rhythms, and Quilting: Black Women's Interweaving of Politics and Education in the Civil Rights Era (1954-1965)

Dellyssa Edinboro Education Policy and Leadership Studies (EPLS)

Quilting signifies a "communal connotation" and in viewing the specific actions of African American women as "patterns" on a larger quilt, one would observe the collective nature and trends within their reform efforts. Quilting was a tradition of African American women since the beginning of American history and its application to African American women's history is particularly relevant. Scholars have highlighted that utilizing quilt-making as a "cultural guide" to understand African American women's history validates the meaningful relationship they had with community, acknowledges their subjectivity, highlights the diversity of their actions, and recognizes how their private and individual experiences culminated into a collective and powerful voice that demanded to visibility and credibility. In this paper, I will expand on these perspectives that highlight the merits of applying a quilt-making approach to African American women's history by utilizing this "cultural guide" as an analytical framework to better understand the educational reform efforts of Black women in the civil rights era. I will specifically address Black women's contributions to education reform in this era by exploring how they weaved together political and educational reform in various strategies. In doing so, this paper will approach Black women's educational strategies as patterns on a larger quilt and trace the intertwining threads of political reform and educational reform in each pattern. Although this paper specifically examines the patterns of Ella Baker and Septima P. Clark, arguably, a larger quilt can be established from the actions of other Black women in the civil rights era whose strategic patterns similarly contained the interconnecting threads of educational and political reform so as to facilitate widespread changes in African American education.

Digital Humanities

12:30-1:30 (Session 1)

Herky Room (343)

Presenter	Department	Title
Caitlin Marley	<i>Classics</i>	The Shape of Cicero: A Sentiment Analysis of Cicero's Orations
Alexander Ashland	<i>English</i>	Making Data Fit: What Digital Repackaging Can Do for the Humanities
Andrea Lakiotis	<i>MFA Literary Translation</i>	Interactive Digital Translation

The Shape of Cicero: A Sentiment Analysis of Cicero's Orations

Caitlin Marley, *Classics*

How did ancient Romans manipulate emotions to appeal to and sway their audiences? This question has been debated by scholars for centuries, and today a computer too can weigh in on the argument. Sentiment analysis is a text mining method most commonly used to measure how positive or negative the voice of a consumer is in reviews and surveys. However, this analysis is not just limited to product and restaurant reviews. Political Scientists use this method to gauge reactions to political events by analyzing social media and news outlets. Recently, this method was applied to works of literature by the English scholar Matthew Jockers, who discovered that the sentiment he was measuring in the fiction could be used as a highly accurate proxy for plot movement. He then found six typical plot shapes used in novels. My experiment is a derivative of Jockers' method. I aimed to detect the "plot" of Cicero's speeches and to find standard plot shapes within them. To do so, I built a Latin sentiment lexicon, a list of Latin words ranked on a scale based on ancient emotional theory. At the end, I found nine distinct shapes in his speeches.

Making Data Fit: What Digital Repackaging Can Do for the Humanities

Alexander Ashland, *English*

This essay explores what I call "digital repackaging," an intentionally problematic concept that borrows its methods and pedagogical exigence from "curation"/github culture and the experimental "sampling" of digital media. It seeks to interrogate what existing visualizations can reveal about original datasets. In contrast to DH methodologies that urge scholars to reimagine graphical displays with core humanistic principles in mind (such as ambiguity, uncertainty, tension) I aim to examine the interpretive possibilities that can emerge from repackaging existing displays. Rather than entertain a top-down, data-first mentality in which developers "design graphical expressions suited to the display of interpreted phenomena" (Drucker 24), I ask, what are the ways in which both scholars and students can leverage, hijack, or otherwise appropriate code in an effort to make it "fit" with original datasets? This open source, sharing, peer-to-peer mentality is motivated by the idea that fitting data into existing visualizations can

actually inspire critical inquiry without sacrificing the kind of interpretive rigor many literary scholars imagine as being so essential to Digital Humanities scholarship. Finally, as a pedagogical concept, I explore several applications for how digital repackaging can teach students how to creatively redeploy existing visual technologies to satisfy their own critical inquiries.

Interactive Digital Translation

Andrea Lakiotis, *MFA Literary Translation*

When reading printed translations, we often encounter words that we imagine to be accurate and invariable, but in reality these words are not as fixed as they appear. A translator must constantly make decisions about word choice, sometimes overdetermining the meaning or infusing the text with his/her own bias. A dual-language edition creates a false sense of equivalency across the margins. For example, the French word “sort” can mean “destiny,” “future,” “spell,” “fate,” and “curse.” How do we translate this into one word, when in the original text there are multiple meanings? If I use “destiny” is quite spiritual whereas “curse” conveys a decidedly negative connotation. In traditional publishing, one must choose a singular meaning or else use asterisks and footnotes, but these text features are distracting and physically removed from the manuscript. Digital publishing enables flexibility unavailable to print. Online platforms can support more integrated features, such as pop-up boxes which appear by simply moving the cursor over or clicking specific words in the translated text. These boxes could provide the original word and its various interpretations or incorporate hyperlinks to connect the reader to external lexical, cultural, or contextual sites. With these relatively simple accompaniments to an online text, reading would become more interactive, inviting readers to participate in the processes of translation and heightening their awareness of the instability of language. In my presentation, I will discuss the theory and process behind creating interactive translations using principles from digital humanities and display the website I created through Ulowa’s Digital Scholarship and Publishing Studio Summer 2017 Fellowship.

Human Capital: Recruitment, Retainment, and Working Environment

12:30-1:30 (Session 1)

47 Things Room (346)

Presenter	Department	Title
Kristina Bigsby	<i>Informatics</i>	Keeping it 100: Social Media and Self-Presentation in College Football Recruitment
Roberto Benzo	<i>Health and Human Physiology</i>	Acute Effects of Interrupting Sitting on Discomfort and Alertness of Office Workers
Brittany Givens	<i>Chemical and Biochemical Engineering</i>	Characterizing Toxicity of Industrial Engineered Nanomaterials
I-Heng (Ray) Wu	<i>Management and Organizations</i>	Understanding when Overqualified Employees Engage in Job Searching or Internal Mobility Behaviors.

Keeping it 100: Social Media and Self-Presentation in College Football Recruitment

Kristina Bigsby, *Informatics*

Social media offers new avenues for individuals to engage in personal branding as well as new opportunities for researchers to study these efforts. We utilize the wealth of data related to American college football recruitment as a natural laboratory for studying the impact of impression management on recruiting outcomes. This study is the first large-scale examination of athletes' online behavior during recruitment, and we build logistic classifiers to identify instances of self promotion and ingratiation. We find that recruits engage in significant amounts of self promotion and ingratiation online. But do these online behaviors have measurable offline outcomes? We combine data about athletes' recruiting activities with data about their online impression management activities to model the number of scholarship offers received as a function of athlete characteristics and impression management strategies. Our results demonstrate that while both self promotion and ingratiation are associated with increased number of scholarships, ingratiation has a larger impact on the number of offers. In the realm of athletic recruiting, this research can help recruits shape their communications strategies during recruitment. Furthermore, our findings provide initial evidence that online impression management may have significant effects on offline outcomes in other recruiting contexts.

Acute Effects of Interrupting Sitting on Discomfort and Alertness of Office Workers

Roberto Benzo, *Health and Human Physiology*

Prolonged sitting time has been linked to various negative health and work-related outcomes. To date, it is unknown what patterns of sedentary behavior results in lower levels discomfort and increased alertness among office workers. The aim of this study was to compare the effect of uninterrupted sitting against interrupted sitting on alertness and discomfort among sedentary office workers. Methods: Fifteen middle-

aged (mean 36.5 years of age, SD 5.5) sedentary (sit more than 75% worktime) employees were randomized to three 4-hour conditions: (1) uninterrupted sitting; (2) sitting interrupted with 10 minutes of standing/hour; and (3) sitting interrupted with 10 minutes of pedaling/hour. Self-reported measures of alertness and discomfort were collected. Results: Uninterrupted sitting significantly increased discomfort ($p < 0.001$). Discomfort was lower in both the standing ($p < 0.001$) and pedaling ($p < 0.001$) conditions compared to the uninterrupted sitting condition. Short-lived improvements in alertness were observed immediately following several standing (50%) and pedaling (100%) interruptions. Conclusion: Prolonged sitting increases discomfort with brief bouts of standing and pedaling attenuate impairments in discomfort among sedentary workers.

Characterizing Toxicity of Industrial Engineered Nanomaterials

Brittany Givens, *Chemical and Biochemical Engineering*

Engineered nanomaterials (ENMs) are commonly used in many products in order to improve their quality and/or lifetime. This results in high exposure for employees manufacturing these products. Additionally, since ENMs are fairly new, there are no guidelines for establishing or reporting toxicity or occupational exposure limits. With this work, we aim to systematically characterize ENMs that are commonly used in industrial processes for their toxicity. To date, we have worked with upwards of ten materials and found that many are non-toxic at the current industrial exposure levels using various cell-based and animal-based studies. Over the course of five years, we aim to test over fifty materials in the same way and begin generating a library of materials based on our findings. Companies and national organizations to develop exposure limits and healthy working environment recommendations can then implement this library.

Understanding when Overqualified Employees Engage in Job Searching or Internal Mobility Behaviors.

I-Heng (Ray) Wu, *Management and Organizations*

Notwithstanding over twenty-five years of research on overqualification—i.e., the circumstance where a person's ability and experience exceed the demands of the job—scholarly understanding of overqualified employees' turnover is yet conclusive. This unfortunate reality prohibits our knowledge about how to retain such employees and better utilize their superior human capital. In this manuscript, we draw on theory of proximal withdrawal states to explain when overqualified employees choose to leave the organization, and which types of job-exit behaviors they engage in. In a field study of 271 employees from diverse organizations and industries in Taiwan, the results suggest that overqualifiers having greater intention to leave likely engaged in job searching behaviors, and that this relationship was strengthened for those who scored high on proactive personality. Moreover, overqualifiers having greater intention to leave likely engaged in internal mobility behaviors, and this relationship was strengthened for those who perceived an ease of movement. Together, our findings contribute to the literature by proposing a fairly parsimonious framework to disentangle the complexity of overqualifiers' turnover decision. Given that overqualification is a costly workplace phenomenon, organizations can also benefit from our study by understanding how to better secure and utilize overqualifiers' superior human capital.

Global Language and Education

12:30-1:30 (Session 1)

Homecoming Room (345)

Presenter	Department	Title
Mitchell Lingo	<i>Education Policy and Leadership Studies (EPLS)</i>	Stratification in Study Abroad Participation
Anna Mikhaylova	<i>Foreign Language Acquisition, Research and Education (FLARE)</i>	The Issue of Second Language Proficiency in Integrated Writing Assessment Tasks
Yue Hu	<i>Political Science</i>	Cultural vs. Non-cultural Impacts: How Does Language Policy Influence Political Trust?

Stratification in Study Abroad Participation

Mitchell Lingo, *Education Policy and Leadership Studies (EPLS)*

The study uses the Wabash Study on Liberal Arts Education to better understand student study abroad participation while holding intent constant. The study furthers past usage of the data in focus on participation and the socioeconomic construct of parental education. Students of advanced degree parents are more likely to study abroad than students with parents of or below a BA. Intent to study abroad, gender, academics, university type, course and orientation towards diversity, non-classroom faculty interactions, and co-curricular involvement have associations with participation. Individual analyses of educational class indicate student intent to participate, academic achievement, and liberal arts institution attendance remain salient in association to increasing study abroad participation with other factors presenting heterogeneity in their associations among classes.

Research and Education (FLARE) The Issue of Second Language Proficiency in Integrated Writing Assessment Tasks

Anna Mikhaylova, *Foreign Language Acquisition*

This paper presents an overview of relevant research studies on the issue of second language (L2) proficiency in integrated writing assessment tasks, which have recently gained popularity and appeared on many large-scale, high-stakes tests, e.g., TOEFL iBT. Integrated writing assessment tasks are based on source texts and require test takers to search for ideas in the source texts, select, synthesize, organize, and connect the ideas, and modify and acknowledge source text borrowing in their own writing. Despite the increasing popularity and many potential benefits (e.g., authenticity, greater fairness), integrated writing assessment tasks may be problematic due to a certain presupposed “threshold level” of L2

proficiency that test takers need to achieve in order to complete such tasks. To address the issue of L2 proficiency in integrated writing assessment tasks, researchers have investigated the relationship of L2 proficiency and discourse features, establishing essential contributions of accuracy and fluency rather than complexity to L2 test takers' scores (Plakans, Gebril, & Bilki, 2016). Scholars have also investigated the relationship of L2 proficiency and source text use: amount and types of source text borrowing (Weigle & Parker, 2012), the impact of comprehension on source text use (Cumming, Kantor, Baba, Erdosy, Eouanzoui, & James, 2005), the use of ideas from source texts (Wu, 2013), and the effect of source text use on lexical diversity (Gebril & Plakans, 2016). Researchers have found that lower-scoring L2 test takers tend not to use source texts or copy verbatim due to their lack of comprehension whereas higher-scoring L2 test takers tend to paraphrase, summarize, and synthesize information from the source texts. Overall, this paper argues for the importance of continuously investigating the issue of L2 proficiency in integrated writing assessment tasks with the goal of overcoming limitations and expanding benefits to L2 teaching, learning, and assessment practices.

***Cultural vs. Non-cultural Impacts:
How Does Language Policy Influence Political Trust?***

Yue Hu, *Political Science*

How can language policy, a public policy used by modern countries to formulate the linguistic systems, affect the public political attitudes and trust? This study challenges the conventional understanding that language policy only influences a minority of the population through cultural entitlement. Instead, it can impact a broader population by three unique communication-based mechanisms reflected in listening, speaking, and relative proficiencies in the official language. Analyses of multiple waves of nationally representative surveys in China support this communication-based theory. The findings demonstrate that Chinese citizens with higher listening proficiency in the official language are more in line with the government; those who have higher speaking proficiency have less trust in the established political institutions, while those who have higher relative proficiency have more trust.

Genes and Disease I: Enzymes and Neurons

12:30-1:30 (Session 1)

MGC Room (337)

Presenter	Department	Title
Chethya Ranasinghe	<i>Chemistry</i>	Effects of Protein Isotopic Labeling on Formate Dehydrogenase Bio-Catalysis
Bolu Zhou	<i>Pharmacology</i>	Genes Candidates in Rat Kidney Regulated by RGD1562963 that are Involved in Metabolic Syndromes
Eric Emmons	<i>Neuroscience</i>	Frontal Control of Temporal Processing in the Striatum
Muhammad Rahman	<i>Biology</i>	Combined Administration of P7C3-A20 and Ibuprofen Protects Rat Spiral Ganglion Neurons after Aminoglycoside Deafening

Effects of Protein Isotopic Labeling on Formate Dehydrogenase Bio-Catalysis Chethya Ranasinghe, *Chemistry*

Enzymes and proteins are the most effective biological catalysts that are essential for life. Enzyme dynamics have a broad spectrum, ranging from slow milliseconds to fast femtoseconds. Previous computational, theoretical, and experimental studies have shown an imperative role of slow enzyme dynamics in its function. It is equally important to unravel the origin of fast enzyme dynamics, which are more likely to play a role in catalyzing chemical bond cleavage. Isotopically labeled (heavy) enzymes were employed to experimentally study the role of fast dynamics. Here, we used nicotinamide adenine dinucleotide (NAD⁺) dependent formate dehydrogenase (FDH) from yeast as the model enzyme system. FDH catalyzes hydride ion transfer from formate to NAD⁺. We investigated the effects of isotopic labeling on both fast and slow time scale events along its catalytic pathway. Heavy enzyme studies were carried out with ¹³C; ¹⁵N (doubly labeled) and ¹³C; ¹⁵N; ²H (triply labeled) FDHs. We employed temperature dependence of kinetic isotope effects (KIE) to indirectly probe the enzyme active site structure fluctuations between unlabeled (native) and labeled enzymes. The results showed that perturbation of fast enzyme dynamics by mass increment, altered the chemical step of the hydride transfer reaction. Interestingly, slow time scale events were also perturbed by different isotopic labeling patterns. Further studies were carried out using two dimensional infra-red spectroscopy (2D-IR), to directly probe the femtosecond timescale motions in the enzyme active site. Together, these studies shed light on the molecular origin of fast motions that enhance catalytic efficiency of enzymes, along with varied effects of protein isotopic labeling.

Genes Candidates in Rat Kidney Regulated by RGD1562963 that are Involved in Metabolic Syndromes Bolu Zhou, *Pharmacology*

A single candidate gene in this locus (RGD1562963), is cis-regulated, has sequence variation between LH and LN rats, is differentially expressed in multiple tissues between LH and LN, and controls the expression of downstream genes mapping to the transeQTL hotspot that are associated with hypertension and MetS.

Frontal Control of Temporal Processing in the Striatum

Eric Emmons, *Neuroscience*

Although frontostriatal circuits are critical for the temporal control of action, the way that time is encoded in frontostriatal circuits is unknown. We recorded from and manipulated frontal and striatal neurons while rats engaged in interval timing, an elementary cognitive function that engages both areas. We report two main results. First, 'ramping' activity—a monotonic change in neuronal firing rate across time—is observed throughout frontostriatal ensembles. Secondly, interval timing and striatal ramping activity are disrupted when the medial frontal cortex is inactivated. Our results support the view that striatal neurons integrate medial frontal activity and suggest a possible mechanism—ramping activity—through which neurons might represent the passage of time. This principle elucidates temporal processing in frontostriatal circuits and provides insight into how the medial frontal cortex exerts top-down control of cognitive processing in the striatum.

Combined Administration of P7C3-A20 and Ibuprofen Protects Rat Spiral Ganglion Neurons after Aminoglycoside Deafening

Muhammad Rahman, *Biology*

Spiral ganglion neurons (SGNs) gradually die after destruction of hair cells, their sole afferent input. During SGN degeneration, the ganglion exhibits both inflammation and upregulation of the major NAD catabolizing enzyme, CD38, an activation marker for inflammatory cells. The novel P7C3 series of neuroprotective compounds helps stabilize neurons in times of energetic stress by activating the rate-limiting enzyme NAMPT in the NAD salvage pathway. Here, we assessed the individual and combined abilities of P7C3A20, a highly active analog of P7C3, and an NSAID, Ibuprofen, to protect SGNs from death in a preclinical model of kanamycin-induced deafening by hair cell destruction. **Methods:** Sprague Dawley rats were deafened by daily intraperitoneal injection of kanamycin, postnatal day 8 (P8)-P16. Rats showing an ABR for stimuli <95 dB SPL were excluded. From P22-P70, rats were injected daily intraperitoneally with P7C3A20 (20 mg/kg) and/or ibuprofen 40 mg/kg in DMSO/corn oil or vehicle only. Rats were euthanized at P70, cochleae fixed and cryosectioned (6 μ m) parallel to the midmodiolar plane. Myosin 6/7 immunofluorescence was used to monitor hair cell loss. NeuN and NF200 immunofluorescence were used to label neurons, which were counted in every fourth near-midmodiolar section. Image analysis was done using the FIJI ImageJ package with custom-written macros. The outline of Rosenthal canal for each turn was manually traced to measure cross-sectional area and to calculate SGN density. **Results:** Kanamycin injection resulted in loss of inner hair cells throughout most of the cochlea. By P70, SGN density in kanamycin-injected rats was significantly reduced in the basal region. Either P7C3 or Ibuprofen improved the survival of SGNs after deafening in the basal region significantly ($P < 0.05$), from ~30% to ~50% whereas a combination of these two agents improved it to ~60%. We conclude that P7C3, Ibuprofen, or a combination of these two is protective against SGN death in basal cochlea after aminoglycoside deafening. This further suggests that dysregulation of NAD⁺ metabolism in both hair cells and inflammatory cells in the spiral ganglion may play a role in SGN death after deafening, and provide a basis for new therapeutic treatments for patients.

The Toxic Environment

12:30-1:30 (Session 1)

Old Capitol (347)

Presenter	Department	Title
Md. Robiul Islam	<i>Chemistry</i>	Primary and Secondary Sources of Ambient Particulate Matter in the Kathmandu Valley, Nepal
Ezazul Haque	<i>Occupational & Environmental Health</i>	The Lead (Pb) Crisis in East Chicago, an Untold Story
Gavin Parker	<i>Chemistry</i>	Chemical Characterization of Metals in House Dust of COPD Patients
Eric Uwimana	<i>Human Toxicology</i>	Human CYP2A6, CYP2B6 and CYP2E1 Metabolize Chiral Polychlorinated Biphenyls (PCBs) to Hydroxylated Metabolites

Primary and Secondary Sources of Ambient Particulate Matter in the Kathmandu Valley, Nepal

Md. Robiul Islam, *Chemistry*

Kathmandu Valley, the capital of Nepal, suffers from severe air quality problems, due in part to particulate matter (PM). In this study, we use molecular markers to identify and quantify PM sources in Kathmandu from April 11-24, 2015. The concentration of PM_{2.5} (particles with diameters < 2.5 µm) ranged 30.0-207.4 µg/m³, all of which exceeded the World Health Organization 24-hour guideline of 25 µg/m³. PM_{2.5} was comprised in part by water-soluble ions, including sulfate (16%), ammonium (9%), nitrate (4%), indicating secondary inorganic aerosol contribution, as well as calcium (1.2%) and magnesium (0.1%), reflecting airborne soil dust. Major fractions of PM_{2.5} were organic carbon (27%) and elemental carbon (13%) that originate from combustion and secondary processes. To gain further insight to sources of organic carbon, gas chromatography coupled to mass spectrometry was used to quantify molecular markers that are indicative of PM sources such as garbage burning, biomass and dung burning, fossil fuel combustion, biogenic and anthropogenic secondary organic aerosol, etc. Preliminary source apportionment using chemical mass balance modeling indicated garbage burning (18%), biomass burning (17%), gasoline and diesel engines (18%) as major sources of PM_{2.5} organic carbon.

The Lead (Pb) Crisis in East Chicago, an Untold Story

Ezazul Haque, *Occupational & Environmental Health*

Polychlorinated biphenyls (PCBs) are mixtures of persistent organic pollutants comprised of 209 congeners depending on the number and position of chlorine atoms. Despite being banned from production in 1979 in the U.S., their physicochemical properties have kept them prevalent in the environment today and for the future. PCBs are commonly found in areas with industrial activities, which tend to also have presence of other toxic, bioaccumulative environmental pollutants such as trace metals. Recently, there has been a rise in concern for potential adverse effects from co-exposure to PCBs and trace metals. For this study, we assessed concentrations of trace metals in sidewalk surficial soils in proximity to a cohort in the Airborne Exposure to Semivolatile Organic Pollutants (AESOP) Study which has been following mothers and their children in East Chicago, IN and Columbus Junction, IA since 2008. Surficial soil samples (n=200) from sidewalks were collected in accordance to U.S. EPA Soil Sampling Guidelines (Method #SESDPROC-300-RI) using a soil sampling core which were then analyzed in situ using X-ray fluorescence spectroscopy (XRF) for Ti, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Rb, Sr, Zr, Mo, Ag, Cd, Sn, Sb, Ba, Hg, and Pb. Concentration of lead in East Chicago was found to be significantly greater than Columbus Junction (p<0.01). Furthermore, lead in soil was found to be greater than the EPA maximum contaminant level (MCL) of 400 ppm in 40% and 0% of the samples from East Chicago and Columbus Junction, respectively. Trace metals in clotted blood were analyzed using inductively coupled plasma-mass spectrometry (ICP-MS) using an acid digestion protocol from the CDC (Method

8005). Results from analysis of a subset of blood clot samples indicate the presence of trace metals in blood of AESOP Study participants in East Chicago. These preliminary results indicate the presence of aforementioned pollutants in East Chicago soil environment and blood and in some cases significantly above the regulatory limits. Ongoing work seeks to better understand the mechanisms responsible for synergistic toxicity resulting from co-exposure to PCBs and trace metals.

Chemical Characterization of Metals in House Dust of COPD Patients

Gavin Parker, *Chemistry*

Chronic obstructive pulmonary disorder (COPD) is a respiratory disorder defined by chronic airflow obstruction which impairs the respiratory system. Patients with COPD are at higher risk of developing respiratory infections, which can cause acute exacerbations of COPD a primary cause of mortality in COPD patients. Particulate matter has been linked with increased respiratory infection from bacterial growth, and metals may provide important bacterial nutrition. Other metals are highly toxic and can cause lung inflammation and oxidative stress, impairing airway immune response. Several studies have shown an association of indoor air pollution exposure and acute COPD exacerbations. This study investigates the mass fractions of metals in house dust collected from homes of 21 COPD patients by electrostatic precipitation during 30 days in winter time. Magnesium, aluminum, vanadium, manganese, iron, nickel, copper, zinc, arsenic, and lead were quantified using a microwave digestion and inductively coupled plasma mass spectrometry. Recoveries of target metal analytes were determined using NIST 2584, a house dust standardized reference material. Recoveries were 80-98% with a standard deviation <10%. The most concentrated metals in house dust were crustal metals such as magnesium, iron, and aluminum, with aluminum being the most prevalent. These species often had mass fractions from 3000-25,000 mg/kg. Toxic metals such as vanadium and arsenic were at levels 3-65 mg/kg. Lead did not exceed 350 mg/kg which is significantly lower than house dust collected from homes with lead based paint.

Human CYP2A6, CYP2B6 and CYP2E1 Metabolize Chiral Polychlorinated Biphenyls (PCBs) to Hydroxylated Metabolites

Eric Uwimana, *Human Toxicology*

Exposure to chiral polychlorinated biphenyls (PCBs) has been associated with neurodevelopmental disorders. Their hydroxylated metabolites (OH-PCBs) are also chiral and potentially toxic to the developing brain; however, the formation of OH-PCBs by human cytochrome P450 isoforms is poorly investigated. To address this knowledge gap, we tested the hypothesis that the biotransformation of 2,2',3,4',6-pentachlorobiphenyl (PCB 91), 2,2',3,5',6-pentachlorobiphenyl (PCB 95), 2,2',3,3',4,6'-hexachlorobiphenyl (PCB 132), and 2,2',3,3',6,6'-hexachlorobiphenyl (PCB 136) is mediated by different human cytochrome P450 isoforms. ADMET Predictor and MetaDrug software were initially used to predict cytochrome P450 isoforms involved in the metabolism of chiral PCBs in silico. These predictions suggested a role of CYP1A2, CYP2A6, CYP2B6, CYP2E1 and CYP3A4 in the metabolism of chiral PCBs. Subsequent metabolism studies with recombinant human enzymes demonstrated that CYP2A6 and CYP2B6 oxidized PCB 91 and PCB 132 in meta position and that CYP2A6 oxidized PCB 95 and PCB 136 in para position. CYP2B6 played only a minor role in the metabolism of PCB 95 and PCB 136, and formed meta hydroxylated metabolites. Traces of para hydroxylated PCB metabolites were detected in incubations with CYP2E1, whereas no hydroxylated metabolites were detected in incubations with CYP1A2 or CYP3A4. These findings suggest that CYP2A6 and CYP2B6 play an important role in the oxidation of neurotoxic, chiral PCB to chiral OH-PCBs in humans. Further studies are needed to characterize the enantioselectivity of the oxidation of PCBs by both cytochrome P450 isoforms and assess the toxicity of the resulting OH-PCBs. [Supported by ES005605, ES013661 and ES027169] Disclaimer: The findings and conclusions in this presentation have not been formally disseminated by the Centers for Disease Control and Prevention/the Agency for Toxic Substances and Disease Registry and should not be construed to represent any agency determination or policy.

***Gender, Women's, and Sexuality Studies II:
Meditations on Identity***

1:30-2:30 (Session 2)

Big Ten Theater (348)

Presenter	Department	Title
Nina Morrison	<i>Theatre Arts</i>	The Age of Innocence
Alea Adigweme	<i>Communication Studies</i>	"A Plea for Color" in <i>Quicksand</i> : Excavating the Essay in Nella Larsen's 1928 Novella
Holly Stevenson	<i>Philosophy</i>	Racial Justice Isn't Black or White

The Age of Innocence

Nina Morrison, *Theatre Arts*

My work as a queer, feminist playwright is centered around reimagining the presentation of women and other marginalized people on stage. I write highly theatrical comedies meant to highlight and satirize aspects of presentation and representation related to gender, race and power. My new play is titled *The Age of Innocence*, like the Edith Wharton novel. Wharton wrote the novel in 1920 when she was 50 years old and thinking about her childhood days in New York City in the 1870's long before the horrors of WWI. The novel is about the forbidden love and extramarital affair between very wealthy white people who cannot deny their love but are afraid of any impropriety that could threaten their wealth and social status. My play of the same title is inspired by Wharton's novel and also by the very public breakup announcement made by famous television writer-director Jill Soloway and famous poet Eileen Myles. Soloway and Myles announced their breakup at a museum lecture that was supposed to be about queer media and queer poetry. They decided to use the public speaking opportunity to publicly announce their breakup and process details of their relationship with the audience. My play is a comedy that borrows from the premise and structure of the Soloway Myles breakup announcement and Wharton's novel to examine gender, identity, privilege, romance and age.

"A Plea for Color" in Quicksand:

Excavating the Essay in Nella Larsen's 1928 Novella

Alea Adigweme, *Communication Studies*

Per the scholar-poet Ann Hostetler, Nella Larsen's 1928 novella *Quicksand* "is a meditation on color" that allows Larsen to "[advance] a thematics of race." Just how long can protagonist Helga Crane — a West Indian-Danish woman born, raised, and cultured in the United States — withstand the trauma of multiple and persistent unbelongings before succumbing to the toxic stressors of racism, sexism, and sexual repression? In prompting and then answering that question, Larsen not only uses pigment as a way to reveal the interiority of her characters, but she also uses it as a way to enumerate the many extant phenotypic representations of blackness, which, in turn, highlights the problems inherent to any attempts

to standardize the ideologies and socio-cultural experiences of the African Diaspora in the United States. Through essayistic prose framing the black female body — an idiosyncratic, and historically devalued, canvas — as an intricate work of polyphonous art, Larsen turns an ekphrastic eye toward skin color and raiment as locations for the visual subversion and/or reinforcement of “Proper Blackness” in order to critique the deep disconnect between active repression of women in black communities and deceitful rhetorics of racial uplift, highlighting the paucity of spaces in which black women could experience their own sexualities without facing sacrifice, violence, or burden as a consequence.

Racial Justice Isn't Black or White

Holly Stevenson, *Philosophy*

This essay has the pragmatic aim of modifying and improving Charles Mills' non-ideal theory regarding racial oppression as he presents it in "The Racial Contract" (1999) in order to further diminish racial injustice. I will present an account which not only reduces the opportunity for people to suffer from white ignorance and colour-blindness (which I believe Mills' account does) but which also accounts for the experiences of black women (which Mills' account detrimentally omits). For clarity, my argument is presented in premise form below.

- I. It is impossible for a theory of justice to avoid idealisations
- II. This constraint is not a bad one
- III. Any means to make it more difficult for people to suffer from white ignorance and/or colour-blindness is beneficial in terms of striving to reduce the level of racial injustice whilst increasing awareness about its magnitude, severity and implications
- IV. It is too detrimental for a theory concerned solely with race to omit intersectionality
- V. Whilst it will be counterproductive to include every intersecting group within a theory concerned with racial justice, such a theory cannot exclude black women

I believe it is crucial at this stage to highlight what my aims are and what they are not. As earlier stated, this paper has a pragmatic aim and is therefore not providing a descriptive account of racial injustice or comparing the varying degrees of harm which racial oppression can have on different individuals and different groups. In articulating an account focusing on racial injustice, I am not implicitly stating that racial oppression is the most important or harmful form of subordination but as my account is action-guiding with regards to this form of oppression exclusively, it is the focus of my paper. It is also worth noting that I am focusing on racial justice and lack thereof as described by Mills and therefore not racial justice broadly construed.

Social Meanings of Place

1:30-2:30 (Session 2)

Herky Room (343)

Presenter	Department	Title
Katherine Ostdiek	<i>English</i>	Digitally Mapping “Closed Worlds” in George Gissing’s <i>The Nether World</i>
Mary Wise	<i>History</i>	Sites of Sovereignty: Emma Big Bear Holt and Amateur Archaeologists, 1917-1968
Tania Lefevre	<i>Education</i>	Finding Tato

Digitally Mapping “Closed Worlds” in George Gissing’s *The Nether World* Katherine Ostdiek, *English*

The poor and the criminalized—outsiders in the British metropole—challenged the meaning of what it was to be British in the late-nineteenth century. As hyperbolized figures, they challenged and redefined local, national, and global expressions of Britishness as they occur in late-Victorian literature. In this presentation, I trace George Gissing’s forced and inevitable confinement of his poverty-stricken and devolved characters to specific locations in his novel *The Nether World* (1889). In these representations of the closed circuits of London slums, Gissing’s characters are unable to form any meaningful attachments or influence the conditions of their environment. Instead, their degree of Britishness, and therefore their national belonging, is reinforced or undermined by their location within the city. This is fiercely policed within and along the margins of the slums, where class and status are defined by a new set of rules and standards. To support my literary analysis, I employ a Neatline map of the British Isles, Met-Memory. I have prepared this digital map with the assistance and support of the Digital Scholarship & Publishing Studio. Met-Memory traces the movement of characters over the course of the novel, noting the range of movement allowed to the marginalized. I match this data with contemporary records on the social and cultural layout of the metropole to highlight the geographical identity of displaced populations and restricted individuals.

Sites of Sovereignty: ***Emma Big Bear Holt and Amateur Archaeologists, 1917-1968*** Mary Wise, *History*

This presentation reviews the cultural activism of Emma Big Bear Holt (Ho-Chunk) at earthworks in northeastern Iowa from 1917 to 1968. The Midwest is a site of Indian Removal and earthwork cultural activism revises these narratives. Non-native hobbyists and professional archeologists have long been recognized for their work on earthworks, including excavation and building collections for study. The work of indigenous cultural activists, like Emma Big Bear Holt, in protecting earthworks attests to the ancient sites’ relevance to contemporary indigenous people, to the limits of Indian Removal, and to the

importance of their work for tribal sovereignty and self-determination. In addition to reviewing Emma Big Bear's cultural activism, I will also review my research methods and I am excited to seek feedback on the visualizations I created. Stripping geographic data from relevant primary sources and visualizing this dataset makes visible how Emma Big Bear Holt and her family made use of site occupation as a means of protecting earthworks from amateur archaeologist and artifact hunters. These visualizations revise existing narratives about the homogenous history of Allamakee County at the turn of the twentieth century, add dimension to the activism of Emma Big Bear Holt and suggest that amateur archaeologists were far more organized than current scholarship asserts. These visualizations are not presented as complete or final. Rather, these visualizations are works-in-progress that help refine my research questions.

Finding Tato

Tania Lefevre, *Education*

Hurricane Maria's recent passing has made it impossible for Puerto Rico to go unnoticed. However, Puerto Ricans history has been shaped by migration to the United States of America, even before Hurricane María's aftermath. These migration patterns in the Puerto Rican community have existed for a long time. Poet Tato Laviera documents distinctive traits and peculiarities as well as values and practices of the emergence of the AmeRícan subculture that pertains to the Puerto Rican culture at large. His contribution to Puerto Rican history, as well as literature, is evident in his poetry because it documents immigration patterns. The objective of this essay lies in understanding two main concepts within Laviera's work: 1) identifying the Puerto Rican community outside the island as means to construe a definition of identity and 2) the importance of teaching Laviera, and other Puerto Rican literature written in English authors, as a form of agency.

Language, culture and identity play an important part of Tato Laviera's work. Within his poetry, one can identify an emergence of a new culture of Puerto Rican immigrants. This new term AmeRícan comes as a result of continuous changes based on a world of divergent attitudes. In Laviera's poetry, we can see that Puerto Rico's dimensions are no longer 100*35, since he creates a sense of inclusion towards a Puerto Rican community, which has established itself outside the island. Through his prose, he depicts the rejection AmeRícan receive from Puerto Ricans residing in the island, and the need for a safe place to those who feel abandoned by their motherland. He encourages and invites readers to break the cycle of rejection, and to think beyond stereotypes, allowing the AmeRícan voice to be heard. Laviera establishes a sense of "puertorriqueñidad" that is not born in "la Isla del Encanto," but rather a sense of "puertorriqueñidad" that engenders in the hearts of those who longed to belong to the island. Tato Laviera's work may provide new teaching perspectives in the classroom to teach students awareness of race, diversity and migration. This investigation's main purpose is to create awareness and to start complicated and uncomfortable discussions for bettering the understanding of Puerto Rican identity, as well as Puerto Rican education.

Math and Optimization

1:30-2:30 (Session 2)

47 Things Room (346)

Presenter	Department	Title
Bhupesh Shetty	<i>Management Sciences</i>	Process Pattern Mining: Identifying sources of assignable error using process event logs
Michael Redmond	<i>Management Sciences</i>	Most Reliable Travel Itinerary
Kevin Bombardier	<i>Mathematics</i>	Atoms in Quasi-local Atomic Domains
Elaina Aceves	<i>Mathematics</i>	Extending the Definition of the Fractional Dehn Twist Coefficient

***Process Pattern Mining:
Identifying Sources of Assignable Error Using Process Event Logs***
Bhupesh Shetty, *Management Sciences*

Most of the manufacturing companies in today's world store data related to their business processes with the hope of utilizing this data in the future to improve the bottom line of the company. Motivated by a problem faced by a local manufacturing company, we devise a method to identify the source of errors using the event log generated by the process. In this thesis, we develop a methodology to identify the sources of error, compare the effectiveness of our method when no process map knowledge is known versus complete process map knowledge is known, develop a supervised learning-based model to predict the probability of defective traces, formulate an optimization model to minimize the overall defect rate, and apply our methodology to other applications such as healthcare and clickstream analysis.

Most Reliable Travel Itinerary
Michael Redmond, *Management Sciences*

Most Reliable Travel Itinerary Problem Travel itineraries between many origin-destination (OD) pairs can require multiple legs, such as several trains, shared rides or flights, to arrive at the final destination. In today's world, travelers expect transparent reliability information to help improve decision-making for multi-leg itineraries. We focus on airline travel as well as "last-mile" transportation in order to make a priori decisions about itineraries based on the reliability of arriving at the destination within the travel time budget. We model the reliability of multi-leg itineraries and, given publicly available data, create probability distributions of flight arrival and departure times. We use these values in our reliability calculations for the entire itinerary. We implement a stochastic network search algorithm that finds the most reliable itinerary (MRI). We also implement several ideas to improve the efficiency of this network search and extend it to other modes of transportation. Computational experiments help identify characteristics of the MRI for a diverse set of OD pairs.

Atoms in Quasi-local Atomic Domains

Kevin Bombardier, *Mathematics*

The mathematical system of the integers has many useful properties. One of these is unique factorization. For example, we can write the number 14 in a unique way: $14 = 2 * 7$. However, the numbers 2 and 7 cannot be factored into "smaller pieces" in a nontrivial way. So in this sense, they could be called atoms of this mathematical system. Other mathematical systems usually do not have all of the nice properties that the integers do. However, some useful properties can be salvaged in certain cases. An atomic domain is a special mathematical system where its members have a factorization into a product of atoms. However, factorizations may not be unique as was the case with $14 = 2 * 7$. We will discuss some important cases of these atomic domains that usually will contain only a small number of atoms.

Extending the Definition of the Fractional Dehn Twist Coefficient

Elaina Aceves, *Mathematics*

One of the most integral motivations regarding examining a given braid is how to determine how twisted the object is in a global sense. To address this problem, Tetsuya Ito and Keiko Kawamuro introduced the Fractional Dehn twist coefficient (FDTC) of a braid in a general open book decomposition, which roughly can be used to measure the twists of the braid. An open book decomposition is a way to decompose a 3-manifold (viewed as a book) where at each cross section of the 3-manifold (each page), we see a surface S that we are more familiar with. The pages are connected together via a map F (the binding) to form the 3-manifold. In the current definition of FDTC, the coefficient is obtained by requiring the set of punctures P (the points where the braid intersects with the surface S) to be contained in a collared neighborhood of the boundary of S . My research extends this definition so that we no longer have any restriction on the location of the punctures.

Language: Rhetoric and Political Discourses

1:30-2:30 (Session 2)

Homecoming Room (345)

Presenter	Department	Title
Subin Paul	<i>Journalism and Mass Communication</i>	The Qatar-Gulf Crisis and Narratives of Emotionality in Nepal's English-language Press
Volha Kananovich	<i>Journalism and Mass Communication</i>	Discursively Empowered and Distrustful: The Impact of the Rhetorical Construction of the Taxpayer on Political Trust
Laura Brown	<i>Philosophy</i>	Free Speech and Alienation

The Qatar-Gulf Crisis and Narratives of Emotionality in Nepal's English-language Press

Subin Paul, *Journalism and Mass Communication*

This study examines the media discourse on the 2017-18 Gulf diplomatic crisis and its effect on one of the most marginalized populations in Qatar: Nepali migrant workers. While the diplomatic crisis made news headlines across the Middle East, Nepal-based newspapers were the only ones to cover the vulnerable migrant worker population in some detail. In writing about this population, three prominent English-language publications in Nepal, the Kathmandu Post, Republica, and People's Review employed emotional storytelling. Drawing on Wahl-Jorgensen's notion of the "strategic ritual of emotionality," this study specifically analyzes the use of emotion in the three publications' news coverage. The study finds that the publications engaged in the ritual of emotionality not by assigning that function to external news sources, as common in Western newspapers, but mainly through their own journalists and opinion writers who narrated their subjective viewpoints and concerns. This unreserved embrace of emotions and subjectivity in newswriting illuminates a unique, cultural mode of producing journalism.

Discursively Empowered and Distrustful: The Impact of the Rhetorical Construction of the Taxpayer on Political Trust

Volha Kananovich, *Journalism and Mass Communication*

Trust in government is crucial to the proper functioning of democracy. Yet, as shown by opinion data, Americans' trust in government is declining. Seeking to identify factors that shape political trust, previous studies have found it to be largely driven by citizen-government interactions, with paying taxes being one of the most salient and regular of those interactions. At the same time, the average American has been consistently found to lack basic awareness of taxation facts, let alone the knowledge necessary to make fully informed assessments of government performance. This makes mass-mediated discourse a commonly available, and potentially influential, interpreter of the meaning of government-taxpayers'

interactions that may affect political trust. However, despite the pervasiveness of taxpayer-centered rhetoric in American political discourse, previous scholarship has not explored its implications, even though recent studies have emphasized the need to provide a more comprehensive understanding of the role of the media in shaping political trust. The present study answers this call by experimentally testing if various ways to construct tax-related discourse (by portraying the taxpayer as either a disempowered subject obliged to the state or an equal partner that the government is accountable to) can influence the level of citizen's political trust. The findings of a randomized, controlled experiment (N=207) show that the "taxpayer-as-an-equal-partner" rhetoric that dominates American political discourse does have potential to boost citizens' level of trust, but this effect is limited to individuals with no direct experience of paying taxes and those with lower perceptions of tax contribution to government revenues. The study contributes to a more nuanced understanding of the role of the media in producing democratically consequential outcomes and may be of interest to activists and policy makers seeking to repair the "deficit of trust" among the American public. Keywords: political trust, taxation, democracy, framing effects, psychological tax contract, cognitive dissonance.

Free Speech and Alienation

Laura Brown, *Philosophy*

Society has reached a fever pitch when dealing with issues of freedom of speech. This topic is unavoidable, whether in the bar, classroom, or out in the social media universe. Certain speech has been deemed so egregious so that it should not be allowed. Others maintain that such a ban on certain speech is too great a cost for society to bear. These are difficult issues, and they become very complicated in the area of hate speech, that is, speech that is motivated by bias and is intended to cause harm. Most anyone can perceive that certain speech acts, like white supremacists speaking in Charlottesville, actually cause significant harm to some people. It seems like recently that hatred for one another has reached epic levels. Our intuition is to shut these people up. I argue that, if our goal is to eradicate hatred, then the best thing we can do to achieve this goal is allow hate speech. Mill and other defenders of free speech have offered several great reasons for why this should be the case, most notably the idea that good speech will correct bad speech. This essay explores a different, under-theorized benefit to permitting the freedom of speech, which is its ability to protect against alienation. In this paper, I argue that censorship leads to two sorts of alienation: alienation of the individual from the state and self-alienation. Both sorts of alienation lead to political instability, which in turn fans the flames of hatred.

Genes and Disease II: Microbial Infection

1:30-2:30 (Session 2)

MGC Room (337)

Presenter	Department	Title
Austin Rau	<i>Geographical & Sustainability Sciences</i>	Environmental Drivers of H3N2 Influenza Hospitalizations in Minnesota: 2012-2013
Amber Vu	<i>Microbiology and Immunology</i>	Extragenic Suppression of a Mutation in Herpes Simplex Virus Type-1 (HSV-1) that Affects Lamina Disruption and Nuclear Egress
Haydar Aljaafari	<i>Chemical and Biochemical Engineering</i>	Eradication of <i>Pseudomonas aeruginosa</i> Biofilm Formed Using Shaker Table and Drip Flow Reactor

Environmental Drivers of H3N2 Influenza Hospitalizations in Minnesota: 2012-2013

Austin Rau, *Geographical & Sustainability Sciences*

Influenza causes thousands of illnesses and deaths each year in the United States. In part, this is a byproduct of influenza genetics changing rapidly, resulting in different variants than the previous season. The current outbreak of H3N2 influenza is a testament to how the changes in influenza genetics can cause a vaccine to be less effective and have massive public health impacts including increased morbidity and mortality. Seasonal influenza traverses landscapes by infecting susceptible hosts, allowing it to move great distances due to the mobility of humans who occupy diverse natural, social, and built environments. Informed by medical geography theory, this study used spatial and statistical methods to identify socioecological components driving hospitalizations from H3N2 influenza in Minnesota during the 2012-2013 influenza season using data at the zip code tabulation area (ZCTA) scale. ZCTAs with high percentages of elderly people and people without health insurance were positively related with increased rates of hospitalizations. The information from these analyses can be used to inform our overall understanding of influenza and socioecological risk factors.

Extragenic Suppression of a Mutation in Herpes Simplex Virus Type-1 (HSV-1) that Affects Lamina Disruption and Nuclear Egress

Amber Vu, *Microbiology and Immunology*

Nuclear egress, the process of HSV-1 capsid escape from the nucleus to the cytoplasm, is accompanied by changes in the architecture of the nuclear lamina. The nuclear lamina is a meshwork of lamin subunits anchored to the inner nuclear membrane (INM) by lamin associated proteins (LAPs) and acts as a steric barrier for nuclear egress. Localized reorganization of the nuclear lamina is thought to facilitate capsid access to and curvature of the INM during the envelopment step of nuclear egress. Viral proteins pUL31 and pUL34 create the nuclear egress complex (NEC), which plays a role in nuclear lamina disruption. We have characterized a point mutant of pUL34, UL34(Q163A), that fails to induce gross changes in nuclear

architecture and redistribution of lamin A/C. The UL34(Q163A) mutant shows a roughly 100-fold defect in single-step growth and forms small plaques. Upon selection of extragenic suppression of UL34(Q163A), a mutation in pUL31, UL31(R229L), was found to largely restore virus replication but was unable to correct the lamina disruption defect. Our findings suggest that changes in nuclear shape and gross displacements of lamin A/C may facilitate, but are unnecessary for nuclear egress.

Eradication of Pseudomonas aeruginosa Biofilm Formed Using Shaker Table and Drip Flow Reactor

Haydar Aljaafari, *Chemical and Biochemical Engineering*

Lack of practical treatments for biofilm infections subject thousands of patients to multiple surgeries to replace implanted medical devices each year. Due to the tremendous protection mechanism of biofilm, even high dosages of antibiotics are unable to eradicate biofilm infection. In this study, the critical population density below which heat shocked biofilm is not viable has been determined by reincubation thermal shocked *Pseudomonas aeruginosa* biofilms. Biofilms were cultured to a steady-state population density of 10^7 colony forming units (CFU) per cm^2 and subjected to heat shocks of varying intensity (60, 70, or 80 °C for 1, 5, or 30 min). Their population density was quantified immediately following thermal shock, demonstrating population reductions ranging from none (no statistically significant reduction) after mild heat shock to complete (no viable bacteria detected) after aggressive heat shocks. Reincubation of thermally shocked biofilms for 2, 4, 12, 24 and 96 hours followed by resuspension and plating showed a bimodal response. Following heat shock, biofilms slowly regrew, eventually reaching their original 10^7 CFU/ cm^2 population density—if the population density immediately following these heat shocks was typically 10^3 CFU/ cm^2 or above. However, if the population density immediately following these heat shocks was typically below 10^3 CFU/ cm^2 (yet clearly detectable and quantifiable), the biofilms would continue dying off, with no viable CFU after a few hours, despite being able to form colonies when immediately resuspended and plated.

What Water Carries

1:30-2:30 (Session 2)

Old Capitol (347)

Presenter	Department	Title
Enrico Bruno	English	Troubled Waters: Postplantation Tidalectics of Charles W. Chesnutt's Conjure Tales
Sanjaya Dilantha Jayalath Mudiyansele	Chemistry	Adsorption of Suwannee River Humic Acid on CuO Nanoparticles: Effects of Nanoparticle Size and Surface Functionality
William Marquardt	Chemistry	Ab Initio Investigation of Interfacial Water Restructuring on Mineral Surfaces

***Troubled Waters:
Postplantation Tidalectics of Charles W. Chesnutt's Conjure Tales***
Enrico Bruno, *English*

Despite a recent revival in ecocritical readings of the works of Charles W. Chesnutt, the role of water in his conjure stories, many of which were collected in 1899's *The Conjure Woman*, remains unexamined. In this paper, I rely on Kamau Braithwaite's concept of tidalectics in reading passages related to waterways on the plantation—including creeks, rivers, and streams—to argue that these waterways are still permeated with the complicated history of plantation slavery in the postplantation period, decades after Emancipation.

Adsorption of Suwannee River Humic Acid on CuO Nanoparticles: Effects of Nanoparticle Size and Surface Functionality
Sanjaya Dilantha Jayalath Mudiyansele, *Chemistry*

Adsorption of Suwannee River Humic Acid on CuO Nanoparticles: Effects of Nanoparticle Size and Surface Functionality Copper oxide (CuO) nanoparticles are industrially important additive used in electronics, ceramics, coatings and lubricant oil. Manufacture and usage of the products containing CuO nps will release these nps into the environment. CuO nps released into the environment can have many negative effects on the environment. Most importantly CuO nps are toxic to many living organisms in the environment including bacteria, algae and plants. Environmental toxicity of CuO nps also depends on the factors present in the environment such as, natural organic matter (NOM). Humic acid is one of the most abundant water-soluble NOM in the environment. Humic acid is a ubiquitous high molecular weight molecule that has a heterogeneous and complex structure. Humic acid can be adsorbed on CuO nps released into the aqueous environment forming a layer of organic matter around the np. This humic acid coating can alter the toxicity and other properties of CuO nps in natural water. In this study the adsorption of HA on CuO nps is investigated in situ on the molecular level using attenuated total reflectance-Fourier

transformation infrared spectroscopy and X-ray photoelectron spectroscopy. According to the results, monodentate coordination mode is suggested as the most probable coordination mode for SRHA adsorption. A 0.39% increase of relative atomic composition of C compared to Cu (C/Cu %) is observed due to the SRHA adsorption in 40 nm CuO and about 4 % increase in C/Cu value is approximated for 4 nm CuO nps due to SRHA adsorption.

***Ab Initio Investigation of Interfacial Water
Restructuring on Mineral Surfaces***
William Marquardt, *Chemistry*

Chemical reactions at environmental interfaces have far-reaching implications. For example, reactions at aqueous interfaces can affect the composition of natural water sources, where contaminants wind up and how far they travel, atmospheric aerosol formation and composition, CO₂ sequestration, and catalysis mediated by both surfaces and surface-bound bacteria. Water adsorption at these interfaces is known to affect their chemical reactivity, but there is not yet a clearly understood relationship between water structuring at surfaces and its effects on reaction rates and energetics. Is coordination state the primary property that dictates surface functional group reactivity? How does the configuration of surface functional groups change in time, and what consequences does that have for reactivity? This work aims to determine both the extent and mediating factors of interfacial water ordering on the reactivity of mineral surfaces during the process of ion adsorption. To accomplish this goal, we will generate ab initio molecular dynamics trajectories starting from density functional theory-optimized static structures of alumina (Al₂O₃) surfaces with varying states of water ordering. Water has been shown to be weakly ordered with respect to alumina surfaces, and arsenate ion (AsO₄³⁻) is known to induce restructuring of interfacial waters on surfaces with weak water ordering. Adsorption energy per layer of water and charge density will be calculated, which should vary with increasing fractional occupancy of arsenate anion.

A Lifecycle of Social Development

3:30-4:30 (Session 3)

47 Things Room (346)

Presenter	Department	Title
Kathryn Goffin	<i>Psychological and Brain Sciences</i>	A Unique Path to Callous-Unemotional Traits
Patrick Bigsby	<i>Journalism</i>	Bombardment (a memoir)
Elizabeth Watters	<i>Couple & Family Therapy</i>	The Associations between Shame, Intimacy, & Relationship Satisfaction
Caitlin Simmons	<i>English</i>	"Something of a Non-Person": Jim Loney's Static Victimry in James Welch's <i>The Death of Jim Loney</i>

A Unique Path to Callous-Unemotional Traits

Kathryn Goffin, *Psychological and Brain Sciences*

It is widely acknowledged that children with callous-unemotional (CU) traits – disregard for rules, compromised empathy and guilt, shallow emotions – are at high risk for psychopathology. Few studies, however, have prospectively examined the early antecedents of CU traits in typically developing children. I will discuss the findings from a study of a community sample of 102 mothers, fathers, and children, followed from toddlerhood to early adolescence. The study examined main and interactive effects of children's fearless temperament and low concern about transgressions from toddler to early school age as predictors of CU traits in middle childhood and early preadolescence. Children's low concern about transgressions predicted CU traits, but those effects were qualified by the expected interactions with fearless temperament: Among relatively fearless children, those who were unconcerned about transgressions were at the highest risk for CU traits. For fearful children, variation in concern about transgressions was unrelated to CU traits. The results support a potentially unique etiology of CU traits in early development.

Bombardment (a memoir)

Patrick Bigsby, *Journalism*

This story is a short work of memoir chronicling a humorous episode from my adolescence. I wanted to write this piece as a means of exploring how rapidly feelings of pride and embarrassment are interchanged in a young person's life, often involuntarily. Viewed through the lens of memoir, the futility of trying to keep the two feelings separate is revealed. Adolescence, long used as the backdrop for melodrama by storytellers in every medium, is a stage of life where both pride and embarrassment are exaggerated to the point of absurdity. Every student of the typical American high school, where this story takes place, is familiar with the struggle to achieve extremely minor accomplishments (of which we feel proud) and avoid trivial social transgressions (of which we are embarrassed). Many memoirists have used episodes from

childhood to create captivating stories; E.B. White, Darin Strauss, and particularly Tobias Wolff stand out as significant influences on my attempt to do so here. If my work were to have any lasting impact, I would hope it might reverse or at least slow the eradication of dodgeball and its variants from high school physical education curricula.

The Associations between Shame, Intimacy, & Relationship Satisfaction

Elizabeth Watters, *Couple & Family Therapy*

Shame is a powerful emotion that can lead to negative perception of the self and cause individuals to withdrawal from relationship with others. Shame is significantly associated with to the social interactions, interpersonal relationships, and perceptions of self that individuals hold. This systematic review synthesizes literature examining the associations between shame, intimacy, and relationship satisfaction in couples. The results of this review indicate that shame-proneness, intensity of shame, and coping style (withdrawal/avoidance or approach behaviors) have a significant relationship with the level of intimacy that individuals and couples experience, as well as their relationship satisfaction.

"Something of a Non-Person": Jim Loney's Static Victimry in James Welch's The Death of Jim Loney

Caitlin Simmons, *English*

James Welch's *The Death of Jim Loney* can be incorrectly categorized as a text that perpetuates the notion of Native American victimry. An initial reading provides images of the "drunken Indian" stuck in stasis with no access to the past and no semblance of a future. My essay interrogates and problematizes this perspective of victimry by asserting Jim Loney's death is actually a moment of survivance and transmotion. By examining Gerald Vizenor's "Firewater Labels and Methodologies" and Gilbert Quintero's "Making the Indian: Colonial Knowledge, Alcohol, and Native Americans," I complicate the common misunderstanding and background of the "drunken Indian" by connecting it with Vizenor's notion of the "indian" as simulation and Quintero's argument that Native drunkenness is a ploy enforced by the colonizer to maintain distance from the colonized. The paper considers Loney's description of himself as "marked" as an internalization and resigned acceptance of shame stemming from his historical dispossession, mixed blood ancestry and alcoholic behavior. However, instead of reading his death as a continuation of that victimry, the paper reads it in light of the recent acquisition of his personal narrative. This new access to his memories acts as a starting point from which he propels himself away from stasis into survivance. By moving with agency to the reservation and making choices about his own future, Loney enacts transmotion. I argue that his death is meant less to continue his victimry and more to illuminate non-Native responses to the Natives who do not remain in their "proper place."

History and Media

3:30-4:30 (Session 3)

Herky Room (343)

Presenter	Department	Title
Dana Spyrikados	<i>Classics</i>	Technical and Ethical Knowledge of Medicine in Achilles Tattius' <i>Leucippe and Clitophon</i>
Nicha Pimthong	<i>School of Music</i>	A Hidden Piano Repertory of Morton Gould: Blue and Gold, in relation to President Herbert Hoover
Laurel Carlson	<i>American Studies</i>	"A Gift to the Camera": Adapting Textuality in McEwan's <i>Atonement</i>
Haley Larson	<i>English</i>	Limning the Infrathin: Image Fracture and Mediating Texts

Technical and Ethical Knowledge of Medicine in Achilles Tattius' Leucippe and Clitophon

Dana Spyrikados, *Classics*

Leucippe and Clitophon is an ancient Greek novel written by Achilles Tattius in the 2nd century. As a work of fiction directed toward a wide audience of varying levels of education and knowledge of the arts, this work contains far more references to theoretical and technical medicine than other novels, as well as ethical dilemmas in medicine, which is uncommon in the novel genre. One scene of particular interest is when Leucippe, the protagonist female, becomes uncontrollably mad. As four characters take turns diagnosing and curing her, Tattius displays knowledge of technical medicine and ethics from Hippocrates, Erasistratus (a Hellenistic anatomist), and Celsus (who wrote an encyclopedia on medicine). He uses this knowledge to make subtle jokes about doctors who undergo expensive training but lack practical skill, and doctors who belong to the Methodist sect. Tattius inverts the reader's expectation by making the characters who know technical medicine turn out to behave like charlatans, while the shady characters performing medicine are the ones who ultimately give the effective cures.

Works Cited: Tattius, Achilles. Tr. Tim Whitmarsh. 2001. *Leucippe and Clitophon*. Oxford UP.

A Hidden Piano Repertory of Morton Gould: "Blue and Gold," in relation to President Herbert Hoover

Nicha Pimthong, *School of Music*

During the Great Depression, music served as a mean for unheard voices. At the height of the time period, a seventeen-year old composer and piano prodigy, Morton Gould wrote a piece of music called "Blue and Gold" for piano and orchestra, which was dedicated and sent to President Herbert Hoover in July of 1931. Surprisingly, it appears to be a mysterious piece that the composer himself never talked about and is missing from Gould's long list of repertory. The manuscript of "Blue and Gold" has long been kept at the Hoover Presidential Library, waiting to be discovered. Thus, paying a visit to the presidential library is the only way anyone would know of its existence. This research aims to unfold the possible reasons of why Gould wrote the piece to President Hoover by integrating relevant findings of President Hoover and Morton Gould's timelines.

“A Gift to the Camera”: Adapting Textuality in McEwan’s *Atonement*
Laurel Carlson, *American Studies*

Ian McEwan’s 2001 novel, *Atonement*, chronicles a woman’s attempt to atone for a terrible mistake she made as a young girl. In 2007, *Atonement* was ambitiously adapted into a film directed by Joe Wright with a screenplay by Christopher Hampton. The critically acclaimed film, starring Keira Knightly and James McAvoy, was nominated for seven Academy Awards, including Best Picture. The difficulty of adapting McEwan’s novel into a film lies in its use of highly textual elements such as metafiction, intertextuality, shifts in perspective, shifts in writing style, and the inclusion of letters. Due to its narrative, which centers on the acts of reading and writing, the novel does not necessarily lend itself to cinematic translation. Thus, adaptation of *Atonement* from novel to film does change the narrative in several ways. While textuality is the focus of McEwan’s written narrative, the film uses cinematic elements in order to tell the same story with a focus on visual and aural components.

The purpose of this presentation is not simply to compare and contrast the novel and film versions of *Atonement*. Rather, the purpose is to explore how a change in medium, from text to film, affects a narrative – specifically a narrative like that of *Atonement*, which has its roots in textuality. Additionally, this presentation will not privilege the “original” written text, as is often the case when analyzing a cinematic adaptation. To focus simply on what is “lost” when a written text is adapted for the screen is not productive. Thus, this presentation will not focus on aspects of the “fidelity” or “infidelity” of Joe Wright’s film to Ian McEwan’s novel. It is much more productive and engaging to instead consider how a written art form versus a visual/aural art form can be used to generate two different consumer experiences using essentially the same source narrative.

Limning the Infrathin: Image Fracture and Mediating Texts
Haley Larson, *English*

Laura Kurgan’s *Monochrome Landscapes* (2004) juxtaposes four monochromatic color fields with slight hue variations and textures, small reminders of the life they represent and their pixel resolutions. These four large-scale satellite images, or monochromes, on the walls of the art gallery place viewers in a flickering perceptual plane. As a mosaic of media forms, they refuse a static status. Perceived as visual works, their text is rendered illegible; perceived as textual works, their visual elements become obscured. What does a flickering interaction with media enframe? How does the transformation of text into image and space rupture the “readability” of the work, and what are the consequences? The issue of illegibility in images has been widely debated, with scholars Judith Butler, Craig Dworkin, and Gérard Genette tackling both the necessity and optionality of context. This paper addresses the physical fracture between context and content and, by examining an art installation, proposes that inhabiting this liminal space is key to motivating critical questions of consumption. Kurgan’s *Monochrome Landscapes* emphasizes the illegibility of image data by including but physically distancing satellite data from images of ecologically and politically conflicted spaces. Enframed by paratexts, the work highlights its deceptive non-representation and rhetorically enacts its own analysis by turning the lens back upon its own socially-determined media protocols. The work places the viewer within a space of fracture, constructing the perception of being “in-between” the work and its context, and extending the gap in perceptual delays Marcel Duchamp coined *l’inframince* (the infrathin). This work utilizes media flicker between legibility and illegibility to challenge the uncritical and nonphysical consumption of visual records. This conceptual technique instantiates critique, alters perceptual protocols, and transfers critical accountability to the viewer. In its critique of media consumption, *Monochrome Landscapes* argues against its own fracture. While images increasingly serve as evidence for events, strategy, and even justice, the fractures between context and object become even more precarious and necessitate closer examination of all media protocols.

Genes and Disease III: Cancer Group

3:30-4:30 (Session 3)

MGC Room (337)

Presenter	Department	Title
Johanna Uthoff	<i>Biomedical Engineering</i>	Computer-aided Diagnosis of Lung Cancer: A Mosaic of Tissue Imaging Characteristics
Ilya Gurevic	<i>Chemistry</i>	Behavior of a TSase Mutant Toward an Alternative Substrate
Melissa Marchal	<i>Biology-Genetics</i>	The Paradoxical Role of Abl Kinases in Metastatic Prostate Cancer

Computer-aided Diagnosis of Lung Cancer: A Mosaic of Tissue Imaging Characteristics

Johanna Uthoff, *Biomedical Engineering*

Patients at high risk of developing lung cancer undergo an increasing amount of medical imaging procedures to detect and assess tumors, we examine the benefit of including surrounding parenchymal features in the development of computer-aided diagnosis (CADx) tools for lung nodule assessment. Methods: Lung nodule cases with pathology confirmed diagnosis (74 malignant, 289 benign) were used to extract quantitative imaging characteristics from computed tomography scans of the nodule and immediately surrounding lung parenchyma tissue. A CADx development pipeline was employed using k-medoids clustering and information theory to determine efficient predictor sets for different amounts of parenchyma inclusion. These feature sets were used to develop ensemble artificial neural networks to predict disease classification. The resulting CADx tool was validated using an independent cohort with lung nodules (50 malignant, 50 benign). Results: The inclusion of parenchymal imaging features produced statistically better CADx tools over exclusively nodular features. The best performing CADx (AUC-ROC = 1.0, precision-recall AUC = 0.945) included features derived from nodule diameter-based quartiles of 25%, 50% and 75% of the surrounding parenchyma tissue. The tool demonstrated little overtraining and obtained similar high performance values on the independent validation cohort (AUC-ROC = 0.965, accuracy = 98%, sensitivity = 100%, specificity = 96%). A comparison using the independent validation cohort with the Fleischner pulmonary nodule follow-up recommendations demonstrated a theoretical reduction in follow-up imaging and procedures. Conclusion: Radiomic features extracted from the parenchyma surrounding lung nodules contain valid signals with spatial relevance for the task of lung cancer risk classification. Through optimization of feature extraction regions from the parenchyma, exceptional CADx performance is achieved.

Behavior of a TSase Mutant Toward an Alternative Substrate

Ilya Gurevic, *Chemistry*

Cells keep an adequate supply of each of the four deoxynucleotide triphosphates on hand for the DNA synthesis that precedes cell division.¹ Most organisms, including *E. coli* and humans, rely on the enzyme thymidylate synthase (TSase) for the production of deoxythymidylate (dTTP) and dihydrofolate from 2'-deoxyuridine-5'-monophosphate (dUMP) and methylene tetrahydrofolate.¹ Thymidylate synthase is a useful anti-cancer target because rapidly dividing cells rely on it.² Knowing an enzyme's modus operandi has proven useful in inhibiting it.³ Our group examined the role that asparagine 177 plays in the TSase-catalyzed reaction. Properties of its aspartic acid mutant

have also been studied by Hardy et al,⁴ who, along with Santi et al,⁵ reported that this N177D mutant methylates deoxycytidylate (dCMP, differing from dUMP by an amino group in place of a carbonyl) along with dUMP and noted that these studies could have a nexus to the mechanisms of enzymes that perform epigenetic methylation of cytosine rings in DNA. Our objective was to examine the role of Mg²⁺, substrate binding order and hydride transfer for this system, as those aspects had not been addressed prior. Techniques such as kinetic isotope effects and their temperature dependency were used to address these questions. We learned that Mg²⁺ has perhaps a surprising effect on the steady-state parameters of N177D TSase. Partial compensation of the dCMP amino group for the amide-to-carboxylic acid transition in the mutant was observed in the other properties studied. Temperature dependency analysis of the intrinsic hydride transfer KIEs to examine this difficult, often rate-limiting step for N177D toward dCMP showed that the transition state for the hydride transfer step is likely precise like the WT-dUMP combination but somewhat less compact. The substrate binding order for N177D toward dCMP/MTHF exhibited a middle ground between the quite randomized substrate binding in N177D with dUMP/MTHF and the strictly ordered pattern for WT with dUMP/MTHF. These data give insight into the mechanism of the WT enzyme and also highlight both the power and the limits of compensatory phenomena of enzymes, which can often partially adjust to perturbations to their system, as was seen in our case.

The Catalytic Behavior of An Asparagine 177 Mutant E. Coli Thymidylate Synthase with Deoxycytidylate Ilya Gurevic, Zahidul Islam, Tasnia Iqbal, Kai Trepka, Ananda Ghosh and Amnon Kohen Department of Chemistry, University of Iowa, 251 N. Capitol St., Iowa City, IA 52245.

1. Carreras, C.W.; Santi, D.V. *Annu. Rev. Biochem.*, 1995, 64, 721-762.
2. Papamichael, D. *Stem Cells*. 2000, 18, 166-175.
3. Evans, G. B.; Furneaux, R. H.; Lewandowicz, A.; Schramm, V. L.; Tyler, P. C. J. *Med. Chem.* 2003, 46, 5271-6.
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The Paradoxical Role of Abl Kinases in Metastatic Prostate Cancer

Melissa Marchal, *Biology-Genetics*

Despite continuous advances in early diagnosis and treatment, prostate cancer remains the third most lethal cancer in U.S. men. The majority of prostate cancer-related deaths are due to the emergence of advanced metastatic disease. Soft-tissue visceral organ metastases occur less frequently in men with prostate cancer than more common metastatic sites, such as the lymph nodes or bone, but are more adversely prognostic. The Abl family kinases (ABL1/ABL and ABL2/ARG) are notoriously proto-oncogenic and are known to be causative for chronic myelogenous leukemia (CML) and Philadelphia chromosome-positive acute lymphocytic leukemia (Ph+ ALL). However, previous research in my lab has proposed that the Abl kinases exert paradoxical tumor suppressive effects in prostate cancer. This observation has significant implications for the treatment of human cancers with Abl inhibitors, and may explain why the Abl inhibitor, imatinib, worsened prostate cancer patients' outcomes in failed clinical trials. To better understand the role of the Abl kinases in prostate cancer, we have utilized single and double shRNA knockdown of ABL and ARG transcripts (ABL KD, ARG KD, and ABL/ARG KD) in GS689.Li cells, a metastatic subline of the PC-3 cell line. Here we report that ABL KD, ARG KD, and ABL/ARG KD exhibit enhanced growth relative to vector control cells (NT) under conditions designed to recapitulate the environment experienced by soft-tissue metastases, and that this growth may be modulated by small molecule Abl inhibitors (imatinib and GNF5) and activators (DPH). We also show, through biochemical analysis, that the Abl kinases act to suppress growth under conditions simulating soft-tissue environments by negatively regulating the PI3K/AKT signaling pathway. The PI3K/AKT signaling pathway is one of the most commonly dysregulated pathways in human cancers and is intimately tied to cancer cell survival. These new data help to establish the Abl family kinases as tumor suppressors in a model of metastatic prostate cancer and provide insights into therapeutic targets for the treatment of prostate cancer-related soft-tissue metastases.

Polymers and Ionic Liquids

3:30-4:30 (Session 3)

Old Capitol Room (347)

Presenter	Department	Title
Waruni Karunartne	<i>Chemistry</i>	Exploring the Interfacial Behavior of Ionic Liquids
Nicole Kloepfer	<i>Chemical and Biochemical Engineering</i>	Predicting Dose Rate Effects in EB Polymerizations Based on Monomer Structure
Thiranjeewa Lansakara	<i>Math, Physical, and Engineering Sciences</i>	Evaluating Mechanical Properties of Polymer Microgels by Using Atomic Force Microscopy (AFM)

Exploring the Interfacial Behavior of Ionic Liquids

Waruni Karunartne, *Chemistry*

Exploring the Interfacial Behavior of Ionic Liquids Ionic Liquids (ILs) are a class of molten salts with unique properties important for multiple applications including electrochemistry and lubrication. It is often the case that in these applications ILs coexist with various interfaces. Therefore, understanding the behavior of ILs exposed to phase boundaries has become an important and exciting area of research. Several experimental and theoretical studies performed over the past few years have illuminated interesting aspects of ILs in contact with interfaces. According to some recent findings, the effect of confining surfaces could extend significantly beyond a couple of liquid layers from the interfacial region. The aim of our work is to provide insight into such patterns of organization seen in ILs using computer simulations. During my presentation I will discuss results from molecular dynamics simulations on an asymmetric IL based on the alkylimidazolium-alkylsulfate family in contact with vacuum. These results will be put in the context of prior simulations and experiments on various ILs.

Predicting Dose Rate Effects in EB Polymerizations Based on Monomer Structure

Nicole Kloepfer, *Chemical and Biochemical Engineering*

Dose rate effects (DREs), or changes in polymer properties due to changes in dose rate, can be problematic during scale-up of electron-beam-initiated polymerization. DREs are not apparent for all formulation chemistries and processing parameters, and predicting when they will occur is challenging. Using glass transition temperature as measured by dynamic mechanical analysis, DREs were characterized for various acrylate monomers polymerized at different dose rates. Results show monomers with more easily abstractable hydrogens have smaller DREs.

***Evaluating Mechanical Properties of Polymer Microgels
by Using Atomic Force Microscopy (AFM)***

Thiranjewa Lansakara, *Math, Physical, and Engineering Sciences*

Nanoparticles have shown excellent promise as drug carriers for targeted drug delivery. Specifically, the nanoparticle size, charge and surface functionality allows a possibility to control the particle uptake at a targeted site. Recent findings suggest that nanoparticle mechanical properties may also have a significant role to play in uptake mechanism of endocytosis where extensive characterization of mechanical properties of drug carrier polymer nanoparticles is important. Here we present a study to determine on a single particle basis mechanical property of polystyrene-co-poly(N-isopropylacrylamide) (pS-co-NIPAM) nanoparticles using Atomic Force Microscopy (AFM) nanoindentation technique and a bulk particle characterization carried out with Brillouin Light Scattering (BLS). Based on the combination of these complementary techniques, we demonstrate an insight into a particle morphology of nonhomogeneous polymer nanoparticles when characterizing mechanical properties.

Oral Presentations by Room

Room	Big 10 Theater (348)	Herky Room (343)	Homecoming Room (345)
Session 1:	Gender, Women's and Sexuality Studies I: Women Working for Social Justice	Digital Humanities	Global Language and Education
Session 2:	Gender, Women's and Sexuality Studies II: Meditations on Identity	Social Meanings of Place	Language: Rhetoric and Political Discourses
Session 3:		History and Media	
	47 Things Room (346)	MGC Room (337)	Old Capitol (347)
Session 1:	Human Capital	Genes and Disease I: Enzymes and Neurons	The Toxic Environment
Session 2:	Math and Optimization	Genes and Disease II: Microbial Infections	What Water Carries
Session 3:	A Lifecycle of Social Development	Genes and Disease III: Cancer Group	Polymers and Ionic Liquids