13th Annual Undergraduate Research Conference

University at Albany
State University of New York

April 29, 2016
Lecture Center Concourse
13th Annual Undergraduate Research Conference

Schedule

Friday April 29, 2016

Poster Session 3:00 – 4:00
Welcome and Award Presentations 4:00 – 4:30
Presentation Session 4:45 – 6:30
Reception 6:30 – 7:30
2016 Presidential Undergraduate Research Award Recipients

Roi Ankawa: "Is the Effect of Glucose on Hippocampal Memory Insulin-Dependent?"
Faculty Advisor: Ewan McNay, College of Arts and Sciences, Department of Psychology

Eliza Barach: "Tweet Sentiment Analysis with Pronoun Choice Reveals Online Community Dynamics in Response to Crisis Events"
Faculty Advisor: Laurie Beth Feldman, College of Arts and Sciences, Department of Psychology

Zana Beck: “Effectiveness of Beer Keg Registration Laws on Reducing Underage Drinking”
Faculty Advisor: Baris Yoruk, College of Arts and Sciences, Department of Economics

Kaitlyn Bellettini: “Let’s Watch Our Lives on the Screen: Reality TV, Video Game Vlogging, and the Endless Search for Identity”
Faculty Advisor: Mary Valentis, College of Arts and Sciences, Department of English

Brian Bollen: “Irrational Eigenvalue of the Discrete Laplacian After Subdivision”
Faculty Advisor: Alexandre Tchernev, College of Arts and Sciences, Department of Mathematics and Statistics

Tomer Burg: “Analysis of Late Summer Heat Waves in the Northeast US”
Faculty Advisor: Lance Bosart, College of Arts and Sciences, Department of Atmospheric and Environmental Sciences

Nicole Cardinale: “Unique for its Time: Head of a Moor by Peter Paul Rubens”
Faculty Advisor: Sarah Cohen, College of Arts and Sciences, Department of Art and Art History

Kelsey Fleming: “Neuronal Glutamate Transporter EAAC1 Regulates Anxiety and Motor Activity in Mice”
Faculty Advisor: Annalisa Scimemi, College of Arts and Sciences, Department of Biology

Anh (Ami) Minh Le: "Colorimetric Assay for Discerning Sex for Fingerprints”
Faculty Advisor: Jan Halamek, College of Arts and Sciences, Department of Chemistry

Faculty Advisor: Morton Schoolman, Rockefeller College of Public Affairs and Policy, Department of Political Science

Emily Schlierer: “The Effects of Social Media Use on Foreign Fighter Recruitment for ISIS”
Faculty Advisor: Dana Peterson, School of Criminal Justice

Aisling Sive: “Marti and Marx: Cuba’s Denial of Racism”
Faculty Advisor: Christine Preble, College of Arts and Sciences, Department of Latin American, Caribbean and U.S. Latino Studies
Poster Session 3:00 – 4:00

*Please See Abstract Section for Abstracts of Posters*

**Lecture Center Concourse**

**Rakshika Balasubramaniyam** - “Potential Therapeutic Impacts of Various PPARs Antagonists and Agonists on Her-2 Positive Breast Cancer”

**Eliza Barach** - “Tweet Sentiment Analysis with Pronoun Choice Reveals Online Community Dynamics in Response to Crisis Events”

**Zana Beck** - “Effectiveness of Beer Keg Registration Laws on Reducing Underage Drinking”

**Mathew Boll** - “Differentiation of Dyed and Undyed Hair Using ATR-FTIR Spectroscopy and Chemometrics”

**Anthony Demme** - “The Classical Limit of a N Particle Quantum System in Entropic Quantum Dynamics”

**Morgan DeVuyst and September Johnson** - “To What Extent Are Health Indicators and Human Rights (HR) Indicators Compatible with Respect to HIV/AIDS Services for Injecting Drug Users (IDUs)”

**Thomas Dunn** - “Phenotypic Characterization of Adipose-specific VDR Knockout Mice on Rescue Diet”

**Christina Ehert** - “IDU in Afghanistan”

**Kelsey Fleming** - “The Neuronal Glutamate Transporter EAAC1 Regulates Motor Activity and Anxiety in Mice”

**Jack Genovesi** - “Explaining Energy Resolution in Liquid Xenon Detectors”

**Emily Grasso** - “Increasing User Engagement in Social Media”


**Vincent LaMantia** – “Unlocked Nucleic Acids for miRNA Detection Using Two Dimensional Nano-Graphene Oxide”

**Imani Lawrence and Angelis Gomez** – “The Impact of Cognitive Executive Function on Self-Correction and Verbal Fluency in Preschoolers”

**Anh (Ami) Minh Le** – “Colorimetric Assay for Discerning Sex for Fingerprints”

**Molly MacIsaac** – “A Two-state DNA Nanoswitch for Nucleic Acid Detection”

**Valdis Rice** - “The Mediating Effect of Moral Beliefs on Responses to Cyberbullying Scenarios”

**Emily Schlierer** – “The Effects of Social Media Use on Foreign Fighter Recruitment for ISIS”

**Lukas Sotola** – “Does Motivation to Rationalize the Status Quo Make People More Receptive to Sexist Humor?”

**Katarina Spero** – “Differential Economies: A Comparative Study of Stone Tools and Faunal Assemblages from the Postclassic Mayan Site of Mayapan”

**Nicholas Voss** – “The Effects of Familiarization on Cross-Modal Aesthetic Preference.”

**Nicole Wallack** – “The Effect of Atmospheric Hydrogen on the Albedo and Surface Temperature of Mars”

**Katherine Wayne** – “Turkey: An Overview on Regional Drug Use, Treatment Design, and the Characteristics of Inpatients Utilizing Treatment”

**Elizabeth Wilkinson** – “Understanding Reconnaissance and Intelligence Gathering Best Practice to Prevent Footprinting and Cyber Attacks”

**Peter Zambetti** – “The Role of Multiple Context Exposures on the Incubation of Fear Memories”
Welcome and Award Presentations 4:00-4:30
Lecture Center Concourse between LC 30 and LC 31

Leslie Halpern, Ph.D., Interim Associate Vice Provost and Interim Honors College Director

James R. Stellar Ph.D., Senior Vice President for Academic Affairs and Provost

Jeanette Altarriba Ph.D., Vice Provost and Dean for Undergraduate Education

James A. Dias Ph.D., Vice President for Research
Please join us for refreshments in the hallway between LC 2 and LC 24 after the Research presentations.

Presentation Session  4:45 – 6:15

Please See Abstract Section for Abstracts of Presentations

LC 3A: History, Political Science, and Art History

Derek Canino - “Leon Johnson: A Fugitive from Injustice”

Jordan Zavesky - “Values in Proceduralist Democracy: A Critique of Minimalism”

Troy Norton - “Mimesis in Practice: The Intersection of Artistic Reproduction and Politics”

There will be a 5 minute break prior to the next two presentations

Akeela Makshood - “Doris Duke’s Islamic Art Collection: Building Bridges between Islamic Art and American Society”

Nicole Cardinale - “Unique for its Time: Head of a Moor by Peter Paul Rubens”

LC 3B: Culture and Literature

Aisling Sive - “Marti and Marx: Cuba’s Denial of Racism”

Katarina Abad - “Lost in Translation? English Influence on the Pragmatic and Idiomatic Expressions of Spanish Heritage Speakers”

Richard Lonergan - “Friction: On the Future and Potential Pitfalls of the Chinese ‘One Belt-One Road’ Transportation Project in Eurasia”

Richard Lonergan - “Fascism in Japan and Beyond: Fascist State Power and State Formation – Organized Crime as Politics”

LC 3C: Psychology and English

Merel Mireille Hermans - “Homophobia in Non-Heterosexuals and Their Families”

Tiffany Araya - “Trans-cending Gender: The Language of Identity”

Kaitlyn Bellettini - “Let’s Watch Our Lives on the Screen: Reality TV, Video Game Vlogging, and the Endless Search for Identity”

Seunghyun Shin - “Documentary of the Modern and the Contemporary Socio-Political Issues: Public Intellectualism in Muriel Rukeyser’s The Book of the Dead and C.D. Wright’s One Big Self”
Please join us for refreshments in the hallway between LC 2 and LC 24 after the Research presentations.

**LC 5: Physics and Biology**

**Felipe Xavier Costa** - “Raman Hyperspectral Imaging of Hybrid PGS-PLGA Fibers with Singular Value Decomposition Analysis”

**Nadia Rodriguez** - “Environmental Pollution in Staten Island’s North Shore and its Effects on Latinos and Other Ethno-Racial Minorities”

**Roi Ankawa** - “Is the Effect of Glucose on Hippocampal Memory Insulin-Dependent?”

**LC 6: Chemistry**

**Tom Geiger** - “New Enzyme-based Forensic Approach for the Identification of Sex from Fingerprints”

**Roselyn Rodrigues** - “Bloodstains Enzyme-based Analysis for Discerning the Age of the Originator”

**Kaycie Lawson** - “Viral Immunity in Yeast: Exploring the Role of RNA post Transcriptional Modifications in the ‘Killer’ Activity of L-A Virus”

**LC 19: Atmospheric Science and Business**

**Rachel O’Donnell** - “Influence of Topography on Convective Patterns across the Greater Capital Region of New York”

**Tomer Burg** - “Analysis of Late Summer Heat Waves in the Northeast US”

**Kaita Albanese** - “The Relation between Social Responsibility and Exit Performance of VC-Based Entrepreneurial Firms”

**LC 20: Mathematics and Computer Science**

**Stuti Misra** - “Low-Cost Ubiquitous Spectrum Sensing and Characterization”

**Timothy LaRock** - “Airpress: Towards Spectrum Inventory at Scale”

**Brian Bollen** - “Irrational Eigenvalues of the Discrete Laplacian after Subvision”
Poster Session

Rakshika Balasubramaniyam - “Potential Therapeutic Impacts of Various PPARs Antagonists and Agonists on Her-2 Positive Breast Cancer”
Faculty Advisor: Douglas Conklin, School of Public Health, Department of Biomedical Science
Accumulation of fatty acids in non-adipose tissues is cytotoxic to cells. In 20 - 30% of breast cancers it is found that ERBB2 oncogene is over-expressed. ERBB2 positive breast cancer cells produce high amounts of fat as a result of overexpression of peroxisome proliferator activated receptor (PPAR)γ binding protein and nuclear receptor NR1D1. Members of the peroxisome proliferator-activated receptor family are known to coordinate extensive changes in gene regulation. PPARγ regulated genes play a vital role in helping fatty acids produced by ERBB2-positive breast cancer cells be converted to triglycerides. PPARγ is therefore considered a crucial factor for prevention of cell death that results from lipotoxicity. Here, potential therapeutic impacts of various PPARγ antagonists and agonists on ERBB2-positive breast cancer cells were investigated. With the help of mass spectrometric quantification of fatty acids and fluorescence-based high content microscopy, cell growth, apoptosis, triglyceride storage and reactive oxygen species (ROS) production rates were determined. Results show that inhibition of the PPARγ pathway gives rise to elevated amounts of fat accumulation in cells along with an increase in the rate of cell death and apoptosis. Also, we find that ERBB2-positive breast cancer cells are more sensitive when PPARγ activity is inhibited by antagonist GW9662 when compared with other types of breast cancer cells or normal mammary epithelial cells.

Eliza Barach - “Tweet Sentiment Analysis with Pronoun Choice Reveals Online Community Dynamics in Response to Crisis Events”
Faculty Advisor: Laurie Beth Feldman, College of Arts and Sciences, Department of Psychology
We describe the development of an online community from naturally occurring social media data. Our method analyzes patterns of word choice in an online social platform to characterize how a community forms in response to crisis events such as a terrorist attack. Our focus is English Twitter messages (tweets), surrounding the Charlie Hebdo terrorist attack in Paris in January 2015. We examined the tweets by breaking them down into their individual words, classifying them by which pronouns they included and then analyzing the word variations that co-occur with individualist pronoun “I” and collectivist pronoun “we”. We used existing databases to measure valence (sadness) and arousal (excitement). Analysis across days showed that tweets containing I pronouns were more negatively valenced, but lower in arousal than tweets containing we pronouns. We also examined the patterns of word choice of the most prolific twitter users (top 2% by number of tweets) and the most frequent tweets in our collection (top 2% by number of retweets). Differences between users and tweets based on frequency are revealing about how lexical variation in tweeting behavior emulates the emergence and evolution of a community in reaction to catastrophe on an international scale.

Zana Beck - “Effectiveness of Beer Keg Registration Laws on Reducing Underage Drinking”
Faculty Advisor: Baris Yoruk, College of Arts and Sciences, Department of Economics
Since the prohibition act of 1919, alcohol has always had high economic costs and benefits. While it increases revenues for the Federal Government through taxation and company profits, there are, unfortunately, several costs that impact society. These costs, also known as negative externalities, include a variety of actions like alcohol related traffic accidents, increased crime, and excessive binge drinking. A negative externality is described as “a cost that is suffered by a third party as a result of an economic transaction,” in which the third party is indirectly affected (MaClean, 2013). In the case of alcohol, society is the third party being inadvertently affected by the transactions of producers and consumers. In order to reign in on some of the economic costs related to alcohol, Federal and State Governments have enacted various laws to try and limit or prohibit activities that cause these negative externalities. And even though there have been numerous studies done in economics to evaluate the effectiveness of said laws, conclusions still remain convoluted. In my study, I try to unravel some of the complexity surrounding the effectiveness of one relatively unusual law, and the effects it has on young adult drinking behaviors: beer keg registration.
Mathew Boll - “Differentiation of Dyed and Undyed Hair Using ATR-FTIR Spectroscopy and Chemometrics”  
Faculty Advisor: Igor Lednev, College of Arts and Sciences, Department of Chemistry  
Although hair is one of the most common and abundant types of evidence found at most crime scenes, the current forensic analyses employed fall short of extracting and utilizing its potential evidentiary value. Microscopy is the fundamental technique used to analyze forensic hair evidence, but even this routine and well-accepted method contains limitations and has recently come under scrutiny. DNA profiling is another means of forensic hair analysis but a DNA profile cannot always be obtained from hair evidence due to the degraded nature of the sample and/or the lack of a root for viable nuclear cellular material. Furthermore, neither technique can accurately and reliably determine if a hair sample has been dyed or not. In this study undyed and dyed hairs from eight individuals, varying in race, gender, and age, were analyzed using attenuated total reflectance-Fourier transform-infrared (ATR-FT-IR) spectroscopy. Through the incorporation of multivariate statistical analysis (chemometrics), dyed and undyed hairs were differentiated with high accuracy. As an additional step, dyed hairs were differentiated amongst themselves based on brand (or manufacturers) and color. All classification models constructed as part of this study were internally and externally validated to gauge the prediction performance.

Anthony Demme - “The Classical Limit of a N Particle Quantum System in Entropic Quantum Dynamics”  
Faculty Advisor: Ariel Caticha, College of Arts and Sciences, Department of Physics  
Quantum mechanics is notoriously difficult to understand, and still has facets that are unexplainable through most theories. Entropic Quantum Dynamics is a theory that attempts to rectify these problems using advanced Bayesian statistics and the principles of maximum entropy. No theory of quantum mechanics can be considered proper, however, if it is not compatible with the forms of physics that are observably true, most notably classical mechanics. In this project I have recovered a Hamilton-Jacobi formalism of classical limit about the center of mass of a system comprised of a large number of quantum particles. Using the mathematics of how a single quantum particle moves, I derived how the center of mass of a system moved and from there recovered a Fokker-Planck equation of motion. I also showed that for specific initial conditions the quantum phase of the center of mass forms a Hamilton-Jacobi equation of motion. By solving this equation through perturbative methods the quantum potential between particles is nullified, recovering classical mechanics. This project is near unique in that while most classical limits are taken by setting Planck’s constant to zero, this one is not.

Morgan DeVuyst and September Johnson - “To What Extent Are Health Indicators and Human Rights (HR) Indicators Compatible with Respect to HIV/AIDS Services for Injecting Drug Users (IDUs)”  
Faculty Advisor: Kamiar Alaei, Rockefeller College of Public Affairs and Policy, Department of Public Administration and Policy, and Global Institute for Health and Human Rights  
HIV/AIDS has a significant impact on the lives of individuals due to denial and violation of their rights. IDUs are more vulnerable due to discrimination and stigma. This poster will assess current health indicators and HR-based health indicators with respect to providing adequate HIV/AIDS services to IDUs, and determine the extent to which these two groups of indicators are reflective of similar concerns and HR values. After examining major treaties we found that non-discrimination, economic accessibility and affordability are among missing HR principles; respect for cultural difference and language barriers of IDUs have not been addressed at all; and disaggregation is limited to gender, age, and type of drug. HIV/AIDS related health indicators for IDUs that are being reported to WHO should be revised to incorporate essential HR principles to apply the newly modified HR-oriented HIV/AIDS related indicators. Using HR indicators, we can determine where more effort is needed to prevent and help IDUS living with HIV/AIDS. The newly developed HR-oriented HIV/AIDS indicators for IDUs can assist in determining the steps being taken by States to exercise their obligations.
Thomas Dunn – “Phenotypic Characterization of Adipose-specific VDR Knockout Mice on Rescue Diet”
Faculty Advisor: JoEllen Welsh, School of Public Health, Department of Environmental Health Sciences
In recent studies, Vitamin D has been shown to slow the proliferation of breast cancer cells, but the mechanisms involved in vivo are poorly defined. Adipose tissue is known to be involved in the regulation of mammary gland development and thus can be involved in the progression of breast cancer. Adipose cells in the mammary tissue are not just for support, they also release signals to the epithelium known as ‘cross talk’. In past studies using adipocyte specific VDR knockout mice the deletion of the VDR gene in mature adipocytes led to increased epithelial branching of mammary gland tissue. Although excess mammary gland growth by itself is not cancerous, an increased rate of cell division raises the risk of mutations that could lead to cancer. The mice in past studies were reared on a high fat diet in order to increase adipogenesis and therefore increase the strength of the cross talk signaling. In this experiment we studied mice with adipose-specific vitamin D receptor (VDR) deletion reared on a non-high fat diet termed rescue. The goal of this project was to study the impact of VDR deletion in adipocytes on mammary gland, white adipose, and other tissue morphologies using histological techniques.

Christina Ehert - “IDU in Afghanistan”
Faculty Advisor: Kamiar Alaei, Rockefeller College of Public Affairs and Policy, Department of Public Administration and Policy, and Global Institute for Health and Human Rights
Five percent of the Afghan population – approximately 1.6 million people – are drug users (World Bank, 2008). This may be exacerbated by Afghanistan’s recent experiences with war, poverty, and associated social instability (UNAIDS, 2011). There are strong cultural influences from border countries like that of Pakistan, Iran, Tajikistan, and Uzbekistan that have made Afghanistan highly differentiated in terms of language, religion, and values. Due to these varying cultural influences and differences, access to HIV prevention programs for our target populations of study (MSM, IDU, and Sex Workers) are extremely limited in size and scope. Our goal is to measure the access of the targeted populations to HIV prevention services by assessing the discrepancy of availability, accessibility, and acceptability of treatment services in relation to the targeted population, the proportion of drug users and injecting drug users, sex workers, sexual behavior, prisoner HIV/IDU prevalence, and more. The prevalence of HIV among targeted populations within these regions can provide a proxy of their access to harm reduction services. We can then desegregate this data by targeted regions so as to examine how policies implemented in various geographic locations are tailored to the cultural framework in order to promote or prohibit access to treatment and prevention services.

Kelsey Fleming - “The Neuronal Glutamate Transporter EAAC1 Regulates Motor Activity and Anxiety in Mice”
Faculty Advisor: Annalisa Scimemi, College of Arts and Sciences, Department of Biology
Obsessive Compulsive disorder (OCD) is a neuropsychiatric disorder characterized by the onset of recurring thoughts, anxiety, and repeated motor behaviors. The molecular basis of OCD remains elusive, but genome-wide association studies suggest the existence of a genetic association between polymorphisms in the gene coding for excitatory amino acid carrier 1 (EAAC1) and OCD. The Cortico-Striatal-Thalamo-Cortical (CSTC) pathway shows patterned hyperactivity in patients with OCD and EAAC1 is abundantly expressed in the cortex and the striatum. It is currently unknown whether mice that do not express EAAC1 have a behavioral phenotype consistent with OCD, which would make them useful to study the molecular basis of the disease. Through traditional as well as novel behavioral measures I examine phenotypic differences between wild-type C57Bl/6 mice and traditional genetic knockout (KO) mice for EAAC1 to investigate the involvement of EAAC1 in the regulation coordinated information processing in the CSTC pathway. Results suggest that the loss of EAAC1 is associated with the onset of motor hyperactivity and anxiety in mice of both sexes; these behaviors are reminiscent of behaviors of patients with OCD and suggest that EAAC1 KO mice may be valuable to determine the molecular mechanisms underlying hyperactivity in the CSTC pathway and OCD.
Jack Genovesi - “Explaining Energy Resolution in Liquid Xenon Detectors”
Faculty Advisor: Matthew Szydagis, College of Arts and Sciences, Department of Physics
Many theories are under consideration for the composition of dark matter, a theoretical form of matter not yet discovered, one of the more popular ones being Weakly Interacting Massive Particles (WIMPs). WIMPs, as the name suggests, wouldn’t interact with normal matter on a scale that we would see for most interactions between baryonic matter, thus requiring exceptionally sensitive detectors. Detectors of various types have emerged, one of the most effective being the two phase xenon time projection chamber as seen from the Particle Identification in Xenon at Yale and Large Underground Xenon detectors. These detectors use both liquid and gaseous xenon. When a particle from an outside source collides with the liquid, photons are emitted from the site dubbed S1 for scintillation 1 while the electrons from recently ionized xenon atoms are subjected to an electric field dragging them to the gaseous-liquid barrier. Upon reaching the barrier, the electrons scintillate and cause additional photons to be emitted called S2. Although a powerful method which offers exceptional position resolution and particle ID, issues arise in energy resolution from S1 and S2. Therefore, a new factor is introduced called “clumping” for electrons to attempt to explain the energy resolution that is observed.

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Emily Grasso – “Increasing User Engagement in Social Media”
Faculty Advisor: Suraj Commuri, School of Business Department of Marketing
For my thesis, I explored the question of what type of content will increase user engagement on social media. I’ve had the opportunity to work on a live project, for a New York-based recruiting agency, Careers on the Move, founded by University at Albany graduate, Richelle Konian.
The goal of the project was to establish, through research, what engages users on social media and then test my findings.
I established, through baseline analytics reports using LinkedIn Analytics, Facebook Insights, and Hootsuite reports that the most appropriate dependent variables will be on LinkedIn, Engagement and Reach; on Facebook, Page Likes and Post Reach; on Twitter, Twitter followers.
I managed the content posted on LinkedIn, Facebook, and Twitter profiles of Careers on the Move to enhance the dependent variables identified in my research. Based off of research on industry trends, I developed a social media marketing plan to determine methods of effectively increasing user engagement. I periodically conducted analytics reports throughout the course of the project. Initially, there was an increase across all three social media sites, but as this began to level off, I conducted additional research to determine which subject matter engaged users.

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Faculty Advisor: Hazel Prelow, College of Arts and Sciences, Department of Psychology
The present study examined whether the mechanism through which ecological adversity influenced drug use in African American youth was their association with deviant peers. In addition, we examined whether association with deviant peers was conditional upon maternal involvement in a sample of 127 urban African American high school adolescents. Association with deviant peers fully mediated the relationship between ecological adversity (comprised of stressful life events and ambient neighborhood hazards) and drug use. Association with deviant peers was related to higher drug use among these youth even after accounting for the effect of adversity. Maternal involvement did not significantly moderate the relationship between ecological adversity and association with deviant peers, nor did it moderate the path between association with deviant peers and drug use. These findings suggest that adolescents living in adverse ecological contexts may be more likely to become involved with deviant peer groups, which in turn could lead to drug use. An implication of the present research is that eliminating association with deviant peer groups should be an important component in interventions for this population.

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Vincent LaMantia – “Unlocked Nucleic Acids for miRNA Detection Using Two Dimensional Nano-Graphene Oxide”
Faculty Advisor: Mehmet V. Yigit, College of Arts and Sciences, Department of Chemistry
In this study we have used unlocked nucleic acids (UNAs) to discriminate a breast cancer oncomiR from two other miRNAs in the same RNA family using two-dimensional graphene oxide nanoassemblies. Fluorescently labeled single stranded probe strands and graphene oxide nanoassemblies have been used to detect miR-10b and discriminate it from miR-10a, which differs by only a single nucleotide (12th base from the 5’ end), and miR-10c, which differs by only two nucleotides (12th and 16th bases from the 5’ end). We have determined the discrimination efficacy and detection capacity of a DNA probe with two inserted UNA monomers (UNA2), and compared it to the DNA probe with two purposefully inserted mutations (DNA_{M2}) and full complementary sequence (DNA_{full}). We have observed that UNA2 is 50 times more powerful than DNA_{full} in discriminating miR-10b from miR-10c while generating an equally high fluorescence signal. This fluorescence signal was then further enhanced with the use of the highly specific endonuclease dsDNase for an enzymatic amplification step. The results demonstrate that the underutilized UNAs have enormous potential for miRNA detection and offer remarkable discrimination efficacy over single and double mismatches.

Imani Lawrence and Angelis Gomez – “The Impact of Cognitive Executive Function on Self-Correction and Verbal Fluency in Preschoolers”
Faculty Advisor: Leslie Halpern, College of Arts and Sciences, Department of Psychology
Executive function is comprised of cognitive skills that are necessary for planning and carrying out specific behaviors. It was hypothesized that children with higher executive function skills would have fewer misses and more correct self-corrections while telling their story. Also, that repetition and executive functioning would not be related. Additionally, it was hypothesized that self-corrections would be related to increased language fluency. Researchers had preschoolers tell a story using a picture book without words. These narratives were coded for self-corrections, mistakes, and repetitive language. Executive function was assessed using the Behavior Rating Inventory of Executive Function – Preschool Version and verbal fluency task using the Fluharty Preschool Speech and Language Screening Test. As expected, increased self-corrective behavior was correlated with lower levels of executive dysfunction, specifically working memory and planning (p<.05, -.33). There were no significant correlations between repetitive language behaviors and any of the executive function subcategories. Children who engaged in more self-corrective behavior scored higher on the general language fluency scale (p<.05, 0.34). The results support the hypothesis that children with lower executive dysfunction self-correct more frequently than children with higher executive dysfunction. These findings demonstrate that verbal fluency and self-corrective language behaviors are related to executive functioning.

Anh (Ami) Minh Le – “Colorimetric Assay for Discerning Sex for Fingerprints”
Faculty Advisor: Jan Halamek, College of Arts and Sciences, Department of Chemistry
The analysis of fingerprints via pictorial comparisons has been largely accepted by the scientific community as a reliable method of identification. While this method is well established, it is not applicable for all situations. For example, a partial or smudged fingerprint makes finding a match much more unlikely. The same is true for DNA. In these cases, the composition of the samples would be of more use than the image. It has recently been demonstrated using bioaffinity-based cascades that the amino acid content in fingerprints can be used to identify the originator’s gender. However, the research displayed here utilizes a straightforward chemical assay instead of the more complex biochemical assay.
Traditionally, fingerprint detection involves ninhydrin, which reacts with the fingerprint content to produce Ruhemann’s purple. The work demonstrated here combines ninhydrin with the concept of using fingerprint content to provide information about the originator’s gender. To insure crime scene viability, research showing the performance of the system on samples collected from various surfaces is provided.
Due to the ease at which the assay can be performed and interpreted, it has the potential to become a portable method for on-site analysis and specialized training is unnecessary, unlike most currently available techniques.

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Molly MacIsaac – “A Two-state DNA Nanoswitch for Nucleic Acid Detection”  
Faculty Advisor: Kenneth Halvorsen, The RNA Institute  
Detection of specific nucleic acid sequences is an important aspect in the medical and forensic fields. However, current detection strategies are typically time consuming, expensive, or involve multiple steps. Our lab designed a DNA nanoswitch to provide a simple answer to these problems. The DNA nanoswitch is a long duplex constructed from a single stranded DNA scaffold (from the viral genome M13) and short pieces of complementary backbone oligonucleotides. Two of these backbone oligonucleotides can be modified to contain overhangs that are partially complementary to the target DNA or RNA. When the target binds to the overhangs, the switch changes from the linear "off" state to a looped "on" state. These two states can be identified on a standard gel electrophoresis based on their migration, providing a simple and quick read-out. This study involved the analysis of the sensitivity and specificity of these nanoswitches, with regards to detection of microRNA sequences. In addition, the shelf life and ideal storing conditions were also determined. Understanding these parameters will aid in the development of the nanoswitch for biological detection, bringing it closer to point-of-care use in biomedical and forensic research.

Valdis Rice - “The Mediating Effect of Moral Beliefs on Responses to Cyberbullying Scenarios”  
Faculty Advisor: Edelgard Wulfert, Dean College of Arts and Sciences and Department of Psychology  
The current study sought to elucidate characteristics that distinguish individuals who act as passive bystanders from those who intervene on a victim’s behalf who is cyberbullied (“active bystanders”). Of particular interest was to examine whether empathy, moral beliefs and emotion regulation predict bystandning. Social self-efficacy, i.e., the belief in one's ability to express one’s opinion and handle interpersonal conflict, was also examined. A sample of 400 college students completed a set of self-report instruments assessing these constructs and cyberbullying. Additionally, participants were asked how they would respond (e.g., “do nothing”, “respond to the bully directly within the thread”) to three interspersed lab-generated scenarios of cyberbullying. Using latent path modeling, I investigated how empathy, moral disengagement, and emotion regulation interrelate to predict bystandning in response to cyberbullying. The results indicated a direct relationship between active bystanders’ empathic concern and their perceived social self-efficacy to confront a bully (“active bystanding”). The findings regarding passive bystanders’ non-intervention were more complicated. Less empathy was related to greater moral disengagement, which in turn was associated with less involvement in the bullying situation. Furthermore, social self-efficacy mediated the relationship between empathy and emotion regulation with passive bystanding.

Emily Schlierer – “The Effects of Social Media Use on Foreign Fighter Recruitment for ISIS”  
Faculty Advisor: Dana Peterson, School of Criminal Justice  
The attack on the United States by Al Qaeda on September 11th, 2001 was the instigation for the War on Terror. Even after the successful conduction of the covert operation by the United Stated ended the rein of Saddam Hussein, the leader of Al Qaeda, the Iraq war continued until December 2011. In 2013 a new jihadist terror organization was named as the Islamic State and claimed its place as one of the most successful terrorist organizations in the modern world. Their main asset is their use of social media for foreign fighter recruitment and the spread of propaganda messages. Due to the interconnected and anonymous nature of the internet, ISIS is able to release thousands of messages every day instantaneously across the world. In this way ISIS is using psychological techniques in order to contact potential fighters and convince them to join their fight in Syria.

The type of individual who may be predisposed to the media efforts of ISIS is not being evaluated. In order to address the psychological aspect of this conflict and the recent trend of foreign fighters to travel and join ISIS, research must be done on the effects of social media propaganda.
Lukas Sotola – “Does Motivation to Rationalize the Status Quo Make People More Receptive to Sexist Humor?”
Faculty Advisor: Anna Newheiser, College of Arts and Sciences, Department of Psychology
Just world beliefs—the tendency of people to believe that individuals get what they deserve—is a pervasive phenomenon associated with greater acceptance of others’ suffering. We tested whether we could decrease people’s just world beliefs, particularly through the lens of gender inequality. We experimentally manipulated the extent to which people are likely to rationalize the existing state of affairs in the world (i.e., system justification). We then gave female participants “evidence” that they support the societal system that disadvantages them by telling them that they have an unconscious preference for men—the advantaged group—following a test of their unconscious gender preferences. Participants then completed a measure of just world beliefs. As a secondary, indirect measure of just world beliefs, participants also rated the appropriateness of sexist jokes. We found no effects on just world beliefs; however, participants in the condition in which they were more likely to justify the system rated the sexist jokes somewhat more favorably. Thus, people with higher system justifying tendencies may be more accepting of humor that is derisive of a disadvantaged group, thereby suggesting that they do not take group inequality seriously and would be less interested in efforts to reduce it.

Faculty Advisor: Marilyn Masson, College of Arts and Sciences, Department of Anthropology
From around 1100 to 1450 A.D. Mayapán served as the last major political capital of the ancient Maya world. Located in the Northwest of Mexico’s Yucatán Peninsula, the city of Mayapán had a thriving marketplace that circulated both local and exotic goods from other polities throughout Mesoamerica. While the majority of archeological research on Mayapán has focused on the monumental architecture and inhabitants of the administrative urban zone, this study incorporates new archaeological data collected during the 2015 field season of the Economic Foundations of Mayapán Project to examine systems of production in the rural settlement areas, as part of Dr. Marilyn Masson’s current research. By looking at the densities, variety of species, and types of animal bones collected from a particular household in Jabah, a small temple-cenote group located outside the boundary of the city wall, we are able to reconstruct the political economy of Mayapán’s rural periphery and compare it to that of the already known urban core. This zooarchaeological research thus offers a complementary but preliminary look at the other, previously unexplored sector of Mayapán and what it meant for the city as a whole during the height of its occupation.

Faculty Advisor: Ronald Friedman, College of Arts and Sciences, Department of Psychology
The question of how we come to develop our unique aesthetic preferences has been a matter of scientific and popular interest for some time. While most people could confidently report their tastes within domains such as art, music, and food, they would likely find it more difficult to explain precisely how and why they came to acquire those preferences in the first place. Exploring the mechanisms underlying such value judgments can give us a greater understanding not only of how we come to like the things we like, but a more complete picture of how experience and internal psychological and biological characteristics continually interact to create a cohesive perceptual picture of the world around us. In this study, subjects viewed and rated varying color stimuli before hearing musical chords. The idea behind our research is to study the effects that familiarization with consonant and dissonant color stimuli have on musical preference. Based on past research, we believe that enough exposure to dissonant stimuli can alter aesthetic preferences, enough to show results during the time it takes to complete one session in our study.
Nicole Wallack – “The Effect of Atmospheric Hydrogen on the Albedo and Surface Temperature of Mars”
Faculty Advisor: Lisa Kaltenegger, Cornell University Department of Astronomy
The presence of hydrogen in planetary atmospheres has been shown to have the potential to dramatically affect the temperatures of planets. The collision-induced absorption (CIA) of hydrogen with carbon dioxide or nitrogen has been shown to have a substantial effect on the atmospheric temperature and albedo of a planet, possibly to the point at which life could exist on a planet where without such CIA the planet would be too cold. Using a single-column radiative-convective climate model, we investigated the effect of the presence of hydrogen on planetary temperatures and albedos across different amounts of hydrogen and across host stars of different temperatures using present-day Mars-like planets. We found that the addition of hydrogen in a planet’s atmosphere increased the surface temperature of the planet. This effect was stronger for the planets orbiting hotter stars. The water vapor profiles showed that this was the case due to the presence of more water vapor in the atmospheres of planets orbiting hotter stars across all percentages of hydrogen. The water vapor concentrations also varied more with the addition of more hydrogen for the planets orbiting hotter stars.

Katherine Waye – “Turkey: An Overview on Regional Drug Use, Treatment Design, and the Characteristics of Inpatients Utilizing Treatment”
Faculty Advisor: Arash Alaei, School of Public Health, Department of Health Policy, Management and Behavior
Existing research on patterns and risk factors of drug use and how they vary by age and location in Turkey is limited. Due to this, we have examined the drug treatment offerings as well as the socio-demographic characteristics, behaviors, and treatment history of Turkish citizens who were admitted to inpatient substance use treatment at public and private facilities in Turkey during 2012 and 2013 and identified correlates of lifetime and current injection drug use. Of the 11,247 patients at the 22 public treatment centers in 2012-2013, a majority were male, lived with family, were unemployed, and had an average age of 27 years. Significant predictors of injection drug use included being homeless, having higher education, heroin as a preferred drug, having a longer duration of drug use, and prior drug treatment. With this information, greater prevention and intervention efforts can be made to reduce the transition to drug use among the youth population as well as improve access to a variety of tailored treatment options.

Elizabeth Wilkinson – “Understanding Reconnaissance and Intelligence Gathering Best Practice to Prevent Footprinting and Cyber Attacks”
Faculty Advisor: Jeffery Baez, College of Engineering and Applied Sciences, Department of Informatics
Many people are unaware of how much information can be obtained about them or their organization and systems through public means. Reconnaissance is an operation to obtain information by observation about an individual, group, or system. Reconnaissance is the first phase of cyber attacks. The problem is that attackers can use a method, known as Footprinting, to gather information in support of conducting malicious acts. It is important to understand what information can be collected as well as how to defend against these techniques. The expectations of this research is to identify, validate, and recommend controls which reduce the attack surface of and help prevent discovery and Footprinting techniques.

Peter Zambetti – “The Role of Multiple Context Exposures on the Incubation of Fear Memories”
Faculty Advisor: Andrew Poulos, College of Arts and Sciences, Department of Psychology
Studying learning and memory through the methods of Pavlovian fear conditioning has been a topic of behavioral neuroscience research for decades. Anxiety disorders such as post-traumatic stress disorder can be modeled in rodents through fear conditioning. This study took on a different approach to study the learning and recall of a fear memory by using a within subjects group. This group was tested at both a recent and remote interval. The recent timepoint was three days after conditioning and the remote timepoint was thirty-one days after conditioning. The timepoints are used to observe the effect the passage of time has on a fear memory, and multiple tests are used to model exposures someone with PTSD might experience. The time spent between acquisition and testing and the number of tests did have an effect on the percent freezing of each group. Remotely tested animals had higher freezing levels than the recently tested group. The group tested twice had some animals increasing in freezing and others decreasing in freezing at the later test point. To investigate the neural correlates of these differences c-Fos was stained for in the Basolateral amygdala complex to signify neuronal activation, and GAD-65 for neuronal inhibition.
Presentation Session

LC 3A: History, Political Science, and Art History

Derek Canino - "Leon Johnson: A Fugitive from Injustice"
Faculty Advisor: Richard Hamm, College of Arts and Sciences, Department of History

In the late 19th century, American Southern states instead of building prisons to punish and rehabilitate criminals put them to work. This forced labor system became known as the chain gang. It quickly became a system of brutal, racist exploitation. Georgia’s chain gang system was typical. I began my research around the mid-19th century to get a broader understanding of all of the regional distinctions about Georgia and its relationship to the penal system. The strongest focus of study begins in the early 1930s when the combination of literature and New Deal legislation facilitated reforms in the criminal justice system. One significant case study of this era was the story of Robert Elliot Burns. Robert Burns was a white criminal that was sent to the chain gang and escaped, twice, the second time writing a book about his experiences. His story brought national attention to the realities of the chain gang, however the abuses continued. Just ten years after Robert Burns’ book and story are public an African American man named Leon Johnson was sentenced to “life with hard labor” on the Georgia chain gang. In these two stories the major points of differentiation are racial and temporal. I will explore these differences insofar as the events played out positively or negatively for these two individuals.

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Jordan Zavesky - "Values in Proceduralist Democracy: A Critique of Minimalism"
Faculty Advisor: Peter Breiner, Rockefeller College of Public Affairs and Policy, Department of Political Science

My senior honors thesis exemplifies a critical debate in Political Theory and explains the aim of the field. I am critiquing the democratic proceduralist minimalist thinkers Joseph A. Schumpeter, Adam Przeworski, and Nadia Urbinati. Schumpeter argues that democracy should be defined as a competitive method among political Elites. Przeworski argues for a value free system of democratic procedure where democracy is defined by a fair election. Lastly, Urbinati argues for minimal normative criteria applied to the electoral method that preserves individual liberty as the definition of democracy. I argue that Schumpeter’s, Przeworski’s, and Urbinati’s definitions of democracy are inadequate because each thinker leaves out important normative and cultural implications necessary for an adequate definition. My research explores the necessity of political liberty, public goods, and cultural participation as three key normative elements needed for an adequate definition of democracy. The process of my research required me to delve into the culture surrounding democratic establishments to decipher which normative claims may be derived from the cultural implications of democratic systems. To research, I mainly used political and philosophical journals found on the Universities database and books located at the Universities main library. My research is still ongoing.

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Troy Norton - "Mimesis in Practice: The Intersection of Artistic Reproduction and Politics"
Faculty Advisor: Morton Schoolman, Rockefeller College of Public Affairs and Policy, Department of Political Science

Political theory is a field best analyzed through the lens of history, which we can understand to include art and literature. In "Mimesis in Practice: The Intersection of Artistic Reproduction and Politics," I do so in an effort to determine how we can use history to better our existing political communities. We may, as Walter Benjamin argued in “The Work of Art in the Age of Mechanical Reproduction”, focus on preserving the historical value of a given artwork, thereby subverting a potentially fascist regime. Or we may, as Jacques Ranciere argued in a series of interviews presented in The Politics of Aesthetics, reproduce artwork so as to illustrate recurring sociopolitical struggles and thus offer a means of resistance. By subjecting both arguments to analysis in terms of the technical methodology used by Erich Auerbach in Mimesis: The Representation of Reality in Western Literature, I demonstrate how we can scrutinize art in such a way as to both maintain its historical value and apply it to the betterment of contemporary political societies.

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There will be a 5 minute break prior to the next two presentations

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Akeela Makshood - “Doris Duke’s Islamic Art Collection: Building Bridges between Islamic Art and American Society”
Faculty Advisor: Camelia Lenart, College of Arts and Sciences, Department of History
My work in progress explores American heiress, Doris Duke’s interest in and passion for collecting artworks from the Muslim world during a time when most Americans hadn’t been acquainted with matters of the Middle East. My approach to the study of this history is significant in that I am exploring the domestic Muslim population during Duke’s lifetime, and the resulting American attitudes toward Muslims and her introduction of Islamic art to the Western world. As such, I argue that Doris Duke’s contribution to the preservation of Islamic art in the United States has built a bridge between the Muslim world and the United States. My advisor, Professor Camelia Lenart and I have been meeting weekly since the beginning of the Spring semester to discuss our progress. For the research that I am conducting, I am utilizing biographies (Too Rich: The Secret Life of Doris Duke), journals, movies, documentaries and Doris Duke’s personal art collection, including Doris Duke’s Shangri-La: A House in Paradise. By shedding some light on Doris Duke’s Islamic art collection, this project will help better understand how the likes of Doris Duke bridged together two different worlds that are often thought to be poles apart.

Nicole Cardinale - “Unique for its Time: Head of a Moor by Peter Paul Rubens”
Faculty Advisor: Sarah Cohen, College of Arts and Sciences, Department of Art and Art History
Upon approaching Peter Paul Rubens’s Head of a Moor from 1620, which hangs in the Hyde Museum in Glens Falls, New York, one cannot help but feel drawn to the subject’s somber, pensive mood. Yet aside from the mood, another, equally significant aspect that attracts viewers’ attentions involves the seventeenth-century artistic tradition of depicting Africans as sub-human and/or lesser beings. Rubens’s oil sketch diverges from this tradition by portraying a black male (who had likely been a servant in real life) as a complex human being absorbed in thought and emotion. To tentatively validate the work’s authenticity and thus enable me to proceed with the above argument, I begin by comparing Head of a Moor’s subject matter and stylistic qualities to those of some of Rubens’s earlier renderings of Africans. Next, I contrast the portrait’s pictorial characteristics and subject matter to those of contemporary works by other artists which adhere to the aforementioned seventeenth-century artistic tradition. Lastly, I show how the same uniqueness that sets Rubens’s work apart from a seventeenth-century artistic tradition also designates it a precursor to another (that is, the post-diplomatic period of Rubens’s career in the 1630s, whereby his once-grand works adopt a more introspective nature).
**LC 3B: Culture and Literature**

**Aisling Sive - “Martí, Marx and Castro: Cuba’s Denial of Racism”**
Faculty Advisor: Christine Preble, College of Arts and Sciences, Department of Latin American, Caribbean, and U.S. Latino Studies

This paper examines how issues surrounding race in Cuba have been constructed by two of the country’s most important historical figures: José Martí and Fidel Castro. The starting point of this paper describes the ways in which Cuba’s national hero, José Martí, explores issues of race in his writings. Through his own personal history with slavery, growing up in Cuba and later moving to the United States, he argues that “we are one race,” we cannot divide ourselves, and we must unite. Secondly, this paper analyzes how race has been viewed in Cuba in the context of the nation’s political shift to communism in the 1960s. I argue that Fidel Castro’s commitment to Karl Marx and his vision of communism resulted in the absence of acknowledging race. Additionally, I argue that the “Fidelismo” atmosphere that took over in Cuba during the 1959 revolution and still continues to this day has resulted in the Cuban people also rejecting the concept of race. This project questions how ideologies of both Martí and Castro, in their acknowledgement or lack thereof, have constructed an atmosphere of denial regarding racism in the current sociopolitical landscape of Cuba.

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**Katarina Abad – “Lost in Translation? English Influence on the Pragmatic and Idiomatic Expressions of Spanish Heritage Speakers”**
Faculty Advisor: Lotfi Sayahi, College of Arts and Sciences, Department of Languages, Literatures and Cultures

Many of the idioms we hear daily incorporated into our colloquial speech are in fact the result of language contact – the selective blending of loan words, grammatical constructions, and translations, as needed by the shifting sociolinguistic interactions of two adjacent communities with different tongues. Such is the case of Spanish and English in the United States today. A particularly fascinating sector of the population is second-generation Spanish heritage speakers, whose speech patterns often reflect the interference of their English fluency and whose expressions have in fact become grammatically absorbed into U.S. Spanish. In this study, I closely interview ten Spanish heritage speakers in Albany, NY, between 18 and 30 years old, to determine any positive correlation between the number of years residing in the U.S. and the rate of occurrence of calques – literally translated expressions – in their speech patterns. To further solidify and standardize my results, I survey the same participants regarding their opinion of and rate of usage of common English-to-Spanish calques. Moving forward, I offer the analyses of my data as support for the salient hypothesis that contact between Spanish and English will continue to produce a dialect of the U.S. distinct from that of any other Spanish-speaking country.

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**Richard Lonergan - “Friction’: On the Future and Potential Pitfalls of the Chinese ‘One Belt-One Road’ Transportation Project in Eurasia”**
Faculty Advisor: James Hargett, College of Arts and Sciences, Department of East Asian Studies

The project undertaken by the Peoples’ Republic of China to create an infrastructure to facilitate globalized trade by rail through Eurasia and Central Asia, guided by both myths of the Silk Road as a distinct logistical entity in antiquity as well as an aspirational goal and potential peril of its form and function in international trade in the era of high imperialism. The resurrection of this idea in the contemporary discourse, yet as this presentation will describe, the problems that these projects face between rent-seeking and what amounts to asymmetric extortion in international affairs, this presentation will explain how the toxic mix of populism and corruption in cross-border relationships will create what Karl von Clausewitz called “friction” in war: the contingencies created by the unexpected. This discussion will involve questions of the contingencies of corruption and how undemocratic governments could maintain and sustain their regimes by exploiting a discourse that ruptures the previous practice of bilateral relations between nation states and the Peoples’ Republic of China, and the Republic of China on Taiwan, a rupture that would create barriers to trade and protect local industry (and/or smuggling) sponsored by and controlled by the local elite, which in turn would be a return of practices from the original “Silk Road.”

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Richard Lonergan - “Fascism in Japan and Beyond: Fascist State Power and State Formation – Organized Crime as Politics”
Faculty Advisor: James Hargett, College of Arts and Sciences, Department of East Asian Studies and John Person, College of Arts and Sciences, Department of East Asian Studies
The discussion of fascism has often centered on its ideological nature, and fascism’s latent hostility towards open democratic societies and externally directed military aggression. What this presentation will seek to explain is how fascism emerged in Japan even earlier than in Italy, and how this synthesis of organized crime as statecraft created a political entity that by its necessity functioned domestically and internationally on the practice of impunity. This presentation will explain how the experience of the practice of politics after 1868 serves as a framework for an alternative “fascist minimum.” This presentation will detail how it was that through the use of organized criminal groups at home and abroad, from the use of organized criminal groups to coerce the first parliamentary election in Japan, the power-brokers of the Japanese government suborned anti-Japanese and pro-Japanese groups to facilitate the means of the retention of state power and expansion abroad, commonalities that were linked to and extended to the practice of fascism in Italy and Germany as well. This presentation will also explain how issues relevant to the Japanese context of the forced prostitution of the “comfort women” are relevant to and synonymous with the Japanese wartime-era macroeconomic policies on one hand, and forced labor in German occupied Europe. To conclude this presentation will explain how to explain a different “fascist minimum” that frames fascism as a political movement and institution that amounts to a transnational organized criminal group practicing impunity in one country through state-run holding companies acting as sovereign wealth and hedge funds in a domestic and especially in international trade, which center on the maintenance of power by the ruling elite, whole political program amounts to a wager that they can maintain power.

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**LC 3C: Psychology and English**

**Merel Mireille Hermans** - “Homophobia in Non-Heterosexuals and Their Families”  
Faculty Advisor: Gordon G. Gallup Jr., College of Arts and Sciences, Department of Psychology  
The evolutionary advantage of homophobia and non-heterosexuality remains poorly understood. This research extends Gallup’s 1995 research, in which people responded more negatively towards same-sex pairs (i.e. imagining their daughter spending time with a lesbian mother, and a son spending time with a gay father), than opposite-sex pairs. Gallup’s study did not include LGBTQ individuals. In the current study, 138 participants were recruited through an email list of two organizations within the University at Albany; the Capital Pride Center in Albany; and several online LGBTQ forums. Participants completed online survey questions regarding how they perceived their family’s response when they spend time with their niece(s) and/or nephew(s). Additionally, participants rated their feelings on a 5 point Likert scale when imagining having a(n) 8 year old or 21 year old niece or nephew who spent time with a lesbian or gay parent. Participants were more negative towards same-sex pairs than opposite-sex pairs. Due to limited sample size, analysis of data regarding the perceptiveness of the family toward participants spending with their nieces and nephews was impossible. In conclusion, several predictions from Gallup’s 1995 research were replicated, but studies that focus on the family members of non-heterosexual individuals seem most promising.

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**Tiffany Araya** – “Trans-cending Gender: The Language of Identity”  
Faculty Advisor: Sami Schalk, College of Arts and Sciences, Department of English  
“Transgender” is a broad umbrella term that covers many groups of people with varying identities, though it is often oversimplified in conversation and in the media. In general, the most common characteristic is that “their gender does not match the sex category they were placed into at birth.” The three films I examine for this senior thesis, Paris is Burning, The Aggressives, and Leave It On the Floor, will communicate distinctive ideas and varying perspectives about something that is widely perceived to be a monolithic topic and population of people. By using these films, I provide a perspective that does not attempt to define (which inevitably creates borders) but to further complicate and disrupt the American gender binary that specifies codes of expression and identification. I take extra care to analyze specifically how the subjects of the films choose to define their selves, even within the limited space they have to do it. The way I do this is by placing the most significance on language, paying close attention to the words they use when sharing their stories, the nuances of how they use language to create their own world and challenge the larger society within which their world exists.

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**Kaitlyn Bellettini** - “Let’s Watch Our Lives on the Screen: Reality TV, Video Game Vlogging, and the Endless Search for Identity”  
Faculty Advisor: Mary Valentis, College of Arts and Sciences, Department of English  
My research project expands on previous studies on celebrity and reality TV culture by analyzing YouTube video game vloggers. Differences in fan relationships between mainstream and micro-celebrity personas, the desire for such entertainment, the search for genuine identity hidden in spectacle, and human connection are my thesis topics.  
It begins with an introduction to Guy Debord’s “Society of the Spectacle” which illuminates the underlying cause of celebrity culture, with its connections of commodity to social identity. The shift in media attention to the “ordinary” individual, and how this correlates with the expansion of spectacle based society will be investigated. Jacques Lacan’s “mirror stage” theory of fragmented identity will be presented as motivation for individual interest in celebrity identity.  
Youtube video game vlogging is coupled with the idea of limited connection and the para-social relationship. Donald Hortan’s and R. Richard Wohl’s views on the “para-social relationship,” compare and contrast this relationship to celebrity culture. This section focuses on two popular video game vloggers, Markiplier and Jacksepticeye. These analyses look at their personas, and the community that forms around them. The difference in fan relationships and how the need for community correlates with social identity is the main focus.  
In a world run by social media, it is paramount that we observe all aspects of its influence. For it is here in this virtual environment where new cultures and communities are being formed. These communities can help reveal more about human nature in an age of limited physical interaction.

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Seunghyun Shin – “Documentary of the Modern and the Contemporary Socio-Political Issues: Public Intellectualism in Muriel Rukeyser’s The Book of the Dead and C.D. Wright’s One Big Self”
Faculty Advisor: Eric Keenaghan, College of Arts and Sciences, Department of English
This research seeks the similarities between the two books composed of poems written by two poets: Muriel Rukeyser and C. D. Wright. Although each poet has different techniques and poetic languages in individual works, I want to claim that there is a conversation between the two poets, who are also the public intellectuals at the same time, about the socio-political issues that include class struggles, totalitarianism, racism, and gender binary, through documenting the stories of the marginalized people: Rukeyser focuses on documenting the afterwards of the Hawk's Nest Tunnel tragedy, and C. D. Wright articulates the ironic life of the prisoners that she discovers while visiting Louisiana State prisons. This specific documentary form of poems in both works includes the poetic languages intermingled with the eye of camera: photography, which Roland Barthes and Susan Sontag mainly considers as the certification of the “presence.” Exploring how Rukeyser and Wright forms a conversation to each other through documentary poems with photographic languages in The Book of the Dead and One Big Self, I will discuss how both writers portray the abomination and the criticism about the socio-political issues as the public intellectuals and how they expand the ideas of Barthes and Sontag.

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Staten Island's environmental issues, which are concentrated in the North Shore, affect Latinos. This paper aims to expose the challenges Latinos and other ethno-racial minorities disproportionately face as they try to improve their lives and make a new home in Staten Island.

Roi Ankawa - “Is the Effect of Glucose on Hippocampal Memory Insulin-Dependent?”
Faculty Advisor: Ewan McNay, College of Arts and Sciences, Department of Psychology
Recent studies, many from our lab, have established that insulin plays multiple roles in the brain: regulation of energy supply and a key modulator of learning and memory. Exogenous insulin enhances, while blockade of intrahippocampal insulin impairs, both metabolism and cognition. Moreover, when insulin signaling is impaired, such as in Type 2 diabetes, hippocampal function is again impaired. However, mechanisms mediating these effects are not yet understood. Memory in the hippocampus is limited by glucose availability, and provision of additional glucose supports enhanced performance. Systemically, insulin regulates glucose transport from the blood into cells; conversely, glucose regulates insulin synthesis and release from the pancreas, so that the two molecules mutually regulate. Although this relationship between insulin and glucose has been well studied, there has been little work on their interaction in the brain. In this study, GluT4, an insulin-dependent glucose transporter found on some hippocampal neurons, was directly blocked in the hippocampus. Blockade impaired spatial memory, reduced anxiety, and, surprisingly, improved performance in a novel object recognition task. These data support a novel role for GluT4 as a mediator of hippocampal memory processing and suggest that insulin acts to regulate cognitive function at least in part via GluT4-mediated glucose transport into neurons. In the presence of indinavir, glucose was unable to enhance memory, consistent with this interpretation and suggesting that enhancement of memory by glucose may require hippocampal insulin signaling.
**LC 6: Chemistry**

**Tom Geiger** - “New Enzyme-based Forensic Approach for the Identification of Sex from Fingerprints”  
Faculty Advisor: Jan Halamek, College of Arts and Sciences, Department of Chemistry  
Fingerprint analysis has seen minimal development over the past century. Currently, the only viable method for analysis is visual comparison of the shape, size, and the patterns, as well as computational and biometric identification software. While these are well established, a clear identification is not always determined. For instance, when only partial or smudged fingerprints are collected, a match is unlikely. The same is true for DNA. In these cases, the composition would be of more use than the image.  
The research presented here demonstrates various bioaffinity-based systems that focus on analysis of the chemical components found in fingerprints. These enzyme cascades are driven by amino acids known to be present in fingerprint content and will be able to provide information on the originator's attributes. This research also shows the performance of one system on samples collected from various surfaces. Current work aims to include being able to identify how long the fingerprint has been at that location.  
These developed bioassays also have the potential to become a portable method that can be used for on-site analysis as they can quickly analyze fingerprint contents and present easily interpretable results, allowing for execution and interpretation by all members of law enforcement.

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**Roselyn Rodrigues** – “Bloodstains Enzyme-based Analysis for Discerning the Age of the Originator”  
Faculty Advisor: Jan Halamek, College of Arts and Sciences, Department of Chemistry  
In the field of forensics, blood is considered a highly useful tool. DNA found in blood is currently viewed as the best source of identifying a suspect, but enzyme levels in blood samples can also be used to determine pertinent information about the blood originator. Relative age of a blood originator can be determined with high accuracy using a bioaffinity-based assay and spectrophotometric analysis of alkaline phosphatase levels. Alkaline phosphatase (ALP) is an enzyme that is commonly used in clinical diagnostics because it is essential to bone growth. Due to its role in growing bones ALP is present in higher levels in people who are younger. The difference in ALP levels between someone who is growing, or “young”, and someone who is no longer growing, or “old”, can be determined using the enzymatic reaction of ALP with p-nitrophenol phosphate. This system can be used even after real human serum samples were left exposed for up to 48 hours. This analysis could potentially help police narrow down the suspect pool, and with further advancements it could even be used on-site at a crime scene in a similar manor to a glucometer in order to provide quick and accurate distinctions.

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**Kaycie Lawson** - “Viral Immunity in Yeast: Exploring the Role of RNA post Transcriptional Modifications in the ‘Killer’ Activity of L-A Virus”  
Faculty Advisor: Daniele Fabris, College of Arts and Sciences, Department of Chemistry  
The L-A virus, a dsRNA virus affecting *S. cerevisiae*, is accompanied by satellite dsRNA, called M, which encodes unique toxin-immunity proteins. This virus mimics rotavirus and serves as an excellent model for understanding the mechanism of cellular response and immunity to viral infection. We are interested in investigating the implication of RNA post-transcriptional modifications (PTMs) in the mechanism of toxin immunity.  
We have developed a mass spectrometry (MS)-based approach for PTM detection from their unique mass and fragmentation signatures, which enables their global profiling at the entire transcriptome level. With the goal of establishing the baseline of PTM expression, we examined a control *S. cerevisiae* strain (BY4741) under different growth conditions, and then compared the results with those provided by strains containing both the L-A virus and M satellite, or just the former (1368 WT, L-A, M and 2404 WT, L-A, respectively). The comparison revealed that specific PTMs were expressed only in virus-containing strains, thus indicating that specific PTMs are unambiguously associated with viral replication. Next, we will assess PTM expression in mutants in which the toxin-immunity proteins were appropriately deleted. A greater understanding of the role of PTMs in viral immunity will be expected to reveal new potential targets for antiviral therapy.

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LC 19: Atmospheric Science and Business

Rachel O’Donnell – “Influence of Topography on Convective Patterns across the Greater Capital Region of New York”
Faculty Advisor: Brian Tang, College of Arts and Sciences, Department of Atmospheric and Environmental Sciences
The greater Albany region is unique in regards to its terrain. The various mountain ranges and river valleys play a significant role in convective patterns due to channeling of flow. The purpose of this research is to compare the days of convection, both severe and non-severe, to the large scale flow pattern. Lightning data from the National Lightning Detection Network was used to analyze the role terrain plays in organizing convection and the associated lightning. The greater capital region was divided into 0.1° grid boxes, and the number of total lightning strikes (both cloud-to-cloud and cloud-to-ground) was recorded within that box for each convective day. The days were then analyzed to find the flow directions using the Climate Forecast System Reanalysis (CFSR). After analysis these events were predominantly in the westerly and southwesterly synoptic-flow regimes. The results show that the flow direction does have an influence on the preferred locations of lightning and hence convection within the greater capital region of New York.

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Tomer Burg – “Analysis of Late Summer Heat Waves in the Northeast US”
Faculty Advisor: Lance Bosart, College of Arts and Sciences, Department of Atmospheric and Environmental Sciences
The climatological temperature maximum and heat wave frequency, defined as three or more consecutive days of maximum temperatures at or above 32 degrees Celsius, often peak around mid to late July in the Northeast United States. However, numerous notable heat waves have occurred in late August into early September, including 1953, 1973, and to a lesser extent 2015. An analysis of daily means of 500 hPa geopotential heights from the NCEP-NCAR Reanalysis dataset over a 67-year period (1948–2015), in addition to surface temperatures from numerous stations east of the Mississippi River, shows a secondary peak in mean temperatures, geopotential heights and heat wave frequency over the Northeast and Ohio Valley, and to a lesser extent in the Southeast, during the late summer. This peak is most evident in late August, both on the synoptic scale and on a localized scale in the selected stations. Composite 500–hPa geopotential height and surface analyses of the warmest late August into early September time frames exhibits an anomalous Western US trough and Eastern US ridge, and an anomalous surface high pressure center near the eastern US.

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Kaita Albanese – “The Relation between Social Responsibility and Exit Performance of VC-Based Entrepreneurial Firms”
Faculty Advisor: Na Dai, School of Business, Department of Finance
This study analyzes the probability of successful exit by venture capital (VC)-backed entrepreneurial firms that focus on “clean energy” initiatives. Such initiatives include generation from renewable sources as well as conservation. The empirical analysis, for ventures between 1990 and 2014, documents that clean energy investments have a higher probability of successful exit through IPO or trade sale than do non-clean energy ventures. Thus, there is no evidence that VC investors should shun socially responsible firms operating in solar and alternative subindustries. In addition, the results show that both solar and alternative energy VC-backed entrepreneurial firms allow their investors a shorter duration to exit. These findings fill the gap in literature regarding social responsibility and VC-backed entrepreneurial firms, providing a starting point for future empirical work regarding venture capital investing in socially responsible firms. Work such as this is important as businesses and society grapple with the question of how to move toward more sustainable industrial activities.

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Stuti Misra – “Low-Cost Ubiquitous Spectrum Sensing and Characterization”
Faculty Advisor: Mariya Zheleva, College of Engineering and Applied Sciences Department of Computer Science

Our research focuses on a new wireless network paradigm called Dynamic Spectrum Access (DSA) that brings hope for wide-spread availability of mobile wireless networks through efficient utilization of radiofrequency resources. A key challenge in DSA networks is the need for ubiquitous and accurate characterization of spectrum occupancy, however, existing techniques are prohibitively expensive and have limited characterization capabilities. Our work develops a low-cost spectrum scan methodology that also provides per-transmitter characterization of spectrum occupancy. Our sensor uses an RTL-SDR dongle with a wide-band multi-polarized antenna and an Android device with wideband scanner application built on top of the hackrf_android library. The spectrum scanner will be attached to a vehicle that will collect traces continuously as the vehicle traverses the city grid. These traces will be ultimately offloaded to a central server for storage and characterization. Such low-cost mobile scanners are characterized with scarcity of spectrum scans and the low range of frequencies caused by a combination of mobility and low instantaneous bandwidth of the sensor. The challenges that arise with our design are the feasibility of trace collection by our sensor in terms of power consumption and storage and the fidelity of sparse scans for detailed spectrum characterization.

Timothy LaRock – “Airpress: Towards Spectrum Inventory at Scale”
Faculty Advisor: Petko Bogdanov, College of Engineering and Applied Sciences, Department of Computer Science and Mariya Zheleva, College of Engineering and Applied Sciences, Department of Computer Science

An accurate, timely inventory of spectrum occupancy is critical for the advancement of Dynamic Spectrum Access technologies and legislation. Creating such inventory at scale requires ubiquitous spectrum scans, which poses challenges related to cost, storage, transmission bandwidth and analysis. To be scalable and effective, a spectrum inventory needs to minimize the amount of data it stores and transmits, while maximizing the utility of that data. To this end, we design AirPress, a spectrum inventory system which utilizes USRP software defined radio and general purpose PCs to reliably characterize the frequency spectrum in real time and minimize the transmission and storage of rich frequency scan data. In software, AirPress makes use of wavelet decomposition to perform scalable spectrum scan compression and spectrum characterization. The system answers queries from devices equipped with dynamic spectrum access capability in order to facilitate frequency hopping with limited interruption of service, as well as from regulatory bodies seeking to understand spectrum usage and the potential for further dynamism.

Brian Bollen – “Irrational Eigenvalues of the Discrete Laplacian after Subvision”
Faculty Advisor: Alexandre Tchernev, College of Arts and Sciences, Department of Mathematics and Statistics

The discrete Laplacian is an important mathematical structure that first arrived through the work of Kirchoff while he was analyzing electrical network flows. It was subsequently seen as a useful operator in many current areas of active mathematical research. The eigenvalues of this discrete Laplacian capture subtle mathematical properties that are of interest to study. One area of mathematics where the discrete Laplacian has found important applications is Topology. We have found that when carrying out the basic act of subdividing twice on the simplest of topological structures, a simplex, the eigenvalues of our discrete Laplacian become irrational. Moreover, if we subdivide a simplex twice and then carry this simplex to the next dimension, the irrationality of the eigenvalues persists. The process of extending this simplex into the next dimension is called coning. Through various techniques, we have pinpointed why this phenomena occurs in any simplex, and also how the irrationality is carried through dimensions with the process of coning.
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Gleams that untraveled world.”
-Tennyson

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