University at Albany

15th Annual Undergraduate Research Conference

April 27, 2018 Lecture Center
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<td>Conference Check In</td>
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<td>Poster Session</td>
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<tr>
<td>Oral Presentation Session 1</td>
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<tr>
<td>Conference Welcome</td>
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<td>Dr. Jeanette Altarriba, Vice Provost and</td>
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<td>Dean for Undergraduate Education</td>
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<td>Dr. Havidan Rodriguez, President</td>
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<td>Paul Stewart, Co-Founder Underground</td>
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<td>Railroad History Project</td>
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<td>Presidential Awards for Undergraduate</td>
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<tr>
<td>Conference Reception</td>
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The University at Albany has a rich tradition of providing undergraduate students with opportunities to engage in research alongside faculty and graduate student mentors. Our annual research conference allows us to showcase the variety of research and creative endeavors our students have been working on over these many months. Today, we celebrate the fine achievements of our students and our scholars and learn about the many different ways in which they are each making unique contributions to the world at large.

Please join me in congratulating our many fine student presenters and acknowledging the efforts of our faculty and staff in providing these rich opportunities for our student researchers.

Thank you for joining us today, and please enjoy the diversity of presentations our conference has to offer.

It's a GREAT day to be a GREAT DANE!

Jeanette Altarriba, Ph.D.
Vice Provost and Dean for Undergraduate Education
POSTER SESSION
Lecture Center Concourse 3:30 – 4:30 PM
For abstracts, please see page 14

Researching Urban Life of Today & Tomorrow

Andrew Boggio-Dandry - Soft Sensing in Smart Cities: Handling 3Vs Using Recommender Systems, Machine Intelligence, and Data Analytics
Jeffrey Brien, Samantha Bufalini, Dylan Huynh, Justin Rydzewski, Steven Rossini, and Chris Balsamo - The Six Types of Air Pollution
Emily Bruce - The Influence of Population Density and Perceived Availability of Substances on Use Among Adolescents
Andrew McMahon - Project: VOST
Christopher Yong - Building Smarter Communities with Data Science: Resolving Reported Issues in SeeClickFix

Advances in Forensics & Criminal Justice

Nana-Hawwa Abdul-Rahman - Rapid Species-level Identification of Atropine and Scopolamine-containing Psychoactive Seeds by Chemometric Processing of Direct Analysis in Real Time-High Resolution Mass Spectral Data
Lisa Dobrowolsky* - Are Jurors' Judgments about Confessions Affected by Juvenile Defendant Race?
Samantha Giuliano* - Determining Donor’s Age through Blood Analysis using ATR FT-IR Spectroscopy
Ashley Hull* - Raman Spectroscopic Analysis of Organic Gunshot Residue Spanning a Range of Excitation Wavelengths
Olivia Johansen* - Empathy and Negative Reciprocity as Predictors of Third-Party Punishment
Keily Linger* - Analysis of Police Responses to Mass Shooting Events
Adrianna Mathis - Biometrics via Sweat Metabolites for the Differentiation of Individuals
Zachary McVicker - Implementing Privacy in Multimedia
Samantha Strine* - Effects of Stereotype Threat on Black and White Individuals’ Verbal Responses in Police Encounters

*Honors College student
Poster Session
Lecture Center Concourse 3:30 – 4:30 PM

For abstracts, please see page 14

Researching Sociopolitical and Sociohistorical Issues Across the Disciplines

Valerie Bresier* and Jaleen Fraser - Maternal Anxiety in the Middle East and North Africa
Tara Caimmerer - Affiliatory Peer Behaviors and Children's Social Cognition
Bibi Chaterpateah - HIV-related Stigma and Discrimination Serves as a “Border” Limiting Opportunities for HIV Care and Treatment
Olivia Delos - Surviving on Less and Less: A Comparison of Strategies between Rural and Non-Rural Communities
Katie Grasso - Rural vs Urban: The Impacts of Family & Environment on Guatemalan Dropout Rates
Mitchell Hura - The Dirty War in Argentina of 1976-1983: Intersections of Violence, Civic Activism, and Gender in an Era of Violent Instability
Michalina Kulesza - The Linguistic Impact of Spanish on Mayan Languages
Cody Ng - Consumerism in African American Communities in Albany during the 19th Century
Ernesto Porcar - Free Trade Does Not Free People
Shannon Ragone - African American Dietary Patterns in Albany during the Early-to-Middle Nineteenth Century as Reconstructed from Faunal Bone Analysis
Tengfei Wang - Economic Deprivation and Its Impact on Burglary Rates in Hong Kong Society

Advances in Mathematics, Chemistry, Physics, and Biology

Evan Busch - Organic Photoredox Catalyzed Thiol-yne Reaction
Hanjoon Choe - Relating Two Combinatorial Models in the Representation Theory of the Symplectic Group
Kristen Forehand - Optimizing CRISPR/CAS Knockout of ROCK Isoforms in SIMS Cell Line
Marina Danielle Infantado* - Development of a Rapid Small-Scale Purification Method for the Quantitation of Heparin-Like Glycosaminoglycans from Cell Culture Media
Simranpreet Kaur* - Kissing Complex Stabilities Modeled by Molecular Dynamics Simulations
Cara Sherman* - Comparative Ethology of the Vulpes Genus

*Honors College student
POSTER SESSION
Lecture Center Concourse  3:30 – 4:30 PM

For abstracts, please see page 14

Health, Medicine, and Health Education

Fu Yee Chua* - Cdkall Protein and its Roles in Type 2 Diabetes
Jerlisa Fontaine - Get HealthE
Leah Gloskey* - Satisfaction of Search (SOS) Errors in Proofreading: Evidence from Eye Movements
Ciara Hoye - Integrated Bio Behavior Surveys Among Female Sex Workers
Oyenike Ilaka* - Comparing Different Health Literacy Measurement Tools Used for Assessing Health Literacy Levels in College Students
Kyler Lehrbach - An Exploratory Study of the Impact of Client Interpersonal Dominance on Early Treatment
Paul Pangburn* - Effects of the 2014 Medicaid Expansion on Health Behaviors

Issues in Atmospheric & Environmental Sciences and Climate Change

Kaylynn Enright*, Brett Casserly, Kyle Davie, Shardae Drew, Rachel Gergely, and Peiyao Lai - The Effects of Climate Change on Endangered Species
Jose Gallegos, Assief Khan, Khalil Foreman, Maggie Gorman, Patrick Smith, and Iqbal Haque - Reduction of Carbon Emissions in Various Cities Around the World!
Alexander Gelfand, Michael Slattery, Danlan Huang, Zachary Boutjdir, Rob Hasenbalg, and Jen Chen - Renewable Energy Sources
Jose Gonzalez, Kyle Grant, Thomas Hagan, Connor Brohan, Nico Montello, and Kledis Capollari - Climate Change and the Future of Animals
Liam Hurley, Chris Stuhlweisser, Yinna Wang, Julia Carbone, and Tracy Kilcoan - The Tragedy of Deforestation
Erin Lynch* - Assessing Effective Rhetoric on Twitter in Relation to Forecast Uncertainty Regarding Hurricane Tracks
Hung-Yu (James) Ma, Lexi Reeves, Kerry Graziosa, Jinhee Lee, Ashley Abelard, and Sophie Patka - The Harmful Effects of Industrialization in New York City
Alexandra Schindler, Alexandra Bowler, Jack Alliegro, Chris Pecoraro, Erika Lister, and Alex Capsello - Economic Water Pollution
Anthony Sedotto, Brad Belotti, Taylor Fitzpatrick, Sean Sullivan, Megan Walkowicz, and Vivi Wang - The Loss of Biodiversity
Alexander Siemenn - Simulating Wind Energy Availability Using Numeric Models

*Honors College student
ORAL PRESENTATION
SESSION 1
3:15 – 4:30 PM

For abstracts, please see page 30

Lecture Center 2: New Approaches in Forensic Science

Eden Alin* - Chemical Assay for Fingerprint Analysis: Moving Toward Multiattribute Determination via Arginine

Allix Coon* - Development of a Condom Lubricant Database using DART-HRMS for use by Forensic Practitioners

Morgan Eldridge* - Enzymatic Assay for Fingerprint Analysis: Moving Toward Multiattribute Determination via Alanine

Robert Rosenblatt - Differentiation of Human Blood from Potential False Positive Substances Using Raman Spectroscopy and Chemometrics

Lecture Center 3A: Activism, Identity, and Equality: New York History's Enduring Legacy

Ryan Fox - Isaac Wise: The Path to American Jewish Unity Through American Nationalism

Derek Healey - Ritual “Garbage” in Working-Living Quarters of Enslaved Persons at Albany’s Ten Broeck Mansion

Jacob Houser - When the World Seemed New: UE Local 301 and the Decline of the American Labor Movement

Lecture Center 3B: Advances in Health, Medicine and Wellness

TJ Brown* - Small Molecule Inhibitors of the Gram-positive T-box Mechanism

Jessica Simon - What Motivates You?

Nina Williams* - Stress Granule Proteins Modulate Zika Infection

Matthew Morano - Simulation of Complex X-Ray Optics Geometries for Medical and Materials Applications

Lecture Center 3C: Research in Atmospheric and Environmental Science

Michael Main* - Differences Between High Shear / Low CAPE Environments Favoring Tornadoes versus Straight-Line Damaging Winds in the Northeast US

Marquette Rocque* - An Analysis of WSR-88D Dual-polarization Radar Parameters from the Ontario Winter Lake-effect Systems Field Campaign

Brenna O'Brien - Life Cycle Environmental Impacts of Dairy Production Systems in New York State

*Honors College student
CONFERENCE WELCOME AND KEYNOTE
4:30 PM–5:00 PM

Dr. Jeanette Altarriba, Vice Provost and Dean for Undergraduate Education

Dr. Havidán Rodríguez, President

Paul Stewart, Co-Founder Underground Railroad History Project
Paul Stewart is co-founder of the Underground Railroad History Project, with his wife Mary Liz. He is a graduate of the University at Albany in the class of 1974 (Summer). He holds a masters degree from Loyola University of Chicago (1981). Paul has 40 years of experience working with non-profit organizations principally related to community development with the last 20 years having been employed at the Community Loan Fund of the Capital Region with a focus on micro-enterprise business development. In 1998 Paul and Mary Liz decided to engage in a personal research project to learn more about the Underground Railroad as it related to the Capital Region. As they explored the topic they realized what they had discovered was not the story people usually told and so they decided to share their discoveries. In their attempt to share the stories they initiated a project of walking tours and then a conference on the subject. They then created the Underground Railroad History Project (URHP). As they did so they discovered a historic site that was connected to the story and which was a threatened structure. They initiated an effort to save the structure and restore it. Their work in telling the story, creating and providing educational programs around the story and saving the structure has won numerous awards including most recently the Annette Delavellade Spotlight Award from the Delta Sigma Theta Sorority for Community Service in February of 2018. They have spoken to hundreds of groups, written articles on the history, their project and had articles written about their work. Since 2009 The Underground Railroad History Project has collaborated with Hartgen Archeological Associates and Albany County Historical Association to provide for the work of a small camp for Junior High and High School youth to do archaeology at the properties connected with the restoration project. Other archaeology has been done by Hartgen at the properties on a limited basis. In 2017 URHP collaborated with the summer class of Professors Marilyn Masson and Michael Lucas for a larger dig that yielded an outstanding trove of artifacts related to the history of the property and the people who lived there. They are working to have those artifacts on display. The Stephen and Harriet Myers Residence is on the National Register of Historic Places.
ORAL PRESENTATION
SESSION 2
5:15 – 6:30 PM

For abstracts, please see page 34

Lecture Center 2: Human Interaction & Identity in Animated and Imagined Worlds

Ryan Badalamenti* - We’ll Make a Man Out of You: Steven Universe, the Bildungsroman, and the Redefinition of the Male Hero
Leslie Beegle - "It’s Alive!": H.P. Lovecraft, Octavia Butler, and the Problem of Object-Oriented Ontology
Joseph Wozlonis - Respawn, Relearn: How Videogames Build and Destroy Emergent Languages
Fernanda Giongo Fernandes - El Disparate Volante: Determination of Origin and Authenticity
Andrea Guerrero - We All Get It...Right?: Sensitizing an Audience through the Reassessment of Tropes, Genre, and Emotive Technique in Jordan Peele’s film Get Out

Lecture Center 3A: Rhetoric, Discourse, Lyrics and Memoirs: Their Real World Effects

Christian Burgos* - A House Divided
Sarah Hladik - The Gallagher Curse or an American Reality: The Subversion of Class Stereotypes and the American Dream Mythos in Shameless
Kendall Aufmuth - Writing and Reading as Healing: Psychotherapy and Narrative in Mental Illness Memoirs
Tim Dillinger - Right On Be Free: The Radical Possibility of Gospel
Bria McKiver - Ice Cube and Rodney King: Hip Hop and the L.A. Riots

Lecture Center 3B: Gender Concerns in Human Rights, Advocacy, Politics, and Language

Kaylynn Enright* - Gender in Politics: A Comparative Study of Female Representation in the New York State Senate
Akua Williams - Trafficking Tactics Used for the Recruitment of Workers within the Commercial Sex Industry
Nadine Zaky Kotb - Gender Assignment to English Nouns in Arabic in New York
Lauren Prosper - Sexual Violence Advocates and the Anti-Rape Movement in New York State’s Capital District Tri-City Areas
Sarah Kate Tavernese - The Story No One Wants to Tell: Sexual Assault and Survivor Discourse

*Honors College student
Lecture Center 3C: Politics, Life, and Policy in the World Today

Daniel Berle - College Debt and the Earnings Premium: Nationally and Regionally
Sandra Asantewa - Effect of Education on Gun Regulations
Adanna Perry - The Criminalization of Black Students with Learning Disabilities
Erik Villalobos - The Salvadoran Struggle: An Ongoing Transnational Resistance of Imperialism
Olamide Olowoyo - Intra-African Trade and Economic Development in Africa

Lecture Center 23: Research in the Fields of Finance and Economics

Kirk Georgantonis - The Effects of Financial Liberalization on Economic Growth in Emerging Markets
Robin Lieb* - The Impact of Labor Rights on Equity Returns: A Cross-Country Analysis
Maksim Papenkov* - Empirical Asset Pricing at the Sector-Level using Fama-French Factors
Michael Spellane - Estimating Implied Risk Premia using Short-Term Interest Rate Models
Peter DiBernardi - Analyzing the Relationship Between Capital Adequacy Ratios, CCAR, and the Systemic Model of Banking Originated Losses (SYMBOL)

Lecture Center 24: Advances in Physics, Chemistry, Math, and Biology

M. Grace Hren* - RNA Secondary Structure of 3’UTR Regulates Translation Control
Corwin Knight - Snowball Chamber: A Super-cooled Approach to Dark Matter Detection
Chris Li - Introduction to Partial Differential Equations
Joshua Martin* - Particle Detection with Cadmium Telluride Quantum Dots

*Honors College student
Andrew Boggio-Dandry - Soft Sensing in Smart Cities: Handling 3Vs Using Recommender Systems, Machine Intelligence, and Data Analytics
Faculty Advisor: Tolga Soyata, College of Engineering and Applied Sciences, Department of Electrical and Computer Engineering

Faculty Advisor: John Welch, College of Arts and Sciences, Department of Chemistry

Timothy Dillinger-Currenton - Right On Be Free: The Radical Possibility of Gospel
Faculty Advisor: Oscar Williams, College of Arts and Sciences, Department of Africana Studies

Lisa Dobrowolsky - Are Jurors’ Judgments about Confessions Affected by Juvenile Defendant Race?
Faculty Advisor: Cynthia Najdowski, School of Criminal Justice

Kaylynn Enright - Gender in Politics: A Comparative Study of Female Representation in the New York State Senate
Faculty Advisor: Patricia Strach, Rockefeller College of Public Affairs and Policy, Department of Public Administration/Political Science

Leah Gloskey - Satisfaction of Search (SOS) Errors in Proofreading: Evidence from Eye Movements
Faculty Advisor: Heather Sheridan, College of Arts and Sciences, Department of Psychology

Andrea Guerrero - We All Get It…Right?: Sensitizing an Audience through the Reassessment of Tropes, Genre, and Emotive Technique in Jordan Peele’s film Get Out
Faculty Advisor: Derik Smith, College of Arts and Sciences, Department of English

Jacob Houser - When the World Seemed New: UE Local 301 and the Decline of the American Labor Movement
Faculty Advisor: Ryan Irwin and David Hochfelder, College of Arts and Sciences, Department of History
PRESIDENTIAL AWARD FOR UNDERGRADUATE RESEARCH
Lecture Center 1
6:35 PM

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

Andrew McMahon - Project: VOST
Faculty Advisor: Michael Young, College of Emergency Preparedness, Homeland Security and Cybersecurity

Matthew Morano - Simulation of Complex X-Ray Optics Geometries for Medical and Materials Applications
Faculty Advisor: Carolyn MacDonald, College of Arts and Sciences, Department of Physics

Cody Ng - Consumerism in African American Communities in Albany during the 19th Century
Faculty Advisor: Marilyn Masson, College of Arts and Sciences, Department of Anthropology

Brenna O'Brien - Life Cycle Environmental Impacts of Dairy Production Systems in New York State
Faculty Advisor: Xiaobo Xue, School of Public Health, Department of Environmental Health Sciences

Paul Pangburn - Effects of the 2014 Medicaid Expansion on Health Behaviors
Faculty Advisor: Pinka Chatterji, College of Arts and Sciences, Department of Economics

Ernesto Porcari - Free Trade Does Not Free People
Faculty Advisor: Christine Vasallo-Obly, College of Arts and Sciences, Department of Latin American, Caribbean and U.S. Latino Studies

Lauren Prosper - Sexual Violence Advocates and the Anti-Rape Movement in New York State's Capital District Tri-City Areas
Faculty Advisor: Angie Chung, College of Arts and Sciences, Department of Sociology

Robert Rosenblatt - Differentiation of Human Blood from Potential False Positive Substances Using Raman Spectroscopy and Chemometrics
Faculty Advisor: Igor Lednev, College of Arts and Sciences, Department of Chemistry

Nadine Zaky Kotb - Gender Assignment to English Nouns in Arabic in New York
Faculty Advisor: Lofti Sayahi, College of Arts and Sciences, Department of Languages, Literatures, and Cultures
SITUATION INTERACTIVE PRIZE FOR EXPERIENCE RESEARCH

Congratulations to the nine University at Albany Undergraduates who received the inaugural Situation Interactive Prize for Experience Research

Valerie Bresier - Maternal Anxiety in the Middle East and North Africa
Faculty Advisor: Kathryn Mishkin, School of Public Health, Department of Health Policy, Management, and Behavior

Celeste Champagne - The Affect of Anthrax Carcasses on Plains Zebras Foraging Behavior
Faculty Advisor: Wendy Turner, College of Arts and Sciences, Department of Biological Sciences

Elise Coombs - Aboard the Yellow Trolley: A Literary Life and Times
Faculty Advisor: Jessy Poole, College of Arts and Sciences, Department of English

Desiree D’Moore - Implementation of a Virtual Reality Environment to Track Social Interactions in Mice
Faculty Advisor: Annalisa Scimemi, College of Arts and Sciences, Department of Biological Sciences

Ryan Fox - Isaac Wise: The Path to American Jewish Unity Through American Nationalism
Faculty Advisor: Ryan Irwin, College of Arts and Sciences, Department of History

Michelle Raissa Kobou Wafo - Investigation of the Effect of Polyphenols Rich Pomegranate (Punica Granatum) Extract on MCF-7 Breast Cancer Cells
Faculty Advisor: Mayra Santiago, Office of Access and Academic Enrichment; Martin Tenniswood, School of Public Health, Department of Biomedical Sciences

Robin Lieb - The Impact of Labor Rights on Equity Returns: A Cross-Country Analysis
Faculty Advisor: Rita Biswas, School of Business, Department of Finance

Molly MacIsaac - Detection of Cellular microRNAs with Programmable DNA Nanoswitches
Faculty Advisor: Ken Halvorsen, Senior Research Scientist, The RNA Institute, University at Albany

Alexander Siemenn - Applied Computer-based Energy Simulation Models as a Foundation to Assess Commercial Building Sustainability Through Costing Analytics
Faculty Advisor: Xiaobo Xue, School of Public Health, Department of Environmental Health Sciences
ABSTRACTS
Poster Session - Arranged alphabetically by author last name

Researching Urban Life of Today & Tomorrow

Andrew Boggio-Dandry - Soft Sensing in Smart Cities: Handling 3Vs Using Recommender Systems, Machine Intelligence, and Data Analytics
Faculty Advisor: Tolga Soyata, College of Engineering and Applied Sciences, Department of Electrical and Computer Engineering
Today's existing smart city research involves many overtly futuristic applications such as smart transportation, in which smart roads warn drivers of bad traffic conditions ahead, smart parking which communicates the location of unoccupied parking spaces to drivers, and smart environment which enables fully automated homes and workplaces to adjust their temperature to conserve energy. The realization of these applications hinges on a data acquisition structure that gathers its data from a countless number of sensors, either deployed for predefined tasks (hard sensing) or built into the mobile devices of smart city residents (soft sensing). At the core of this big data infrastructure lie the 3Vs: veracity, volume, velocity, variety and value. The soft sensing component of a smart city sensing network is particularly affected by the 3Vs: veracity, volume, and velocity. To address the unique challenges of big data, recommender systems, statistical reputation systems, and context analysis are used to ensure the veracity of acquired data, machine learning algorithms are applied to handle the data volume, and data analytics algorithms are implemented to manage data velocity. Despite its seemingly innumerable size, the acquired data is highly redundant and systematic use of machine intelligence and data analytics can facilitate processing by extracting only the relevant information; in this paper, we study the role of these algorithms through the lens of the 3Vs in facilitating soft sensing within the framework of smart city applications.

Jeffrey Brien, Samantha Bualini, Dylan Huynh, Justin Rydzewski, Steven Rossini, and Chris Balsamo - The Six Types of Air Pollution
Faculty Advisor: Mary Ellen Mallia, Office of Sustainability
Good air quality is something many of us take for granted. Yet there are a variety of air pollutants that exist including Nitrogen Dioxide, Sulfur Dioxide, Particulate Matter, Ground level Ozone, Carbon Monoxide, and Lead. This project focuses on the western coast of the US and describes these pollutants, their formation and introduction to our atmosphere as well as their negative effects and toll on human health. Included is a discussion about what is being done to curb their prevalence in our atmosphere and the successes or failures of policies.

Emily Bruce - The Influence of Population Density and Perceived Availability of Substances on Use Among Adolescents
Faculty Advisor: Tomoko Udo, School of Public Health, Department of Health Policy, Management & Behavior
Adolescent substance usage and risk factors are important to study because usage rates are often sentinel of long-term behavioral changes, such as future, life-long drug usage. While it has been suggested that the availability of substances may explain differences in substance use vulnerability by population density, this question has not been investigated. This study examined whether risk for use of alcohol, marijuana, and non-medical prescription drugs were different by population density and perceived availability in U.S. adolescents. Using the data from the 2015 Monitoring the Future dataset (n=29,960), we used multiple logistic regression analysis to examine whether odds of lifetime and past-month alcohol, marijuana, and non-medical prescription drug use prevalence significantly differed by population density (defined by U.S. Census Metropolitan Statistical Area) and perceived availability. We found that regardless of the population density, perceived availability was associated with significantly increased odds of lifetime and past-month use for all drugs; odds of substance use were not significantly different by population density. For non-medical prescription drug use, among those who reported low perceived availability, odds of lifetime and past-month use were significantly higher for high and medium population densities relative to low population densities. High perceived availability was significantly associated with greater risk for substance use, regardless of population density, indicating its potential for substance use prevention policies. Population density may influence prescription drug use when perceived availability is low. There have been significant efforts to reduce the amount of diverted prescription drugs available to the population. Increased use prevalence with low reported availability could potentially indicate that areas of high and medium population density still have a greater supply of diverted prescription drugs compared to areas of low population density. Investigating this difference could illuminate what changes may further reduce the availability, and subsequent usage prevalence, of diverted prescription medications.
ABSTRACTS
Poster Session - Arranged alphabetically by author last name

Researching Urban Life of Today & Tomorrow

Andrew McMahon - Project: VOST
Faculty Advisor: Michael Young, College of Emergency Preparedness, Homeland Security and Cybersecurity
VOST, or Virtual Operations Support Teams, is a concept developed by emergency managers to increase the existing social media capabilities of agencies or organizations during times of disaster or when existing capabilities have been exhausted. Project: VOST is an exploratory research project meant to determine the viability of launching a VOST at SUNY University at Albany under the College of Emergency Preparedness, Homeland Security and Cyber Security. The team (comprised of volunteers with applicable training) is activated during events to help increase the social media capacity of an agency or organization, and has been used in the real world to respond to natural disasters and large-scale incidents as well as small, preplanned events such as mass gatherings and community events. Teams can watch social media for rumors and the spreading of misinformation, monitor what’s trending, and increase situational awareness for the organization requesting activation. The goal of the project is to mix practical and theoretical knowledge on the VOST concept into something that’s unique to the college and benefits the University as well as the surrounding areas. In the future I would like the College of Emergency Preparedness, Homeland Security, and Cyber Security VOST to serve as a model for other universities and research based institutions to further this concept of digital volunteerism.

Christopher Yong - Building Smarter Communities with Data Science: Resolving Reported Issues in SeeClickFix
Faculty Advisor: Daphne-Stavroula Zois, College of Engineering and Applied Sciences, Department of Electrical and Computer Engineering
Platforms such as SeeClickFix (https://seeclickfix.com/) have been built to introduce an easy-to-use web interface to assist concerned citizens report problems to governmental agencies regarding their local environment. However, the concreteness of a reported issue depends on the reporter; the actual status and demand to the status may not be described clearly or either one may be misdescribed in the report, leaving officials scrambling about what the actual problem may be. The collection of self-reported issues from SeeClickFix is critical in developing computational methods to estimate the actual issue from ambiguous and/or complementary information such as textual descriptions and photographs and assigning reported issues to the appropriate authorities accurately and efficiently. The aim of this project is to collect and computationally analyze SeeClickFix data, and automatically classify issues based on textual description.
ABSTRACTS
Poster Session - Arranged alphabetically by author last name

Advances in Forensics & Criminal Justice

Nana-Hawwa Abdul-Rahman - Rapid Species-level Identification of Atropine and Scopolamine-containing Psychoactive Seeds by
Chemometric Processing of Direct Analysis in Real Time-High Resolution Mass Spectral Data
Faculty Advisor: Rabih Musah, College of Arts and Sciences, Department of Chemistry
In an effort to circumvent current drug laws or avoid the well-known dangers of highly addictive substances such as cocaine, heroin and methamphetamine among other compounds, an increasing number of drug users are resorting to the ingestion of unscheduled psychoactive plants as a means to get high. However, many of these plants are themselves toxic and contain banned psychoactive substances. Examples include plants that contain the drugs atropine and scopolamine, both of which are scheduled, while the plants from which they are derived are not. The ability to legislate the use of these substances is hampered by the absence of methods that can be used by law enforcement to identify these plant materials when they are discovered in a crime scene context. Reported here is the development of a method that can be used by law enforcement to rapidly identify and distinguish between plant drugs that contain atropine and scopolamine. The seeds of 24 species representing the genera that contain both compounds (i.e. Atropa, Hyoscyamus, Brugmansia, Datura, and Mandragora) were analyzed by direct analysis in real-time mass spectrometry (DART-MS) in order to determine the unique chemical fingerprint that characterized each. Analyses were conducted in replicates of 8-10 and a total of 240 spectra were acquired. The presence of the key biomarkers atropine at m/z 290.369 and scopolamine at m/z 304.353 was confirmed in all the seed spectra. Hierarchical clustering analysis of the data yielded a dendrogram that showed clustering of like species and separation between species. The observed leave-one-out cross validation was 96.54% and the external validation was 100%. The results provide the first database of atropine and scopolamine-containing seeds that can be used by crime labs to identify them. Advantages of the method include the ability to analyze samples in their native form, its speed, and its accuracy.

Lisa Dobrowolsky - Are Jurors’ Judgments about Confessions Affected by Juvenile Defendant Race?
Faculty Advisor: Cynthia Najdowski, School of Criminal Justice
This research is focused on understanding jurors’ beliefs about how much weight juvenile defendants’ confessions should be given, especially when the confessions were coerced. This is an important topic because adolescents are vulnerable and at risk for producing false confessions. Because of their age and other developmental factors, they can sometimes be coerced by police during interrogation to admit to crimes they did not commit. Once a confession is obtained, it can be very persuasive to jurors because it is hard for them to believe that someone would admit to a crime they did not commit. This can lead to wrongful convictions. Furthermore, certain racial groups are treated unfairly in the criminal justice system, yet no previous studies have examined whether defendant race affects the way potential jurors view confession evidence. Thus, this mock trial research investigates whether jurors are able to disregard a coerced confession made by a juvenile defendant, and whether that decision is affected by the race of the juvenile. Participants completed an online experimental survey in which they read a summary of a case involving a 12-year-old girl charged with murdering her father. The girl defendant was either Black or White and she either gave no confession, a voluntary confession, or a coerced confession. Effects of defendant race and confession type on jurors’ judgments were measured via suspicion-of-guilt and degree-of-guilt ratings. Results and implications for ensuring fair and just jury trials will be discussed.

Samantha Giuliano - Determining Donor’s Age through Blood Analysis using ATR FT-IR Spectroscopy
Faculty Advisor: Igor Lednev, College of Arts and Sciences, Department of Chemistry
Phenotype profiling is useful in the forensics world to help narrow down suspects. It can be used to identify a subject using composition of their biological matrices. Attenuated total reflection Fourier-transform infrared (ATR FT-IR) spectroscopy is the technique used to acquire information on the (bio)chemical composition of a sample. The goal of this study is to identify a person’s age range using dried bloodstains. For the purpose of this experiment, a diverse pool of donors between newborn (>1), adolescent (11-13), and adult (43-68) age ranges were used. It has been reported in the literature that different donors’ age groups have different levels of methHb and proteins in a whole blood. Spectral differences are minor due to all samples consisting of the same components with only quantitative changes between them. Therefore, the collected dataset was analyzed using chemometrics to enhance the differentiation power of the method. The plan is to create a statistical model that can classify unknown blood samples in the correct category of newborn, adolescent, or adult with statistical confidence. Overall, ATR FT-IR spectroscopy is non-destructive and can be used in-field since portable instruments are commercially available. Also, it is an inexpensive way to process data and the development of this statistical model could help increase the amount of identifiable information about an individual from evidence.
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Advances in Forensics & Criminal Justice

Ashley Hull - Raman Spectroscopic Analysis of Organic Gunshot Residue Spanning a Range of Excitation Wavelengths
Faculty Advisor: Igor Lednev and Shelby Khandasamy, College of Arts and Sciences, Department of Chemistry
Gunshot residue (GSR) is a type of trace evidence that can often be recovered at crime scenes. Organic gunshot residue (OGSR) is one of the two major components of GSR. This study investigates the analysis of OGSR, and aims to determine the optimum parameters at which to obtain Raman spectroscopic signals for OGSR particles using different excitation wavelengths. In this study, a total of 3 different excitation wavelengths were utilized: namely 785 nm, 457 nm, and 406 nm. The samples were created such that OGSR particles were hand selected and placed upon a tape substrate. Each of the OGSR particles were cordoned off through the employment of a grid formation in order to ensure clear assignment of spectra to the respective particles. The purpose of determining the optimum parameters for obtaining Raman spectra of OGSR at various excitation wavelengths is to facilitate the ease of OGSR detection using a Raman spectrometer.

Olivia Johansen - Empathy and Negative Reciprocity as Predictors of Third-Party Punishment
Faculty Advisor: Brendan Gessar and Dylan Campbell, College of Arts and Sciences, Department of Psychology
What motivates us to punish others? Individual differences dictate most of our behaviors, so our beliefs about fairness and retribution play into the type and degree of punishment we administer. Past work has highlighted the significant negative correlation between empathy and punishment, but a potentially stronger predictor of punishment behavior exists. This study pits empathic concern against negative norms about reciprocity to see which is a better predictor of punishment behavior in an economic goods game. We predicted that the negative reciprocity would be a better predictor of punishment than empathy, but ultimately found that empathy prevailed as the stronger predictor. The findings in this study raise questions about the implications of using individual difference measures to predict punishment behavior in other scenarios like jury settings.

Kelly Linger - Analysis of Police Responses to Mass Shooting Events
Faculty Advisor: Michael Young, College of Emergency Preparedness, Homeland Security and Cybersecurity
This study examines 186 mass shooting events for the protocol police followed upon arrival at the scene. In 2/3 of these cases, the police arrived on scene after the shooter had stopped shooting, either because the shooter committed suicide, fled the scene or was detained by people in the area who were not currently police officers. Of the 186, only 66 cases included police arriving on scene and following a response protocol, either engagement or perimeter. The number of casualties varied for each incident and type of police response. These cases were analyzed to determine if one type of response protocol was more effective in decreasing the number of casualties resulting from a shooting. Analysis of the data showed signs that suggested there are more casualties as a result of following perimeter protocol, but these results remain statistically insignificant.

Adrianna Mathis - Biometrics via Sweat Metabolites for the Differentiation of Individuals
Faculty Advisor: Jen Halamek and Mindy Hair, College of Arts and Sciences, Department of Chemistry
Sweat is a biological fluid present on the skin surface of every individual and is known to contain amino acids as well as other low molecular weight compounds. The concentrations of the biochemical content within an individual’s sweat are largely controlled by metabolic processes within the body that fluctuate regularly based on attributes such as age, biological sex, and activity levels. Therefore, the concentrations of these sweat components are person-specific and can be exploited to differentiate individuals based on trace amounts of sweat. Three model compounds were studied – lactate, urea, and glutamate using three separate bioaffinity-based systems: lactate oxidase coupled with horseradish peroxidase (LOx-HRP), urease coupled with glutamate dehydrogenase (UR-GDH), and glutamate dehydrogenase alone (GDH). Analysis was performed on 50 mimicked and 25 authentic sweat samples, following a developed and optimized collection and extraction protocol. A multivariate analysis of variance (MANOVA) test was performed to demonstrate that these three single-analyte enzymatic assays were effectively used to identify each person in both sample sets. This novel sweat analysis approach is capable of differentiating individuals based on the collective responses from the chosen metabolic compounds in sweat, without the use of DNA. Applications for this newly developed, non-invasive analysis can include the field of forensic science in order to differentiate between individuals, as well as the fields of homeland security and cybersecurity for personal authentication via unlocking mechanisms in smart devices that monitor metabolites. Through further development and analysis, this concept also has the potential to be clinically applicable in monitoring the health of individuals based on particular biomarker combinations.
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Advances in Forensics & Criminal Justice
Zachary McVicker - Implementing Privacy in Multimedia
Faculty Advisor: Liyue Fan, School of Business, Department of Information Security & Digital Forensics
Everyday hundreds of millions of photographs are uploaded to the internet. Facebook and Instagram are two of the largest platforms that receive these photographs. With the latest scandal regarding Cambridge Analytica, many people are concerned about what type of personal information is gathered by social media platforms. What they don’t oftentimes consider, is how much personal information can be seen and gathered just by one photograph. Identifying information of either the people, objects, or the location captured by the photograph is often accessed freely by the public. To this end, we have built a website that will present a user with a variety of photographs and will allow a user to obfuscate regions of the image to increase the privacy of the photograph, while preserving the basic utility of the photograph. Our website will apply a novel image obfuscation method to regions defined by the user, which provide rigorous privacy guarantees. All the user input data is aggregated such that after having multiple users utilize our webpage, we will be able to identify what areas of an image were deemed to be the most sensitive when it comes to personal information and privacy. In addition, we will also study the user satisfaction of the obfuscated image as a viewer. Our end goal is that social media platforms should adopt our technology, so that only people you are friends with can see the original image: the general public will only see an obfuscated version of the image.

Samantha Strine - Effects of Stereotype Threat on Black and White Individuals' Verbal Responses in Police Encounters
Faculty Advisor: Cynthia Najdowski, School of Criminal Justice
I examined whether Black and White individuals have different verbal behaviors in police encounters and, if so, whether stereotype threat explains these differences. This question is important because police officers use certain verbal behaviors as evidence of deception. Thus, unconscious behaviors arising from concern about being stereotyped as a criminal could cause Black men to be perceived by police as suspicious and, in turn, contribute to discrepancies in police treatment of Black versus White men. In this study, Black and White men interacted with a White security officer in a staged encounter that varied in stereotype relevance (low or high). The participants also completed a measure of stereotype threat. Participants’ verbal responses were videorecorded, transcribed, and coded for words that reflected spatial and perceptual information, analytical thinking, affiliation, tone, authenticity, and cognitive processes. Black men reported experiencing more stereotype threat in the interaction than did White men, and stereotype threat increased as the relevance of the criminal stereotype went from low to high. Although neither race nor stereotype relevance influenced spatial or perceptual information, Black men used fewer authentic words than did White men. Also, all participants used more analytical thinking and affiliation words and more negative tone when stereotype relevance was high as compared to low. Use of words indicating cognitive processes decreased as stereotype relevance increased, and this effect was partially mediated by stereotype threat. These findings imply that race and stereotype relevance are related to verbal behaviors that could lead police officers to be more likely to perceive Black than White men as guilty. This could impact how the officer interacts with Black men and contribute to the cycle of mistrust and tension between Black individuals and police.
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Researching Sociopolitical and Sociohistorical Issues Across the Disciplines

Valerie Bresier and Jaleen Fraser - Maternal Anxiety in the Middle East and North Africa
Faculty Advisor: Kathryn Mishkin, School of Public Health, Department of Health Policy, Management, and Behavior
Maternal anxiety, characterized by excessive and uncontrollable worry, occurs during pregnancy and within the first year after termination of pregnancy. Globally, 15 to 20% of women experience maternal anxiety, however, the rate is significantly higher among women in the Middle East and Northern Africa (MENA) region, where rates range from 24% to 50%. While these rates are documented, few studies have explored reasons why women in the MENA region are at exceptionally high risk for maternal anxiety. A comprehensive literature review was conducted to identify factors associated with maternal anxiety among women living in the MENA region. The results suggest that maternal anxiety in the MENA region is associated with high risk pregnancy, preterm birth, having history of fetal or neonatal mortality and complications, having a history of domestic violence or abuse, having low social support from a partner or family, having low maternal health education, and having low income. Additionally, maternal anxiety was more common among women in their third trimester of pregnancy and among women who gave birth to a female child. Findings suggest that there are multiple intersectional challenges faced by women in the MENA region that impact maternal anxiety including domestic violence, social and gender norms, and clinical complications. Health care policy reform should be adopted to implement social, emotional, and psychological support programs for women with high risk pregnancies and to support women who are victims of gender-based violence and lack a positive support system.

Tara Caemmerer - Affiliatory Peer Behaviors and Children’s Social Cognition
Faculty Advisor: Erin Baker, School of Education, Department of Educational and Counseling Psychology
This study serves to investigate children’s behavior towards people with whom they are familiar and unfamiliar. We are particularly interested to see what social behaviors (e.g., sharing) children find acceptable with known peers versus unknown peers. Specifically, we are interested in whether or not children think they should be nicer to known peers, and if they actually behave as such. Data will be collected through 10-minute interviews the child. The interview consists of the child completing three tasks with the Research Assistant. The first task is a puppet show in which two puppets explain how they would react in a scenario. The child is asked to which puppet they are alike, and how much they are like that puppet. This task assesses what relationship is required for a child to relationally aggress in, if any. The second task is a story in which a girl puts a ball into a basket and then another girl finds the ball and it puts in into a box. This will assess the child’s perspective-taking abilities. The third task is another story in which the child will have to differentiate between how a boy feels on this inside versus how he looks on the outside. This task assesses the child’s social competence. It is expected that children are more likely to relationally aggress towards people they know.

Bibi Chaterpateh - HIV-related Stigma and Discrimination Serves as a “Border” Limiting Opportunities for HIV Care and Treatment
Faculty Advisor: Kathryn Mishkin, School of Public Health, Department of Health Policy, Management, and Behavior
HIV-related stigma and discrimination serve as significant “borders” impacting the lives of people living with HIV (PLWH) and their health care providers. These self-imposed and society-imposed borders limit access to HIV treatment and result in worse health outcomes. Central Asia and Eastern Europe is the only region in the world where the number of new HIV infections among women continues to increase at an epidemic level. Analysis shows that self-stigma is associated with poor HIV treatment adherence among women residing in rural areas. Women are hesitant to disclose their HIV status for fear of inadequate family support, domestic violence, and abandonment. Because of the unique challenges faced by women living with HIV, this paper recommends the development of novel qualitative research focusing on the perceptions and experiences of women living with HIV and their health care providers. A comprehensive guide for this qualitative research is provided to illustrate appropriate methodology and tools. Findings from this research may be used to inform policies and interventions aimed at reducing HIV-related stigma and discrimination among women living with HIV.
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Researching Sociopolitical and Sociohistorical Issues Across the Disciplines

Olivia Delos - Surviving on Less and Less: A Comparison of Strategies between Rural and Non-Rural Communities
Faculty Advisor: Angie Chung, College of Arts and Sciences, Department of Sociology
Throughout history, there has been little support for the Welfare System because of the negative stigmas surrounding it. In 1996, Bill Clinton replaced Aid to Families with Dependent Children (AFDC) with Temporary Assistance for Needy Families (TANF). Recipients were required to find a job within two years of receiving TANF, whereas previously, there was no time limit on how long they could collect assistance. Single parent households especially have a difficult time getting themselves over the poverty line. Not only do they have the enormous expenses that arise from having a child, many are unable to find a job that pays more than minimum wage, an income that is not sufficient to support both a parent and a child. Because of this, many families are forced to turn to other methods in order to supplement their lack of income.

The circumstances of the poor, either working, receiving welfare, or both, vary depending on where they live. No matter the location, the impoverished must use other strategies in order to survive on almost nothing. These strategies include relying on networks, taking advantage of public spaces and charities, income-generation, and stretching their resources and making do with less. My prediction is that the ways in which these strategies are used among the working and non-working poor will differ based on whether they reside in a rural or an urban region. Rural communities are often faced with a lack of resources and jobs, while urban communities hold more charities and opportunities to help the poor. These disparities, and others, result in differences between the tactics used by residents of both regions. Studying the approaches the poor take is important in order to find a better solution to both, the Welfare System and eliminating the cycle of poverty altogether.

Katie Grasso - Rural vs Urban: The Impacts of Family & Environment on Guatemalan Dropout Rates
Faculty Advisor: Christine Vasallo-Oby, College of Arts and Sciences, Department of Latin American, Caribbean and U.S. Latino Studies
Throughout the 21st century Guatemalan education has gone through many advances and setbacks including access to different resources in rural and urban areas. Rural areas tend to be more heavily populated with indigenous people and tend to have less adequate teaching materials because of this, which in turn leads to a less adequate education. The Global Education Fund states, “Additionally, with more than half the population living below the poverty line, many children, especially rural and indigenous children, are forced to drop out of school to help support their families or because they are unable to afford the cost of uniforms, books, supplies and transportation”. School is especially difficult for girls who are usually expected to take care of their siblings, leave school early to obtain jobs to help the family or get married early. Research on how family and environment affect dropout rates is especially important in the context of Guatemala because it focuses on the effects that the sociocultural aspects of family and environment have on children’s’ lives and access to education. By focusing on how family and environment affect children in rural and urban areas this research will uncover how greatly children are affected by these aspects and what areas are impacted the most. To unearth this information, this project will need to find out what the actual dropout rates are in rural and urban Guatemala, how these dropout rates affect children’s daily lives, what the major sociocultural differences and similarities there are between rural and urban areas, and how traditional family units influence youth and their decision to stay in school. In this research paper, I will investigate the sociocultural impacts of Guatemalan dropout rates among young adults, ages 13 to 18. I argue that sociocultural aspects, like family and environment, effect middle and secondary school dropout rates in both rural and urban Guatemala in the 21st century.

Mitchell Ihura - The Dirty War in Argentina of 1976-1983: Intersections of Violence, Civic Activism, and Gender in an Era of Violent Instability
Faculty Advisor: Michitake Aso, College of Arts and Sciences, Department of History
The Dirty War in Argentina (1976 - 1983) was a period of systemic state violence promulgated by the military junta that ruled at the time. The intensity of the brutality of the regime, especially the forced disappearances, torture, and murder of innocent Argentines, prompted women across the nation to rise up in defiance. In my research, I seek to understand how the women during this period reconstructed gender roles and attempted to assert unprecedented levels of dominance in response, and as a result of, the brutality of the state-sponsored terrorism.
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Ernesto Porcari - *Free Trade Does Not Free People*
Faculty Advisor: Christine Vasallo-Oby, College of Arts and Sciences, Department of Latin American, Caribbean and U.S. Latino Studies
Put into effect in January 1994, the North American Free Trade Agreement or in Spanish, Tratado de Libre Comercio de América del Norte, brought about a sweeping economic change upon the North American continent and its peoples (NAFTA, 1994). Gone were the tariffs and trade restrictions, and in was the era of Neo-liberalism economics of free trade, privatization, and globalization capitalism. Since its passing, many have looked to it as a model for all trade, and others have demonized it, but twenty-three years later and three different US presidential administrations largely aloof of it barring its passing under the Clinton administration; NAFTA is making noise again in American politics. Both from the left and from the right, anger is rising among the American populace about the benefits or there lack of when it comes to free trade. Nowhere is this debate more pertinent and loud than the US-Mexican border, and as to direct pinpoint attention to delve into this topic, focus will be made on the region connecting Texas and Mexico. My project is a direct analysis of the effects the NAFTA agreement has had on both the people of Mexico and the United States.

Tengfei Wang - *Economic Deprivation and Its Impact on Burglary Rates in Hong Kong Society*
Faculty Advisor: Zai Liang, College of Arts and Sciences, Department of Sociology
Economic deprivation has always been a serious social problem in Hong Kong society in recent years. According to the census published by Hong Kong government, the GINI coefficient—an index from 0 to 1 that measures the wealth gap—reached its historical highest in 2016 which was 0.539 since Hong Kong began recording the income equality 46 years ago, and poverty was particularly serious for certain districts. Another notable social phenomenon is the trend of burglary of Hong Kong society. According to the recent statistics from HKPF, though Hong Kong is one of the safest metropolitans in the world, the burglary just steals the spotlight of Hong Kong society and it takes place more in the less developed districts than other districts. Based on the perspectives of some western classical theories, such as the social strain theory and the Marxism, the economic deprivation, which includes both relative economic deprivation and absolute economic deprivation, tends to increase the rates of property crimes such as the burglary. Based on the background information of Hong Kong, the relative economic deprivation is increasingly serious for the whole society as the gap between the rich and the poor is increasing, and for certain districts, the absolute economic deprivation is one of the major issues as the issue of poverty and related livelihood issues in these districts are particularly serious. Having noticed the two remarkable issues (economic deprivation and burglary) in Hong Kong society, I study the economic deprivation and its impact on the burglary rates in two levels from 2006 to 2016, one is the relative economic deprivation of the whole city (measured by GINI coefficient) and its impact on the burglary rates, the other is the absolute economic deprivation on the district level (measured by the income level) and its impact on the burglary rates.

Michalina Kulesza - *The Linguistic Impact of Spanish on Mayan Languages*
Faculty Advisor: Lauren Clemens, College of Arts and Sciences, Department of Anthropology
Linguists will learn even in their most elementary lessons that language is very adaptive, evolving systematically to suit its environment and ensure communication among its speakers. Because a given language can have various layers of diversity within any given region, it is overwhelming to think of all the possibilities that can occur when a foreign language enters the environment and takes permanent occupancy. Considering the extent of the Mayan empire in modern day Guatemala, Belize, southern Mexico, western El Salvador and Honduras, dating from 2000 BCE all the way through the Spanish conquest of Hernan Cortes in 1697, we see the prevalence of several languages, all connected under the same Proto-Mayan roots (Mark, Maya Civilization). This includes but is not limited to Jakaltek, Mam, Q’anjobal, Sipakapenese, and Wastek. In the position of colonizer, the Spanish language pervaded cultural boundaries in addition to phonological, morpho-syntactical, lexical, and sociolinguistic understanding of Mayan truths, and would even go on to replace Mayan languages as the indigenous fought disease and genocide to keep their legacy alive. In the paper, we will discuss the introduction of new sounds, such as b, d, and g, words, such as those used in Roman Catholicism, and ideas of gender, in relation to a language that used items of nature to categorize, and its long term effects on the manner in which a civilization spoke and further, wished to identify themselves. The paper will also touch on sociolinguistic implications of using a native Mayan language in a society that became dominated by the Spanish language as well as the migration of Maya peoples in search of self-preservation.

Cody Ng - *Consumerism in African American Communities in Albany during the 19th Century*
Faculty Advisor: Marilyn Masson, College of Arts and Sciences, Department of Anthropology
During the summer of 2017, the University at Albany anthropology department along with New York State Museum conducted a dig site in downtown Albany at the Stephen Harriet Meyers house, a prominent figure in Albany’s own abolition and underground railroad movement. Amongst our artifacts we excavated several glass bottles ranging from beer/soda bottles, medicinal bottles, food bottles, and luxury items such as perfume bottles. By examining these artifacts the site, we are able to compare them to other African American sites to understand how the wealth of the Meyers may have been different to other urbanities during the timer period, what can the artifacts tell us about family composition, preferences, and social status/identity.
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Researching Sociopolitical and Sociohistorical Issues Across the Disciplines

Shannon Ragone - African American Dietary Patterns in Albany during the Early-to-Middle Nineteenth Century as Reconstructed from Faunal Bone Analysis

Faculty Advisor: Marilyn Masson, College of Arts and Sciences, Department of Anthropology

This paper presents an analysis of African American foodways from the perspective of faunal bones found at two historic archaeological sites in Albany, New York. In the summer of 2017, the University at Albany conducted an archaeology field school that excavated at two prominent middle-class homes of important leaders in Albany’s Underground Railroad. The field school’s objective was to learn of African American lifeways in the local community during the post-revolutionary war period. The first excavation took place at the Ten Broeck Mansion in Arbor Hill, Albany. Homeowners General Abraham Ten Broeck and wife Elizabeth Van Rensselaer had African American servants in the early nineteenth century. The second excavation occurred at the Stephen and Harriet Myers residence. Property owners Stephen and Harriet Myers were black abolitionists and offered their home as a safe haven for freedom seekers. With a focus on the excavated faunal bone, both sites held concentrated amounts of bones in historical privy outbuildings, which were structures used to dispose of trash and kitchen remnants. Further detailed analysis of the bones at both residences exemplify a high volume of butchered bone from knife impressions and clean cuts of limb bones, vertebrae, ribs, and scapula, typical cuts of meat. The size, shape and diagnostic markings on the bones indicate they belonged to mostly cows, sheep, goats, and pigs, common animals for meat consumption. Furthermore, the presence of unused animal parts, such as teeth, provides evidence of on-site butchering for both residences. The results of this faunal bone analysis offers a detailed view into the diets and daily life of nineteenth-century African Americans in the historical, small community of Arbor Hill. It is hoped that this study will bring further insight and understanding into the lives of slaves and freedom seekers in nineteenth-century, Albany.
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Advances in Math, Chemistry, Physics, and Biology

**Evan Busch - Organic Photoredox Catalyzed Thiol-yne Reaction**
Faculty Advisor: Ting Wang, College of Arts and Sciences, Department of Chemistry
The goal of this project was to expand and explore the capabilities of a visible light organic photoredox catalyzed thiol-yne reaction and its potential for multiple substitutions of a thiol to an alkyn. The photocatalyst for this reaction is 9-mesityl-10-methylacridinium tetrafluoroborate and absorbs light of roughly 450 nm which was supplied via two blue LEDs. This photocatalyst has previously been shown to initiate a radical thiol-yne reaction with relatively high yields and near stoichiometric ratio of reactants. This reaction proved to be successful substituting twice with a mono-substituted thiol (benzyl mercaptan) and a simple alkyn alcohol. The reactivity of the first and second substitution showed to be sterically linked to the thiol and alkyn and as such the ideal conditions for the reaction varied. This method of thiol-yne substitution shows potential for the expansion of green chemical methods through organic visible light photocatalysis.

**Hanjoon Choe - Relating Two Combinatorial Models in the Representation Theory of the Symplectic Group**
Faculty Advisor: Christian Lenart, College of Arts and Sciences, Department of Mathematics
Representation theory is a basic tool for understanding group symmetry using linear algebra, namely group elements are represented as invertible matrices. The symplectic groups Sp_n are an important class of infinite groups, also known as simple Lie groups of type C. An irreducible representation of Sp_2n is indexed by partitions with at most n parts, or Young diagrams with at most n rows. A basis of such a representation is indexed by two types of fillings of the mentioned Young diagrams with integers ranging from -n to n except 0, known as King tableaux and De Concini tableaux. I give an implementation of an algorithm which constructs a bijection between these two sets of tableaux. This bijection has many applications to the study of representations of the symplectic group.

**Kristen Forhand - Optimizing CRISPR/CAS Knockout of ROCK Isoforms in SIMS Cell Line**
Faculty Advisor: Melinda Larsen and Matthew Koslow, College of Arts and Sciences, Department of Biology
In understanding gland development, we may obtain insights into regenerative medicine. Salivary glands form during embryonic development through epithelial-mesenchymal interactions. Rho-associated protein kinase (ROCK), a serine-threonine kinase with two protein isoforms (ROCK1/ROCK2) that regulates the shape and movement of cells by acting on the cytoskeleton has been shown to be important for salivary gland morphogenesis. We previously have shown that ROCK is a component of a mechano-chemical checkpoint which regulates cleft initiation, as well as coordinating cell polarity and basement membrane deposition during early gland development. While ROCK has been shown to exhibit various functions in the epithelium, the specific role ROCK has in the mesenchyme is currently not known. In previous research, ROCK inhibition has been shown to promote stem cells survival in other organs and in salivary glands. We have used ROCK inhibition to generate organoids that include mesenchyme cells to support secretory acinar progenitor cells. We previously designed guide RNAs targeting ROCK1 and ROCK 2 for use in CRISPR/CAS9-mediated knockout of the catalytic domain of ROCK1 and ROCK2. We hypothesize that although loss of ROCK signaling in the epithelium promotes survival of progenitor cells, that loss of ROCK signaling in the mesenchyme will prevent epithelial differentiation in tissue engineering applications. We will use a salivary gland epithelial cell line, SIMS, and mouse embryonic fibroblasts, NIH3T3s, to optimize transfection and identify the most effective guide RNAs for ROCK 1 and ROCK 2. These studies will provide the ground work for CRISPR/CAS knockdown of ROCK 1 and 2 in primary mesenchyme to determine if ECM deposition is reduced with knockdown of ROCK 1. We will generate organoids in which ROCK 1 or 2 is specifically knocked down in the mesenchyme to help us to determine whether ROCK signaling in the mesenchyme is required for acinar progenitor cell maintenance.

**Marina Danielle Infantado - Development of a Rapid Small-Scale Purification Method for the Quantitation of Heparin-Like Glycosaminoglycans from Cell Culture Media**
Faculty Advisor: Susan Shafterstein, College of Nanoscale Science & Engineering, Department of Nanobioscience; Trent Gemmill, Albany College of Pharmacy and Health Sciences
Heparin is an anticoagulant medically used to inhibit blood clotting. It is commonly administered to patients requiring surgery or kidney dialysis. Presently, it is produced from animal tissues, but a recent contamination crisis pointed to the need for a safer source of the drug. Our project seeks to develop a rapid, inexpensive, high-throughput assay to quantitate the production of heparin and other glycosaminoglycans (GAGs) from cultured mammalian cells. In order to quantitate heparin from cell culture media, a purification method is needed to separate GAGs from interfering constituents in the media. We developed a purification protocol that absorbs Pluronic and most proteins to Sep-Pak C-18 cartridges, followed by ultrafiltration through 5 kDa cutoff Vivaspin centrifugal concentrators. The purified GAGs are then quantitated by a microcarbazole assay.
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Advances in Math, Chemistry, Physics, and Biology

Simranpreet Kaur - Kissing Complex Stabilities Modeled by Molecular Dynamics Simulations
Faculty Advisor: Alan Chen, College of Arts and Sciences, Department of Chemistry
Kissing complexes are quaternary nucleic acid interactions that form when complementary loop portions of two hairpins interact with each other and form base pairs. They are vital intermediates during viral replication. Although factors that govern kissing loop stability are generally less understood than factors that govern double helix stability, loop size is known to play a role. Molecular dynamics simulations were used to model 14 DNA kissing loop systems in order to determine the effects of loop size on complex stability. The correct simulation method to approach this was found using a reductionist approach, which eliminated methods like brute force folding simulations, replica exchange over temperature, and replica exchange over constraints. The most efficient method was found to be replica exchange over temperature and constraint level. This method will be used to form the kissing complexes, then pulling simulations will use specified energies to pull the complex apart. The minimum energy required to dismantle the complex will indicate the strength of the interaction and can be compared to experimental data. It is expected that the number of base pairs per turn cause structural arrangements in RNA and DNA that may favor an optimal loop length and play a significant role in complex stability. Interesting structural changes during the formation of the kissing complex will be noted for possible mechanistic prediction and can be indicative of other factors relating to stability.

Cara Sherman - Comparative Ethology of the Vulpes Genus
Faculty Advisor: John Davis, College of Arts and Sciences, Department of Biology
The purpose of this project is to analyze the behavioral patterns of eleven Vulpes species. In the first phase, the Focal Individual sampling method is used to observe the actions of each individual in a series of video recordings obtained from a public archive. Records are made of the duration of each behavior observed and the order in which the behaviors occurred. Descriptions of each behavior are also documented. The second phase analyzes the collected data. An ethogram is produced by categorizing the behavior patterns and providing a written description of each. The categories are further divided into subcategories, to provide another level of detail. A time budget, primary transition matrix, and kinematic diagram are created from the data. Despite great differences in physical appearance and geographical location, the analysis allows for the conclusion that members of the Vulpes genus share many behaviors that closely resemble each other.
Health, Medicine, and Health Education

Fu Yee Chua - Cdkal1 Protein and its Roles in Type 2 Diabetes
Faculty Advisor: Amithi Narendran and Paul Agis, College of Arts and Sciences, Department of Biology
In 2015, diabetes caused 1.6 million deaths worldwide and Type 2 diabetes (T2D, non-insulin-dependent) contributed to the majority of the deaths. T2D results from the body’s ineffective use of insulin. The single nucleotide polymorphisms (SNPs) of Cdkal1 (CDK5 regulatory subunit associated protein-1 like 1) has been identified as one of the most reproducible risk factors for T2D but how mutations of Cdkal1 affect action of insulin is not well studied. Cdkal1 is a member of a superfamily of radical S-adenosyl-L-methionine (SAM) enzymes. Cdkal1 protein modifies one of nearly forty-five human transfer RNA (tRNA) species, tRNAlys UUU, which decodes the lysine AAA/G codons. Cdkal1 is an important enzyme hypothesized to be responsible for the rare methylthio-, m2-, modification found on tRNAlys. It transfers the m2 - moiety from SAM to tRNAlys, resulting in the modification of N6-threonylcarbamoyladenosine-37 (t6A37) to methylthio-2-t6A37 (ms26tA37). Mutations in Cdkal1 result in an enzymatic dysfunction that affects the transfer of m2 to tRNAlys. The lysine codon appears in pre-proinsulin mRNA at Lys88 which is critical for proper cleavage of proinsulin and for correct insulin processing and function. Our hypothesis is that the mutation of Cdkal1 and the lack of m2-modification of tRNAlys UUU can result in incorrect incorporation or a frameshift mutation at Lys88 and improper cleavage of proinsulin and processing of insulin. In this study, experiments of the large-scale expression test and purification system like Ni-NTA column purification will be carried. Next, experiments will be carried out to evaluate structural and biochemical characteristics of the purified Cdkal1-544 protein. Mass spectrometry will be used for detection of iron based on its mass-to-charge ratio. Circular dichroism (CD) Spectroscopy will be performed for analysis of secondary structures of Cdkal1-544.

Jeriisa Fontaine - Get HealthE
Faculty Advisor: Jennifer Manganello, School of Public Health, Department of Health Policy, Management and Behavior
Studies show that young adults could benefit from improved health literacy and eHealth literacy skills. Yet, more information is needed to identify which skills young adults feel are most important and how they would want to learn those skills. Qualitative research is a useful way to understand issues in an exploratory way. Given that, eight focus groups consisting of young adults ranging from ages of 18-24 years were conducted in 2017 to 2018. Groups ranged in size from 5 to 12. Questions asked about issues with getting health care, health insurance, health information seeking, and talking with providers. Questions also asked about preferences for how to be educated on these topics. A moderator was responsible for presenting questions and maintaining the fluidity of the conversation to ensure that all participants could take part in the conversation. Focus groups were recorded and transcribed, and data analysis was conducted using NVivo. Through the data collected, common issues cited by young adults included issues with how to find a physician, and how to choose and use health insurance. Other issues included how to identify credible sources for health information and who to go to with health questions. Findings also suggest that time and money are important barriers to seeking health care. An online resource such as a website could be developed so that young adults have a way to increase their knowledge about navigating the health system and seeking health information for young adults.

Leah Gloskey - Satisfaction of Search (SOS) Errors in Proofreading: Evidence from Eye Movements
Faculty Advisor: Heather Sheridan, College of Arts and Sciences, Department of Psychology
When performing a visual search task, it has been observed that upon successful detection of one target, one will fail to detect a succeeding target. This idea is known as subsequent search misses or satisfaction of search. Originating in the medical field of radiology, this effect is being tested for in other disciplines. Our study uses a proofreading task to explore the mechanisms that support the detection of misspelled words, we are exploring the identification of misspelled words displayed within a group of correctly spelled words. Using eye-tracking, we examine whether this type of visual search task will be susceptible to the subsequent search misses phenomenon. Participant’s eye movements are monitored while they are looking at trials that present 0, 1, or 2 spelling errors within an array of random words. This task contains high salience spelling errors which are easy to detect (such as sepch instead of search) and low-salience spelling errors which are hard to detect (such as science instead of science). We are testing to see if the presence of the high salience typo will affect the detection of the low salience typo. I predict that participants will fail to identify a low salience typo when a high salience typo is present because the participants will conduct a less thorough search following the detection of an easily identifiable spelling error.
ABSTRACTS
Poster Session - Arranged alphabetically by author last name

Health, Medicine, and Health Education

Clara Hoye - Integrated Bio Behavior Surveys Among Female Sex Workers
Faculty Advisor: Kathryn Mishkin, School of Public Health, Department of Health Policy, Management, and Behavior
The Integrated Bio Behavior Survey (IBBS) is a survey that includes both biomarker and behavior-related questions that is used to understand factors associated with HIV transmission in countries that are estimated to have a high prevalence of HIV/AIDS. The IBBS has been used in countries such as Lebanon, Tajikistan, Sudan and many other regions due to their high rates of HIV. The IBBS is especially useful among populations that are hard to reach because of its methodology and the nature of the questions. This paper provides a thorough examination of the protocol and methodology of the IBBS, as published by the World Bank, University of California, San Francisco Institute for Global Health Sciences and related empirical examinations. Specifically, this paper focuses on how the IBBS has been used to target one of the most-at-risk populations for HIV who are also hard to reach, female sex workers (FSWs). IBBS research targeting FSWs has shown that FSWs are not accessing HIV services and treatment adequately. There are significant gaps in HIV knowledge and negative attitudes regarding condom use among FSWs. FSWs that use condoms report accessing HIV services. Because of the knowledge gap, there is a need to increase education with regards to HIV transmission. There is also a need to increase access to contraceptives and HIV treatment. Providing free contraception in areas that are frequented by FSWs could be beneficial.

Oyenike Ilaka - Comparing Different Health Literacy Measurement Tools Used for Assessing Health Literacy Levels in College Students
Faculty Advisor: Jennifer Manganello, School of Public Health
Different measurement tools can be used to measure the health literacy levels in college students. This study was designed to understand the variations in health literacy assessments in college students using five different measurement tools (NVS, S-TOFHLA, REALM-teen, SILS, & HLS-14). The sample included college students attending a public university in the Northeast region of the United States. A total of 249 participants were recruited by class survey administration and flyer recruitments in 2008-2009. All 249 participants completed the survey, and 122 of them completed the health literacy assessments. All students had high literacy scores for HLS-14, REALM-teen, and S-TOFHLA. However, some had low or inadequate health literacy scores for NVS and SILS. As a consequence, some students who had high literacy scores using some measurement tools were not identified as having low health literacy with other tools. The five measurement tools (NVS, S-TOFHLA, REALM-teen, SILS, & HLS-14) could be combined and modified to create a new measurement tool that gives a more accurate health literacy assessment for college students.

Kyler Lehrbach - An Exploratory Study of the Impact of Client Interpersonal Dominance on Early Treatment
Faculty Advisor: James Boswell, College of Arts and Sciences, Department of Psychology
The influence of psychotherapy client traits on therapist intervention delivery has received little attention. Such knowledge has implications for therapist training, treatment implementation, and client outcomes. Objective. This preliminary study explored the influence of client interpersonal subtype, specifically trait dominance, on therapist use of directive and non-directive interventions in early sessions of cognitive-behavioral therapy (CBT) for generalized anxiety disorder (GAD). Method. The sample comprised a subset of participants (n = 27) from a completed controlled trial of CBT for GAD. Clients completed the Inventory of Interpersonal Problems (IIP) at baseline, and the Dominance subscale score was used for analysis. Therapist intervention use was observationally coded using an established multidimensional measure that includes subscales assessing behavioral and cognitive therapy interventions (directive), as well as common factor use (non-directive) in session. The first 5 sessions of each client were coded, in order to look at patterns of interventions over time. The relationship between Dominance and intervention use was assessed through visual inspection of plots across high and low Dominance client groups, as well as through a multiple regressions examining associations between Dominance scores and intervention use across the three intervention scales. Results. Visual inspection of plots indicated that individuals with lower than average Dominance scores appeared to receive more directive and non-directive interventions in session. However, there were no statistically significant associations between Dominance scores and any of the intervention subscales. Conclusion. The small sample limited the use of inferential tests. The preliminary descriptive results, however, indicated that there may be some differences in the level and trend of directive and non-directive interventions between more and less interpersonally dominant clients. Less dominant clients appeared to receive more of both types of interventions. Further research with a larger and more diverse sample size is needed to determine if the observed trends are meaningful.
Health, Medicine, and Health Education

**Paul Pangburn - Effects of the 2014 Medicaid Expansion on Health Behaviors**

Faculty Advisor: Pinka Chatterji, College of Arts and Sciences, Department of Economics

Under the Patient Protection and Affordable Care Act, signed into law by President Obama in 2010, health insurance coverage was expanded to 20 million previously uninsured people. Of these, 14.5 million were Medicaid eligible. Moral hazard, a common research topic in insurance, is defined as when the private actions of an individual in a risk-sharing situation influence the probability of the outcome. Ex-ante moral hazard, which is what is being investigated in this poster, is when a behavior changes and potentially causes a health event. This poster considers that ex-ante moral hazard developed in the portion of the population insured by Medicaid following its expansion in 25 states. A difference-in-difference model is used to compare these 25 states to the 18 that have not voted to expand Medicaid. There are eight states which are excluded from the model because the legislatures of these states voted to expand Medicaid after the January 1, 2014 deadline. Findings from this project are based on data from the Behavioral Risk Factor Surveillance System, which is maintained by the Centers for Disease Control. This poster will examine the rates of obesity, smoking, binge drinking and seat belt use to determine if there is a significant difference between the states which did and did not expand Medicaid.
ABSTRACTS
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Issues in Atmospheric & Environmental Sciences and Climate Change

Kaylynn Enright, Brett Casserly, Kyle Davie, Shardae Drew, Rachel Gergely, and Peiyao Lai - The Effects of Climate Change on Endangered Species
Faculty Advisor: Mary Ellen Mallia, Office of Sustainability
Through sensitivity to temperature change and habitat destruction, climate change has created a peril for many species around the world. This research focuses on several endangered species that have been impacted by this change including sea turtles, elephants, butterflies, codfish, tigers, and cheetahs. The climatic threats posed to these animals along with potential solutions to protect their population will be highlighted.

Jose Gallegos, Assief Khan, Khalil Forman, Maggie Gorman, Patrick Smith, and Iqbal Haque - Reduction of Carbon Emissions in Various Cities Around the World!
Faculty Advisor: Mary Ellen Mallia, Office of Sustainability
Since the start of the first industrial revolution in England back in the 18th century, we have experienced a decline in the air quality of our planet accompanied by an increase in carbon emissions. It was not until the late 20th century when many nations discussed what they could do to decrease their impact on the environment. New ideas have flourished and today we see many improvements such as hybrid cars, clean renewable energy and green building materials. This project illustrates these efforts through five city case studies from Beijing, New York, Melbourne, Tokyo, Copenhagen, and Singapore and discusses their progress towards reducing their environmental footprint.

Alex Gelband, Michael Slattery, Danlan Huang, Zachary Boutjdir, Rob Hasenbalg, and Jen Chen - Renewable Energy Sources
Faculty Advisor: Mary Ellen Mallia, Office of Sustainability
As global warming, carbon emissions and environmental responsibility become increasingly more relevant in our lives, we must fully understand all our options to respond to these challenges. This research explores the multiple alternatives available for renewable energy sources focusing on biomass, hydroelectric, wind, solar and geothermal energy. This history of each technology will be explored along with the level of current adoption and its future potential to meet our energy demand.

Jose Gonzalez, Kylegrant, Thomas Hagan, Connor Brohan, Nico Montello, and Kledis Capollari - Climate Change and the Future of Animals
Faculty Advisor: Mary Ellen Mallia, Office of Sustainability
Climate change is affecting animal populations around the world, and a rapidly increasing amount of new species have been classified as endangered in our lifetime. This research highlights several species discussing how climate change plays a role in their dwindling population, and reviewing what can be done to prevent them from becoming extinct. Some of the species that will be included in this research will be the Polar Bear and the Green Sea Turtles, who’s populations have been gradually decreasing as temperatures rise around the globe. Will the next generation be fortunate enough to experience first-hand the beauty of these animals?

Liam Hurley, Chris Stulhweiser, Yinna Wang, Julia Carbone, and Tracy Kilcoin - The Tragedy of Deforestation
Faculty Advisor: Mary Ellen Mallia, Office of Sustainability
The world is changing both by itself and by the intercessions of human activities. these human-related actions release too much carbon dioxide, among other harmful gases, in the Earth while reducing the plants that can actually help reduce the damaging gases. The forest is a substantial biodiversity that is home to many types of trees, plants, and animals. However, with the continuous expansion of human activities, more and more forests have been cut down, and the area of forest has been drastically reduced. It means that there will be not enough trees to support our paper needs in the future with seventy percent of American forests already deforested. although there are other options like hemp, it is more expensive and not legal everywhere and has better uses in other products. This presentation discusses some of the human-induced activity that impacts on the natural occurrences. For instance, road infrastructure has hurt certain parts of the Amazon through the various effects it causes in habitats. The deforestation, which can affect humans in ways we wouldn’t at first think it would, Such as Greenhouse Effect, Soil Erosion, etc. To sum up, the Earth has provided the humans with resources to live, yet their search for progress affected the planet negatively. Deforestation is just one of the human activities that affect the natural cycle of the planet. Humans should make choices and continue to advance while saving the earth.

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Issues in Atmospheric & Environmental Sciences and Climate Change

Erin Lynch - Assessing Effective Rhetoric on Twitter in Relation to Forecast Uncertainty Regarding Hurricane Tracks
Faculty Advisor: Brian Tang, College of Arts and Sciences, Department of Atmospheric and Environmental Sciences
A forecast is only as good as the way it is communicated. As the National Weather Service (NWS) transitions to an Impact-Based Communication, the new public forecasts discuss how to effectively prepare and protect oneself from harm in the face of severe and significant weather. After severe events, meteorologists need to take the time to analyze the language and style of the rhetoric to assess how effective it was in getting people in harm’s way to take protective actions. It is even more important to understand how information was communicated when there is large uncertainty in the forecast. Uncertainty can lead to confusion in the public, which in turn, leads to potential life and death situations. Hurricane Irma’s (2017) impacts in Florida provides one such occasion where reflection could prove beneficial in understanding how people respond to forecast information, especially when there is large uncertainty and shifts in that forecast. Using the social media platform Twitter, tweets to and from the Florida NWS offices, local Emergency Management Offices, and politicians were collected to assess how Irma forecast information was disseminated on the platform. Gauging the public’s reception and reaction to this information provides essential insight to meteorologists. The information collected can be used to tailor their future forecasts to ensure protective actions are taken if, and when, the next severe weather outbreak occurs.

Hung-Yu (James) Ma, Lexi Reeves, Kerry Graziosa, Jinhee Lee, Ashley Abelard, and Sophie Patka - The Harmful Effects of Industrialization in New York City
Faculty Advisor: Mary Ellen Mallia, Office of Sustainability
Throughout New York City’s history, industrialization has caused growth, but also detrimental effects to the environment. This research identifies the harmful effects of industrialization, climate change, population growth, pollution, emphasizing habitat fragmentation, the replacement of native species by invasive species and significant resource depletion. Another prevalent issue within New York City is littering which is exacerbated by increased population and impacts the animal habitats and aesthetics of the area. Although our society has been built up by industrialization, there are certain ways as to which we can combat its harmful effects.

Alexandra Schindler, Alexandra Bowler, Jack Alliegro, Chris Pecoraro, Erika Lister, and Alex Capsello - Economic Water Pollution
Faculty Advisor: Mary Ellen Mallia, Office of Sustainability
Consumption and demand for production have led to the deterioration of the quality of our world’s water supply. Companies improperly dumping and disposing of hazardous byproducts, unintended consequences from production, and individuals’ lack of concern or awareness of the negative externalities associated with their actions all contribute to the issue. This research highlights six case studies, illustrating the problem of water pollution and stressing the importance of effectively addressing the matter.

Anthony Sedotto, Brad Belotti, Taylor Fitzpatrick, Sean Sullivan, Megan Walkowicz, and Vivi Wang - The Loss of Biodiversity
Faculty Advisor: Mary Ellen Mallia, Office of Sustainability
Climate change and pollution are among the many factors that have led to the current global losses of biodiversity, but the fact that these losses are occurring is undeniable. In nearly all biodiversity hotspots such as mountain ranges, the arctic, rainforests, deserts, oceans, and temperate forests, fragile ecosystems are in danger of collapsing due to the nature of an ecosystem, where a miscellany of life creates a stable environment. This research focuses on the losses of biodiversity from the 1980’s through present, and the potential future problems that may arise as a result.

Alexander Siemenn - Simulating Wind Energy Availability Using Numeric Models
Faculty Advisor: Jeffrey Freedman and Richard Perez, College of Arts and Sciences, Department of Atmospheric and Environmental Sciences
Wind energy is a form of renewable energy which may be harvested using wind turbines as a method to capture the kinetic energy of wind flows. Even though wind as a resource is available almost everywhere, the limiting factor to building wind farms is the amount of available wind at turbine hub height. The goal of this project is to use wind extrapolation and forecasting methods such as the power law and neural networks, respectively, to simulate the amount of energy that any turbine may be able to generate at a given location for several hours into the future. New York State Mesonet data were used as the wind resource inputs, AWS Truepower power coefficient curves were used to compute turbine efficiency, and LiDAR data were used for wind speed extrapolation and prediction model validation.
ABSTRACTS
Oral Presentation Session One - Arranged alphabetically by author last name

Lecture Center 2: New Approaches in Forensic Science

Eden Alin - Chemical Assay for Fingerprint Analysis: Moving Toward Multiattribute Determination via Arginine
Faculty Advisor: Jan Halamek and Erica Brunelle, College of Arts and Sciences, Department of Chemistry
When a fingerprint is left at a crime scene, there is often a chance that the fingerprint will not match one that is currently in the FBI’s database of fingerprint images, called the Automatic Fingerprint Identification System (AFIS). For the past 2 years, our group’s goal was to establish a way to identify originator attributes, specifically biological sex, from a single analyte via chemical methods. To date, two chemical assays have been developed for the analysis of multiple analytes. In this presentation, an additional assay has been developed that targets only one amino acid. This method, known as the Sakaguchi test, targets arginine which is the 10th highest amino acid concentration in female fingerprint content and 12th highest in male fingerprint content. This assay proved to be capable of accurately differentiating between male and female fingerprints. The ability to target a single analyte will transform forensic science as each originator attribute can be correlated to a different analyte. It would allow for the creation of a physical profile of an individual from one fingerprint without additional processes. The quick and straightforward method, displayed here, has the potential to be utilized on-site without the need for scientific training or knowledge.

Alix Coon - Development of a Condom Lubricant Database using DART-HRMS for use by Forensic Practitioners
Faculty Advisor: Rabi Musah, College of Arts and Sciences, Department of Chemistry
A disturbing trend is the increasing use of condoms by perpetrators of sexual assault. The reason for the use of condoms in this context is to avoid leaving behind incriminating DNA evidence that could be used to establish a definitive link between the attacker and the victim. In the absence of DNA, other forms of evidence must be used to corroborate the victim’s report or exonerate the falsely accused. One such form of evidence is the condom derived lubricant left behind. To successfully use condom residue in this manner, a database of chemical fingerprints of lubricants against which acquired evidence can be screened is required, so that condom brands and types can be identified from the residue. In this study, 110 different condoms representing 16 brands from multiple countries were analyzed by direct analysis in real time high resolution mass spectrometry (DART-HRMS), in order to generate a database of diagnostic condom residue chemical fingerprints against which condom residue evidence can be screened and identified. Over 700 spectra were acquired and the data was processed by multivariate statistical analysis processing. Partial least squared discriminant analysis (PLS-DA) and artificial neural networks (ANN) were used. The database consisted of 588 known spectra and external validation was completed with 117 spectra. The precision and accuracy ranged from 83% to 100%. Across all brands of condoms the accuracy of the model was greater than 83%. This indicates that a very robust database has been developed with the capabilities of providing a presumptive test that can be used not only to identify brands, but also the particular condom type within a brand. This database can be readily expanded as additional condom types emerge, and may be particularly useful for corroborating the accounts of victims, or exonerating the falsely accused in cases where DNA evidence is lacking.

Morgan Eldridge - Enzymatic Assay for Fingerprint Analysis: Moving Toward Multiattribute Determination via Alanine
Faculty Advisor: Jan Halamek and Erica Brunelle, College of Arts and Sciences, Department of Chemistry
Fingerprint analysis traditionally relies on comparing and matching fingerprint patterns via experts and/or the automated fingerprint identification system (AFIS). Often times, fingerprints are unusable because they are smudged/smeared or do not have a comparative match. For the past 2 years, our group’s goal was to establish a way to identify originator attributes, specifically biological sex, from a single analyte utilizing enzymatic assays. To date, one assay has been developed for the analysis of multiple analytes. Here, however, the development of an additional enzymatic assay is shown. The assay targets only one amino acid – alanine – via the enzymatic cascade consisting of alanine transaminase (ALT), pyruvate oxidase (POx), and horseradish peroxidase (HRP). It is important to note that alanine is the 3rd and 6th highest amino acid concentration in female and male fingerprint content, respectively. This assay proved to be capable of accurately differentiating between male and female fingerprints. The ability to target a single analyte will transform forensic science as each originator attribute can be correlated to a different analyte thus, leading to the possibility of identifying multiple attributes from a single fingerprint sample. Ultimately, this would allow for a physical profile of a person with little to no scientific training.

Robert Rosenblatt - Differentiation of Human Blood from Potential False Positive Substances Using Raman Spectroscopy and Chemometrics
Faculty Advisor: Igor Lednev, College of Arts and Sciences, Department of Chemistry
The identification of bodily fluid (BF) stains at a crime scene is a necessary part of evidence evaluation, but currently has many inherent complexities. This research proves that Raman spectroscopy is a more viable method for testing BF stains than other methods currently in use, specifically for it not being susceptible to false positive (FP) assignments. Currently, different confirmatory tests need to be used for each of the five most common BFs (blood, saliva, semen, sweat, and vaginal fluid). These tests also do not serve the purpose of identifying unknown BFs. Raman spectroscopy is advantageous due to its chemical selectivity, providing unique spectra for all substances analyzed and the ability to correctly identify all types of BFs. By building statistical models, and comparing spectra of BFs to potential false positive substances, all BF stains can be correctly identified with one test. This study specifically analyzed twenty-four substances that may be misclassified as blood due to their appearance or if known to provide a FP result with currently used tests.
ABSTRACTS

Lecture Center 3A: Activism, Identity, and Equality: New York History’s Enduring Legacy

**Ryan Fox - Isaac Wise: The Path to American Jewish Unity Through American Nationalism**

Faculty Advisor: Ryan Irwin, College of Arts and Sciences, Department of History

Isaac Mayer Wise was a pivotal American Nationalistic figure in the small, growing, and evolving American Jewish community of the mid- to late 1800’s. His fervent work to unite the Jews of the United States at a time of rampant divisions between communities on all ideological fronts, displayed his powerful characteristic as a pragmatist. Although he maintained the same philosophies from the time spanning his arrival in New York in 1846, to the time of his death in 1900, his employed different methods over the years to achieve his accomplishments. Many scholars undervalue the prevalence of Nationalism as a means of achieving unity among the American Israelites. Through correspondence with leading American popular figures, news battles with other Jewish community members, and his originally authored Hebrew prayer book, Wise formulated one of the strongest movements in United States religious history. The impact of the Rabbi was echoed beyond the limits of audiences, reaching the most polarized leaders from the radical reform and orthodox factions of his own religion. Both the establishment of the American Union of Hebrew Congregations, and the simultaneously built Hebrew Union College, are confirmations of his success in rallying the Jewish people of the mid-19th century under one unitary system.

**Derek Healey - Ritual “Garbage” in Working-Living Quarters of Enslaved Persons at Albany’s Ten Broeck Mansion**

Faculty Advisor: Marilyn Mason, College of Arts and Sciences, Department of Anthropology

Studying the lives of enslaved freedom seekers is never an easy task. Analyzing the material remains of countless unheard stories of those who lived, worked, and loved in the northern colonies is riddled with conjecture. African descent more than ever deserve dignity to be given to their ancestors, and this requires increased dedicated research with an intersectional racial lens in the field. In the summer of 2017, collaborative field school research was conducted at Ten Broeck “Prospect” Mansion of the Arbor Hill community in Albany, New York. Our focus was on the rear outbuildings of the site, which was often the work and summer sleeping quarters for enslaved persons owned by the Ten Broeck family in the early 1800s. Several artefacts were unearthed including a possible foundation deposit and ritual feature including a quartz crystal point, white limestone balls, clam & oyster shells, burned ceramics, pipe stem & pipe bowls, metal buttons, fanal bones, bent nails, and glass. These pieces outside of context would seem to be simple “garbage,” however it is too often that unsuspected colonoware and folk religion pieces are mindlessly discarded. Evidence for these practices has been found elsewhere in Albany, and it is the purpose of this paper to do a qualitative comparative analysis showcasing African American lifeway practices associated with real symbolic meaning and purpose. The slow process of emancipation allowed for the continued enslavement of northern people of colour at Ten Broeck Mansion until the death of the widow Elizabeth Van Rensselaer in 1813. What became of these freedom seekers is largely unknown, but what we do possess with the potential ritual significance of such objects offers a larger disenfranchised community a chance to see vestiges of the past in a more nuanced and decolonised way.

**Jacob Houser - When the World Seemed New: UE Local 301 and the Decline of the American Labor Movement**

Faculty Advisor: Ryan Irwin and David Hochfelder, College of Arts and Sciences, Department of History

The American labor movement was immensely successful during the 1930s and 1940s when more workers than ever were being organized in unions across the country. In Schenectady, New York, a city with a rich history of leftist politics, UE Local 301 represented workers at the General Electric plant from 1916-1954. During its early years, the union gained membership and support by embracing the New Deal relationship between labor and the federal government. After World War 2 the workers demanded a seat at the table alongside the government and management, and anchored that demand in international politics. The complex nature of foreign relations forced unions to retreat from local issues while their competition, conservatives in the government and within the labor movement itself, went back to embracing national issues in order to win back support from the left-wing unions. By the 1950s the UE was struggling mightily and Local 301 was one of its last remaining strongholds because the left had been politically outmaneuvered. This paper uses national union convention proceedings, union newspapers, and various other union records to examine what went wrong for UE Local 301. Many labor scholars have attributed labor’s decline in this era to McCarthyism but that argument rests on the supposition that anti-Communism started at the top and worked its way down. This paper argues the opposite. McCarthy was the end, not the beginning. A growing grassroots conservatism and resentment over foreign politics began locally and found itself being exploited by those in positions of power. This account of UE Local 301 attempts to fill in gaps of America’s labor history by focusing on ideology and the changing American identity of the early Cold War years.
ABSTRACTS

Lecture Center 3B: Advances in Health, Medicine, and Wellness

**TJ Brown - Small Molecule Inhibitors of the Gram-positive T-box Mechanism**
Faculty Advisor: Amitha Narendran, College of Arts and Sciences, Department of Biology

Antimicrobial resistance in bacteria is a global problem that is accelerated by misuse of antibiotics by humans. Such misuse has led to an increase in bacterial resistance and a decrease in effectiveness of essential antibiotics that are used to treat a variety of bacterial infections. In Gram-positive bacteria the T-box leader sequence is an RNA regulatory element that controls gene expression by binding to uncharged tRNA. Uncharged tRNA binds the T-box at the specifier loop as well as an antiterminator loop to stabilize the transcriptional unit for gene expression. Novel antimicrobials such as lead compounds PKZ-18 and PKZ-18-22 have demonstrated bacteriostatic properties due to the ability to target the T-box mechanism. These compounds function by binding to the specifier loop on the T-box regulator, effectively blocking the binding of uncharged tRNA, thus causing termination of the transcriptional unit. This stops expression of downstream aminoacyl-tRNA synthetase (aaRS) genes and other essential genes which disables protein synthesis and causes growth arrest and eventually cell death. To optimize a lead compound among the PKZ family of small molecule inhibitors structure activity relationship (SAR) studies on the novel analogs will be performed. Analogs of the current lead compounds will undergo Kirby-Bauer disc diffusion assays against Staphylococcus aureus, Streptococcus pyogenes and Bacillus subtilis cultures to determine if they have more effective antimicrobial properties than the current lead compounds. E. coli, a Gram-negative species, will be used as a control to ensure specificity of the novel analogs is maintained. Further studies such as MIC (minimum inhibitory concentration) and MBC (minimum bactericidal concentration) determination and resistance assays will be conducted on promising analogs.

**Jessica Simon - What Motivates You?**
Faculty Advisor: Jason Randall, College of Arts and Sciences, Department of Psychology

Learning management systems (LMS), defined as online course-administration tools that allow access to a wide range of pedagogical course material, are becoming increasingly prevalent among university communities. College students rely heavily on LMS; therefore, the current study attempts to uncover how LMS affects students, not simply whether to use LMS. In this study I operationalize LMS use quantitatively by assessing frequency of checking. In order to explain and predict how frequently students check their LMS, I draw on personality-based theories of goal orientation, specifically performance-approach, performance-avoidance, and mastery orientations. In order to understand the consequences of LMS use, I evaluate its influences on both academic performance and students' stress levels. Additionally, I investigate whether addictive tendencies of LMS use exaggerate the negative effects of LMS use on stress levels. Students (N = 172) self-reported academic performance, stress levels, goal orientation, LMS checking frequency, and addiction to LMS across two measurement periods separated by four weeks to separate predictor variables from dependent variables. My hypotheses were evaluated with correlational and multiple linear regression analyses. Results showed no significant relationships between goal orientation dimensions and LMS checking frequency. Further, academic performance and stress levels were not predicted from checking frequency. I did find a moderating effect of addiction on some dimensions of stress, indicating that addiction to LMS use in some cases exaggerated the negative effects of LMS use on stress dimensions. Overall, frequency of LMS use does have some implications on students' outcomes, although more research is needed.

**Nina Williams - Stress Granule Proteins Modulate Zika Infection**
Faculty Advisor: Cara Pager and Gaston Bonenfant, College of Arts and Sciences, Department of Biology

The recent Zika virus (ZIKV) outbreak in the Americas captivated the world with the images of microcephaly babies born to infected mothers and the appearance of Guillain-Barre syndrome in infected adults. ZIKV belongs to the Flaviviridae family of viruses, which includes other well-known viruses such as hepatitis C virus, Dengue virus, and Yellow Fever virus. The long-term goal of our research is to understand the mechanisms by which ZIKV subverts the host translation machinery. My research in particular focuses on the role of RNA stress granules during ZIKV infection. Stress granules are cytoplasmic protein-RNA complexes that form when the cell is exposed to a stressor such as a viral infection. Using immunofluorescence and microscopy studies we discovered that ZIKV suppresses the formation of these granules. To investigate which stress granule proteins are required for ZIKV gene expression we used target-specific siRNAs to deplete different stress granule proteins. We discovered that depletion of G3BP1 and HuR respectively decreased and increased ZIKV protein and RNA expression and viral titer. Moreover, the effects on ZIKV gene expression could be reversed by overexpressing G3BP1 and HuR. Recent preliminary data using a luciferase reporter ZIKV genome suggest that HuR modulates replication of the ZIKV genome. Together our data show that ZIKV inhibits the assembly of stress granule to promote viral gene expression and limit cellular antiviral activities.
Lecture Center 3B: Advances in Health, Medicine and Wellness

Matthew Morano - Simulation of Complex X-Ray Optics Geometries for Medical and Materials Applications
Faculty Advisor: Carolyn MacDonald, College of Arts and Sciences, Department of Physics

In many x-ray applications, focused beams are required for accurate analysis. Doubly curved crystal (DCC) optics collect x-rays over a wide range of angles and focus them to a spot related to the source spot. This large accepting angle allows for more source power to be directed towards the sample versus a pinhole aperture. DCC optics are designed to diffract rays that are incident at the Bragg angle, resulting in an intense monochromatic beam. A previously developed simulation was converted to a modern programming language to allow for easier use and adjustment. Originally the simulation was designed for the symmetric case, where input and output focal length are equal. Functionality for asymmetric focal lengths was added, and the accuracy of the new code was compared to experimental data. This simulation is a fast, repeatable method of testing various optic and scan parameters.
ABSTRACTS

Lecture Center 3C: Research in Atmospheric and Environmental Science

Michael Main - Differences Between High Shear / Low CAPE Environments Favoring Tornadoes versus Straight-Line Damaging Winds in the Northeast US
Faculty Advisor: Ross Lazear and Lane Bosart, College of Arts and Sciences, Department of Atmospheric and Environmental Sciences
High shear / low CAPE (HSLC) environments are common in the Northeast US (NEUS) and can occur throughout the year. Severe weather in HSLC environments is hard to predict, often catching forecasters off-guard. The goal of this project is to help forecasters to identify HSLC environments favorable for severe weather in the NEUS, and to discriminate between HSLC environments that are supportive of tornadoes versus those that favor straight-line damaging winds. A 10-year HSLC severe weather environmental climatology was created for the NEUS (New England, New York, New Jersey, Pennsylvania), which includes ~45 different parameters that can be used to describe severe weather environments. Composite plots of the large-scale flow patterns were also created to show key differences in synoptic scale-features between tornadic and non-tornadic HSLC severe weather environments. HSLC criteria was defined as surface-based CAPE (SBCAPE) ≤ 500 J kg⁻¹, most unstable parcel CAPE (MCAPPE) and mixed-layer CAPE (MLCAPE) ≤ 1000 J kg⁻¹, and 0–6-km wind shear ≥ 18 m s⁻¹ (Sherburn et al 2016). Each event was classified by the season in which it occurred and the mode (discrete, cluster of cells, quasi-linear convective system (QLCS)) of the storm which produced the reports.
Preliminary results show that warm season HSLC severe events typically occurred either at the beginning or end of an event in an environment where CAPE values were predominantly too large to meet HSLC criteria. Storm mode was variable for warm season events, but cool season events were dominated by QLCSs. Results also show greater effective wind shear and helicity with tornadic storms than ones which only produce straight-line wind damage. Low-level wind direction and lifted condensation level heights are other parameters which show skill at discriminating between HSLC tornadic and non-tornadic events. Operational application of these results will briefly be discussed.

Marquette Rocque - An Analysis of WSR-88D Dual-polarization Radar Parameters from the Ontario Winter Lake-effect Systems Field Campaign
Faculty Advisor: Justin Minder, College of Arts and Sciences, Department of Atmospheric and Environmental Sciences
Knowing the composition and microphysical processes that occur in lake-effect precipitation systems could help forecasters predict snow totals and snow water equivalents. Many studies have shown that processes such as riming and dendritic growth can be seen in dual-polarization radar data through parameters such as reflectivity (Z), differential reflectivity (ZDR) and correlation coefficient (CC). This research examines WSR-88D data from the KTYX (Montague, NY) radar located on the Tug Hill Plateau for several intensive observing periods (IOPs) from the Ontario Winter Lake-effect Systems (OWLs) field campaign which took place in the winter of 2013-2014. Quasi-vertical profiles (QVPs), in which the radar parameters are azimuthally averaged at a fixed elevation angle and time, were generated, and the spatial and temporal variations of Z, ZDR, CC, and differential phase were compared with other data sets including manual surface observations, vertically-pointing micro-rain radars (MRRs), and aircraft data. QVP results show the most spatial and temporal variation in dual-pol parameters for IOP5 where multiple hydrometeor types were recorded at the manual observing sites including pristine dendrites, aggregates, and graupel. The MRR data shows increased vertical motion and spectral width during the period of graupel formation which could indicate more super cooled water, an increase in riming, and therefore an increase in graupel production. Other IOPs show a slight spatial variation in the QVPs, specifically in ZDR, and although graupel was not recorded at any manual observing site, this variation could be a result of aggregation, where pristine crystals aloft have a higher ZDR value than aggregates falling towards the surface. Flight-level data recorded by the Wyoming King Air for several IOPs was also analyzed and compared with the QVPs. Results show that radar data, along with other data sets, can be used to understand microphysical processes occurring in lake-effect bands.
ABSTRACTS

Lecture Center 3C: Research in Atmospheric and Environmental Science

**Brenna O’Brien - Life Cycle Environmental Impacts of Dairy Production Systems in New York State**

Faculty Advisor: Xiaobo Xue, School of Public Health, Department of Environmental Health Sciences

Agriculture production is linked with a range of environmental impacts and globally responsible for one fifth (Humane Society International) of all greenhouse gas emissions (GHG). Dairy farms are an important source of GHG emissions and nutrient releases. Identifying production strategies capable of improving productivity and mitigating negative environmental impacts is essential to sustainable production. This study’s goal is to analyze the impacts of grazing cover crop, grazing crop residue, and rotational grazing in New York through life cycle assessment (LCA), and determine the strategy with the lowest impact. While most LCAs focus on production outside of NY, this study focuses specifically on NY (ranked fourth in the US).

A process based LCA model was developed to assess global warming (GWP), eutrophication, ozone formation, and acidification potentials of typical production systems. Integrated Farm System Model (IFSM), developed by the USDA, was used to simulate on-farm releases; ammonia volatilization, nitrate leaching, phosphorous runoff. Releases calculated were fed into a cradle-to-gate LCA model, OpenLCA, with the ecoinvent 2.2 database embedded in the program using 1kg milk as the functional unit. Sensitivity assessment was conducted to evaluate the influences of key input parameters.

However, dairy production strategies pose tradeoffs. Grazing crop residue presented the highest acidification potential, 0.711KgSO2eq, while grazing cover crop has the highest GWP, 1.162KgCO2eq. Acidification potentials largest contributor, on-farm ammonia, released 9.02E-03KgSO2eq - 5.23E-03KgSO2eq across all strategies studied. Rotational grazing(150ac) showed the lowest eutrophication potential of 0.016KgNeq; grazing cover crop, grazing crop residue, and rotational grazing(650ac) resulted in a eutrophication potentials ranging 0.0094KgNeq - 0.0098KgNeq. Methane contributed 0.07KgCO2eq for rotational grazing(150ac) and 0.51KgCO2eq - 0.59KgCO2eq for all other strategies.
ABSTRACTS

Lecture Center 2: Human Interaction & Identity in Animated and Imagined Worlds

Ryan Badalamenti - We’ll Make a Man Out of You: Steven Universe, the Bildungsroman, and the Redefinition of the Male Hero
Faculty Advisor: Mary Valenti and Richard Barney, College of Arts and Sciences, Department of English
This talk explores how the various gendered characteristics of the Bildungsroman, the novel of formation, interact with the formation of the titular character in the cartoon Steven Universe, the coming of age tale of a boy’s work to defend the Earth from magical threats.
Traditional cartoon studies identify distinct gender identities between male and female characters. Similarly, Bildungsroman studies tend to analyze male heroes, with contemporary studies coining the term “female Bildungsroman” to talk about the formation of female protagonists. This paper argues that Steven, the protagonist of Steven Universe, incorporates aspects of both the Bildungsroman and the female Bildungsroman into his identity, transforming into a character not bound by the gendered roles inherent in Bildungsroman studies and cartoons. Steven creates a male figure realistically found in society to an audience that’s often exposed to violent, hypermasculine male characters. This essay will achieve this through analyzing Steven Universe through the lens of various Bildungsroman and female Bildungsroman theories, as well as comparing the show to James Joyce’s The Portrait of the Artist as a Young Man and Claire Messud’s The Burning Girl, a Modernist story about the coming of age of an artist and a contemporary novel about the coming of age of two teenage girls, respectively.

Leslie Beegle - “It's Alive!”. H.P. Lovecraft, Octavia Butler, and the Problem of Object-Oriented Ontology
Faculty Advisor: Jil Hanifan, College of Arts and Sciences, Department of English

Object Oriented Ontology (OOO) is a posthumanist philosophy that seeks to provide a more ethical way of being in the world through the deprivileging of human existence and experience in comparison to that of non-human objects. Much of the inspiration for this philosophy has come from the work of H.P. Lovecraft, a writer who is lauded as one of the forefathers of Science Fiction despite racism and xenophobia which is an intrinsic part of his writing. However, when those who work with OOO, such as philosopher Graham Harman fail to engage with the problematic aspects of Lovecraft’s work while using it as the basis of OOO, it creates critical flaws in the philosophy. This project seeks to examine why and how OOO fails to offer a viable method of thinking about a posthuman future by analyzing Harman’s readings of Lovecraft’s short stories “The Shadow Over Innsmouth” and “The Dunwich Horror”, and to use Octavia Butler’s Xenogenesis Trilogy to intervene in this way of thinking. Butler offers an alternative path through the ways in which her characters use their intersectional perspectives to negotiate new futures for both humanity and the alien Oankali. Ultimately, this project seeks to emphasize the importance of considering multiple perspectives when trying to postulate about a posthuman future as well as the ways in which these perspectives are necessary to the creation of this future.

Joseph Wozlois - Respawn, Relearn: How Videogames Build and Destroy Emergent Languages
Faculty Advisor: Jil Hanifan and Tamika Carey, College of Arts and Sciences, Department of English

My project, a critical thesis titled “Respawn, Relearn: How Videogames Build and Destroy Emergent Languages,” explores the connections between literacy and narrative in videogames. By using Kenneth Burke’s language-acquisition concept of terministic screens, I establish that the didactic function of symbolic actions interior and exterior to the game-space contribute to an accumulative ludic-literacy, enabling players to unlock progressive narrative spaces. These narrative spaces function as modular archives and, thus, contain hidden histories, cultural mythologies, and problematic representations of time. My thesis culminates in an analysis of Crystal Dynamic’s Rise of the Tomb Raider, a videogame that reframes ancient religious conflicts and reimagines the cultural mythology of Lara Croft all remediated through polychotomous temporalities. In my analyses, I synthesize the fields of linguistics, game-theory, literacy studies, and narratology to conclude that, when gamers can play through a narrative in a videogame, they are engaging a polyphonic terminal: a narratological matrix wherein the player embodies an emergent ludic language while simultaneously occupying internal and external narrative spaces. I argue that in order to understand the videogame as a culturally relevant digital text, we must understand how players learn to occupy a ludo-narrative space, and how videogames remediate history, mythology, and time.

Fernanda Giongo Fernandes - El Disparate Volante: Determination of Origin and Authenticity
Faculty Advisor: Sarah Cohen, College of Arts and Sciences, Department of Art History

Francisco de Goya y Lucientes was a painter and printmaker in the late eighteenth, and early nineteenth centuries. During his lifetime he produced countless etchings, including four print series: Los Caprichos, Los Desastres de La Guerra, La Tauromaquia, and Los Proverbios. The material properties and iconographies of a single print from Plate 5 of Los Proverbios obtained separately from its series will be analyzed in this presentation. Known alterations to the original plates place the print date between 1875 and 1937, meaning that it could have been made as part of editions two through nine, removing the possibility of it being a working proof, trial proof, or part of a first edition. Further research on the types of papers contained in each edition place the print date post l 891 when laid paper began to be used. Wiping method, type of ink used, and condition of the printed aquatint were the only other identifiers that could be used to date the print. The date was only able to be narrowed down by making comparisons between the single print and those of other editions housed in public art institutions.
ABSTRACTS

Oral Presentation Session Two - Arranged alphabetically by author last name

Lecture Center 2: Human Interaction & Identity in Animated and Imagined Worlds
Andrea Guerrero - We All Get It...Right?: Sensitizing an Audience through the Reassessment of Tropes, Genre, and Emotive Technique in Jordan Peele’s film Get Out
Faculty Advisor: Derek Smith, College of Arts and Sciences, Department of English
This project analyzes the elements of narrative and cinematic technique in staple horror films representing African-Americans, so as to lead up to the film Get Out (2017) that reverses and reimagines the roles of the African American such as the sexual deviant, the violent aggressor, and the buffoon. I focus on the movie Get Out for its modern take on horror and its depiction of African Americans in this genre specifically. Despite many films giving African Americans a bigger stage, this film achieves it through horror, a genre often perceived as mere entertainment and not requiring engagement or reflection. Making use of critics such as Ed Guerrero and Robin Wood, the project reveals how Get Out invites empathy for black life as a form of understanding rather than the traditional distanced sympathy, which is often the route taken by recent Hollywood films on African Americans. Get Out examines the fears of the black man, invites its audience to experience Blackness, and effectively sensitizes a racially desensitized audience.
ABSTRACTS

Lecture Center 3A: Rhetoric, Discourse, Lyrics and Memoirs: Their Real World Effects

Christian Burgos - *A House Divided*
Faculty Advisor: Edward Schwarzschild, College of Arts and Sciences, Department of English

Abraham Lincoln coined the phrase, "A house divided cannot stand." So how would he feel about the current administration's stances against individuals in minority groups, whose identities are already heavily politicized? This collection of short stories I've written delves into the lives of those individuals as they have been targeted and continue to be affected by the rhetoric and policy threats of this administration. Each story follows an individual who deals with the effects of this rhetoric, both directly and indirectly. The experiences of the individuals in these stories are not universal; these experiences illustrate the potential circumstances and consequences these individuals face in real life, on a daily basis. Additional characters within each story represent different attitudes and reactions to the rhetoric on groups like immigrants, Muslims, women, etc. Some challenge those ideas. Others internalize them. The project as a whole exhibits how dangerous unchecked language can be. Unlike other works that analyze the current administration's members, rhetoric, and policies, this collection takes the approach of fiction, in the form of short stories. The use of fiction evokes emotion in the readers that numbers and statistics cannot. Additionally, each short story contains elements of both realistic and speculative fiction, suggesting that while the events in the story may not have necessarily taken place, they are very much within the realm of possibility. Some of these stories include specific acts of violence, which may or may not have happened, but have been inspired by other acts that have been documented. My hope is that this project inspires allies by opening a lot of eyes to the insensitivity and bigotry being displayed and normalized.

Sarah Iladik - *The Gallagher Curse or an American Reality: The Subversion of Class Stereotypes and the American Dream Mythos in Shameless*
Faculty Advisor: Laura Wilder, College of Arts and Sciences, Department of English

This project serves as a rhetorical analysis of the representations of poverty that exist in both past and present media portrayals, including news articles, literature, advertisements, and television shows. As depictions of the poor remain limited across these media platforms, this project explores why the few representations we do have often rely on stereotypes or constructions of what scholar Diana George calls a “deserving” poor, meaning those who are deemed deserving of help versus those who are not. There is a lack of conversation about the “reality” of poverty that the media constructs and how these portrayals often foster capitalist ideals such as the American Dream. Because poverty is greatly feared in America, mass media often avoids this topic or conveys stereotypical ideals which become the basic societal understanding of who is poor in America and why. My first chapter analyzes examples of these past media portrayals in order to acknowledge the stereotypes and cultural issues they reinforce. My second chapter explores the contradictions within the current television series Shameless and identifies how the show disrupts George’s categorization of a “deserving” and “undeserving” poor. The themes and storylines in Shameless subversively challenge past media traditions, yet the show is a commodity in itself with many utopic qualities. My presentation will focus on the character representations in Shameless and how they reflect a social pathology of poverty that fosters repetitive behaviors of self-destruction and dysfunction. I will discuss how the Gallagher children are continually tricked into believing they will escape their impoverished life, but are quickly let down and brought back to their reality. As my project title insinuates, this “Gallagher Curse” motif in the show is really a universal curse for many poor families, where the American Dream’s promise of hard work leading to a better life is often left unfulfilled.

Kendall Aufmuth - *Writing and Reading as Healing: Psychotherapy and Narrative in Mental Illness Memoirs*
Faculty Advisor: Cheng Chen, Rockefeller College of Public Affairs and Policy, Department of Political Science, and Tamika Carey, College of Arts and Sciences, Department of English

This thesis explores how memoirs, both written and read, complete psychotherapeutic work through narrative relationships. The essential problem addressed throughout is how memoirs serve as a facilitating healer. A close analysis of Elizabeth Wurtzel’s, *Prozac Nation* will illustrate how memoirs facilitate healing. More specifically, I will be focusing on how memoirs should be read as guides to instructional living. By doing so, it will reveal to each person how relationships throughout one’s life can impact their mental health. Despite contentions held against memoirs, there is a larger importance that they play on individual and societal levels. Although literary scholars argue against the memoir genre, devaluing their positive aspects, they do not address their healing abilities, particularly on the psychotherapeutic level. My thesis ultimately argues for a deeper understanding and acceptance of memoirs’ place in literary and societal realms, moving past the anti-memoir bias.
ABSTRACTS
Oral Presentation Session Two - Arranged alphabetically by author last name

Lecture Center 3A: Rhetoric, Discourse, Lyrics and Memoirs: Their Real World Effects

Timothy Dillinger-Currenton - Right On Be Free: The Radical Possibility of Gospel
Faculty Advisor: Oscar Williams, College of Arts and Sciences, Department of Africana Studies
“Right On, Be Free: The Radical Possibility of Gospel” explores the Voices of East Harlem and the New York Community Choir (NYCC), two choirs that provide rare links between gospel music and the Black Power and Black Arts Movements. Both groups transgressed the border between the sacred and the secular, daring to take the spirit of the church into “the world,” fusing their Pentecostal roots with liberation theology. Utilizing interviews with key members of both groups in addition to features, reviews and interviews from music industry journals, I examine the connections of these groups to gospel’s pioneers and establish their compulsion to deviate from the norms of the church as central to gospel’s intention. I also explore the ways in which the groups experienced and worked with the tension between commercial success and community formation. I contend that the Voices and NYCC are important narratives to reflect upon as gospel music shifts from being largely apolitical to being immersed in the ideology of the Religious Right.

Bria McKiver - Ice Cube and Rodney King: Hip Hop and the L.A. Riots
Faculty Advisor: David Hochfelder, College of Arts and Sciences, Department of History
The L.A. Riots also known as the Rodney King Riots devastated South Central Los Angeles in 1990s. Ice Cube used this event and the trial and beating of Rodney King to educate individuals across the world about the plight of the black American and create a rally cry for the deterioration of the black man. History is defined simply as the study of past events. However, history is often written by the victors and black history especially often is limited to just slavery and the Civil Rights Movement. I aim to analyze how Ice Cube’s activism shed light on an issue effecting the black community all over the country - police brutality.
ABSTRACTS
Oral Presentation Session Two - Arranged alphabetically by author last name

Lecture Center 3B: Gender Concerns in Human Rights, Advocacy, Politics, and Language

Kaylyn Enright - Gender in Politics: A Comparative Study of Female Representation in the New York State Senate
Faculty Advisor: Patricia Strach, Rockefeller College of Public Affairs and Policy, Department of Public Administration/Political Science
This paper utilizes data obtained from the New York State Senate spanning five elections between 2008 and 2016 to determine if gender impacts election outcomes. More specifically, I attempt to understand if the New York State Senate matches the common belief in the literature that women tend to fare less well than men in elections, and female Democrats have greater success than female Republicans in winning elections. By focusing on the New York State Senate, I seek to uncover whether the idiosyncrasies of New York State politics are reflected in any distinctions from the prominent conclusions made in the literature which utilize meta-analyses of several state legislatures. This paper uses linear regression models with controls including incumbency status, campaign funding, number of donors, year and district fixed effects as well as gender and political party interactions in order to discover an association between gender and election success. The strongest finding conveys that women Democrats tend to win New York State Senate elections less often than all other candidates.

Akua Williams - Trafficking Tactics Used for the Recruitment of Workers within the Commercial Sex Industry
Faculty Advisor: Inna Chandra, Rockefeller College of Public Affairs and Policy, Department of Political Science
Sex trafficking is the recruitment of persons through force, coercion, or fraud for the purpose of sex trade. Often occurring undetected, the commercial sex industry is practiced internationally, and involves the use of humans as a commodity. This research presentation aims to understand the decision-making process traffickers undergo when they engage in the capture of trafficking victims. The argument advanced is that traffickers target impoverished women using their needs and desires to formulate a trap. The study empirically tests this argument through qualitative methodology based on three case studies: United States, China and Italy.

Nadine Zaky Kotb - Gender Assignment to English Nouns in Arabic in New York
Faculty Advisor: Lotfi Sayahi, College of Arts and Sciences, Department of Languages, Literatures, and Cultures
While Arabic has grammatical gender that applies to all nouns whether animate or inanimate (the moon is masculine, but the sun is feminine), English doesn't have grammatical gender as such. A question arises regarding the process of gender assignment to English nouns that are used by bilingual speakers when they are speaking Arabic. Arabic grammar requires them to show agreement in the noun phrase and the verb phrase and as such the English nouns require explicit gender assignment by the speaker. Nouns are the most common category when it comes to borrowing and code-switching between languages, which makes the study of gender assignment in case of incongruences between languages an important one. In this study we analyze the factors that condition the assignment of masculine or feminine gender to English nouns in a corpus of 10 interviews with Arabic/English bilingual speakers from New York State. The objective is to show if, like in many other studies, biological gender of the referent and phonological gender of the noun is what determines whether an English noun will receive masculine gender or feminine gender when used in Arabic discourse. Results of the study will be compared to other cases where English nouns are inserted in other languages, including Spanish and French.

Lauren Prosper - Sexual Violence Advocates and the Anti-Rape Movement in New York State's Capital District Tri-City Areas
Faculty Advisor: Angie Chung, College of Arts and Sciences, Department of Sociology
Race, color, ethnicity, class, educational status, socioeconomic status, national origin, age, education status, religion, creed, gender, gender identity or gender expression, immigration status, disability, and sexual orientation. We all can categorize ourselves in one of the previously mentioned groups and sexual violence affects each and every one in them. Sexual Violence is a people issue, that does not discriminate, and can happen to anyone. How you are defined in these categories and their interactions increases or decreases the likelihood and frequency that sexual violence can affect you. The dialogue of sexual violence and the Anti-Rape Movement is relevant as it is currently April 27th, 2018, one of the last days of April, Sexual Assault Awareness Month. What is known as the “#MeToo Movement” that took over Twitter on October 15th, 2017 was created by Tarana Burke over 10 years ago in 2006. Her intention when creating “Me Too.” was to “empower through empathy.” Letting victims and survivors impacted by sexual violence know they are not alone. Tarana Burke’s “Me Too Movement” has gained newfound momentum around the Anti-Rape Movement that is still creating discussions and coverage amongst online newspapers, radio shows, social media platforms, academic institutions, and news channels. This research will cover the perspective of advocates working in paid positions that have direct contact or work with an institution that provide services with victims and survivors impacted by sexual violence within New York State’s Capital District Tri-City Areas. The qualifications of being paid to be considered an advocate will not be in effect for persons who support victims and survivors of sexual violence, who come from marginalized communities. The concept of advocate will be explored further and conceptualized by utilizing methodological methods including qualitative interviews and content analysis of position descriptions of institutions, where advocates are interviewed.
ABSTRACTS

Oral Presentation Session Two - Arranged alphabetically by author last name

Lecture Center 3B: Gender Concerns in Human Rights, Advocacy, Politics, and Language
Sarah Kate Tavernese - The Story No One Wants to Tell: Sexual Assault and Survivor Discourse
Faculty Advisor: Mary Valenti, College of Arts and Sciences, Department of English
The New York Times gender editor identifies the #Me Too movement, in a recent article called “The Reckoning,” as “a watershed cultural moment that has inspired a “tsunami” of stories. Confessional narratives from celebrities’ toppled Hollywood producers, actors, and politicians, while sexually assaulted women made headlines tearing off the blinders of the public at large. Sarah Tavernese’s thesis arrives at this moment in the zeitgeist. She identifies sexual assault survivor discourse as “the story no one wants to tell” and then provides a searing critique of why “speak out” narratives in the popular media have, up until now, induced shame and silence in the victim. Her exemplars are derived from the widely popular series Law and Order: SVU and The Hunting Ground, a documentary, both of which rely on gender stereotypes and predictable outcomes accepted and normalized by the dominant culture. Tavernese’s theoretical framework, a combination of Michel Foucault’s treatise on sexual discourse and its imaginaries, A History of Sexuality, and feminist theory revolving around survivor discourse, sexual experience and phenomenology, ballast her contention that language itself doesn’t allow for the contradictions and perceived in-authenticities of survivor discourse. The Cassandra effect, a rejection of survivor truth-speak, is rampant in the popular media yet less prominent in the memoir. Sarah calls the memoir “the most powerful rhetorical device in shaping society’s discourse around sexual assault.” Using the memoirs College Girl and The Kiss to demonstrate how the survivor memoir memorializes the trauma/attack and disorients and estranges its readers via disruptive language, i.e. father rapist, the thesis pursues the phenomenological impact of abreaction on the survivor: that is the therapeutic and metaphysical effects of using transgressive language towards the recuperative goal.
ABSTRACTS
Oral Presentation Session Two - Arranged alphabetically by author last name

Lecture Center 3C: Politics, Life, and Policy in the World Today

Daniel Berle - College Debt and the Earnings Premium: Nationally and Regionally
Faculty Advisor: Lewis Segal, College of Arts and Sciences, Department of Economics
An economic analysis of the decision to attend college involves weighing the opportunity costs of time and debt against the earnings gained. I show that while the cost of college and school debt have skyrocketed; the average earnings gap between college and high school has widened even more. This observation leads to the question of how this gap varies with demographic variables including age, location, and gender. The American Community Survey (ACS) provides the information needed to consider this question. It is designed to provide yearly data that is similar to the decennial census. The ACS takes a precise snapshot of what is going on in America down to the local level. With the right tools, I can use this survey to create a picture of what factors lead to higher income including how income responds to education levels across different regions of the United States. My analysis begins with a regression model of earnings using 2012-2016 ACS data. Weights provided for each year of data adjust for both sampling and inflation. The model measures the expected income gap nationally and within each of the nine sub regions designated by the Census Bureau. Control variables include: age, age squared, race and gender. Besides examining the relationship between annual income and education level, I also explore other variables that have a strong correlation with yearly earnings such as major, industry, and class of worker. The regression also provides an estimate of the uncertainty of the earnings gap, a factor which is not generally incorporated in the educational decision framework. This is comparable to the analysis of both expected return and risk in models of finance. The earnings premium and uncertainty can be used with what we know about college costs and debt to better inform educational decision making nationally and regionally.

Sandra Asantewa - Effect of Education on Gun Regulations
Faculty Advisor: Zai Liang and Angie Chung, College of Arts and Sciences, Department of Sociology
This is a report on the effect of education on gun regulations. The data for the table was derived from the General Social Survey. Participants have different educational degrees and different views on gun permits. The independent variable is education while the dependent variable is gun laws. A cross-tabulation was used to find the relationship between the variables. The result showed an increase in educational degree for every increase in favor and an increase in opposition for every decrease in educational degree. The literature of reference is “Self-interest, Symbolic Politics and Public Attitudes Toward Gun Control” by Robin M. Wolpert and James G. Gimpel.

Adanna Perry - The Criminalization of Black Students with Learning Disabilities
Faculty Advisor: Hayward Horton, College of Arts and Sciences, Department of Sociology
Today, students are increasingly being funneled out of public schools and into the juvenile justice system. This process is widely known as the School-to-Prison pipeline. This refers to the policies and practices that force America’s schoolchildren, especially the most at-risk, out of classrooms and into the juvenile justice system” (ACLU 2008). In this paper, I will explore the School-to-Prison pipeline and how it affects Black students with a specific focus on learning disabilities. This topic will be analyzed through the framework of Critical Race Theory and Disability Critical Race Theory. Furthermore, I will discuss the differences between treatment of White and Black students with learning disabilities. Additionally, I will examine whether or not Black students with learning disabilities are at an increased risk of being criminalized when compared to their able-bodied counterparts. Lastly, I will explore potential solutions that are focused on reconstructing America’s education system.

Erik Villalobos - The Salvadoran Struggle: An Ongoing Transnational Resistance of Imperialism
Faculty Advisor: Christine Vasallo-Oby, College of Arts and Sciences, Department of Latin American, Caribbean and U.S. Latino Studies
After a devastating civil war, a crumbling economy, mass migration to the United States, and an ongoing crisis of violence, the Central American nation of El Salvador has clearly had a long history with the effects of US imperialism. The civil war and the post war neoliberal economy displaced a significant portion of the Salvadoran population and forced millions to migrate north in search of a prosperous future in the United States. While Salvadorans at home are living under harsh conditions such as poverty, political corruption and gang violence, US diasporas became well established despite living under the increasing threat of deportation. Although Salvadorans have spent over 30 years of struggling through effects of US imperialism, they have managed to persist with a strong sense of resistance. Salvadoran resistance has had several failures but it has not diminished. Instead, it has transformed over time, taking the form of Guerrilla Warfare during the Reagan Era, to Immigrant rights activism under the Trump era. This project will evaluate the effects of imperialism on the transnational Salvadoran community through the perspective of Salvadorans in the United States in order to assess how imperialism is not reinforcing colonial control of El Salvador but instead, is reviving its resistance.
Olamide Olowoyo - *Intra-African trade and Economic Development in Africa*
Faculty Advisor: Ibrahim Gunay, College of Arts and Sciences, Department of Economics

The recent news of 44 African leaders signing an agreement to create the African Continental Free Trade Area (ACFTA) is significant to the future of African integration. In the African Economic Outlook 2017, the African Development Bank says that intra-African trade is key to sustainable development and integration on the continent. This study examines the relationship between intra-African trade and economic growth and development in Africa. I use data from the World Bank DataBank to analyze how intra-African trade has affected African growth and development from 1960 to 2015. I will also examine which industries and groups of people have benefited from such trade. To date, not all African countries have signed the ACFTA, noticeably Nigeria, the most populous country in Africa. Research on the effects of intra-African trade on the domestic economies of African countries will be important in creating trade policies that will benefit citizens across the continent.
ABSTRACTS

Lecture Center 23: Research in the Fields of Finance and Economics

Kirk Georgantoni - The Effects of Financial Liberalization on Economic Growth in Emerging Markets
Faculty Advisor: Rita Biswas and David Smith, School of Business, Department of Finance
This study examines the role of financial liberalization on economic growth in emerging economies. Specifically, the study examines the role of alternate indicators of financial liberalization, such as the Chinn-Ito measure of financial openness (Chinn-Ito, 2006), broad money and trade openness on economic growth. A cross-country panel regression analysis is conducted for 14 emerging market nations focusing on how varying degrees of financial liberalization, as measured by these indicators, has influenced economic growth in these countries over the period 2007 through 2016. In conclusion, this paper finds that financial liberalization generally has a positive impact on economic growth, though this impact can vary.

Robin Lieb - The Impact of Labor Rights on Equity Returns: A Cross-Country Analysis
Faculty Advisor: Rita Biswas, School of Business, Department of Finance
There is ample evidence that financial market development leads to economic growth. If improving labor rights can be shown to positively influence equity markets, then that, in turn, will lead to economic growth. The finance literature has examined the impact of a broader metric, namely, the Economic Freedom Index, on equity returns worldwide and the evidence is mixed. This paper focuses on one dimension of economic freedom: labor rights. Specifically, the study analyzes the impact of labor rights on national equity market indexes, using the Labor Rights Index developed by the Organization for Economic Co-operation and Development (OECD) and the Fraser Institute (FI). Using panel regression analysis for 49 countries (for the OECD Index) and 76 countries (for the FI Index) over the period 1985 through 2014, the study finds that changes in labor rights have a statistically significant positive impact on equity returns, after controlling for business-cycle effects and time fixed effects. The study also finds significant differences in the Labor-Rights-Equity Returns relationship between developed and less developed economies.

Maksim Papenkov - Empirical Asset Pricing at the Sector-Level using Fama-French Factors
Faculty Advisor: Lewis Segal, College of Arts and Sciences, Department of Economics
The Capital Asset Pricing Model estimates stock returns based on volatility relative to a market portfolio. The Fama-French Five-Factor Model expands upon this with additional effects due to size, value, profitability, and investment. These models separate risk as either systematic (market-wide) or idiosyncratic (stock-specific), to identify a stock’s alpha, the risk-adjusted active return on investment. This study refines this description of risk by partitioning systematic risk at the sector-level, which varies based on the elasticity of a sector’s underlying goods and services. Specifically, Fama-French factors are constructed for each sector using CRSP and Compustat data, developing a two-stage approach for identifying alpha. The first stage generates alphas for sector-portfolios relative to the entire market, while the second stage generates alphas for individual stocks relative to their corresponding sector. This process yields a long-only investment strategy for rotating high-alpha stocks in high-alpha sectors, based on both market and sector factors. The returns generated by this strategy are evaluated against a sector-portfolio rotation strategy, and simply holding a market portfolio. Additional analyses consider the differences in magnitude of effects measured by Fama-French factors between sectors. This study is currently in-progress, though results and conclusions should be finalized by the time of the conference.

Michael Spellane - Estimating Implied Risk Premia using Short-Term Interest Rate Models
Faculty Advisor: Lewis Segal, College of Arts and Sciences, Department of Economics
Commercial paper rates combine several risks that affect their yields, including credit risk and liquidity risk. In essence, how sure is the investor that they will be able to get the money they’re owed and how sure is the investor that they will be able to sell the bond? In this paper, we seek to explore interest rate dynamics implied within commercial paper rates by quantifying the default and liquidity risk premia. We will estimate several short-term continuous interest rate models, including Vasicek, Merton, Cox-Ingersoll-Ross, Chen, and others; and compare these models to determine which model provides the best characterization of interest rates. Moreover, we will also study the risk-free rate implied within treasuries and look at the spreads between commercial paper rates and the risk-free rate to derive inflation, credit, and liquidity risk premia to develop our understanding of commercial paper rates as an aggregation of risk premia.
Peter DiBernardi - Analyzing the Relationship Between Capital Adequacy Ratios, CCAR, and the Systemic Model of Banking Originated Losses (SYMBOL)

Faculty Advisor: Rita Biswas, School of Business, Department of Finance

The Systemic Model of Banking Originated Losses (SYMBOL) has been utilized to evaluate the effectiveness of EU regulatory requirements, optimize portfolios, as well as indicate the probability of default for Basel-compliant financial institutions. SYMBOL is a micro-simulation model based on the Basel risk assessment framework that estimates the distribution of bank losses, concerning balance sheet risk exposure and an individual institution’s required capital, utilizing Monte-Carlo Simulations. This paper aims to utilize the SYMBOL framework to determine if institutions tested by the United States Federal Reserve Bank’s Comprehensive Capital Analysis and Review (CCAR) can predict a lower default risk, relating the two as stress testing tools. This paper analyzes if the most systemically important financial institutions in the U.S. Banking System, subject to CCAR currently, can improve lending capabilities without compromising on default risk levels. Post financial crisis, regulators are continually searching for processes, which may enhance efficient lending across the financial world to continue providing adequate liquidity to the markets. In this context, this paper determines that the SYMBOL framework proves itself as a strong alternative to the credit risk default metrics of CCAR. We find that the results of CCAR should not be the sole determinants of riskiness.
ABSTRACTS

Lecture Center 24: Advances in Physics, Chemistry, Math, and Biology

Faculty Advisor: John Welch, College of Arts and Sciences, Department of Chemistry
The trifluoromethyl-\(\lambda^6\)tetrafluorosulfany(CF\(_3\)SF\(_4\)) group remains relatively unexplored in comparison with that of the SF\(_5\)s and CF\(_3\)s groups. This paucity of information is largely due to the difficulty of preparing and handling the CF\(_3\)SF\(_4\)s group. Research exploring the CF\(_3\)SF\(_4\) group has shown that the properties of this group are consistent with those associated with polar hydrophobicity, reduced desolvation energy along with retention of a significant dipole moment. The CF\(_3\)SF\(_4\)s group can be introduced by the addition of trifluoromethyl-\(\lambda^6\)tetrafluorosulfany chloride (CF\(_3\)SF\(_4\)Cl) to alkenes or alkynes. Initial fluoride ion displacement of the chloride leaving groups can be followed by oxidative chlorofluorination to form CF\(_3\)SF\(_5\)Cl from readily available perchloromethyl chloride. The reactivity of CF\(_3\)SF\(_4\)-substituted molecules has been explored, creating a variety CF\(_3\)SF\(_4\)-substituted building blocks. In this work focus will be on simple two-carbon building blocks, such as CF\(_3\)SF\(_5\)-acetic acid, 2-CF\(_3\)SF\(_5\)-ethanol and 2-CF\(_3\)SF\(_5\)-ethyl halides.

M. Grace Hren - RNA Secondary Structure of 3'UTR Regulates Translation Control
Faculty Advisor: Prash Rangan, College of Arts and Sciences, Department of Biology
Translation of mRNA into protein is extremely precise, and as such is controlled by many different factors, both spatially and temporally. This phenomenon is known as translation control. Many times, this regulation is influenced by secondary structures, often in the form of stem loops on the mRNA. These secondary structures found on mRNA, specifically in the 3' Untranslated Region (3'UTR) of mRNA, can then have an influence on how a gene is expressed in the cell. For example, these gene can be upregulated or downregulated, depending on the function of the stem loops. When regulatory factors, for example RNA binding proteins (RBPs) bind to the 3'UTR mRNA, repression or activation of the gene can be initiated. Our research focused on determining whether the secondary structures of the 3'UTR were playing a role in translation control. To determine this, we deleted certain stem loops, most notably stem loop 10, on the 3'UTR mRNA sequence in a specific gene, known as pgc. The level of expression of the pgc mRNA and pgc protein was quantified, to determine if this deletion caused an effect in translation control in the cell. After quantification, it could be determined whether a deletion of a specific stem loop on the pgc 3'UTR mRNA caused an upregulation or downregulation of the pgc gene. It was determined that stem loop 10 (SL10) is required for translation control during embryogenesis, but is not required during oogenesis. It was further predicted that SL10 will bind YTH21B, a protein with an YTH protein domain, as SL10 contains a sequence that is recognized by YTH domains.

The translation pattern of pgc mRNA was observed in YTH mutants that could not produce this protein, in both oogenesis and embryogenesis. In oogenesis, the level of mRNA and protein expression showed no significant change. Additionally, in embryogenesis, the level of mRNAs showed no significant change. However, the level of protein expressed in these mutant flies showed a significant increase in protein expression. When this data was normalized, a significant upregulation of pgc gene expression was determined in YTH mutant flies. This is the same phenotype that was observed in flies with deleted SL10. Based on these results, it was concluded that this protein is only required for translation control in embryogenesis, and not during oogenesis.

Corwin Knight - Snowball Chamber: A Super-cooled Approach to Dark Matter Detection
Faculty Advisor: Matthew Szydagis, College of Arts and Sciences, Department of Physics
As higher mass particles are eliminated as possibilities in the search for dark matter, it is important to explore new types of detectors that are more specialized at looking for lower mass particles. For this purpose, I've been exploring super-cooled water as a target material for future detectors. This talk will go over the motivations for a detector of this type, the preliminary evidence that has been collected, and additional applications beyond searching for dark matter.

Chris Li - Introduction to Partial Differential Equations
Faculty Advisor: Marius Beceanu, College of Arts and Sciences, Department of Mathematics
Differential equations are mathematical equations which describe how something — a system or quantity, for example — changes in response to one or more independent variables. Differential equations are useful in many branches of study. In biology, they are used to model how the population of a species changes over time. In economics, they can describe how changes in the price of a good affect the good's supply and demand. When a differential equation involves one independent variable, it is called an ordinary differential equation (ODE). If it involves more than one independent variable, it is called a partial differential equation (PDE). In this presentation, I will give an intuitive description of some important PDEs such as the heat and wave equations. I will also describe the independent study I am doing in PDEs, which involves solving nonlinear PDEs on the computer.
Lecture Center 24: Advances in Physics, Chemistry, Math, and Biology

Joshua Martin - Particle Detection with Cadmium Telluride Quantum Dots

Faculty Advisor: Matthew Szydagis, College of Arts and Sciences, Department of Physics

Cadmium Telluride Quantum Dots are small semi-conductor particles, only several nanometers in size. Cadmium Telluride Quantum Dots will emit light of specific frequencies if light is applied to them, and these frequencies are dependent on the dots’ size. But would they also emit light if a neutrino or neutron, were to pass through it? In this experiment we attempt to figure out if Cadmium Telluride Quantum Dots can serve as a neutron, neutrino, or gamma detector. If so, this could lead to the creation of a detector that can easily reconstruct the energy of neutron events in water. This could possibly aid in the detection of dark matter.
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- Biodiversity, Conservation and Policy: MS
- Biology: MS, MS in Forensic Biology, PhD
- Chemistry: MS, MS in Applied Chemistry, PhD
- Communication: MA, MS/MA in Teaching English to Speakers of Other Languages (TESOL), PhD
- Data Science: MS
- Economics: CGS, MA, PhD
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- Geography and Planning: CGS, MA in Geography, Master of Regional Planning (MRP) Urban and Regional Planning, MRP/Juris Doctor (JD)*, MS in Geographic Information Science
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- Spanish: MA, PhD
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- General Educational Studies: MS
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- Literacy: CAS, MS, PhD
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- School Psychology: CAS, Doctor of Psychology (PsyD)
- Secondary Education: MS
- Special Education: AGC, MS
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### College of Engineering and Applied Sciences
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- Political Science: MA, PhD
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- Environmental Health: DrPH, MPH, MS, PhD
- Epidemiology: DrPH, MPH, MS, PhD
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