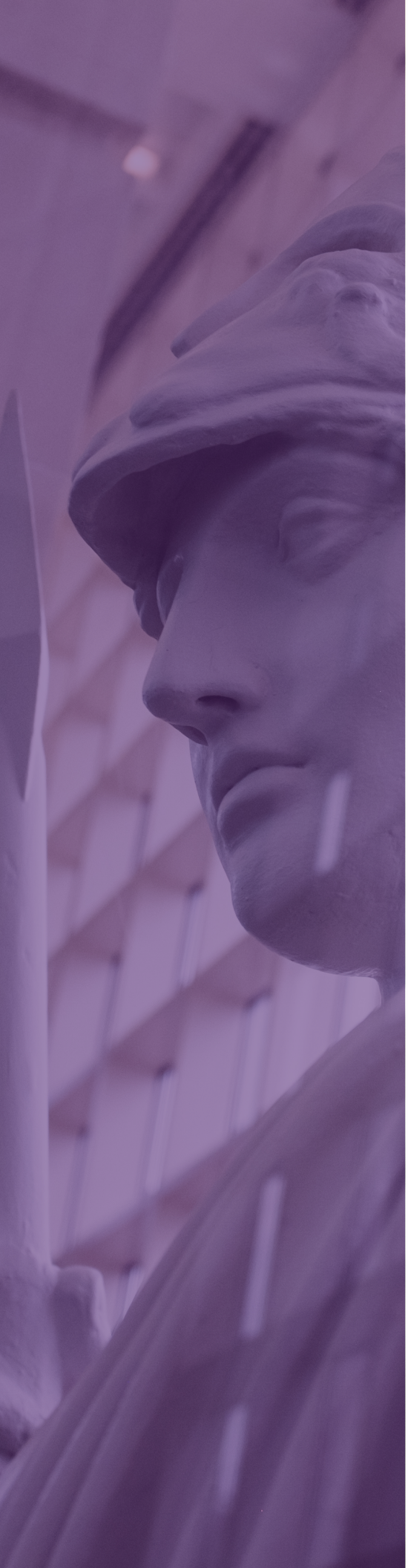
THE
CENTER FOR UNDERGRADUATE
RESEARCH AND CREATIVE ENGAGEMENT PRESENTS

19TH ANNUAL STUDENT CONFERENCE

FRIDAY, APRIL 22ND, 2022 · 3:30-6:30 PM
LECTURE CENTER CONCOURSE



PROGRAM

MESSAGE FROM THE VICE PROVOST

Dear Friends, Colleagues, Students, and Families,

Welcome to the 19th Annual Student Conference at the University at Albany. The Center for Undergraduate Research and Creative Engagement (CURCE) is pleased to showcase the research, scholarship, and creative works of 124 students through 94 presentations.

You will be able to view the works of both undergraduate and graduate student researchers who have worked with faculty from the University at Albany to engage in research ranging from COVID-19 continued impacts on our lives from an environmental and policy lens, to emergency preparedness research and communication for response, to RNA research on breast cancer, Mytonic Dystrophy, and many others.

The efforts of the students and faculty are exceptional, and highlight the breadth and depth of research activities that are not just happening through independent opportunities, but through classroom-based work, like the collaboration with Dr. Jonathan Muckell's Engineering Design course and the Chemistry Department.

I extend my hearty congratulations to the 52 students who have received funding awards through CURCE this year, and the 23 students selected as recipients of the 2022 Presidential Award for Undergraduate Research.

As we close this week's recognition of student research, I look forward to next year's conference as part of the University at Albany Showcase Day which will bring together the robust research and creative works for the entire university and community.

Sincerely,

CONFERENCE SCHEDULE

APRIL • 22 • 2022

ORAL PRESENTATIONS, LC 12

3:30 PM - 5:30 PM

POSTER SESSION

3:30 PM - 6:30 PM

SESSION 1:	Context is Everything: History, Anthropology, and Archaeology
SESSION 2:	Gender Studies Across the Disciplines & Centuries
SESSION 3:	Other Worlds, Cultures, and Transforming Narratives in Literary Analysis
SESSION 4:	Issues in Public Health, Public Policy, and Sociology
SESSION 5:	Criminal Justice & Homeland Security on the National and World Stage
SESSION 6:	New Perspectives in Financial Analysis
SESSION 7:	Innovations in Atmospheric & Environmental Science
SESSION 8:	Innovations in Chemistry, Computer Science, & Physics
SESSION 9:	Advances in Biological Science, Biomedicine, & Cancer Research
SESSION 10:	Engineering Design Challenge
SESSION 11:	Advances in Neuroscience: Disease, Disorders, and Behavioral Assessments
SESSION 12:	Advances in Psychology: Clinical, Industrial, & Cognitive Science

SUSTAINABILITY RESEARCH

In collaboration with Dr. Mary Ellen Mallia, Director of Sustainability, CURCE is proud to recognize the following students for their research efforts towards building a more sustainable global society.

Big challenges like poverty, hunger, inequality and climate change need bold action to overcome them, and that is where the Global Goals come in. The 17 Sustainable Development Goals are a collection of interlinked global goals agreed to by all world leaders to build a greener, fairer and better world by 2030. The 17 SDGs are: (1) No Poverty, (2) Zero Hunger, (3) Good Health and Well-being, (4) Quality Education, (5) Gender Equality, (6) Clean Water and Sanitation, (7) Affordable and Clean Energy, (8) Decent Work and Economic Growth, (9) Industry, Innovation and Infrastructure, (10) Reduced Inequality, (11) Sustainable Cities and Communities, (12) Responsible Consumption and Production, (13) Climate Action, (14) Life Below Water, (15) Life On Land, (16) Peace, Justice, and Strong Institutions, (17) Partnerships for the Goals. For more info go to: www.globalgoals.org.

(3) Good Health and Well-being

Kaya Carvajal - *The Parasitic Identity in Annihilation*

Faculty Advisor: Mike Hill, College of Arts and Sciences, Department of English

Ethan Gerber and Sanchita Paul - *Impacts of COVID-19 Pandemic on Concentrations and Sources of Fine Particulate Matter in NYC Metro Area*

Faculty Advisor: Bari Aynul, College of Engineering & Applied Sciences, Department of Environmental and Sustainable Engineering

Amal Siddiqui - *The Asthma Severity Amongst School Age Children: No Access to Treatment and Live in Poor Environments*

Faculty Advisor: Julia Hastings, School of Public Health, Department of Health Policy, Management and Behavior

(9) Industry, Innovation and Infrastructure

Dua Kaurejo - *Characterization of the Antarctic Firn using Wideband Microwave Radiometry*

Faculty Advisor: Mustafa Aksoy, College of Engineering & Applied Sciences, Department of Electrical and Computer Engineering

(10) Reduced Inequality

Habib Affinnih - *Improving Rural Emergency Preparedness and Response*

Faculty Advisor(s): Mariya Zheleva and Petko Bogdanov, College of Engineering & Applied Sciences, Department of Computer Science

Eiryn Sheades - *Faunal Remains at Ten Broeck Mansion: Examining the Procurement and Processing of Food at a Post-Revolutionary Slave-Holding Site in Albany, NY*

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

Amal Siddiqui - *The Asthma Severity Amongst School Age Children: No Access to Treatment and Live in Poor Environments*

Faculty Advisor: Julia Hastings, School of Public Health, Department of Health Policy, Management and Behavior

(11) Sustainable Cities and Communities

Habib Affinnih - *Improving Rural Emergency Preparedness and Response*

Faculty Advisor(s): Mariya Zheleva and Petko Bogdanov, College of Engineering & Applied Sciences, Department of Computer Science

Maxim Couillard - *Observations and Analysis of the 7 October 2020 Derecho*

Faculty Advisor(s): Brian Tang and Ross Lazear, College of Arts and Sciences, Department of Atmospheric and Environmental Sciences

Sherlyn Mercado - *Disaster Preparedness among Older Americans in the U.S., 2017: An Assessment of the Correlates of Vulnerability*

Faculty Advisor: Samantha Friedman, College of Arts and Sciences, Department of Sociology

Amal Siddiqui - *The Asthma Severity Amongst School Age Children: No Access to Treatment and Live in Poor Environments*

Faculty Advisor: Julia Hastings, School of Public Health, Department of Health Policy, Management and Behavior

Sydney Snyder - *A Least-Cost Path Analysis of Dorset Travel Across Newfoundland*

Faculty Advisor: Christopher Wolff, College of Arts and Sciences, Department of Anthropology

Zhuoning Wu and Victoria James - *The Relationship between City Governance and Smart City Projects*

Faculty Advisor(s): Luis Felipe Luna-Reyes, Rockefeller College of Public Affairs & Policy, Public Administration and Policy and Emmanuel Udoh, College of Emergency Preparedness, Homeland Security, and Cybersecurity

(13) Climate Action

Maxim Couillard - *Observations and Analysis of the 7 October 2020 Derecho*

Faculty Advisor(s): Brian Tang and Ross Lazear, College of Arts and Sciences, Department of Atmospheric and Environmental Sciences

Macy Hayes - *The Future of Climate Action: Evaluating Three Prospective Solutions to the Climate Crisis*

Faculty Advisor: Jennifer Dodge, Rockefeller College of Public Affairs and Policy, Department of Public Administration and Policy

Dua Kaurejo - *Characterization of the Antarctic Firn using Wideband Microwave Radiometry*

Faculty Advisor: Mustafa Aksoy, College of Engineering & Applied Sciences, Department of Electrical and Computer Engineering

Sherlyn Mercado - *Disaster Preparedness among Older Americans in the U.S., 2017: An Assessment of the Correlates of Vulnerability*

Faculty Advisor: Samantha Friedman, College of Arts and Sciences, Department of Sociology

Zhuoning Wu and Victoria James - *The Relationship between City Governance and Smart City Projects*

Faculty Advisor(s): Luis Felipe Luna-Reyes, Rockefeller College of Public Affairs & Policy, Public Administration and Policy and Emmanuel Udoh, College of Emergency Preparedness, Homeland Security, and Cybersecurity

(14) Life Below Water

John Michael Garbellano - *Hudson River Shell Middens: New Realizations at Dogan Point*

Faculty Advisor: Christopher Wolff, College of Arts and Sciences, Department of Anthropology

Sydney Snyder - *A Least-Cost Path Analysis of Dorset Travel Across Newfoundland*

Faculty Advisor: Christopher Wolff, College of Arts and Sciences, Department of Anthropology

(15) Life On Land

Kaya Carvajal - *The Parasitic Identity in Annihilation*

Faculty Advisor: Mike Hill, College of Arts and Sciences, Department of English

John Michael Garbellano - *Hudson River Shell Middens: New Realizations at Dogan Point*

Faculty Advisor: Christopher Wolff, College of Arts and Sciences, Department of Anthropology

Ethan Gerber and Sanchita Paul - *Impacts of COVID-19 Pandemic on Concentrations and Sources of Fine Particulate Matter in NYC Metro Area*

Faculty Advisor: Bari Aynul, College of Engineering & Applied Sciences, Department of Environmental and Sustainable Engineering

Dua Kaurejo - *Characterization of the Antarctic Firn using Wideband Microwave Radiometry*

Faculty Advisor: Mustafa Aksoy, College of Engineering & Applied Sciences, Department of Electrical and Computer Engineering

Sara Magee - *The Ecological Consequences of Species Loss: Insights from Recent Malagasy Mammal Extinctions*

Faculty Advisor: John Rowan, College of Arts and Sciences, Department of Anthropology

Eiryn Sheades - *Faunal Remains at Ten Broeck Mansion: Examining the Procurement and Processing of Food at a Post-Revolutionary Slave-Holding Site in Albany, NY*

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

Sydney Snyder - *A Least-Cost Path Analysis of Dorset Travel Across Newfoundland*

Faculty Advisor: Christopher Wolff, College of Arts and Sciences, Department of Anthropology

GLOBALLY ENGAGED RESEARCH

The University at Albany celebrates undergraduate research and creative engagement that enhance intercultural development and international community engagement as well as discourse and problem-solving on global issues. The Center for International Education and Global Strategy joins CURCE in recognizing the following globally-focused scholarship and scholars.

Joshua Cho - *Korean Syllable Recognition - OCR implementation via Deep Convolutional Neural Network*
Faculty Advisor: Ming-Ching Chang, College of Engineering and Applied Science

Cameron Cupp - *Franco's Failed War of Legitimacy: Constructing Historical Memory of the Spanish Civil War in Education*
Faculty Advisor(s): Michitake Aso and Richard Fogarty, College of Arts and Sciences, Department of History

Xavier Fitzsimmons Cruz - *Literary Guerillas: Understanding Nuyorican Nationhood*
Faculty Advisor(s): Richard Barney and Helen Elam, College of Arts and Sciences, Department of English

Ziliang Gao - *Neighboring Influence: The Soviet-Chinese Dance-Cultural Relationships From 1950 to the 1960s*
Faculty Advisor: Camelia Lenart, College of Arts and Sciences, Department of History

John Michael Garbellano - *Hudson River Shell Middens: New Realizations at Dogan Point*
Faculty Advisor: Christopher Wolff, College of Arts and Sciences, Department of Anthropology

Haylie Gray - *The Adornment of Maya Women: How Articles of Clothing and Jewelry Can Infer the Status of Classic and Postclassic Maya Women*
Faculty Advisor: Robert Rosenswig, College of Arts and Sciences, Department of Anthropology

Alyssa Guiang - *Iba Tayo: Filipino Americans as an Ethnic Subgroup*
Faculty Advisor: Meredith Weiss, Rockefeller College of Public Affairs & Policy, Department of Political Science

Mina Gul - *The Disappearance of Human Rights under Erdogan's Regime*
Faculty Advisor: William Pridemore, Rockefeller College of Public Affairs and Policy, School of Criminal Justice

Macy Hayes - *The Future of Climate Action: Evaluating Three Prospective Solutions to the Climate Crisis*
Faculty Advisor: Jennifer Dodge, Rockefeller College of Public Affairs and Policy, Department of Public Administration and Policy

Jessica Holtz - *Vowel Hiatus in Copala Triqui: Why Are Vowel Sequences Permitted?*
Faculty Advisor: Lauren Clemens, College of Arts and Sciences, Department of Anthropology

Dua Kaurejo - *Characterization of the Antarctic Firn using Wideband Microwave Radiometry*
Faculty Advisor: Mustafa Aksoy, College of Engineering & Applied Sciences, Department of Electrical and Computer Engineering

Augustus Lovett - *A Conch, A Corpse, and a Cowrie: An Analysis of the Presence of Shell in Burial Inclusions and the Social Implications they Hold at Mayapan*
Faculty Advisor: Marilyn Masson, College of Arts and Sciences, Department of Anthropology

Sara Magee - *The Ecological Consequences of Species Loss: Insights from Recent Malagasy Mammal Extinctions*
Faculty Advisor: John Rowan, College of Arts and Sciences, Department of Anthropology

Janelle Moe - *The Exoticiation of Black Women in 20th Century Europe*

Faculty Advisor: Camelia Lenart, College of Arts and Sciences, Department of History

Jonathan Muller - *Indigenous Representation in Video Games*

Faculty Advisor: Jennifer Burrell, College of Arts and Sciences, Department of Anthropology

Brianna Nugent - *Witchcraft, Poor Laws and Misogyny in the Early Modern Period*

Faculty Advisor: Julia Jennings, College of Arts and Sciences, Department of Anthropology

Asalah Obaid - *Grammatical Gender: An Analysis of Two Competing Theories*

Faculty Advisor: Jeanette Altarriba**,** College of Arts and Sciences, Department of Psychology

Kalie Rodriguez - *The Butterfly Sisters*

Faculty Advisor: Camelia Lenart, College of Arts and Sciences, Department of History

Kayleigh Ross - *A Case Study: The Development of Obstetrics in Eighteenth-Century Northern Europe through Printed Medical Illustrations*

Faculty Advisor: Sarah Cohen, College of Arts and Sciences, Department of Art & Art History

Kayleigh Ross - *American Indian and Alaskan Native Child and Adolescent Mortality*

Faculty Advisor: Lawrence Schell, College of Arts and Sciences, Department of Anthropology

Eiryn Sheades - *Faunal Remains at Ten Broeck Mansion: Examining the Procurement and Processing of Food at a Post-Revolutionary Slave-Holding Site in Albany, NY*

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

Sydney Snyder - *A Least-Cost Path Analysis of Dorset Travel Across Newfoundland*

Faculty Advisor: Christopher Wolff, College of Arts and Sciences, Department of Anthropology

PRESIDENTIAL AWARD FOR UNDERGRADUATE RESEARCH

Congratulations to the twenty-three University at Albany Undergraduates who received the Presidential Award for Undergraduate Research

Anastasia Acerno - *Creation of the Legislation During the Crack Epidemic of the United States*
Faculty Advisor: Ryan Irwin, College of Arts and Sciences, Department of History

Saad Ahmad - *Dendritic Spine Morphology Changes Following Stereotaxic Injections of A 42-AAV*
Faculty Advisor: Annalisa Scimemi, College of Arts and Sciences, Department of Biological Sciences

Cassidy Bowes - *Gender Differences in Labor Market Outcomes during the COVID-19 pandemic*
Faculty Advisor: Pinka Chatterji, College of Arts and Sciences, Department of Economics

Kaya Carvajal - *Postcolonial Studies, Climate Change, and Science Fiction: A Study of James Vandermeer's Southern Trilogy*
Faculty Advisor: Mike Hill, College of Arts and Sciences, Department of English

Maxim Couillard - *Observations and Analysis of the 7 October 2020 Derecho*
Faculty Advisor: Ross Lazear, College of Arts and Sciences, Department of Atmospheric and Environmental Science

Cameron Cupp - *Franco's Failed War of Legitimacy: Constructing Historical Memory of the Spanish Civil War in Education*
Faculty Advisor: Michitake Aso, College of Arts and Sciences, Department of History

Xavier Fitzsimmons Cruz - *Literary Guerillas: Understanding Nuyorican nationhood*
Faculty Advisor: Helen Elam, College of Arts and Sciences, Department of English

Ethan Gerber - *Impacts of COVID-19 Pandemic on Concentrations and Sources of Fine Particulate Matter in NYC Metro Area*
Faculty Advisor: Md. Aynul Bari, College of Engineering and Applied Sciences, Environmental and Sustainable Engineering

Alyssa Guiang - *Iba Tayo: Filipino Americans as an Ethnic Subgroup*
Faculty Advisor: Meredith Weiss, Rockefeller College of Public Affairs and Policy, Department of Political Science

Mina Gul - *Human Rights Challenges in Turkey Under the Erdogan Regime*
Faculty Advisor: William Pridemore, Rockefeller College of Public Affairs and Policy, School of Criminal Justice

Macy Hayes - *The Future of Climate Action: Evaluating Three Prospective Solutions to the Climate Crisis*
Faculty Advisor: Jennifer Dodge, Rockefeller College of Public Affairs and Policy, Department of Public Administration and Policy

Julie Jasewicz - *Building Resilience*
Faculty Advisor: Jason Randall, College of Arts and Sciences, Department of Psychology

Dua Kaurejo - *Wideband Passive Microwave Remote Sensing of the Antarctic Firn*
Faculty Advisor: Mustafa Aksoy, College of Engineering and Applied Sciences, Department of Electrical and Computer Engineering

Taylor Lovelace - *Did Small Businesses in Rural Counties in the United States Have Equal Access to the Paycheck Protection Program?*
Faculty Advisor: Na Dai, School of Business, Department of Finance

Augustus Lovett - *A Conch, A Corpse, and a Cowrie: An Analysis of the Presence of Shell in Burial Inclusions and the Social Implications at Mayapan*
Faculty Advisor: Marilyn Masson, College of Arts and Sciences, Department of Anthropology

Hasan Mehdi - *Amyloid Aβ Alters Spine Morphology and Synaptic Function*
Faculty Advisor: Annalisa Scimemi, College of Arts and Sciences, Department of Biological Sciences

Naileen Nunez - *Understanding Students' Preparation for College*
Faculty Advisor: Lani Jones, School of Social Welfare, Department of Women, Gender and Sexuality Studies

Asalah Obaid - *Grammatical Gender: An Analysis of Two Competing Theories*
Faculty Advisor: Jeanette Altarriba, College of Arts and Sciences, Department of Psychology

Deirdre Occhino - *Countering Russian Interference*
Faculty Advisor: Gary Ackerman, College of Emergency Preparedness, Homeland Security and Cybersecurity

Azeeza Saafir - *Adverse Childhood Events and Their Relationship with Mental Health and Risk-Taking Behaviors in Undergraduate Students*
Faculty Advisor: Kimberly Colvin, School of Education, Educational Psychology and Methodology

Angelina Tassone - *Two Projects. 1. IL-10 Administration in Male Wistar Rats: Effects on Spatial Working Memory, BBB Permeability, and TNF-α and iNOS Expression; 2. Light Level Intensity Alters Anxiety, but Not Memory, During Open-Field and Novel Object Location Tasks in Male Rats.*
Faculty Advisor: Ewan McNay, College of Arts and Sciences, Department of Psychology

Morgan Thomas - *NYS Youth Justice Institute News Media Project Data Validation*
Faculty Advisor: Alan Lizotte, Rockefeller College of Public Affairs and Policy, School of Criminal Justice

Garrett Wagner - *Neuronal Glutamate Transporters Shape Glutamatergic Transmission to the Striatum*
Faculty Advisor: Annalisa Scimemi, College of Arts and Sciences, Department of Biological Sciences

SITUATION PRIZE FOR RESEARCH
COMMUNITY, CAUSE, AND ADVOCACY

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

Sadena Ahmad - *A Pandemic Within a Pandemic: Helping Children From Minority Communities Thrive*

Jewls Douge - *Beber's Hungry*

Marco Eugene - *Improving Air Quality at Underserved Neighborhoods in the Hudson Valley Region through Low-Cost Sensor Monitoring and Community Engagement*

Salah Harris - *Career InTouch*

Macy Hayes - *The Future of Climate Action: Evaluating Three Prospective Solutions to the Climate Crisis*

Patrick Murphy - *Introduction to the Problem of Coral Survival*

Azeeza Saafir - *Adverse Childhood Events and Their Relationship with Mental Health and Risk-Taking Behaviors in Undergraduate Students*

Jose Velez - *Identifying and Addressing the Health Disparities that Disproportionately affect the Health Care of Marginalized persons in Albany County*

Christian Vitek - *New York State's Local Governments & Cannabis Opt-Out*

SORRELL CHESIN RESEARCH AWARD

Congratulations to the four Juniors and Seniors in Life Sciences Research at University at Albany who received the Sorrell Chesin Research Award

Sevinj Mursalova - *Specific Gene Misregulation DM1 Male and Female Patients*
Faculty Advisor: Andrew Berglund, College of Arts and Sciences, Department of Biological Sciences

Ché-Doni Platt - *Toward Long Non-Coding RNA Detection Using DNA Nanoswitches*
Faculty Advisor: Ken Halvorsen, The RNA Institute

Kevin Thomas - *Using the Centrifuge Force Microscope as a Single-Molecule Technique for Studying Base-Stacking Interactions*
Faculty Advisor: Ken Halvorsen, The RNA Institute

Jose Velez - *Exercise as a Therapeutic for Alzheimer's Disease Resulting from Vascular Disease; Investigating the Role of Aerobic Exercise on the Permeability of the Blood Brain Barrier*
Faculty Advisor: Ewan McNay, College of Arts and Sciences, Department of Psychology

Fall 2021 & Spring 2022
FUNDING RECIPIENTS

Congratulations to the University at Albany Undergraduates who received an Undergraduate Research Scholarship for the 2021-2022 Academic Year

Fall 2021 Recipients

Adelaide Schmid '38 Endowed Research Fund

Jahniah Kum - *365daysofHello*

Faculty Advisor: Dani Ruf, College of Arts and Sciences, Department of Art & Art History

Sherlyn Mercado - *Disaster Preparedness among Older Americans in the US., 2017: An Assessment of the Correlates of Vulnerability*

Faculty Advisor: Samantha Friedman, College of Arts and Sciences, Department of Sociology

Deirdre Occhino - *Red Teaming Election Interference*

Faculty Advisor(s): Gary Ackerman and Jenna LaTourette, College of Emergency Preparedness, Homeland Security and Cybersecurity

Adrienne Zimberg '83 Memorial Endow

Matthew Killeen - *Generation of Near-Infrared Genomic Silver Clusters via Attribute Regularized Variational Autoencoders*

Faculty Advisor: Petko Bogdanov, College of Engineering and Applied Sciences, Department of Computer Science

Clyde & Virgina Roosa '32 Slocum Research Fund

Habib Affinnih - *Improving Rural Emergency Preparedness and Response*

Faculty Advisor: Mariya Zheleva, College of Engineering and Applied Sciences, Department of Computer Science

Ken W. & Thelma Miller Abele '38 Research Fund

Rachel Dolowich - *Emotional Intelligence, Trauma Response, and Neuroplasticity of the Amygdala*

Faculty Advisor: James Stellar, College of Arts and Sciences, Department of Psychology

Jaci Yong - *Glutamate Transporter Control of Reward-Seeking Behaviors*

Faculty Advisor: Annalisa Scimemi, College of Arts and Sciences, Department of Biological Sciences

Lita & Steven Greenwald '40 Research Fund

Teja Buddhavarapu - *The Effect of IL-10 Administration on BBB Permeability in Rat Models*
Faculty Advisor: Ewan McNay, College of Arts and Sciences, Department of Psychology

Olivia Buyea - *Demonstrating that IGF2, Acting Via the IGF2R, Enhances Basal or Insulin-Stimulated Glucose Uptake in Primary Hippocampal Neurons*
Faculty Advisor: Ewan McNay, College of Arts and Sciences, Department of Psychology

George Homenides - *The Snowball Chamber Dark Matter Experiment*
Faculty Advisor: Matthew Szydagis, College of Arts and Sciences, Department of Physics

Alyssa Kamara - *Effects of Obstetric Unit Closures in Rural Areas On Maternal And Child Health Outcomes In The US*
Faculty Advisor: Pinka Chatterji, College of Arts and Sciences, Department of Economics

Dua Kaurejo - *Characterization of Antarctic Firn by Multi-Frequency Passive Remote Sensing from Space*
Faculty Advisor: Mustafa Aksoy, College of Engineering and Applied Sciences, Department of Electrical and Computer Engineering

Sevinj Mursalova - *Specific Gene Misregulation in DM1 Male and Female Patients*
Faculty Advisor: Andrew Berglund, College of Arts and Sciences, Department of Biological Sciences

Che'-Doni Platt - *Toward Long Non-Coding RNA Detection Using DNA Nanoswitches*
Faculty Advisor: Ken Halvorsen, RNA Institute

Enya Sullivan - *How Does the Serine Phosphorylation of Insulin-Like Growth Factor 2 Receptor Correlate to Neuronal Activation and Protein Synthesis?*
Faculty Advisor: Ewan McNay, College of Arts and Sciences, Department of Psychology

Angelina Tassone - *Cerebral Open Flow Microperfusion vs. Microdialysis: Differences in Neuronal Damage and Gliosis During Measurement of Hippocampal Extracellular Insulin*
Faculty Advisor: Ewan McNay, College of Arts and Sciences, Department of Psychology

Kevin Thomas - *Using the Centrifuge Force Microscope as a Single-Molecule Technique for Studying Biomolecular Interactions*
Faculty Advisor: Ken Halvorsen, The RNA Institute

Sandra Wiedmann - *Conductive Polymers of Intrinsic Microporosity*
Faculty Advisor: Jeremy Feldblyum, College of Arts and Sciences, Department of Chemistry

Robert W. Moyer Research Fund

Niitiggya Taneja - *The Role of Insulin-Like Growth Factor-2 in the Neural Benefits of Physical Exercise*
Faculty Advisor: Ewan McNay, College of Arts and Sciences, Department of Psychology

Spring 2022 Recipients

Adelaide Schmid ’38 Endowed Research Fund

Jessie Miller - *The Effects of Developmental Exposure to Synthetic Progestin on Microglia in Hippocampal Regions*
Faculty Advisor: Paige Graney, College of Arts and Sciences, Department of Psychology

Brianna Nugent - *Witchcraft and Poor Laws in Early Modern Britain*
Faculty Advisor: Julia Jennings, College of Arts and Sciences, Department of Anthropology

Adrienne Zimberg ’83 Memorial Endow

Joseph Pasquariello - *Perceptions of Antidepressant Withdrawal*
Faculty Advisor: Mitch Earleywine, College of Arts and Sciences, Department of Psychology

Kayleigh Ross - *Reclaiming Feminine Hysteria*
Faculty Advisor: Leona Christie, College of Arts and Sciences, Department of Art & Art History

Clyde & Virgina Roosa ’32 Slocum Research Fund

Erica Whitman - *Learning through the Opioid Epidemic*
Faculty Advisor: Patricia Strach, Rockefeller College of Public Affairs and Policy, Department of Public Administration and Policy

Ken W. & Thelma Miller Abele ’38 Research Fund

Steven Lindsay - *Attentional Bias and Body Image*
Faculty Advisor: Gregory Cox, College of Arts and Sciences, Department of Psychology

Lita & Steven Greenwald ’40 Research Fund

Mazin Chater, Jaden Pharoah, and Youssef Jalwaj Soubai - *Tensiometer Design Challenge*
Faculty Advisor: Jonathan Muckell, College of Engineering and Applied Sciences, Department of Electrical and Computer Engineering

Nathan Forrest - *Analysis of DNA Hybridization Kinetics Using Gel-Applied Global Force Changes*
Faculty Advisor: Ken Halvorsen, The RNA Institute

George Homenides - *The Snowball Chamber Dark Matter Experiment*
Faculty Advisor: Matthew Szydagis, College of Arts and Sciences, Department of Physics

Nikhita Kumar - *Quantification of Fibrosis in the Salivary Gland*
Faculty Advisor: Melinda Larsen, College of Arts and Sciences, Department of Biological Sciences

Matthew Long - *Post-Translational Modifications on Ribosomal Proteins in Response to Cellular Stress*
Faculty Advisor: Gabriele Fuchs, College of Arts and Sciences, Department of Biological Sciences

Corey Nilon - *Do Neuronal Glutamate Transporters Alter Social Interactions?*
Faculty Advisor: Annalisa Scimemi, College of Arts and Sciences, Department of Biological Sciences

Akul Patel - *Testing the Biostability of Different Sized Tetrahedra*

Faculty Advisor: Ken Halvorsen, The RNA Institute

Ché-Doni Platt - *Toward Long Non-Coding RNA Detection Using DNA Nanoswitches*

Faculty Advisor: Ken Halvorsen, The RNA Institute

Emma Saidenberg - *Strontium-Calcium and Oxygen Isotope Analysis of Red Sea Corals*
Faculty Advisor: Sujata Murty, College of Arts and Sciences, Department of Atmospheric and Environmental Science

Jose Velez - *Investigating the role of Aerobic Exercise on Blood Brain Barrier Permeability*

Faculty Advisor: Ewan McNay, College of Arts and Sciences, Department of Psychology

Robert W. Moyer Research Fund

Sadena Ahmad - *Empathy Coding and Prosocial Behavior*

Faculty Advisor: Elana Gordis, College of Arts and Sciences, Department of Psychology

Julia Drake - *Depression and Reasoning Project*

Faculty Advisor: Gregory Cox, College of Arts and Sciences, Department of Psychology

Kellie Gavin - *Emotion Regulation and Racial Trauma Symptom Severity*
Faculty Advisor: James Boswell, College of Arts and Sciences, Department of Psychology

Helena Horvat - *Confessed Personal Use of Psychedelics and Their Cultural Congruence: Impact on Perceptions of Researcher Integrity and Quality of Research*
Faculty Advisor: Mitch Earleywine, College of Arts and Sciences, Department of Psychology

Lauren Russell - *NYS Youth Justice Institute*

Faculty Advisor: Megan Willows, Rockefeller College of Public Affairs and Policy, School of Criminal Justice & NYS Youth Justice Institute

ABSTRACTS

Arranged by session group and alphabetically by author last name

Oral Presentations – Located in LC 12

3:30pm, Janelle Moe - *The Exoticiation of Black Women in 20th Century Europe*

Faculty Advisor: Camila Lenart, College of Arts and Sciences, Department of History

The project will dive into ways that women were objectified in Europe specifically Black Women. During this time period, racism was still heightened and a mindset of objectifying Black women was seen as something that was common. Therefore, when looking at Black women, they were seen as objects. They were looked at in terms of their bodies and physical appearance rather than who they were as people. The project will mostly focus on Josephine Baker as her objectification was seen in various countries in Europe and the use of her body was very obvious. She had the opportunity to use this towards her benefit, but sadly not every Black woman can do that. I will talk about the exoticiation from all aspects, and ensure that the word itself is known in the terms of Black Women.

3:45pm, Kalie Rodriguez - *The Butterfly Sisters*

Faculty Advisor: Camila Lenart, College of Arts and Sciences, Department of History

I will be speaking about revolutionary women (the butterfly sisters) who went again Dictatorship in the Dominican Republic. These sisters went against all odds and are hardly spoken about in global history.

4:00pm, Anastasia Acerno - *Creation of the Legislation During the Crack Epidemic of the United States*

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

The effects of legislation when it comes to crack cocaine and other substances has been discussed over the decades. Where communities have been affected by harsher sentencing policies, and greater criminalization of drug dealing and drug abusing. When researching and writing this project, the goal was to look at what was going on within society at the time of the Crack Epidemic. This was done to understand the motivations behind politicians and policy-makers and the decisions they made which would lead to controversial, hypocritical, and contradictory public policies. The actions of community members are also crucial and were looked at intently in order to understand the feelings and actions of those closely affected by crack abuse. Community activists and teachers were looked at intently in order to show the reader that community members had taken actions into their own hands when they had become increasingly concerned with drug abuse in their communities and were waiting for effective public policy to be enacted. A special in-depth look on the Governorship of Andrew M. Cuomo allows the reader to see the contradictory policies adopted during the time. The idea of a "brute-force public policy" becomes present, where taking suggestions from all areas on the political spectrum resulted in less-effective public policy in handling a health crisis. The goal of the project is to look at the actions taken by members in a society in order to give greater context to the other readings available on the effects of Crack Epidemic era legislation.

4:30pm, Dua Kaurejo - *Characterization of the Antarctic Firn using Wideband Microwave Radiometry*

Faculty Advisor: Mustafa Aksoy, College of Engineering and Applied Sciences, Department of Electrical and Computer Engineering

Due to the extreme environmental conditions of the Antarctic, remote sensing techniques are most suitable for measuring the physical properties of the Antarctic ice sheet. This project aims to test whether the Antarctic firn can be characterized in terms of its subsurface temperature, density, and grain size versus depth through multi-frequency passive microwave remote sensing as microwave emissions from ice sheets are sensitive to these properties and the electromagnetic penetration depth varies with frequency. The Global Precipitation Measurement (GPM) constellation is utilized as a single multi-frequency wideband radiometer system, in combination with depth-dependent models of physical properties and improved electromagnetic forward emission models. In-situ measurements across Antarctica, available at the United States Antarctic Program Data Center, have been collected and fit to depth-dependent models using least squares regression to determine the boundary values for the parameters in these models. Microwave radiations from the Antarctic firn have been simulated using the bounded models of physical properties and a good match has been achieved with satellite measurements (GPM) over the Concordia and Vostok Stations. These initial results will be used as a stepping stone to implement a more comprehensive retrieval in the future.

5:00pm, Ché-Doni Platt - *Toward Long Non-Coding RNA Detection Using DNA Nanoswitches*

Faculty Advisor: Ken Halvorsen, The RNA Institute

Long non-coding RNAs (lncRNAs) are transcripts that are over 200 nucleotides and do not encode proteins. LncRNAs are involved in a wide spectrum of biological processes ranging from cell proliferation, apoptosis, and nutrient sensing to cell differentiation. Further, lncRNAs have been reported to play an important role in a wide range of pathophysiological processes and linked to diseases such as cancer. Thus, lncRNAs are becoming increasingly important as biomarkers to study biological and disease processes. In our work, we develop a DNA nanoswitch-based assay for detecting long RNAs. The DNA nanoswitch is a reconfigurable device that undergoes a conformational change from a linear “off” state to a looped “on” state upon interaction with the target molecule. The two states can be easily identified on an agarose gel. Using in vitro transcribed RNA controls, we optimize the assay for detecting different lengths of target RNAs, validate sensitivity and specificity of the assay, and detection of target RNA in the presence of total RNA extract. Our work aims to create a lncRNA detection assay that will be useful in early treatment of diseases and in screening potential biomarkers (for example, in Duchenne Muscular Dystrophy). The DNA nanoswitch-based assay is low-cost, highly sensitive and specific, and easily adaptable in any laboratory for detecting various biomarkers.

Session 1 – Context is Everything: History, Anthropology, and Archaeology

Alondra Aca Garcia - *HSI: Institutional Response to Latinx Student Needs during Covid-19*

Faculty Advisor: Jennifer Burrell, College of Arts and Sciences, Department of Anthropology

Key Word: Covid-19, Hispanic Serving Institutions, Higher Education, Latinx Students, Institutional Support, Non-traditional Student

This study examines institutional response and support provided during the Covid-19 and the current pandemic. This study draws conclusions based from Latinx college students attending a public Hispanic Serving Institutions (HSI) based in New York City. This study will draw results from a four year City University that serves over 50% Latinx students. Because Latinx college students are considered "non-traditional" students given their experiences and realities that may impact their educational endeavors it is crucial to understand the ways their educational trajectories were impacted or shaped during the pandemic. Through the examination of institutional support both through administrators and faculty as well as support services this study hopes to examine the role educational institutions have in promoting the well being and the success of college students. Through a mixed-method approach of survey and interviews this study examines how supported students felt, what resources were implemented to best support the students in the unprecedented times and the institutional response and perspectives from institutional agents. The study will further highlights the resources sought, lack of resources and academic related obstacles faced by Latinx college students and faculty during the pandemic and how the institution responded to those specific needs. This will be done by emphasizing students' realities and experiences navigating internal and external resources.

John Michael Garbellano - *Hudson River Shell Middens: New Realizations at Dogan Point*

Faculty Advisor: Christopher Wolff, College of Arts and Sciences, Department of Anthropology

This research explores cultural and environmental evidence for the earliest occupation and use of shellfish and other resources along the Hudson River Estuary, specifically at the Dogan Point site. Dogan Point is one of the oldest (if not the oldest) shell midden sites in the northeast and greater Atlantic region of North America. However, the site's boundaries, presence and absence of shell, and relationship to early and middle archaic adaptations and human-environmental relations have not been fully realized. My research is focused on answering questions about these topics, and this poster discusses and shows the preliminary results of my fieldwork and post fieldwork analysis during the Summer and Fall of 2021, and Winter of 2022. I will discuss the idea of ancient human-ecosystem relations and adaptations that developed at Dogan Point and allowed early and middle archaic peoples to survive through periods of rising and stabilizing sea levels. I will also discuss and show the areas where renewed excavations took place as well as what was found. Lastly, I lay out the next steps of my research for 2022-2023, the methods I intend to use, and why.

Haylie Gray - *The Adornment of Maya Women: How Articles of Clothing and Jewelry Can Infer the Status of Classic and Postclassic Maya Women*

Faculty Advisor: Robert Rosenswig, College of Arts and Sciences, Department of Anthropology

The need for copious amount of jewelry and accessories to assert status among the Ancient Maya has been seen through the use of figurines, stone stelae, and painted murals for hundreds of years. A medium that can be found during the Classic and Postclassic that had utilized colorful depictions of Maya dress are ceramic vessels painted with portraits containing a range of individuals, from commoners to Kings, and their preferred method of adornment. An aspect that I am hoping to explore through my research is the use of clothing and jewelry to depict status among Maya women, and how their styles differed from each other, with images found among numerous painted vase artifacts and the variety of scenes. With the use of the Kerr vase database, I intend to interpret trends of specific articles that are being represented more often than others, on women exclusively, to solidify which pieces are seen as more common and those that would have been more rare, or held more prestige or importance. By using this method, I intend to have a solidified path of understanding as to what was being worn by the demographic of women during a time of differentiated status and unique adornment strategies.

Jessica Holtz - *Vowel Hiatus in Copala Triqui: Why Are Vowel Sequences Permitted?*

Faculty Advisor: Lauren Clemens, College of Arts and Sciences, Department of Anthropology

Copala Triqui is an Otomanguean language with a diaspora community of speakers in Albany. The language broadly permits hiatus, or sequences of vowels across syllable boundaries. This contrasts findings in many other languages where hiatus is often repaired, at least in certain contexts. The question is then, why should Copala Triqui not seek to repair hiatus? What factors are prioritized over the crosslinguistic tendency to prefer syllable onsets and what factors may allow hiatus to surface as the preferred form? There is a tendency for languages to preserve segments and features in more prominent positions, and this is something which is demonstrated in Copala Triqui as well. This work proposes that factors which prevent resolution strategies are primarily due to the functional load carried by word-final syllables in Copala Triqui in conjunction with universal preferences in hiatus contexts. The preservation of word-final segments is crucial in Copala Triqui as these segments contain important information central to the meaning of the overall word. Crosslinguistic preferences for preserving word-initial vowels prevent other resolution strategies, as well. This research is a preliminary investigation into factors which may contribute to how or if hiatus surfaces in Copala Triqui, and is part of a larger project of cross-linguistic comparison of hiatus resolution and its conditioning factors using newly elicited data from work with native speakers of multiple languages.

Augustus Lovett - *A Conch, A Corpse, and a Cowrie: An Analysis of the Presence of Shell in Burial Inclusions and the Social Implications they Hold at Mayapan*

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

This project analyzes the distribution of shells in graves of persons of varying social status from the Pre-Columbian Maya archaeological city of Mayapan in the Yucatan peninsula of Mexico. Shells were an important crafting and trade commodity in the period of this study from A.D. 1150-1450, and some of them had ritual and symbolic significance, while others were used as money in marketplace exchanges. This paper builds on prior studies arguing that different types of shells were valued differently in Maya society. To test this argument, I analyze the distribution of categories of shell (crafting debris, finished ornaments) according to the social status of 72 burials at the site. My study draws on an Excel database created from published burial descriptions and grave goods, originally reported by A.L. Smith of the Carnegie Institution of Washington in 1962. My findings identify shells in common use in mortuary settings irrespective of social class and differences in shells associated with elites.

Sara Magee - *The Ecological Consequences of Species Loss: Insights from Recent Malagasy Mammal Extinctions*

Faculty Advisor: John Rowan, College of Arts and Sciences, Department of Anthropology

Madagascar is a biodiversity hotspot world-renowned for its highly endemic flora and fauna, including at least 100 extant species of lemurs. Their modern diversity, culminating over millions of years, has produced an extraordinary range of functional traits which enable these taxa to serve key roles in their communities. However, this present variety is only a fragment of the Island's past, where an unprecedented diversity of over a dozen recently-extinct lemurs – alongside other unique vertebrate taxa – comprise a rich Holocene subfossil record spanning the last several thousand years. While past lemur extinctions are generally believed to have been instigated by human impacts, the anthropogenic threats facing Malagasy species today are undeniable, and this extraordinary 'near-time' fossil record provides a critical context for understanding how impending human-driven lemur extinctions can impact Malagasy ecosystems. Through quantitative functional trait-based analyses and simulated extinctions, I address how such events incur not only the loss of species themselves, but also widespread ecological change; therefore, the major goal of my graduate research is to explore the ecological consequences of extinction for Malagasy lemur communities through time, both as they have changed in the past and how they can change in the future.

Jonathan Muller - *Indigenous Representation in Video Games*

Faculty Advisor: Jennifer Burrell, College of Arts and Sciences, Department of Anthropology

Settler-colonial narratives have been part and parcel of the socially dominating framework of society since the processes of settler colonialism began. These narratives drive continuing patterns of exploitation and erasure of indigenous people and their identities. These narratives have proceeded to broach beyond physical space and have entered into the growing scape of new digital worlds that people have come to inhabit. The ongoing invasion of settler-colonial narratives into digital space is perhaps nowhere more prevalent than through video games. The video game industry is one of the wealthiest and fastest growing industries in the world. It is also notorious for being heavily dominated by wealthy white men, who are often the driving forces behind settler colonial narratives, not only since the creation of those narratives, but well into the present. It is almost to be expected that the video game industry would contain settler-colonial narratives. Thus, what must ultimately be brought to light are the ways in which video games have simultaneously fostered representations of indigeneity as well as the extent to which these representations have countered settler-colonial narratives through their respective historical accuracy and cultural authenticity.

Antonio Otero - *Primate Distal Femur Shape Variation and its Relationship to Locomotor Repertoire*

Faculty Advisor: Adam Gordon, College of Arts and Sciences, Department of Anthropology

The primate knee plays an important role during locomotion due to the variability and range of locomotor forms employed by primate species. Species can employ a variety of locomotor forms at varying rates (i.e., differing percentages of use) and the full suite of locomotor forms a species can employ comprises its locomotor repertoire. To better understand the relationship between the functional morphology of the femur and primate locomotion, I conducted a morphometric analysis of distal femur shape across a diverse range of primate taxa varying in both body masses and locomotor repertoire. The sample included 110 specimens (extant, subfossil, and fossil), representing 68 species across 40 genera and locomotor repertoires composed of nine locomotor forms. Seventeen landmarks per specimen were placed using the extension SlicerMorph in the program 3D Slicer and statistical analyses were run in R. A principal components analysis (PCA), linear discriminant function analysis (DFA) with species identity as the grouping variable, and DFA with locomotor form as the grouping variable were run on the landmark data. A cross-validation and leave-one-out cross-validation was also run for the DFA grouping by locomotion. Results of the PCA and DFA by species do not indicate expected consistent taxonomic grouping, but the DFA by locomotion separates as expected (i.e., separation by quadrupeds, brachiators, bipeds, and quadrumanous clamberers). However, leave-one-out cross-validation results (65.5%) indicate significant overlap among some locomotor forms. Overall, these results indicate that locomotor form influences distal femur shape such that locomotor grouping can be done regardless of species identity.

Kayleigh Ross - *American Indian and Alaskan Native Child and Adolescent Mortality*

Faculty Advisor: Lawrence Schell, College of Arts and Sciences, Department of Anthropology

The American Indian/Alaskan Native (AI/AN) population experiences substantial health disparities, but the extent is not well characterized. The data available from the National Center for Health Statistics is inaccurate as AI/AN persons are often not recognized as such on death certificates. Rates of subadult deaths are less well-known causing undercounting of AI/AN deaths. However, some generalizations may possible by considering the direction of error. As AI/AN deaths are undercounted, racial/ethnic comparisons that show greater death rates among AI/AN are "Estimates of Minimal Difference" (EMD); the difference in rates would only be increased by more accurate race/ethnicity classification on certificates because more AI/AN individuals would be counted as such. We compare rates of AI/AN leading causes of death to non-Hispanic White (n-HW) and non-Hispanic Black (n-HB) rates using annual reports for “Deaths: Leading Causes” from 2015-2017 from the National Vital Statistics System. Among 1-19 year-olds suicide deaths among AI/AN are significantly higher ($p<0.00001$) than among n-HB (OR=4.34; CI=3.68-5.1) and n-HWs ($p< 0.007$; OR=1.23; CI=1.05-1.42); deaths from accidents are significantly higher ($p<0.0001$) than among n-HB (OR=1.71; CI=1.49-1.93) and deaths due to assault (homicide) are significantly higher ($p<0.00002$) than among n-HWs (OR=1.64; CI=1.3-2.05). The appearance of suicide as a leading cause of death among AI/AN occurs in the 10-14-year-age group and is significantly more common in the 15-19-year-age group compared to both n-HB and n-HW. Even without adjusting for undercounting, EMDs show that there are significant health disparities for preventable deaths of AI/AN children and adolescents to be addressed by public health policy.

Eiryn Sheades - *Faunal Remains at Ten Broeck Mansion: Examining the Procurement and Processing of Food at a Post-Revolutionary Slave-Holding Site in Albany, NY*

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

Applying archaeological methods to historical contexts where African American enslaved persons lived and labored aids in providing additional understanding to a marginalized group that is often overlooked in history. Enslaved African Americans in the post-revolutionary Northeast United States often do not receive mention or recognition in documentary sources. This paper aims to provide a zooarchaeological investigation into the food procurement, processing, and consumption practices of the four to twelve enslaved persons living at the Ten Broeck Mansion, Albany, New York from 1790-1810. Taxonomic and taphonomic observations from a sample of 479 faunal remains indicate a high reliance on large domestic animals. The enslaved individuals living at the mansion- Britt, Susannah, Herry, John, Gan, Laney, Dinah, Susan, and Mary- were likely the individuals most deeply intimate with the care and butchering of Bos taurus, Sus scrofa, and Ovis aris/Capra hircus, as well as to a lesser degree domestic birds and fish. On site butchery would have required knowledge of knives and saws, along with that of anatomy. Most of the meat processed by these individuals would have been destined for meals consumed by Abraham and Elizabeth Ten Broeck, with fractions allocated for their enslaved laborers.

Sydney Snyder - *A Least-Cost Path Analysis of Dorset Travel Across Newfoundland*

Faculty Advisor: Christopher Wolff, College of Arts and Sciences, Department of Anthropology

The Paleo-Inuit Dorset people of Newfoundland were a hunter-gatherer society with a highly specialized marine economy, with a specific focus on migratory harp seals (Pagophilus groenlandica). The animal’s reliance on sea ice and its accessibility along the island’s western and northern coasts, along with evidence for ice-adapted technologies led researchers to suggest that the Dorset chose to occupy coasts to provide better access to sea ice and the resources they provided; however, the lack of archaeological evidence for watercraft has made addressing the question of Dorset travel between site locations difficult. It is possible that there were other forms of travel between sites through the island’s interior rather than taking the longer pathways along shorelines. GIS technology can address the question of potential interior island land-use by using a least-cost analysis to determine possible pathways, or “shortcuts”, between sites and resources and comparing them with documented Dorset sites across the island. This project’s primary aim is to provide insight into how the Dorset utilized the extent of their landscape and the resources available to them and indirectly assess not just where they travelled, but how.

Briana Sullivan - *In Houses of Ill Fame: An Archaeological Analysis of Social Resistance and Conformity Within Historical Brothel Spaces*

Faculty Advisor: Sean Rafferty, College of Arts and Sciences, Department of Anthropology

Nineteenth century prostitution in the American northeast contends with ambivalent attitudes from Victorian contemporaries in addition to run ins with the law and street politics. In a period in which women were seen as docile and asexual, prostitutes engaged in activity outside the realm of acceptable behavior. However, historical prostitutes cannot be strictly categorized by their sexuality and resistant behavior as they still existed within a society held to the standards of the Victorian period. In this way, female sex workers embodied their womanhood by the standards of their period’s cultural norms as well as direction oppositions to those same norms. Women in brothels took part in extramarital affairs and smoked and drank to a point of excessiveness while also decorating their homes and places of work in a style reminiscent of higher class homes. Brothels provide a unique material culture that can speak to this paradox of resistance and conformity. As a way to break down the complexities of historical brothel culture, this research evaluates previous studies conducted on archaeological assemblages of prostitute related contexts as well as analyzing the raw assemblage data from the Endicott Street brothel privy site of Boston. Assemblage data will report on evidence of both resistance and normative actions, ultimately connecting back to how prostitutes negotiate their womanhood in relation to existing inside and outside the realm of nineteenth century cultural norms.

Session 2 – Gender Studies Across the Disciplines & Centuries

Dyonne Lindsay - *Restructuring the Gaming Industry by Empowering Females*

Faculty Advisor: Micheal Leczinsky, College of Emergency Preparedness, Homeland Security and Cybersecurity

The misogynistic presence of the gaming industry is the main cause of women and girls not having a prominent presence. Until this aspect changes, women and girls are reluctant to enter this field. The restructuring of the gaming industry must start at the top and work our way down to smaller independent companies. The community of video game players is evolving, and the industry is changing with it. What once might have been seen as a more solitary experience has grown into a new world of players and spectators who have transformed the act of gaming into a professional experience. Players now have the chance to compete in global competitions worth millions of dollars in cash prizes and sponsorships. Research shows encouraging young girls to play games can be good for their development and their social skills, inclusion and expose these girls to different views of society.

Brianna Nugent - *Witchcraft, Poor Laws and Misogyny in the Early Modern Period*

Faculty Advisor: Julia Jennings, College of Arts and Sciences, Department of Anthropology

This project looks at witchcraft in the early modern period in Britain and its colonies in North America, and how this issue was more social than religious. By analyzing primary sources, secondary scholarship throughout the twentieth and twenty first centuries, and using artifacts from museum visits, this project seeks to uncover how witchcraft was a way to persecute the poor, the destitute, and the unwanted members of early modern society. This project has a unique emphasis on poor laws and how they are in conjunction with the persecution of "witches" in England and Salem, as well as the plight of a female-centered persecution that privileged the male body over the female one. It also plans to use artwork from this time period in an integrated manner in order to ask the questions of why these brutal persecutions happened, what they meant for those who suffered through them, and what is the future of the descendants of these women and the scholarship of those who question why these movements happened in the first place.

Kayleigh Ross - *A Case Study: The Development of Obstetrics in Eighteenth-Century Northern Europe through Printed Medical Illustrations*

Faculty Advisor: Sarah Cohen, College of Arts and Sciences, Department of Art & Art History

The eighteenth century in Europe was a time of intellectual and cultural advancement, as in the medical realm observable evidence and experimentation served to advance the understanding of how the body operated. During an age of curiosity, the growing professionalization of medicine, increasingly literate population, and the expansion of print culture into scientific learning created a market for the popularization of medical texts. Medical manuals often included illustrated prints, as these images were integral modes for learning and teaching. As the reproductive female body became included in the study of anatomy and appeared in medical manuals, it marked the gendered shift in the attitudes of childbirth from a female midwife dominated affair to a male medical professional one. With the medical professionalization of midwifery and obstetrics came the growing requirement for education and training, especially regarding instrumentation developments like the forceps and anatomical knowledge, including that of the pelvis. Thus, the medical texts and illustrations produced under three practitioners in Northern Europe: Hendrik van Deventer, William Smellie, and Angélique Marguerite Le Boursier du Coudray, serve as case studies of the sexual politics and cultural, geographic, religious, and temporal differences in the advancements of gynecology and obstetrics, especially in the conception of the pelvis and the application or elimination of forceps in practical procedure during the eighteenth century.

Session 3 – Other Worlds, Cultures, and Transforming Narratives in Literary Analysis

Kaya Carvajal - *The Parasitic Identity in Annihilation*

Faculty Advisor: Mike Hill, College of Arts and Sciences, Department of English

In my project, I will explore the ways in which Jeff VanderMeer's eco-horror novel Annihilation, as well as science fiction in general calls back to a colonial dynamic between the native and the Other. I expand this connection by looking at feelings of confusion and distortion evident in both Annihilation and post-colonial scholarship, identity ambivalence, which shifts and changes throughout the novel, the power of colonized language, and a parasitic force taking over the protagonist's identity. The protagonist's colonization occurs through the ingestion of colonizer language, so I argue that the horror of this story is that instead of language being the tool that grants her freedom from her colonizers, it is actually her fated cause of death. Through examining these subsections, I have been able to conclude that Annihilation and stories like it can be read as post-colonial novels, with the aliens as the colonizers. I have also noticed the current popularity of eco-horror to be related to a fear of the natural environment colonizing modern civilizations because of climate change.

Cameron Cupp - *Franco's Failed War of Legitimacy: Constructing Historical Memory of the Spanish Civil War in Education*

Faculty Advisor(s): Michitake Aso and Richard Fogarty, College of Arts and Sciences, Department of History

In 1939, General Francisco Franco rose to power as a result of his victory in the Spanish Civil War. The Spain he ruled over was war-torn and fractured, grieving over lost loved ones and burning towns. As he looked to repair Spain, Franco turned to education. He entrusted the Catholic Church to administer his new curriculum which looked to accomplish one goal: indoctrinate Spanish youth into a new generation of National-Catholic sycophants. Although this goal seemed sound, Franco and his disciples failed to understand exactly what their legitimacy was founded upon, which I argue was the fear and terror inflicted upon the public during the war. As the century churned on, young Spaniards, not frightened of Franco as their parents were, dissented in mass. This led the Church to divorce itself from the Franco regime and their educational strategy. I argue that the split between the Franco Regime and the Catholic Church in the realm of educational policy was fostered by the lack of historical memory surrounding the Spanish Civil War. Furthermore, I argue the regime failed to establish a historical narrative of the Civil War through education, which created a void that would be filled with dissent. This paper will examine educational policy throughout the duration of the Franco regime through avenues such as firsthand testimony and educational laws and doctrines. Given that Spain is embroiled in an internal reckoning with the Franco regime, it is necessary to examine this period in the lens of historical memory.

Xavier Fitzsimmons Cruz - *Literary Guerillas: Understanding Nuyorican Nationhood*

Faculty Advisor(s): Richard Barney and Helen Elam, College of Arts and Sciences, Department of English

"Literary Guerillas: Understanding Nuyorican Nationhood" is a literary analysis of a corpus of texts dealing with the issue of identity and nationhood in the Puerto Rican diaspora. This paper analyses the way Puerto Rican culture survived in the United States, following the mass exodus of Puerto Ricans from Puerto Rico to the mainland throughout the mid 20th century. Fundamentally, my research uses the texts of this major diaspora, to understand how it remade itself in the context of urban America in the 20th century. I use the Nuyorican arts movement, which started as a Civil Rights era artistic movement within the Puerto Rican diaspora, as an example of cultural germination in between two dominant cultures. From this perspective, the Nuyorican arts movement becomes an effort in nation-building against two distinct zones of tension: between the diaspora and the U.S., and between the diaspora and Puerto Rico. In many modern theories of "border", the "border" is depicted as a vague cultural space, whose hybrid cultural landscape marks where two dominant cultures grate against each other. In contrast, I argue that the Nuyorican arts movement "culturally liberated" the Puerto Rican-American borderland and sustained a new culture from the unique experience of the Puerto Rican diaspora in urban America. In these conditions, the Nuyorican author becomes a "literary guerilla fighter," using the unconventional language of their diaspora, and unideal circumstances of institutional neglect to affirm the cultural silhouette of their national identity as neither American nor organically Puerto Rican.

Ziliang Gao - *Neighboring Influence: The Soviet-Chinese Dance-Cultural Relationships From 1950 to the 1960s*

Faculty Advisor: Camelia Lenart, College of Arts and Sciences, Department of History

The period from 1950 to 1963 is often referred to as the "honeymoon period" of Sino-Soviet relations. The two countries signed a series of agreements, and the Soviet Union provided assistance to China in a range of areas, including trade, higher education, nuclear technology, and industry. In the contemporary era, the technological aid and diplomatic ties between the two countries often get the most attention from the historical perspective. Yet, between that period, the ties between the two countries were linked not only by the series of agreements and assistance but also by a factor that is relatively not viewed as the same important - cultural. The influence of Russian and Soviet culture on China in modern times has been significant. It penetrates all corners of culture, profoundly influencing the development of dances, literary creation, movie industry. This research paper will focus primarily on the Soviet influence on dance in the People's Republic. The influence of the Soviets on Chinese dance education was manifested in the training of the first generation of professional dance teachers and helped to establish a dance education system and the creation and education of ballet in China. The influence of Soviet dance art on the development of dance in China is comprehensive. It is expressed in the establishment of music and dance art groups at all levels in China, including the system, establishment, scale, division of labor.

Alyssa Guiang - *Iba Tayo: Filipino Americans as an Ethnic Subgroup*

Faculty Advisor: Meredith Weiss, Rockefeller College of Public Affairs and Policy, Department of Political Science

Compared to other diaspora groups in the United States and their mainland counterparts, Filipino Americans have endured overlapping historical experiences that bond the population into a distinguished ethnic subgroup. “Iba tayo” is a Tagalog phrase that represents this concept of Fil-Am exclusivity, meaning “we are different”. The general topic area of this research is how identity changes in a diaspora group. Specifically, I examine the ethnic differentiation between folks who disperse from a mainland with a certain national identity and those who remain behind, and the generational process under which this identity transforms into a separate ethnic category. Previous research on diaspora identities alludes to the notion that the shared experiences of a group in the same host country constructs an explicit bond. In the case of Filipino Americans, the unique colonial dynamic shared by the United States and the Philippines shapes much of the identifiable Filipino American ethnicity. It is meaningful to explore this concept because it sheds light on how historical processes impact the status of contemporary and future communal identities. Through the approach of literature review, interviews, and a survey, I explore the colonial and social elements that bring about a newly constructed ethnicity. In the interviews and survey, I inspect the personal experiences of Generation Z (Gen Z) Filipino Americans. These methods reveal the salience of an emerging ethnicity exclusive to Filipino Americans. This signifies that in the search for an identity to claim, Filipino Americans may find refuge in the unfolding legacy they contribute to.

Michaela Kirwan - *Investigación sobre los Materiales Disponibles en Español en el Sitio Web “NY State of Health”*

Faculty Advisor: Lotfi Sayahi, College of Arts and Sciences, Department of Languages, Literatures & Cultures

Varios estudios han mostrado que grupos hispanohablantes, y otras personas que hablan lenguas minoritarias, tienen un conocimiento práctico limitado en el campo de la salud. Eso quiere decir que estas personas probablemente van a tener muchas dificultades para entender la información médica sin un traductor o un intérprete que no suelen estar disponibles en cada oficina o hospital. Para combatir estas discrepancias, algunas gobiernos locales han tratado de implementar programas de instrucción en inglés como segunda lengua para facilitar el acceso a la información médica en esta lengua, pero estos programas no está siempre disponibles para todas las personas. El estado de Nueva York ofrece la información relacionada con los programas de seguros médicos en inglés pero también en español. Queda por saber el grado de eficacia de los materiales disponibles en este sitio y la naturaleza del uso que se hace de la lengua española. En este estudio, examino los documentos y videos en español del sitio web de “NY State of Health” para determinar si, efectivamente, garantizan el acceso a la información necesaria sobre los seguros y los beneficios médicos. También, investigo casos de variación dialectal presentes en estos materiales para identificar qué dialecto del español predomina y si esto coincide con las variedades que se suelen usar por los grupos de hispanos más dominantes en el estado de Nueva York. También examino si efectivamente no hace falta saber inglés para informarse de forma completa sobre el tema o si no toda la información está disponible en español.

Steffi Santos - *Wanderer Above the Sea of Desolation: The Romantic Ruin in Contemporary Dark Fantasy*

Faculty Advisor: Kir Kuiken, College of Arts and Sciences, Department of English

Any work involving a fictional universe is reliant on the mastery of its author in the conventions of that universe. In most works of high fantasy, authors proudly (often superfluously) showcase their worldbuilding: Languid, heavy-handed exposition and colorful, winding descriptions are the norm. However, the fictional worlds of the dark fantasy subgenre contradict this by utilizing understatement as a mode of storytelling. Exposition through imagery, ambiance, and little pieces of lore scattered throughout a story is how the worldbuilding of dark fantasy settings is presented. Such is the case for the 2016 dark fantasy video game Dark Souls 3. Instead of the bustling, colorful civilizations that usually populate the fantasy genre, Souls’ setting is depicted as broken-down, abandoned, and overgrown: A mere echo of the once-grand civilizations that precede the game’s present. The presence of these ruined spaces prompts an essential worldbuilding question: Why create such civilizations, only to desecrate them? I posit that modern dark fantasy literature cannot be evaluated without Romantic ideology, where interest in ruins -- marks of human achievement, suspended in time -- revolutionized a previously anthropocentric understanding of the world. This new way of thinking about history (and its skeletal monuments) is essential for parsing through the settings of dark fantasy worlds, whose rich histories are obscured by the decay of time. For this project, I will unpack the understated storytelling within the game’s natural progression, and how this lends to a rich exploration of a mythical universe from the lens of its dilapidated present.

Session 4 – Issues in Public Health, Public Policy, and Sociology

Cassidy Bowes - *Gender Differences in Labor Market Outcomes During the COVID-19 Pandemic*

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

In the events of the COVID-19 pandemic, the Department of Homeland security released guidelines of who would be an essential worker and required to keep going into work for the benefit of society. Two of the industries deemed essential were healthcare and education, both of which are heavily concentrated by female workers. In this study, I use Current Population Survey data spanning November 2019- December 2021 to test for gender differences in wages among those working in the healthcare and education occupations during the pandemic. I estimate a regression model which includes controls for time trends and other factors, allowing me to isolate the impact of the pandemic on the gender difference in wages. The pandemic has presented new challenges to these employees, especially those who must provide childcare. The goal of this analysis is to see how the pandemic has affected the gender wage gap in these occupations and determine what factors contribute to this gap.

Macy Hayes - *The Future of Climate Action: Evaluating Three Prospective Solutions to the Climate Crisis*

Faculty Advisor: Jennifer Dodge, Rockefeller College of Public Affairs and Policy, Department of Public Administration and Policy

The amount of time remaining to address the climate crisis before it becomes irreversible is precipitously declining. The current literature on climate policy establishes patchworks of policy solutions and scientific findings that would help partially mitigate the crisis but would not solve the issue comprehensively. This research project aimed to determine a narrative that illustrates a complete transformation and solution that will successfully address the climate crisis. My research suggests that the proposed solutions fall into three main categories: climate capitalism (e.g., Lovins & Cohen, 2011; Rand 2020), a Green New Deal (e.g., Chomsky & Pollin, 2020; Rifkin, 2019), and ecosocialism (e.g., Klein, 2015; Wallis, 2018). I will analyze these different proposals of political, economic, and social transformation and evaluate their projections of the future through Mische's (2009) Dimensions of Projectivity and Wright's (2013) strategies of social transformation. The narrative analysis of these proposals reveals which plans have a clear vision of the future that galvanizes policy actors of all stripes into action. I conclude that the Green New Deal is the transformation that must be adopted because it is the most comprehensive, specific, feasible plan with the most potential to overcome barriers to action.

Alyssa Kamara - *Investigation of Common Ownership in Medicaid Part D Plans*

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

Medicare Part D is type of government instituted health insurance plan which covers prescription drug costs. Part D is operated by private insurance companies who sell Part D plans to consumers who are able to choose from variations of the plan to match their coverage and cost needs. The private entities that distribute the plan vary between geographic service areas (typically organized by state); more insurers and plans per service should be to the benefit of the consumer as it allows for greater competition and lower prices. However, if many private insurance companies are owned by a select few companies, competition amongst these firms is compromised. This indicates that despite there being numerous companies per service area, competition may be limited because of the few owners dominating the private insurance market which distributes Part D plans. We employ market data to investigate the ownership of each insurance company that sells Medicare part D plans throughout every service region within the United States through recognizing all Part D distributers using public records from the Centers for Medicare & Medicaid Services. Through this state-by-state list, we identify the top 10 shareholders who have ownership in each company which demonstrates which companies ultimately dominate the market. Thus far, 16 companies have been found to be consistent across this dataset. The possibility and implications of the lack of competition caused by these companies must be further researched, but may be detrimental to Medicare consumers' options and subsequent policy implications.

Sherlyn Mercado - *Disaster Preparedness among Older Americans in the U.S., 2017: An Assessment of the Correlates of Vulnerability*

Faculty Advisor: Samantha Friedman, College of Arts and Sciences, Department of Sociology

Older Americans are vulnerable to the effects of natural disasters, experiencing higher rates of mortality and hospitalization than younger adults from these events. Research that examines disaster preparedness among older adults has primarily relied on data from 2010 and earlier, when billion-dollar disasters were less common than today. The main goal of this paper is to identify the correlates of the variation in the disaster preparedness of older adults. We use more recent data from the 2017 American Housing Survey, which are ideal because they include a topical module on disaster planning. Our results reveal that older adults vary in the nature of their preparation for natural disasters. While many have sufficient food, financial resources, and an evacuation vehicle, fewer older adults have emergency supply kits, generators, and flood insurance. Multivariate analyses reveal that householder age, race and ethnicity, poverty status, and region are important correlates of their preparedness.

Emma Mingot - *Healthy Habits During COVID-19*

Faculty Advisor: Michael Leczinsky, College of Emergency Preparedness, Homeland Security and Cybersecurity

I created 4 posters based on recommendations and efforts by the CDC during peak Covid times on how to prevent the spread. Each poster is based on a different significance and staple ideal that was shared directly from the CDC. Using art programs such as Clip Studio Paint, and a Wacom drawing tablet I was able to do research and create these posters. Since the standards are constantly changing it has become a research project on healthy habits and making an effort to make these posters apply to some other scenarios such as always wash your hands or cover your mouth when you cough. These posters are meant to make the public more self aware how these illnesses can spread from not only yourself but from others.

Amal Siddiqui - *The Asthma Severity Amongst School Age Children: No Access to Treatment and Live in Poor Environments*

Faculty Advisor: Julia Hastings, School of Public Health, Department of Health Policy, Management and Behavior

Asthma represents a health condition that affects nearly 10% of school-age children. It is one of the most common long-term diseases of children and is known as a health condition where it becomes difficult to breathe because the airways become are constricted and too inflamed to allow oxygen to pass normally. Asthma can typically be managed with rescue inhalers, but severe asthma is not as easy to live with as the mild cases because there are many medications and treatment plans that need to be constructed prescribed and adjusted to each individual. Individuals with a low socioeconomic status (SES) have a one-and-a-half-fold higher prevalence of asthma than those with a high socioeconomic status. Additionally, studies found that symptoms of asthma put adolescents' health and education at jeopardy, leading to absences from school, increasing the rate of dropouts, and involvement with the youth justice system. Because of its disproportionate incidence among particular racial and ethnic groups, asthma contributes to health and social inequities. The purpose of the study is to explore the problems that are present in the asthma care amongst adolescents in relation to educational impacts and environmental factors that surround them.

Stephany Solis and Ashley Duran - *Post-Pandemic Policymaking: A Comparison of Expert and Public Opinion on Health Care and Public Health Policy*

Faculty Advisor: Ashley Fox, Rockefeller College of Public Affairs and Policy, Department of Public Administration and Policy

The purpose of the project is to an online survey of health policy experts recruited from universities across the country concerning their opinions on: 1. Top health reform priorities for the US (e.g., Medicare for All, public option, All-Payer Rate Setting, Medicare negotiating drug prices); 2. The appropriateness of different policy responses to the COVID-19 pandemic (school closures, stay-at-home orders, vaccine mandates, travel restrictions, economic support, etc); 3. Their publication habits prior to and before the pandemic (e.g., whether they publish in open- access journals). The ultimate goal of the survey is to compare policy experts opinions on health policy options to the general public's views and to examine how strong the correspondence is as well to gain a better understanding of how much consensus there is on different policy options among experts. Additionally, the survey will provide an understanding of how academic policy experts are navigating the increasingly complex open-access trends that are occurring in academic publishing and whose views get elevated over others through their ability to pay to publish open access.

Erica Whitman - *Administrative Burdens of Transportation on those with Substance Use Disorder*

Faculty Advisor: Patricia Strach, Rockefeller College of Public Affairs and Policy, Department of Public Administration and Policy

The research project focuses on the opioid epidemic in New York State. Through the work done by K. Zuber, E. Perez-Chiques, and P. Strach, hundreds of individuals have been interviewed to learn about how local communities are responding to the problem. These individuals range from people suffering from substance use disorder (SUD), non-profit leaders, and government officials. Through papers produced by other researchers and the information provided by those interviewed, I will be working on a project applying research on administrative burdens to the case of transportation, focusing on the relation to SUD treatment, to evaluate what the literature explains well and what it fails to explain about the difficulties people with SUD face in accessing services.

Zhuoning Wu and Victoria M James - *The Relationship between City Governance and Smart City Projects*

Faculty Advisor(s): Luis Felipe Luna-Reyes, Rockefeller College of Public Affairs and Policy, Department of Public Administration and Policy, and Emmanuel S. Udoh, College of Emergency Preparedness, Homeland Security and Cybersecurity

Cities use a combination of institutional and organizational systems along with technological innovation to make cities “smarter” in facing current challenges of urban sprawl and sustainability. However, the Smart City projects conducted by cities drastically vary in terms of scope and size, from building infrastructure for data gathering in the areas of transportation, energy or the environment, to developing more efficient government services and even covering the aspect of increasing education level in the community. Is there a relationship between the cities’ governance structure such as regulations, strategic plan and partnerships, funding or form of government and which Smart City projects are implemented by cities? How does the governance structure affect the results of the implementation of different Smart City projects in different cities? Our team’s research focuses on the types of Smart City projects implemented by the two major cities of all fifty American States, along with each city’s governance and other contributing factors such as funding. Data comes from scraping city government web pages, the US Census Bureau, and other local news web outlets. This research intends to shine a light on the relationship between city governance and Smart City projects, and provide insight for academics as well as policymakers as cities continue to make themselves “smarter” in terms of efficiency, effectiveness, productivity, transparency, and sustainability.

Session 5 – Criminal Justice & Homeland Security on the National and World Stage

Mina Gul - *The Disappearance of Human Rights under Erdogan's Regime*

Faculty Advisor: William Pridemore, Rockefeller College of Public Affairs and Policy, School of Criminal Justice

After the failed coup attempt on July 15th, 2016 the Turkish Government began an appalling crackdown on hundreds of thousands of people. This paper will investigate this persecution and how the human rights have been slowly deteriorating under Erdogan's dictatorship regime. There were a total of 175 interviews conducted of those who have fallen victim to the devastating turn of events in Turkey. It has been found that nearly all of the victims have been persecuted in one or more of the following trends: loss of jobs, mobbing, loss of freedom of travel/movement, deprivation of health services (in the criminal justice system and in daily life), persecution (physical and psychological), extrajudicial executions. This paper hopes to shed light on the horrendous state terrorism taking place within Turkey and be a voice of those who are silently being oppressed.

Deirdre Occhino - *Red Teaming Election Interference*

Faculty Advisor(s): Gary Ackerman and Jenna LaTourette, College of Emergency Preparedness, Homeland Security and Cybersecurity

The complexity of threats of the 21st century requires an increase of education and research in security studies. Our adversaries seek to attack all aspects of society, so it is imperative to have a system to understand their intent, motivations, and strategies. Red Teaming encompasses a wide range of techniques to identify emerging threats that will then be tested through simulations, where the output is analyzed for improvements. One specific threat that plagues many assets in the U.S. through exploiting vulnerabilities is interference, disruption and spread of disinformation specifically in elections linked to states and extremist groups. The Center for Advanced Red Teaming is an interdisciplinary research center that seeks to advance the art and science of red teaming to be used among private and public sectors. Through open-source research and analysis, I have identified the general motives, intent, strategy and capabilities of adversaries to carry out attacks. The primary focus was general background on states and the far-right, narrowing in on past interference attempts. This approach has been critical in understanding the threat to democracy and future elections. CART's work adds to the literature and developments in the field of Red Teaming through their own sponsored Red Team exercises, as well as serving as clearinghouse for the field of Red Teaming.

Lauren Russell - *NYS Youth Justice Institute News Project*

Faculty Advisor(s): Megan Willows, Rockefeller College of Public Affairs and Policy, School of Criminal Justice, and Giza Lopes, NYS Youth Justice Institute

The New York State Youth Justice Institute is an initiative of the Division of Criminal Justice Services, Office of Children and Family Services, and University at Albany which builds and strengthens the capacity of localities around New York State to adopt evidence-informed youth justice practices. This is done by disseminating information, assisting with implementation and assessing efficacy in existing justice programs, and conducting cutting-edge research to advance the science and practices of evidence-based initiatives. The Youth Justice Institute is responsible for multiple ongoing projects including the News Project. The News Project serves as a source for youth justice information. The News Crew team uses a qualitative coding process to record information about articles, which pertain to youth justice, coming from a series of email alerts known as Google Alerts. Multiple processes are in place in order to improve and ensure reliability and consistency with the coding of the news articles. The News Project also functions as a source for other Youth Justice Institute projects, serves as the basis for the Youth Justice Institute Dashboard on the Institute's website, and future academic articles may utilize the news repository as a data source.

Morgan Thomas - *NYS Youth Justice Institute News Media Project Data Validation*

Faculty Advisor(s): Giza Lopes and Alysha Gagnon, College of Arts and Sciences, Department of Sociology

News media can be difficult and frustrating to sort through when working on any project. The Youth Justice Institute took this problem into their own hands in September of 2018 and created a database for those in academia to find and reference youth justice related news in a certain area, time, or topic. The team was able to put together an email that receives a series of news based on search terms (Google Alerts): Youth Justice, Youth Justice New York, Juvenile Justice Programs, Juvenile Justice Reform, and Juvenile Justice and Raise the Age, along with a codebook that includes __ tags (topics), such as Detention, Law and Politics, and Age of Criminal Responsibility. In March of 2019, the news crew noticed an influx of irrelevant articles, those coded as inaccessible, not youth justice related, or not new, leading to the creation of the Data Validation portion of the News Project. Data Validation allows us to analyze our methods and see which alerts are producing irrelevant articles, which tags are being used and how often, along with how many articles are being coded monthly. This project has since progressed into the production of a new series of google alerts to decrease the amount of irrelevant news articles, the division of tags to make it easier for our users to find the information they are looking for, the deletion of tags that are not used, and to see how many articles are being coded for our users monthly.

Session 6 – New Perspectives in Financial Analysis

Taylor Lovelace - *Did Small Businesses in Rural Counties in the United States Have Equal Access to the Paycheck Protection Program?*

Faculty Advisor: Na Dai, School of Business, Department of Finance

I investigate how the Paycheck Protection Program (PPP) loans were distributed to small businesses in the United States during the Covid-19 Pandemic, with a focus on the discrepancies in lending practices between rural and urban small businesses using the Small Business Administration PPP loan database. In both rounds of PPP loans, Rural small businesses received smaller disbursements than urban small businesses after controlling the size of payroll. However, rural small businesses received their loans more quickly than urban small businesses. This finding is consistent with the notion that rural small businesses rely on community banks for loans which has traditionally greater emphasis on relationship banking. The pre-existing relationship between rural businesses and community banks may have facilitated the PPP loan distribution among rural small businesses.

Emily Ordonez - *Kora: The Money App for College Students*

Faculty Advisor: Rich Anad, Internship Supervisor

Financial Literacy is one of the most important facets of life. As college students, our autonomy is growing as we transition into adulthood and financial liberty lies at our fingertips. Shockingly, we are the most unprepared group to handle our finances. Research has shown college students lack skills, knowledge, and confidence to handle finances. We are in such a critical time frame and becoming educated on this topic has never been more important. Kora is a mobile application designed for college students to gain financial knowledge. Kora facilitates budgeting to ensure we don't overspend. Auto Loans has never been easier to access, with competitive APRs. Most importantly, Kora is where college students can take the first steps into building a credit score, a very important tool to be used throughout life. Kora is a learning hub and place to track where your money is going, and see what your spending habits look like. It is our responsibility to embark the journey of becoming money smart and Kora has all the tools needed to start today.

Session 7 – Innovations in Atmospheric & Environmental Science

Maxim Couillard - *Observations and Analysis of the 7 October 2020 Derecho*

Faculty Advisor(s): Brian Tang and Ross Lazear, College of Arts and Sciences, Department of Atmospheric and Environmental Science

A serial derecho impacted Upstate New York and western Massachusetts on the afternoon of 7 October 2020, resulting in 120 damaging wind reports along a 515-km swath. The magnitude and extent of this event was unexpected and not well forecast, motivating a closer examination. This study seeks to better understand the conditions prior to and during the derecho to diagnose what led to such a damaging wind event. The synoptic forcing for this event was an upper-level jet with a broad, negatively tilted trough over the northeast U.S. and southeast Canada. The upper-level pattern provided forcing for a 990-hPa surface low in southern Quebec with a cold front draping southwest across New York. A mesoscale convective system (MCS) formed as the cold front progressed eastward along the Mohawk Valley. The pre-convective environment was characterized by high shear and low CAPE with < 500 Jkg-1 CAPE and > 35 ms-1 0–6-km shear. The local storm evolution was analyzed using New York State Mesonet surface observations along the Mohawk Valley, in the propagation direction of the derecho. These observations show that surface warming ahead of the cold front increased the temperature gradient and decreased stability immediately prior to the derecho passage. Future research will be done to assess model forecast error associated with this event.

Ethan Gerber and Sanchita Paul - *Impacts of COVID-19 Pandemic on Concentrations and Sources of Fine Particulate Matter in NYC Metro Area*

Faculty Advisor: Md. Aynul Bari, College of Engineering and Applied Sciences, Environmental and Sustainable Engineering

The overarching goal of this study is to investigate the overall magnitude of the impact of COVID-19 pandemic on particulate air pollution in the New York City (NYC) metropolitan area. In the United States, NYC metropolitan area was the hardest hit early in the 2020 COVID-19 outbreak. To date, no attempt has been made in the U.S. to understand impact of COVID-19 pandemic on chemical composition of PM2.5 and their resulting effects on O3 and secondary organic aerosol formation. The specific objectives are to: 1) determine the extent to which emissions and concentrations of PM2.5 and its components, changed during COVID-19 pandemic in relation to long-term trends over the past 10 years, 2) identify and quantify the impacts of changes in anthropogenic activities during COVID-19 pandemic to air quality in relation to long-term trends. The study will examine changes in in PM2.5 components over the last decade (2011–2020) for three time periods i.e., 1) pre-lockdown (January 1 – March 16), 2) lockdown (March 17 – May 31), and 3) reopening phase (June 1 – December 31). To identify and quantify changes in PM2.5 sources during COVID-19 pandemic, we applied positive matrix factorization (PMF) for 2011–2020 for urban and background areas in the NYC metro area including New. The changes in O3 and secondary organic aerosol formation during the COVID-19 pandemic were also investigated. Findings will improve our understanding of overall magnitude and impacts of COVID-19 pandemic on air quality, which is important for the broader scientific community and general public.

Sumar Hart - *A Lake Sediment Record of Hydro-climate in the Southeastern US*

Faculty Advisor: Aubrey Hillman, College of Arts and Sciences, Department of Atmospheric and Environmental Science

The overall purpose of this research project is to understand the driving forces of precipitation patterns over the US southeast in the past 5000 years. It is possible the climate oscillations are affected by climate modes such as the Pacific North American (PNA) pattern or the North Atlantic Oscillation (NAO). The hypothesis is that the PNA is responsible for alternating precipitation patterns in the southeast. If this is true, we will see opposing precipitation modes in Northern Georgia and Alabama compared to Southern Georgia and Alabama. In order to test this, we are using lake core sediment and looking at the ratio of carbon to nitrogen (C/N) overtime by collecting samples at various intervals. A high C/N ratio infers surrounding terrestrial plants were the main source of carbon to the lake and low C/N means the main source of carbon is likely aquatic plants. Because of this relationship, we are using C/N as an indirect proxy for precipitation since C/N depends on the amount and types of vegetation surrounding the lake. In this case a low C/N ratio could infer a high lake level and thus a period of increased precipitation, whereas a high C/N would mean a lower lake level and fewer aquatic plants. Our results thus far have shown that around 2000 years before present, there is a rapid decrease in C/N compared to the previous few thousand years. This suggests a shift to a time of higher lake level, increased precipitation, and wetter conditions in the region.

Session 8 – Innovations in Chemistry, Computer Science, & Physics

Habib Affinnih - *Improving Rural Emergency Preparedness and Response*

Faculty Advisor(s): Mariya Zheleva and Petko Bogdanov, College of Engineering and Applied Sciences, Department of Computer Science

Rural areas are more vulnerable to emergencies than their urban counterparts due to their geography and remoteness, low population density, and communication issues. A major hurdle that impedes reliable communication of emergency information is limited or non-existent broadband. This restricts emergency services' ability to share critical resources to prepare for and respond to emergencies. We are building an app that leverages WiFi-Direct, a technology readily available in consumer Android devices, and community interaction to disseminate emergency information within a community. We compile data from various emergency information agencies and deliver it to users who have broadband access. These users can in turn serve as beacons of information for isolated users who do not have broadband. By coming into proximity to other users, their phones can exchange information over WiFi-Direct without the use of an internet connection. This development will improve emergency response and preparedness (EPR) in rural communities and help slow the widening gap between rural and urban EPR services.

Joshua Cho - *Korean Syllable Recognition - OCR implementation via Deep Convolutional Neural Network*

Faculty Advisor: Ming-Ching Chang, College of Engineering and Applied Sciences, Department of Computer Science

In 1443, King Sejong the Great created Hangul, a Korean alphabet, so that the people in the lower classes would be able to read and write and establish a cultural identity. It is a phonetic alphabet, consisting of 17 consonants modeled after the shapes of vocal organs and 11 vowels that symbolize the sky, earth, and human. Because of this scientific structure, beauty, and today's cultural influence, the usage of Hangul has increased dramatically worldwide. In spite of this increased usage in the language, however, Hangul recognition remains largely unsolved as there exist 11,172 syllables to classify whereas there exist only 23 symbols for the Latin script. While open-source Optical Character Recognition (OCR) software engines such as Google Tesseract is certainly exemplary of the significant success in text recognition, the performance on the Korean symbols is still much inferior to the Latin script. Thus, I propose a new model based on a deep convolutional neural network, with which I was able to have a 99.80% test accuracy. This paper also compares different network designs to demonstrate the impact of network architecture on the accuracy rate. In addition, an open dataset called PHD08 was utilized to evaluate the performance of the proposed model on new types of image data to validate its practicality in real-world application and its accuracy is compared with that of Google Tesseract and EasyOCR.

Eric Haarer - *Near Infrared Single Photon Emission Microscopy*

Faculty Advisor: Spryos Gallis, SUNY Poly Colleges of Nanoscale Science & Engineering

Single-photon emitters (SPEs) associated with point-defects and ions in semiconductors are currently considered a significant resource for the solid-state implementation of photonic quantum information processing, quantum imaging, and quantum key distribution technologies. Specifically, non-classical single-photon light sources emitting in the near-infrared region of the electromagnetic spectrum around 1.5 μm, falling in the lowest loss wavelength range of fiber optics networks, are critical chip-scale building components for the development of fiber-based quantum networks. The realization of scalable on-chip quantum devices, such as single-photon sources and quantum memories, requires novel nanostructured materials that must be compatible and can be integrated with existing electronic circuits, waveguide architectures, and current chip-scale and silicon process technology. The precise placement of rare-earth ions into silicon-based wide-bandgap nanostructured materials with high integration functionality, such as silicon carbide (SiC) nanowires (NWs), can serve as critical building-blocks towards the implementation of such quantum devices. To this end, we introduce a modular interface to our micro-PL spectroscopy setup to enable automated and highly repeatable measurements, where the same positions along the NW sample can be probed across multiple trials. Benchmarking and optimization of the novel micro-PL module in conjunction with our state-of-the-art near-infrared single photon detector system were performed to enable the study of single-photon behavior from these Er:SiC NW nanophotonic structures at telecom wavelengths. This upgrade benefits current and future PL spectroscopic measurements for our samples.

George Homenides - *The Snowball Chamber Dark Matter Experiment*

Faculty Advisor(s): Matthew Szydagis and Cecilia Levy, College of Arts and Sciences, Department of Physics

Supercooled water is cooled below freezing while remaining a liquid. It has many, interdisciplinary applications. This is especially true since the discovery by Levy and Szydagis that particles, specifically neutrons, can trigger its phase transition. Today I will present the effects of water purity levels created by different filters, and immiscible hydrophobic oils as surface sealing fluids used to determine the ideal conditions for achieving minimum temperature and greatest stability. The lower the operating temperature, the lower the amount of energy a particle needs to deposit in order to trigger freezing. In the search for dark matter, a low energy threshold (sub-keV) is especially crucial, specifically at low masses (sub-GeV). We have thus far managed to suppress stochastic background nucleation long enough to allow for < -20°C for O(10) seconds in a test freezer, using very pure water. This presentation will explain how this was accomplished, and what the future of this work may hold.

Bailey Hoplight - *Optimization of Raman Protocol to Age Waterlogged Bones*

Faculty Advisor: Igor Lednev, College of Arts and Sciences, Department of Chemistry

In many fields of forensic science bias between scientists can lead to false convictions. The field of forensic anthropology is not immune to this. Current methods used for aging of bones, like the use of luminol or core temperature, are heavily influenced by environmental conditions and can be susceptible to bias. Raman Spectroscopy could provide a method to analyze the composition of bone that is fast and less influenced by the bias of the interpreter. The burial time of bones that have been buried in water is being investigated through the use of Raman spectroscopy. Scapula from pigs that have been buried for 250-4000 accumulated degree days will be analyzed by Raman Spectroscopy. The change in the chemical composition of the bones will be visualized using a Raman spectrometer with a 785nm excitation wavelength. The end goal of my project would be to create a model that would determine the age of bones while streamlining the process and minimizing bias.

Matthew Killeen - *Generation of Near-Infrared Genomic Silver Clusters via Attribute Regularized Variational Autoencoders*

Faculty Advisor: Petko Bogdanov, College of Engineering and Applied Sciences, Department of Computer Science

Keywords: nanomaterials design, DNA, variational autoencoders
Genomic silver clusters are nanoclusters of DNA and silver ions which fluoresce when exposed to ultraviolet light. These nanoclusters, when they fluoresce in the near infrared (near-IR) spectrum of 750-1400 nanometers, are extremely useful in life science applications. Different DNA sequences produce variations of these clusters; however, only a small fraction fluoresce within the near-IR spectrum. These near-IR fluorescing clusters also must fluoresce brightly and be chemically stable, further decreasing the number of viable clusters. This begs the question of whether there are certain attributes that determine the nature of these clusters, and whether these properties can be learned to synthesize new clusters. Genomic silver clusters, however, are small and complex, being tens of nanometers in size and composed of only a few hundred atoms; physical analysis is therefore impossible. Furthermore, the number of possible clusters is extremely large, increasing exponentially with the number of bases in the DNA sequence; this makes the analysis of all possible clusters impractical. To get around these problems, we have chosen to use a generative machine learning model that can create new DNA sequences with our desired properties. The proposed model is a new type of Variational Autoencoder, known as an Attribute Regularized Variational Autoencoder (ARVAE). The ARVAE encodes training data into a higher dimensional, latent space and decodes the samples taken from the data-generated normal distribution in the form of new DNA sequences with our desired properties.

Sandra Wiedmann - *Separation of Ferrocene-Based Molecules Using Metal Organic Frameworks (Mofs)*
Faculty Advisor: Jeremy Feldblyum, College of Arts and Sciences, Department of Chemistry

One of the most common ways to purify a compound is through column chromatography with silica gel. This method allows the separation of chemical compounds in a mixture based on their respective polarities. In certain cases, however, desired and undesired compounds can have near-identical polarities, making their separation by traditional column chromatographic methods particularly challenging. Metal-organic frameworks (MOFs) are porous coordination polymers in which metal ions or clusters coordinate to organic ligands in an alternating fashion. The coordination between metal and ligand leads to the formation of empty pores in the three-dimensional structure of the material. The properties of these pores (shape, size, and chemistry) depend on the choice of ligand and metal center. Due to their uniform pore size, MOFs have potential to effect size-based separations of molecules, as opposed to separations based on molecules' polarity. Our goal is to use MIL-53(Al), an aluminum-based MOF, to separate ferrocene-based molecules by size. MIL-53(Al), however, possesses polar hydroxy groups, which can complicate attempts at molecular separations based solely on size (and not on polarity). Functionalization of the external MOF surface can replace these polar groups with nonpolar hydrocarbon chains to limit the influence of polarity, and replacement of internal hydroxide groups with alkoxy species may enable purely size-based separations. Progress towards these aims will be discussed.

Session 9 – Advances in Biological Science, Biomedicine, & Cancer Research

Kharmin Hemraj - *A Second Isoform of the FRK Tyrosine Kinase in the Human Genome*

Faculty Advisor: Douglas Conklin, School of Public Health, Department of Biomedical Sciences

BTK-C is an alternate form of the normal Bruton's tyrosine kinase (BTK-A), a protein that has been found to be required for cancer cell survival. BTK-C is expressed at higher levels in tumorigenic breast cells than in normal breast cells, however the mechanisms of BTK-C have not been well characterized. Previous studies have shown association of the BTK-C isoform with the cell membrane, more so than those shown with the BTK-A. It is predicted that this association is attributed to palmitoylation of the amino-terminal extension specific to BTK-C. It is thought that the palmitoylation of BTK plays a significant role in its function. Palmitoylation is a post-translational modification where fatty acid chains are bonded to cysteine residues on proteins. This allows proteins, such as BTK, to be localized to the membrane, where they normally operate. We will examine other kinases in the human genome with gene structures similar to BTK for effects on breast cancer cells survival. We will also analyze the different effects on BTK-A and BTK-C on how it is localized in the membrane and its post-modification on cell survival.

Kavipriya Kovai Palanivel - *Potentially Cis-acting Super-Enhancer long non-coding RNAs as Biomarkers in Triple Negative Breast Cancer Progression*

Faculty Advisor: Jason Herschkowitz, School of Public Health, Department of Biomedical Sciences

Triple negative breast cancer (TNBC) is defined by the lack of estrogen receptors (ER), the lack of progesterone receptors (PR), and normal human epidermal growth factor 2 (HER2) protein levels, contributing to limited treatment options. Determining genes that regulate TNBC tumor progression may help develop novel therapeutic techniques. Many super-enhancer long non-coding RNAs (SE-lncRNAs) are differentially expressed in cancer cells. Cis-acting SE-lncRNAs often augment super-enhancer activity in controlling target gene expression. Therefore, we hypothesize cis-acting SE-lncRNAs may control the expression of neighboring genes with implications in TNBC progression. To determine candidate SE-lncRNAs with potential cis-acting mechanisms in influencing progression, differential gene expression analysis of 42 TNBC and 21 paired normal patient samples was performed. SE-lncRNAs with $|\log2 \text{ fold change}| \geq 2$ and adjusted p-values ≤ 0.05 were selected as significantly differentially expressed. Furthermore, the genomic regions of the SE-lncRNAs and of super-enhancers classified in breast cancer progression: from normal to atypical ductal hyperplasia (AT1), ductal carcinoma in situ (DCIS), and invasive ductal carcinoma (CA1) were intersected. Six SE-lncRNAs; RBMS3-AS3, AL121906.1, SLC2A1-AS1, AC126696.3, AC126696.1, and TFAP2A-AS1; were selected as the top candidate cis-acting SE-lncRNAs with neighboring genes that had implications in breast cancer. The neighboring protein-coding genes have roles in various canonical cancer pathways. These SE-lncRNAs may serve as biomarkers and potential therapeutic targets against TNBC progression. Here, we knockdown two SE-lncRNAs, SLC2A1-AS1 and TFAP2A-AS1, in CA1 cells and quantify the expression of SLC2A1 and TFAP2A, respectively.

Nikhita Kumar - *Quantification of Fibrosis in the Salivary Gland*

Faculty Advisor: Melinda Larsen, College of Arts and Sciences, Department of Biological Sciences

Fibrosis is characterized by the excessive buildup of extracellular matrix components (ECM) in tissues and organs in response to injury, chronic inflammation, and genetic alterations. Non obese diabetic mice (NOD) are a model for Sjogren's Syndrome. We hypothesize that NOD, which develop Sjogren's like disease, are suffering from hyposalivation due to fibrosis of the submandibular salivary glands (SMGs). To test this hypothesis 16-week-old mice were treated with either the fibrosis inhibitor Nintedanib (treatment) or vehicle (non-treatment) for 4 or 8 weeks. NOD background strain CD1, age-matched mice were used as a negative control. All animals were euthanized; the SMGs were then removed and cryopreserved. Histological, serial sections were created for characterization of the entire gland. Masson's Trichrome staining will be performed on cryopreserved sections of the left salivary gland of NOD mice and CD1 wild-type (WT) mice in order to determine where collagen is deposited. These will be compared with salivary glands of NOD mice treated with Nintendanib to determine whether there was a reduction in fibrosis. The aniline blue stain in Masson's Trichrome stains Collagen I and elastin fibrils blue (proteins typically elevated in fibrosis). These stained sections will be imaged using a brightfield channel. Then, the areas of collagen deposition will be quantified by measuring the amount of blue in the glands proportional to the area of the gland using the ImageJ software. The area of collagen deposition will be compared to determine if Nintendanib decreased ECM deposition in the salivary glands of NOD mice compared to controls.

Matt Long - *Effects of Lysine Acetyltransferases KAT 3A/3B Inhibition on Poliovirus Proliferation*

Faculty Advisor: Gabriele Fuchs, College of Arts and Sciences, Department of Biological Sciences

Post-translational modifications (PTMs) on ribosomal proteins are often necessary components of ribosomal protein biosynthesis, playing crucial roles in protein function. PTM pathways are known to be affected by cellular stressors, but the extent to which these stressors impact protein biosynthesis is mostly unknown. One PTM, acetylation, is known to be impacted by viral infection, however it is unknown whether it is a specific response to viral infection or if it is a general stress response. This project focused on lysine acetylation on ribosomal proteins in response to induced viral stress to determine if these stressors induce unique stress responses on any specific sites of ribosomal proteins. This was done through two different experiments. In the first experiment, HeLa cells were grown, lysed and were subsequently transfected with differing concentrations of A485 Histone Acetyltransferase (KAT) inhibitor or dimethyl sulfoxide (DMSO). Human poliovirus 1 Mahoney (Poliovirus) was then transfected into the cells, and after incubation the cultures were stained to determine the effect that the inhibitor had on viral replication by plaque assays. In the second experiment, HeLa cells were again grown and transfected with A485, but were also transfected with various transcriptional promoters before poliovirus transfection. The level of poliovirus translation in each treatment was measured by Luciferase assay. By shedding light on the specific ribosomal target site that produces viral stress response, as well as the effects of ribosomal protein post-translational modifications on viral translation, valuable tools and potential target sites for therapeutic treatment of viral infection can be gained.

Maha Mehmood - *Investigating the Effects of Pathological Mutations on the Notch Signaling Response In Vivo*

Faculty Advisor: ChangHwan Lee, College of Arts and Sciences, Department of Biological Sciences

Notch signaling is a highly conserved intercellular signaling pathway that is crucial in metazoan development. Dysregulation within the pathway can cause diseases, including cardiovascular disease and neurodegeneration. Major sources of this dysregulation includes genetic mutations in key Notch components and stressors such as hypoxia. Despite the extensive studies, the underlying molecular mechanisms by which these conditions cause diseases are largely elusive. The goal of this project is to investigate the pathological Notch mutations with single-molecule precision in an in vivo model, Caenorhabditis elegans. I will focus on its germline, where Notch signaling regulates germline stem cell (GSC) maintenance and promotes gonadal development. Importantly, the C. elegans germline recapitulates the human stem cell niche and provides a simple, tractable model to study it in vivo. My current research focuses on the sel-12 gene that is orthologous to the human presenilin gene, which cleaves the Notch receptor for transcriptional activation of the downstream target genes. Mutations in presenilin causes Alzheimer's disease or dilated cardiomyopathy. To understand the underlying mechanisms, I will first characterize two loss of function mutations in sel-12 using the single-molecule RNA in situ hybridization method, where the in vivo Notch signaling response can be visualized in the presence of pathological mutations using several complementary direct and indirect readouts. By combining single-molecule assays with computational methods and statistics, I will precisely detect and analyze the spatiotemporal patterns of the Notch response for both transcription and translation in an intact tissue. My results will have broad implications to new therapeutic approaches.

Sevinj Mursalova - *Specific Gene Misregulation DM1 Male and Female Patients*

Faculty Advisor: Andrew Berglund, College of Arts and Sciences, Department of Biological Sciences

Myotonic Dystrophy type 1 (DM1) is an autosomal dominant neuromuscular disease caused by unstable CTG trinucleotide repeat expansions in the noncoding region of the DMPK gene. It occurs in about 1 in 8,000 people worldwide and is characterized by myotonia (weak muscles) muscular dystrophy (muscle degeneration), cataracts, hypogonadism, frontal balding, and heartbeat irregularities. Muscleblind (MBNL) regulates alternative splicing by affecting splice site selection and myotonic dystrophy occurs when MBNL does not properly function. In myotonic dystrophy, MBNL is mislocalized by sequesteration to the expanded CUG repeats. Generally, as the CUG repeats become longer the more severe the disease becomes. I will be performing analysis on previously published RNA-seq data to determine if there are unique differences between males and females in DM1. I will then dose small molecules on patient derived cell lines to analyze if those unique changes between males and females who have DM1 are rescued by the small molecules.

Kevin Thomas - *Using the Centrifuge Force Microscope as a Single-Molecule Technique for Studying Base-Stacking Interactions*

Faculty Advisor: Ken Halvorsen, The RNA Institute

A wide range of single-molecule techniques has streamlined the process of applying and studying the effects of force on individual molecules. The Centrifuge Force Microscope (CFM) is one such technique that allows for high-throughput DNA pulling experiments. It is relatively inexpensive and user-friendly, making it a suitable tool to study the effects of force on various biomolecular interactions. A benchtop centrifuge can be used to apply centrifugal force to molecular constructs that are tethered between a glass slide and a microsphere. Molecular events like bond dissociation result in the removal of the microsphere from the surface, which is observed by video microscopy inside the centrifuge. In this project, we used the CFM in a constant force mode to quantify the energetics of nucleotide base-stacking interactions in short DNA duplexes. The interactions were quantified by measuring force-induced off-rates of DNA constructs with or without an interfacial base-stack. We observed differences in the off-rates between the constructs containing additional base-stacks relative to those without and this difference was used with the Arrhenius equation to calculate the energy contribution of the additional base-stack. A global trend was identified, with purine-purine base-stacks being the most stable, then purine-pyrimidine base-stacks, and finally, pyrimidine-pyrimidine base-stacks being the least stable. This data will be useful in improving molecular modeling and in designing more stable DNA nanostructures. Similar experimental designs can be used to study other biomolecular interactions like receptor-ligand binding or enzyme activity assays. Moreover, this spotlights the capabilities of the CFM as a versatile single-molecule technique.

Bryant Vazquez-Castillo - *Investigating Transcriptional Dynamics of Notch Stem Cell Regulation in Caenorhabditis Elegans*

Faculty Advisor: ChangHwan Lee, College of Arts and Sciences, Department of Biological Sciences

Transcription is a dynamic process that is a fundamental step of gene regulation. Although this ‘bursty’ transcription has been seen in various systems, little is known how its dynamics is regulated in vivo, due to the lack of proper model systems. My research goal is to analyze transcriptional dynamics in vivo and investigate its underlying mechanisms. To do so, I will use the Caenorhabditis elegans germline, where Notch signaling maintains a pool of germline stem cells (GSCs). Notch is a broadly conserved signaling pathway that is crucial to animal development. It activates transcription in a ‘bursty’ manner for GSC maintenance in C. elegans, which provides us a unique in vivo model to study transcriptional dynamics. To assess the Notch-induced transcriptional dynamics, I construct a C. elegans strain harboring the PP7 system, which allows me to assess transcription of a Notch target, lst-1 in real time in the living animal. The system requires two transgenes: one expressing the PP7 stem loops with the lst-1 gene; and the other expressing PCP-GFP to visualize individual lst-1 transcripts. After generating and validating the transgenic worms, I record the PCP-GFP signal in the living animal to analyze the lst-1 transcriptional dynamics in real time. In addition, I examine the dynamics of the stem cell niche, a single mesenchymal cell providing Notch signaling, to understand how the critical extrinsic factor regulates Notch-induced transcriptional dynamics. My results will broaden our understanding of in vivo transcriptional dynamics and how Notch regulates the dynamics for animal development.

Session 10 – Engineering Design Challenge

Thomas Birkholz, Ayman Salaheldin, and Brian Sorrentino - *Atomian Tensiometer*

Faculty Advisor: Jonathan Muckell, College of Engineering and Applied Sciences, Department of Electrical and Computer Engineering

Reliable equipment is crucial factor for Research and testing new products and ensure they meet the required standards. To ensure this in our project we aimed to maximize accuracy and precision while improving the user's experience when using the project to collect data. This will be done though improving unreliable component such as the distance sensor with better options and developing a fail-safe mechanic to protect the components . Another important goal is limiting the human interaction with the software, to make it easier for users run the program and acquire the needed data. In addition to fixing existing problems as the difficulty of setting up the Martial and stretching it. Through the implementation of a crank system and changing the clamps, instead of relaying on automated machines, to easier the usage of the system while also minimizing the possible human error. When combining the new implemented systems, the user should have easier time running the process and eliminating the need for long training section and long documentations on how to install and set up.

Mazin Chater, Jaden Pharoah, and Youssef Jalwaj Soubai - *Improved Tensile Tester*

Faculty Advisor: Jonathan Muckell, College of Engineering and Applied Sciences, Department of Electrical and Computer Engineering

A uni-axial tensile tester is a widely used system for gathering ultimate tensile strength and Young's Modulus of a given material. Generally, these systems can be expensive and sophisticated yet their value as an educational tool for chemistry students is significant. As such, a cheaper, student-friendly design is highly desirable. Provided a minimally functional base model with issues ranging from largely inaccurate and imprecise results, obscure functionality, and generally an unpleasant and non-intuitive user interface, a targeted solution must aim to re-envision and harmonize the old structure into a more refined prototype. What follows is an advanced design that rectifies a number of defects as well as markedly improves accuracy and reliability. Additional ease-of-use features are implemented with an emphasis towards student use. The new capabilities deliver a low-budget, discernibly innovative solution with supporting documentation that sum to provide an accessible educational tool for students.

Omar Elmejjati, Brianna Lossow, and Alex Karampelas - *Point break*

Faculty Advisor: Jonathan Muckell, College of Engineering and Applied Sciences, Department of Electrical and Computer Engineering

The existing tensiometer design has much potential for improvement. The clamps require constant disassembly and reassembly and the maximum force the system can handle is quite small. These flaws are detrimental to the current system, as with the current design only materials with a small ultimate tensile strength will be able to be examined using the tensile tester. Replacing the current load cell with one designed to withstand more force, as well as stronger mounting hardware and a stronger rope will allow for the examination of materials with a higher tensile strength. The combination of better and more streamlined hardware should allow for better accuracy. Additionally, many improvements can be made in favor of the user experience as well as ease of use. Adding a pulley to the system allows for a smoother experience, as well as a more uniform application of force a more uniformed application should also allow for results to be more accurate as the force will be constant throughout the results. Overall, the improvements will allow for a more convenient user experience as well as improved range of functionality for the system's operation.

Gavin Haar, Zhen Xu, and Liuhuan Zhang - *Improvement of Arduino-based Uniaxial Tensile*

Faculty Advisor: Jonathan Muckell, College of Engineering and Applied Sciences, Department of Electrical and Computer Engineering

The paper "Fabrication of an Economical Arduino-based Uniaxial Tensile Tester" by Julien H. Arriza- balaga,† Aaron D. Simmons,‡ and Matthias U. Nollert et al. details how the team designed and constructed a tensiometer, which is a machine which measures the tensile strength of various materials, at a reduced cost compared to a professional model. Their model worked well, especially considering their low budget of only 100 dollars. However, their model has many shortcomings. The largest issue of this design is the method of which force is applied to the material. The largest issue of this design is the method of which force is applied to the material.

Kihyun Lee, Farid Barak, Alex Reyes, and Nour El banna - *Automatic Uniaxial Tensiometer: Test your limit*

Faculty Advisor: Jonathan Muckell, College of Engineering and Applied Sciences, Department of Electrical and Computer Engineering

The purpose of this design proposal is to improve the existing tensiometer design. The current system is functional but does not meet the set requirements. The main problem with the system is its accuracy. The sensors and the method which data is collected produces results with considerable amounts of error. The largest requirements set for the system are accuracy and precision, therefore the results from the tensiometer must be close to known results for tested materials which the current system does not produce reliably. This problem with the current system can be improved by upgrading the current load and distance sensors. Other ways to improve the accuracy and precision of the system is to improve the software used to interface with the sensors and to collect the data. With an improved and simplified method to use the collected data, the results from the system fall closer to the expected results. Improvements in the sensors and the way that they interface with the system as well as addressing a few physical design flaws that make the tensiometer more difficult to use such as the method that the material being tested is held in place, improves and solves problems with the system that fail to meet the requirements.

Derren Lyons and Bailey McElhinney - *Tensiometer Design*

Faculty Advisor: Jonathan Muckell, College of Engineering and Applied Sciences, Department of Electrical and Computer Engineering

In its current state, the tensile tester is flawed but it can be improved to become a reliable piece of lab equipment. The highest priority during a lab is to get reliable data, which is what will be highlighted in our improvements. Currently, there is a large uncertainty in the accuracy of our sensor readings. The rope has give which will impact force measurements; and the distance sensor has a large standard deviation when measuring the distance at a single point. Over the course of a trial, this leads to a large uncertainty percentage that greatly impacts the stress-strain curve for a material. Some quality of life improvements are required too for easier accessibility across a range of individuals (typical case is a classroom lab setting). An example of such an improvement is in the jumbled data output stream when conducting a trial. Currently it is a polling mess of numbers in an output window. Condensing the data stream to a simpler output will greatly improve user experience. Bridging these gaps in our design will lead to an improved system that can be relied upon for experimentation purposes.

Max Manier, Abdullah Qureshi, and Jan Karl Galia - *Student Accessible Tensiometer*

Faculty Advisor: Jonathan Muckell, College of Engineering and Applied Sciences, Department of Electrical and Computer Engineering

The existing design for the tensiometer from the Journal of Chemical Education is accessible but has some design flaws. Among the problems with the current tensiometer design are accuracy of the range sensor, friction between the track, weight limit of the load cell, elasticity of the cable for pulling, human error when pulling, and non-uniform force application. The problems described above need to be addressed because they add errors to the measurements, making it difficult to calculate Young's Modulus and Ultimate Tensile Strength accurately. The fixes for these problems include: Replacing the current range sensor with a laser optical range sensor for relatively accurate measurements of strain. Replacing the current load cell with a 20-kilogram load cell allows greater force application when stressing materials with large Young's Modulus. Replacing the current pulling track with a linear bearing track reduces measurement errors caused by resistance. Replacing current cable with non elastic metal cable reduces errors in measurements caused by rope elasticity. Adding a ratchet crank in order to apply force uniformly. Lastly, adding a LCD screen to prompt the users with basic instructions improves ease of use. These solutions will allow for the stress and strain to be measured with greater accuracy and consistency.

Mariela Monterroso, Elijah Lallemand, Kaleb Bogardus, and Kareem Abdeltawab - *Tensile Tester*

Faculty Advisor: Johnathan Muckell, College of Engineering and Applied Sciences, Department of Electrical and Computer Engineering

Creating a device that will measure the stretch strength of a material.

Jebadiah Parillo, Alexander Rotariu, Hiroaki Nakahara, and Alistair Talabic - *Improvement of an Existing Soft Material Tensile Tester*

Faculty Advisor: Jonathan Muckell, College of Engineering and Applied Sciences, Department of Electrical and Computer Engineering

The group was given a tensiometer from UAlbany's chemistry department that was functional but needed improvements. Several issues were identified with the current tensiometer device. The chemistry department at UAlbany requested a machine that was accurate and easy to use. In order to meet their requirements, new hardware such as a vertically mounted load sensor and a motorized pulley system. Ideas were introduced to improve the accuracy and speed of the collected data. The new software will also be introduced to help manage the new hardware system.

Jason Wong, Logan Mead, and Ug Brilinkevicius - *Improved Tensile Strength Tester*

Faculty Advisor: Jonathan Muckell, College of Engineering and Applied Sciences, Department of Electrical and Computer Engineering

Our solution to improve the system consists of adding an LCD screen which will display instructions and data to the user. In addition, since the distance from the sensor is calculated through the speed of sound in the air which is affected by temperature and humidity, we will implement a temperature / humidity sensor. This will increase accuracy as it will give us the current temperature and humidity so we can use that to better calibrate our distance sensor readings. In addition, we can prevent the system from breaking with warnings such as green led when the user has not exceeded 75 percent of maximum load and red led and buzzer sound to go off to alert the user to stop pulling. Lastly, we will upgrade some of the components throughout the system including the pulley system, rope, clamps and overall stability of the physical.

Ethan Wrobel, Maria Peregrina, and Maduabuchi Okolo - *Improvement of Ultimate Tensile Strength*

Faculty Advisor: Jonathan Muckell, College of Engineering and Applied Sciences, Department of Electrical and Computer Engineering

Based upon the original design of the tensiometer, issues were encountered that inhibited the process to calculate a stress-strain curve. Therefore, by replacing the clamps and adding a winch, the system would improve drastically. The original clamps that were given lowered the amount of time you can measure force in a given amount of time, due to how long it takes to actually put the material within said clamps. Thus, 3-D printed clamps that make the process of measuring the material easier. Same thing can be said about the original pulley system. Originally someone would have to pull on the rope manually to allow force to be measured and to stretch the material, but this leads to inaccuracy due to many factors like pulling the rope too fast. So, by adding a winch to the design, it allows us to stretch the material with a rope at a more constant speed that can be replicated. Once, these improvements are made, the next step would be to find the median of the load and distance data. This will be done by improving the program that is used to help compute the stress-strain curve.

Session 11 – Advances in Neuroscience: Disease, Disorders, and Behavioral Assessments

Saad Ahmad and Hasan Medhi - *Dendritic Spine Morphology Changes Following Stereotaxic Injections of AB42-AAV*

Faculty Advisor: Annalisa Scimemi, College of Arts and Sciences, Department of Biological Sciences

Alzheimer's disease (AD) is a progressive neurodegenerative disease that affects over 4.5 million people in the United States. Age is the greatest risk factor for developing AD and with a globally aging population, understanding more about the disease is imperative. The causes of Alzheimer's disease are the formation of beta amyloid plaques and the accumulation of hyperphosphorylated tau proteins. We are looking to specifically explore the effects of the Amyloid β1-42 (Aβ1-42) protein. Aβ1-42 is known to cause the formation of amyloid plaques in the brain, which are known to have detrimental synaptic effects. Buildup of Aβ1-42 also negatively affects glutamate clearance in the hippocampus. Dendritic spines are small protrusions that change their morphology in response to synaptic plasticity. The main function of spines is to communicate with neighboring neurons through excitatory synapses. Here, we explore changes in spine morphology in AD by using a stereotaxic adeno-associated virus (AAV) approach to model Aβ1-42 accumulation. We analyze spine morphology by reconstructing the biocytin-filled neurons imaged with confocal microscopy.

Teja Buddhavarapu - *Light Level Intensity Alters Anxiety, but Not Memory, During Open-Field and Novel Object Location Tasks in Male Rats*

Faculty Advisor: Ewan McNay, College of Arts and Sciences, Department of Psychology

Appropriate design and control of testing conditions during assessment of animal behavior is critical to maximize generalizability, replicability, and translational relevance. Some sensory stimuli are often controlled: for instance, during rodent behavioral testing, efforts are commonly made to reduce or eliminate olfactory and auditory distractions. However, less attention is paid to the ambient light level intensity (lux), which may vary even between rooms in the same facility. Modification compares anxiety-like behaviors, exploration, and spatial memory performance in 7-month-old, male, Sprague-Dawley rats under conditions of either the standard bright illumination of the testing room (approx. 618 lux, n=9) or dim light (approx. 10 lux, n=10). During the open-field and novel object location tasks (OFT and NOL), rats in the bright light condition froze more often and spent more time frozen than rats in the dim condition; in addition, during OFT, bright condition rats spent more time in the corners of the apparatus. No differences were detected in overall mobility or total time spent in the center of the OFT, and no differences in object preference or mobility were detected in NOL. Testing under dim-light conditions reduces the expression of anxiety-like behaviors compared to bright-light conditions. We conclude that bright illumination during behavioral assessment increases freezing behaviors and may therefore bias results subsequent interpretation. To control for the potentially confounding effect of bright light, behavioral assays should be performed under dim-light conditions.

Olivia Buyea - *Demonstrating that Insulin-like Growth Factor 2 Enhances Glucose Uptake in Primary Hippocampal Neurons via the IGF2 Receptor*

Faculty Advisor: Ewan McNay, College of Arts and Sciences, Department of Psychology

Alzheimer's disease (AD) currently affects 20 million people. This figure is expected to reach nearly 50 million by 2050. Neuronal hypometabolism, which may result from insulin resistance, is a prominent cause of Alzheimer's pathology and contributes to disease progression and the accompanying cognitive deficits. Insulin-like growth factor 2, a growth factor homologous to insulin that binds at insulin and IGF2 receptors concentrated in the hippocampus, has produced cognitive benefits and enhanced learning when administered into the brains of rodents. Because brain IGF2 levels decrease significantly with age, it is a potential contributor to the onset of AD in aged patients. We seek to conduct a series of experiments to determine the effect of IGF2 on glucose uptake in hippocampal neurons isolated from rat pups and grown in vitro. Hippocampal neurons grown in vitro will be divided into fourteen treatment groups to determine the effects of IGF2 at three doses on glucose uptake alone and in combination with insulin. Additionally, treatments with Leu-27-IGF2, a synthetic IGF2 analog that binds exclusively at the IGF2 receptor, will determine which receptor allows IGF2 to effectively stimulate glucose uptake. Previous studies have demonstrated the benefits of IGF2 on cognition and as a potential therapeutic target for neurodegenerative diseases, but the mechanism by which IGF2 produces these benefits is unknown. Past studies from our lab suggest that IGF2 may produce these benefits by stimulating glucose uptake in hippocampal neurons. We hypothesize that IGF2 stimulates neuronal glucose uptake in a dose-dependent manner,via the IGF2 receptor.

Corey Nilon - *Do Neuronal Glutamate Transporters Alter Social Interactions?*

Faculty Advisor: Annalisa Scimemi, College of Arts and Sciences, Department of Biological Sciences

Obsessive-compulsive disorder (OCD) is a chronic, commonly occurring neuropsychiatric disorder that features uncontrollable, intrusive thoughts (obsessions) and/or behaviors (compulsions). Genomic studies identify Slc1a1, which encodes neuronal glutamate transporter EAAC1, as a genetic risk factor for OCD. Here, we plan to identify behavioral features of EAAC1-/- mice and investigate the neural circuitry that contributes to OCD in mice. Our experimental group is composed of EAAC1-/- mice, and our control group is composed of C57BL/6J mice. Elevated anxiety, increased impulsivity, impaired social interaction, and altered grooming behaviors are some behavioral phenotypes consistent in neuropsychiatric disorders like OCD. Here, we plan to use a python-based software called ezTrack to construct a trajectory analysis of the movement of mice, aged 2-3 months, in a confined environment over a series of 10-minute behavioral sessions. To do this, we will divide our sample into two groups: one group of mice that test singly, and one group of mice that test in pairs. Using two groups permits us to better identify and distinguish the social behaviors that may or may not occur in the presence of another mouse. Following, two-dimensional Gaussian distributions will be used to determine the specific locations of the behavioral chamber that mice spend most of their time in. By utilizing our transgenic OCD mouse model, we can effectively analyze the behavioral features of EAAC1-/- mice and enhance our understanding of the mechanisms that contribute to hyperactivity in neural networks and control OCD in humans.

Joseph Reitano - *Cerebral Open Flow Microperfusion vs. Microdialysis: An In Vitro Analysis Of Technique Efficacy in Measuring Insulin*

Faculty Advisor: Starlette Douglass & Ewan McNay, College of Arts and Sciences, Department of Psychology

Microdialysis is a sampling technique used to measure metabolites, neurotransmitters, and other low-weight substrates found in the brain. Microdialysis works by diffusing a perfusate across the inserted probe's dialysis membrane, allowing the concentration gradient of various solutes to create a dialysate that accurately reflects neuronal concentrations of analytes in the interstitial fluid. The probe's semipermeable membrane provides a protective covering for the surrounding tissue; however, the membrane's pores can become clogged with substrates if they aggregate with each other. Additionally, microdialysis cannulas cause sometimes severe trauma and scarring to affected areas and can be easily damaged upon insertion and removal during testing. Cerebral open flow microperfusion (cOFM) is an alternative to microdialysis that allows free flowing solute exchange, without a molecular cutoff, that utilizes a push-pull method. Moreover, cOFM could be used to combat issues presented by microdialysis, by having a thinner, more flexible membrane in addition to a healing dummy to protect the tissue from scarring. However, the use of a push-pull method could cause more damage to the surrounding tissue, especially without a protective membrane. Exploring the accuracy of these claims and other potential drawbacks in an in vitro model is valuable prior to in vivo experimentation due to possible unknown equipment and testing confounds. In the following experiment, we measured the efficacy of two microdialysis probes and a cOFM probe in measuring insulin and glucose, two extremely important substrates in learning and memory.

Enya Sullivan, Gregory FitzGerald, and Maddie Ascioti - *Does Phosphorylation of the Insulin-Like Growth Factor Receptor (IGF2R) Correlate with IGF2 Binding Activity in Rat Brain Tissue?*

Faculty Advisor: Ewan McNay, College of Arts and Sciences, Department of Psychology

Insulin-like growth factor-2 (IGF2) is a neurotrophic protein that is being investigated as a novel therapeutic agent for treating Alzheimer's disease. Brain IGF2 declines in Alzheimer's disease, and exogenous IGF2 improves neurocognitive function in animal models of Alzheimer's disease. However, assessing the efficacy of IGF2 as a therapeutic agent is made challenging by the fact that one of its major receptors, the IGF2 receptor (IGF2R), has no known conformational changes that could serve as the basis for an immunological assay of IGF2 activity. Instead, it is thought that the mechanism by which IGF2 transduces its intracellular effects is by first binding and then internalizing plasma membrane-bound IGF2R. Unfortunately, there is no convenient assay for measuring these internalization dynamics; an immunoreactive detection method would be desirable. Interestingly, there are two serine residues on the intracellular tail of IGF2R that are reported to be phosphorylated upon binding IGF2 (and other ligands). Based on prior work demonstrating that (1) these serine residues are phosphorylated when IGF2R is internalized, and (2) IGF2 binding stimulates IGF2R internalization, it is plausible that IGF2R phosphorylation correlates with increased IGF2 binding. Here, we validate two antibodies that are reported to specifically bind at the pSer-2409 and pSer-2484 residues of IGF2R, demonstrating colocalization and appropriate subcellular localization for each phosphorylated form in immunohistochemistry of rat brain tissue. Next, we present our ongoing efforts to validate these antibodies for the western blotting detection method, as well as a proposed follow-up experiment to validate this technique in vivo.

Niitiggya Taneja - *Formation of Idiopathic Alzheimer's Model Using AAV Viral Vector*

Faculty Advisor: Annalisa Scimemi, College of Arts and Sciences, Department of Biological Sciences

Amyloid-beta 42 accumulation in limbic structures is one of the major pathophysiological markers of Alzheimer's disease. Alzheimer's exists in two main forms: familial and idiopathic. While AD affects nearly 4.5 million people in the United States, current models to study this neurodegenerative disease only account for the familial variant even though more than 90% of AD patients have the idiopathic form of the condition. Our project aims at using an AAV virus that causes an overproduction of Aβ bilaterally in the mouse hippocampus by limiting the uptake capacity of glutamate in astrocytes in the hippocampus. Mice that were injected with the virus showed a reduced NMDA/AMPA ratio in pyramidal neurons. This leads to the notion that Aβ overproduction causes glutamate uptake in astrocytes and NMDA/AMPA receptors. By developing this model using AAV-A-β 42 virus, we aim to create a more comprehensive model to study AD in all versatile manners.

Angelina Tassone - *Cerebral Open Flow Microperfusion vs. Microdialysis: Sampling Insulin in the Brain's Extracellular Space*

Faculty Advisor: Ewan McNay, College of Arts and Sciences, Department of Psychology

Sampling the brain's extracellular space is invasive, which risks damaging tissue and producing confounding results. Microdialysis (MD) has been shown to cause neuronal loss and gliosis surrounding the cannulation site. Alternatively, cerebral open flow microperfusion (cOFM), uses a thinner probe and an open-sided cannulae. Studies have suggested that cOFM may reduce gliosis, tissue damage, and better preserve blood-brain-barrier integrity during sampling. The absence of a dialysis membrane in cOFM may also increase recovery of some molecules: one is insulin, which is (i) large compared to traditional MD analytes and (ii) potentially trapped by adhesion to the membrane. Insulin is an important target: it regulates hippocampal metabolism and cognition, and loss of hippocampal insulin signaling is key in Alzheimer's Disease. We hypothesized that cOFM would decrease tissue damage and improve recovery of insulin during hippocampal sampling. 15-week-old Sprague Dawley rats were dual-cannulated with MD and cOFM cannulae, one per hippocampus, counter-balanced across animals. Female rats underwent estrous staging while males underwent a control procedure. After recovery, probes were inserted and samples were taken, after which rats were euthanized and perfused with paraformaldehyde and harvested. Slices were analyzed for transmembrane protein 119 (TMEM-119) to label microglia, cluster of differentiation 68 (CD68) to label phagocytotic microglia, glial fibrillary acidic protein (GFAP) to label astrocytes, and NeuroTrace to label Nissl bodies in neurons. Slices were visually inspected for signs of hemorrhaging and tissue damage at the probe sites. Extracellular insulin was analyzed via ELISA, and extracellular glucose was analyzed via glucose oxidase assay.

Jaci Yong - *Glutamate Transporter Control of Reward-Seeking Behaviors*

Faculty Advisor: Annalisa Scimemi, College of Arts and Sciences, Department of Biological Sciences

The striatum is a brain region that controls reward-seeking behaviors. It receives glutamatergic inputs from the cortex/thalamus. The time course of glutamate clearance from these afferents is controlled by transporters expressed in neuronal and non-neuronal cells. EAAC1 is a neuronal glutamate transporter expressed post-synaptically in striatal neurons. What remains unknown is how EAAC1 shapes the functional properties of these cells and reward-seeking. Does EAAC1 control impulsivity (latency) or compulsivity (repeated execution)? In our previous work, mice received a water reward after pressing a lever once. Here, EAAC1-/- mice received fewer rewards than age-matched WT mice. However, EAAC1-/- mice collected more rewards when the reward was delivered after eight lever presses. This was associated with reduced latency between consecutive lever press trains, with no change in the time window over which the lever presses were performed. This points to a potential role for EAAC1 in reducing impulsivity. If this were true, we would expect WT and EAAC1-/- mice to collect a similar number of rewards if a warning sign (e.g., a tone) preceded the onset of a rewarding period during which multiple lever presses lead to a water reward. We would expect the latency to the first lever press to remain shorter in EAAC1-/- mice. This is the experiment we plan to do, using WT and EAAC1-/- mice of either sex (2-3 months old). Determining impulsivity versus compulsivity would provide a foundation for future research on the effects of EAAC1 in striatum-dependent control of action selection during reward-based behaviors.

Session 12 – Advances in Psychology: Clinical, Industrial, & Cognitive Science

Sadena Ahmad - *The Moderating Role of Adaptive Coping Strategies on the Link Between Internalizing Symptoms and Empath*

Faculty Advisor: Elana Gordis, College of Arts and Sciences, Department of Psychology

Empathy encompasses one's trait and state abilities to take the perspective of others. Globally, the COVID-19 pandemic has adversely impacted individuals, contributing to increased internalizing symptoms that may impede the ability to exhibit empathy. Adaptive coping strategies may be able to buffer the negative effects of internalizing symptoms. The present study examines the moderating effects of adaptive coping strategies used during the COVID-19 pandemic on the relationship between internalizing symptoms and empathy in 211 emerging adults (M age=19.26 years; 55% female; 41.2% White, 29.4% Black or African American, 16.1% Hispanic or Latino, 10% Asian, 2.4% Mixed/Biracial, .9% Other). Participants self-reported their empathy (Empathy Quotient), current adaptive coping strategies (i.e., exercise, socialization with friends and families, journaling, listening to music, or engaging in religious activities), and internalizing symptoms (Depression, Anxiety, Stress Scale). We conducted a simple moderation analysis and controlled for gender. Results revealed that adaptive coping strategies significantly moderated the relationship between internalizing symptoms and empathy, such that participants who endorsed more adaptive coping strategies were more likely to have a decrease in empathy with increased internalizing symptoms ($b=-.13$, $t(206)=-2.1$, $p<.05$). Our study provides insight into how adaptive coping strategies interact with internalizing symptoms to influence empathy levels. Further research on the relationship between internalizing symptoms and adaptive coping strategies may clarify factors that predict empathy to enhance prevention and intervention strategies.

Rachel Dolowich - *Emotional Intelligence, Trauma Response, and Neuroplasticity of the Amygdala*

Faculty Advisor: James Stellar, College of Arts and Sciences, Department of Psychology

We have learned that a possible direct neural connection between the frontal cortex and the amygdala that relates to Emotional Intelligence and the treatment of PTSD. We now want to extend this thinking to trauma, and we have assessed Emotional Intelligence to be a potential primary factor in mediating the healing process of a patient who presents with both internal and external PTSD symptoms. A possible component that I will investigate lies in stress and resulting neuroplasticity within the amygdala, particularly as it occurs after the traumatic events take place. Since the amygdala is responsible for stress regulation and involved with fear and anxiety, this area will be the primary focus of our attention. It is important to determine the changes that occur in PTSD to potentially revise the way we treat patients. We will use past studies in humans (fMRI) and animals to look at possible neural changes. We will look at the kind of behavioral testing that has been done to assess stress, and the changes in the regulation of stress in the amygdala/frontal-cortex function. This research could be used to help diagnose and treat future patients perhaps with brain scanners, as we will have a better understanding of the cognitive function that is present in patients presenting with onset or previously diagnosed Post Traumatic Stress Disorder. To the Stellar laboratory, it is an important parallel to their other work on experiential education where again there is a discussion of cognitive-emotional integration.

Michael Gatti - *Exploring Perceptions to Alcohol Use Disorder (AUD) and Binge-Eating Disorder (BED), Using Vignette Analysis*

Faculty Advisor: Julia Hormes, College of Arts and Sciences, Department of Psychology

In general, stigma is defined by marks of shame or discredit; when stigma is used in reference to mental illness, it represents a multifaceted construct involving stereotypical and prejudicial processes (Corrigan & Wassel, 2008; Overton & Medina, 2008). Given the transdiagnostic factors of impulsivity and deficits in self-regulatory control that are implicated AUD and BED (Minhas, et al, 2021), one may assume similar levels of stigma for BED, but this has yet to be examined. The aim is to compare perceptions of AUD with BED in order to assess the role of stigma in these disorders. Participants (n=402 undergraduates, 58.7% female) were randomly shown one of two vignettes that were identically the same, except for the behavior expressed (binge eating versus drinking). After the participants seen one of the two vignettes, the participants rated them on twenty-one characteristics (e.g. likeable, weak, lazy) while also adding their perception as each suffering from the addictive disorder brought up (AUD or BED). BED is implicitly associated with weight status as demonstrated by the significantly higher ratings of "overweight," "obese" and lower ratings of "thin" than the AUD target. Interestingly, the BED target was rated significantly higher on "active" and "strong," suggesting an association with more positive physical traits despite perceived links of binge eating with overweight/obesity.

Kellie Gavin - *Emotion Regulation and Racial Trauma Symptom Severity*

Faculty Advisor: James Boswell, College of Arts and Sciences, Department of Psychology

With a slavery-ridden history and contemporary race-related issues such as discrimination and police brutality against Black Americans, racism is nothing new in the United States. As such, recent literature has focused on the higher incidence of posttraumatic stress disorder (PTSD) among Black populations (Holliday et al., 2021). Experiences of racial discrimination, prejudice, oppression, and violence, referred to as racial trauma, are associated with higher levels of PTSD symptoms (Pieterse et al., 2010). Moreover, the relationship between racial trauma and PTSD symptoms extends to vicarious racial trauma exposure via viewing media coverage of police brutality (Tynes et al., 2019). While use of problematic emotion regulation strategies such as avoidance, expressive suppression, and rumination is a well-established contributor to PTSD symptom severity (Chesney & Gordon, 2016; Pugach et al., 2019), little is known about the association between emotion regulation and racial trauma symptoms. Thus, the present research seeks to investigate the relationship between problematic emotion regulation (i.e., expressive suppression) and racial trauma-related symptoms among Black Americans. The present study will use a sample of 175 Black Americans who will be asked to complete self-report measures of their exposure to anti-Black violence in the media, racial trauma-related symptoms, and emotion regulation strategy use. Due to the relationship between PTSD and emotion regulation strategies, the hypothesis for this research is that Black Americans who habitually engage in expressive suppression will experience racial trauma symptoms as a result of exposure to anti-Black violence in the media.

Helena Horvat - *Confessed Personal Use of Psychedelics and Their Cultural Congruence: Impact on Perceptions of Researcher Integrity and Quality of Research*

Faculty Advisor: Mitch Earleywine, College of Arts and Sciences, Department of Psychology

There is promising research supporting the health benefits of taking psychedelics, but there are still many negative stereotypes about them. We will replicate Forstmann and Sagioglou's 2020 study in "How psychedelic researchers' self-admitted substance use and their association with psychedelic culture affect people's perceptions of their scientific integrity and the quality of their research". The goal of their research was to see how a psychedelic researcher's self-admitted use of psychedelics affected participants views of their integrity and quality of research. We will sample 300 MTurk participants and use a survey asking them to rate a fictitious researcher named Prof. Sanchez on his integrity and quality of research. Our study will examine ratings in which he does or does not take psychedelics himself and ratings in which he takes LSD (a synthetic psychedelic) or Ayahuasca (a psychoactive brew). The name Sanchez is congruent with the South American culture in which Ayahuasca is popular. South American countries are known for holding rituals in which the tea is consumed under controlled circumstances and guided meditations. We predict lower ratings for the conditions in which Sanchez takes psychedelics himself and lower ratings for when he takes LSD. This research will bring us closer to understanding the stereotypes surrounding psychedelic research and plant medicine. Examining the image of psychedelics in research brings us closer to making psychedelic assisted psychotherapy an accepted and respected part of mental health treatment.

Julie Jasewicz - *Building Resilience*

Faculty Advisor: Jason Randall, College of Arts and Sciences, Department of Psychology

Amongst those most negatively impacted by the COVID-19 pandemic and other harmful events we find many examples of individuals who are able to "bounce back" from their adversities more easily than others. This reflects the concept of resilience—the process of positively adapting and evolving during and after experiencing adversity thereby becoming less vulnerable to future adversity. Due to a need to build resilience among college students, and without clear guidance as to how to do that, the present study investigated the effects of a resilience intervention. 232 college student participants were assigned to either an experimental group, who received the resilience training immediately after entering the study, or a waitlist control group, who received the resilience training after four weeks of entering the study. I assessed levels of psychological resilience, empathy, psychological well-being, university satisfaction, and social support at three different time points to evaluate the change in these outcomes as the result of the resilience intervention. Findings support the idea that resilience can indeed be taught, and that doing so not only increases resilience, but its byproducts as well—empathy, psychological well-being, university satisfaction, and social support. I discuss the limitations and implications of these findings for the scientific study of resilience, but also for their potential contributions in equipping individuals with the skills they need to adapt and evolve from their current challenges to become less vulnerable in the future.

Seanessa Lee, Chioma Ofodile, Kathryn Richardson - *Picture This! The Impact of the Survival Processing Effect on Image Recognition and Recall*

Faculty Advisor: Jeanette Altarriba, College of Arts and Sciences, Department of Psychology

The survival processing effect (SPE) has been found to occur when people experience a memory advantage (better recall) for items that are processed within a survival context over items that are processed in other encoding conditions, such as relevance to moving or an item's pleasantness (how pleasant an image is to you). The specific mechanisms involved in the SPE seem to be unclear; however, it is proposed to have an evolutionary basis in which better memory developed to assist encoding information which promotes reproductive fitness (Nairne et al., 2007). Researchers also hypothesized that encoding images instead of words may increase ecological validity for the survival processing effect. To study the applicability of the SPE to recognition tasks and test whether the memory improvement transfers from stimuli encoded as images to the retrieval of word labels for those images, participants imagined they were in a survival or moving scenario and rated images for their relatedness to these scenarios, or rated items for their pleasantness. After completing an intervening task, participants then unexpectedly recalled images using word labels, identified word labels that corresponded with previously rated images, or identified the images themselves. Results are discussed with respect to current explanations of the SPE.

Asalah Obaid - *Grammatical Gender: An Analysis of Two Competing Theories*

Faculty Advisor: Jeanette Altarriba, College of Arts and Sciences, Department of Psychology

A grammatical gender system is a way to classify nouns as either masculine or feminine. It is used in the majority of languages including Arabic, French, Italian and Spanish while absent in other languages like English and Chinese. It has been widely accepted that one's first language (L1) plays a significant role on processing in one's second language (L2) (Ringbom, 1987; White, 1985). The question of interest becomes if a grammatical gender system is not present in L1 how would it affect gender assignment proficiency in L2, if L2 has a grammatical gender system and vice versa? The Full Transfer/Full Access hypothesis has stated L2 learners have the potential to transfer grammatical features from L1 in their L2 learning and the Failed Functional Features hypothesis suggested it is near impossible to transfer any grammatical features from L1 to L2 if L1 does not have a grammatical gender system (Hawkins & Chan, 1997; Schwartz & Sprouse, 1994, 1996). The aim of this literature review was to compare the Full Transfer/Full Access hypothesis and Failed Functional Features hypothesis. The resulting table indicates the Full Transfer/Full Access hypothesis has been supported more broadly than the Failed Functional Features hypothesis.

Joseph Pasquariello - *Perceptions of Antidepressant Withdrawal*

Faculty Advisor: Mitch Earleywine, College of Arts and Sciences, Department of Psychology

Though research regarding antidepressant withdrawal has increased in the last decade, this area is still underrepresented when one considers its potential harmful effects on individuals with depression. This study's aim to assess the general public's knowledge on antidepressant withdrawal and perceptions on discontinuation reactions more generally, an area of antidepressant research that have seen few empirical studies. To assess these variables, a novel questionnaire will be designed on Qualtrics and circulated using UAlbany's SONA System and Amazon Mturk, with a target of 250 valid responses for each. We predict that our sample will exhibit relatively low knowledge of antidepressant withdrawal including under-estimated prevalence of occurrence, severity of symptoms, and length of symptoms. A key research question in this project is whether participants who have taken antidepressants differ in their knowledge and perceptions when compared to those who have not, though we currently have no specific predictions relating the differences with these two groups. Findings from this research could be used to provide evidence to support the need for focused education on antidepressant withdrawal effects among the general population. Additionally, this research can be used to advise policy makers, inform medical professionals on their interactions with patients, and spark further research on antidepressant withdrawal.

Azeeza Saafir - *Adverse Childhood Events and Their Relationship with Mental Health and Risk-Taking Behaviors in Undergraduate Students*

Faculty Advisor: Kimberly Colvin, School of Education, Educational Psychology and Methodology

Both positive and negative events that people experience in their lives leave an impact. Negative events, in particular, have implications for a person's health and overall well-being later on life. In this study, I examined the relationship between adverse childhood events (ACEs) and the mental health of college students, as well as risk-taking behaviors among college students. According to the CDC, adverse childhood events, which can be experienced by people from any background, are positively associated with negative health outcomes. Research has found that people with ACEs are more likely to show signs of anxiety, depression, and worse mental health, as well as take part in dangerous behaviors like substance abuse and risky sexual practices. I asked two research questions, (a) how are adverse events in childhood related to mental health in adulthood? and (b) how are adverse childhood events related to risk-taking behaviors in college? I hypothesized that students who experience more ACEs have both worse mental health and engage in more risky behaviors than students with less or no ACEs. I did a correlational design and surveyed 55 undergraduate students on areas of ACE, mental health (depression, anxiety, and stress) as well as risky behaviors. The results of my study did not support either of my hypotheses possibly due to several reasons such as small sample size and not having a random sample.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