Promoting Interdisciplinary Conversations

2026 Western Research Day Schedule

Schedule for May 8th:

10:00- 11:00 – Opening Remarks and Keynote Address

11:00-12:30 – Poster Session

12:00 – 1:00 – Light Refreshments/ Lunch

1:30 -2:00 – Closing Remarks and Provost Award

Contents:

2026 Keynote

Dr. Becca Stearns from the Korey Stringer Institute

Dr. Rebecca Stearns will present a keynote that traces her career at the intersection of research, medical care, and policy advocacy in sports safety. Drawing on her career at the Korey Stringer Institute (KSI), Dr. Stearns will highlight her current research on exertional heat stroke (EHS) trends, particularly in football and road race populations. She will share insights from over 454 documented EHS survivals at the Falmouth Road Race, emphasizing treatment protocols and survival success. The presentation will also feature findings from her recent publication analyzing 40 years of EHS data in the high school setting, which documents over 67 athlete deaths and underscores the urgent need for improved prevention and response strategies. Additionally, Dr. Stearns will showcase the transformative work of the TUFSS (Team Up For Sports Safety) initiative, which has reached 48 states to date and successfully influenced the adoption of over 463 state-level policies aimed at improving outcomes for catastrophic sport injuries in the past seven years. This keynote will offer a powerful narrative of evidence-based advocacy and its real-world impact on athlete safety.

Student Participants

Poster number	Name	Department
1	Aaqil Ajwan Ahamed	Chemistry & Biochemistry
2	Brandon Albuquerque	Biology
3	Ismael Arenas	Chemistry & Biochemistry
4	Nora Benson-Beckman	Anthropology/Sociology
5	Parker Brown	Meteorology
6	Jessica Cano	Economics
7	Victoria Caplan	Chemistry
8	David Ciskowski	EdD in Instructional Leadership
9	Nicole F. Cote	EdD in Instructional Leadership
10	Reagan Doolan	English
11	Milo Duch	Biology
12	Landon Fitzgerald	Biology
13	Kate Jackson	Political Science
14	Daniel Joseph	Professor Lumbantobing
15	Anne Joyce	EdD in Instructional Leadership
16	Nikita Karim	M.S. Artificial Intelligence
17	Jahmaro Gordon	Computer Science
18	Matthew K. Kelly	EdD in Instructional Leadership
19	James Kielkucki	Psychology
20	Cameron Kurasz	Meteorology
21	Antonia Madison	EdD in Instructional Leadership
22	Christian Majeste	Economics
23	Hannah McCabe	Biology
24	Ritvika Misra	Finance
25	Minhee Mok	JLA
26	Grace Morin	Biology
27	Emelie Myhill	English department
28	Matt Naczi	Biology
29	Razi Naouali	Economics
30	Katelynn A. Oviatt	EdD in Instructional Leadership
31	Alexa Perrefort	EdD in Instructional Leadership
32	Gustavo Alexander Pimentel Castellanos	History
33	Tanner Poissant	Chemistry
34	Adam Psenicnik	Applied &; Computational Mathematics
35	Yadira Reinoso	Psychology
36	Kimberly Rodriguez	World Languages and Composition
37	John P. Ryan	EdD in Instructional Leadership
38	Abe Sari	Economics
39	Samantha Schlierf	Biology
40	Alton Spencer	Biology
41	Ryan Stillman	Biology

Faculty Participants

Katherine Allocco	History
Galina Bakhtiarova	World Languages and Composition
Daniel Baluha	Chemistry
Shahab Band	Computer Science
Daniel Berta	Finance
Erica Bower	Meteorology
Stavros Christofi	Mathematics
Dorothy Christopher	Biology
Brian Clements	Honors program
Joshua Cordeira	Biology
Marcia Delcourt	Education
Michaela Flippin	JLA
Nicholas Grecco	Chemistry
Noreen Grice	Astronomy
Heather Levy	English
Rotua Lumbantobing	Economics
Mary Murphy	M.S. Addiction Studies
Judith Prieto	Chemistry & Biochemistry
Hannah Reynolds	Biology
Carlos Santibanez-Lopez	Biology
Faline Schneiderman	Social Sciences
Xiaodi Wang	Computer Science

Student Abstracts

1	**Structural Identification of Amino Acid Mutations in the Plasmodium falciparum DHFR Quadruple Mutant and Comparative Analysis with Trypanosoma brucei DHFR** ***Aaqil Ajwan Ahamed*** **Advisor:** *Judith Prieto, Chemistry & Biochemistry* Drug resistance in *Plasmodium falciparum* is largely driven by mutations in the dihydrofolate reductase (pfDHFR) gene, which reduce the effectiveness of antifolate drugs such as pyrimethamine and cycloguanil. This study examines the structural and functional impact of the pfDHFR quadruple mutant (N51I, C59R, S108N, I164L). These mutations occur within or near the active site, altering inhibitor binding while preserving enzyme function. The S108N mutation introduces steric hindrance that directly reduces drug binding, while N51I and C59R reshape and stabilizes the active site. The I164L mutation contributes through some conformational changes and stability. Comparative analysis with wild type DHFR from *Trypanosoma brucei* shows similar active site features, including a similar bulky residue at position 108. These similarities help explain its intrinsic antifolate resistance and provide us valuable information for designing more effective next generation drugs. URL for poster: **Click here**
2	**Decoding Diversity… COI Identification Using Oxford Nanopore Sequencing** ***Brandon Albuquerque*** with: Justin Sarrazin, Erick Gonzalez **Advisor:** *Carlos Santibanez-Lopez, Biology* Biodiversity of species has steadily declined due to factors such as climate change, habitat loss, and pollution. In order to understand this loss of biodiversity, genetic sequencing techniques such as DNA extraction, PCR amplification, and genomic data analysis were used to sequence nine chelicerate samples. Next-generation sequencing tools, such as Oxford Nanopore MinION, can deliver sequences effectively at a lower cost and are capable of improving on species identification in areas where morphology cannot. We used MinION to sequence nine chelicerate samples to compare and identify species using the DNA COI barcode. Since biodiversity is declining rapidly, this study is important for understanding which chelicerate species are most vulnerable to threats and allows for methods of conservation to be constructed to preserve biodiversity. URL for poster: **Click here**

3	**Expression and Purification of pLG72** ***Ismael Arenas*** **Advisor:** *Helena Prieto, Biochemistry/ Chemistry* This study builds on research identifying biomarkers associated with schizophrenia (SCZ), including elevated G72 mRNA and pLG72 protein levels in patient blood and brain (Loredano Pollegion et al., 2018). pLG72 is hypothesized to regulate D-amino acid oxidase (DAAO), an enzyme that modulates D-serine levels and NMDA receptor signaling. However, conflicting reports suggest pLG72 may either activate or destabilize DAAO. A major limitation in understanding pLG72 is the lack of structural data due to challenges in protein expression and solubility. To address this, a plasmid containing the pLG72 gene will be transformed into E. coli C41 cells, which are optimized for expressing poorly soluble proteins. Following induction, cells will be lysed and fractionated to determine whether pLG72 is present in soluble or insoluble fractions. Successful expression and detection of pLG72 will support future structural studies and help clarify its role in NMDA receptor dysregulation in SCZ. URL for poster: **Click here**
4	**Danbury's Lost Patriots** ***Nora Benson-Beckman*** with: Sydney Hansen (Anthropology/Sociology), Elijah Crehan (Anthropology/Sociology) **Advisor:** *Faline Schneiderman, Social Sciences* Danbury Connecticut's role in the Revolutionary war is often overlooked, was our town and its people important to the victory of the patriots? The answer is yes. Extensive documentary research as part of a NHPA Section106 Phase 1 report has revealed that town legends are not just legends, but rich with patriot history. Land records, historic maps and aerials, written accounts, and deeds were all researched to determine if and where Danbury's rumored Continental Army hospital and burial ground existed, and what it meant for the Revolution. Our research has chronicled the establishment, uses, and scandals of the hospital, as well as set the stage for further research on the patients at the hospital, those who lived and those who died. The suspected burials of soldiers and civilians treated here would be protected through further archaeological research that would reveal vital information about how patients were injured, treated, and died. URL for poster: **Click here**

5	**Investigation of the Relationship between Upper Tropospheric Specific Humidity Anomalies and Integrated Vapor Transport in the Northern Pacific Ocean** ***Parker Brown*** **Advisor:** *Erica Bower, Meteorology* Although atmospheric rivers (ARs) are a subject of extensive research, forecasting challenges remain due to a lack of observational data over the North Pacific Ocean, where ARs evolve rapidly and unpredictably. The current variable used to diagnose the intensity of ARs is integrated vapor transport (IVT). However, the calculation to evaluate IVT is complex and requires various precise observations done at many pressure levels in order to obtain an accurate result. Upper tropospheric specific humidity (UTH) is a simpler, easier variable to obtain. UTH is often overlooked when analyzing ARs, though. This study investigates the relationship between 300mb specific humidity anomalies and IVT magnitude in the North Pacific Ocean from 2016-2017. Results find that UTH anomalies can precede an increase of IVT magnitude by up to 24 hours. Correlation between UTH anomalies and IVT magnitude increases northward and westward and in fall and winter. URL for poster: **Click here**
6	**State Role Differences: South Korea vs. Denmark** ***Jessica Cano*** with: Jacob Pedicini **Advisor:** *Rotua Lumbantobing, Economics* Denmark's state plays a major role in its economy by providing strong welfare programs and investing in public services like education and healthcare. In contrast, South Korea state involvement has historically focused more on industrial innovation, guiding private firms and key industries rather than providing extensive welfare distribution. URL for poster: **Click here**

7	**Identification of Textiles with Infrared Spectroscopy** ***Victoria Caplan*** **Advisor:** *Daniel Baluha, Chemistry* The textile industry is one of the largest manufacturing industries in the world. Throughout the different stages of production, the listed fiber content may become inaccurate, and by the time it reaches the consumer, the label could be entirely false. Infrared Spectroscopy (IR) is a non-destructive technique that can be used for the identification of the fibers within a textile. In this project, IR spectra from over 300 unique textile samples were collected. These spectra were then analyzed by three multivariate analysis techniques (i.e., Principal Component Analysis (PCA), Principal Coordinate Analysis (PCoA), and Non-metric Multidimensional Scaling (NMDS)). The ability of these analysis techniques to accurately compare textile composition was qualitatively evaluated. Based on expected fiber content, PCoA provided the most reasonable clustering of each sample. Spectral reproducibility was shown to be very good for pure textiles, but poor for blended textiles, which was likely due to sample inhomogeneity. URL for poster: **Click here**
8	**Predictors of Agendy Thinking in First-Generation and Continuing-Generation College Undergraduates** ***David Ciskowski*** with: Marcia A. B. Delcourt, Marsha Daria, Jeanette Moore **Advisor:** *Marcia Delcourt, EdD in Instructional Leadership, Department of Education* The purpose of the study was to gain insight into the self-perceptions and perspectives of hopefulness of first-generation and continuing-generation college undergraduates by surveying students at a northeastern university. The theoretical foundation of hope theory is based on creating goals (agency thinking) and having steps to achieve those goals (pathways thinking). For this correlational study, data were collected during the Spring 2025 semester. The sample included survey results from those in their first through final year of college. The instruments included a student demographic questionnaire, a survey about hopefulness that reflects perceptions of agency and pathways thinking as well as an academic self-perceptions survey with five subscales. Using a multiple linear regression procedure, the set of variables including motivation/self-regulation, pathways thinking, attitudes toward teachers, and self-reported GPA were statistically significant predictors of agency thinking. Student status, first-generation and continuing-generation college undergraduates, was not a significant predictor of agency. URL for poster: **Click here**

9	**The Impact of Using Strengths-Based Instructional Strategies on Teachers' Knowledge About and Self-Efficacy for Engaging Students at the Secondary School Level** ***Nicole F. Cote*** with: Marcia A. B. Delcourt, Annmarie Spatola, Stephanie Wozniak **Advisor:** *Marcia Delcourt, EdD in Instructional Leadership, Department of Education* Strengths-based ideals are rooted in positive psychology. In this study, secondary school teachers were provided with a 6-week professional learning sequence to increase their use of strengths-based classroom strategies which have been shown to promote student engagement. Using a mixed methods approach, the researcher implemented a quasi-experimental design to compare outcomes over time and between 46 educators in either a treatment or comparison group. Responses to a self-efficacy survey and a quantitatively coded scenario were used to examine differences in teachers' use of instructional strategies, classroom management techniques, student engagement, and strengths-based classroom practices. Qualitative data were collected through semi-structured interviews with teachers from the treatment group to determine how they applied their newly acquired skills. Initial results indicated that teachers from the treatment group significantly improved in their knowledge about and confidence in using strengths-based classroom practices. Findings from this study will be used to direct future professional development. URL for poster: **Click here**
10	**"Sans Teeth, Sans Eyes, Sans Taste, Sans Everything": The Performance of Identity in Katie Kitamura's Audition** ***Reagan Doolan*** **Advisor:** *Heather Levy, English* In a performance, exposition is not often explicitly stated to an audience. Relationships, motivations, and overall context must be inferred through the cues of an actor that understands their inherent responsibility to convey information. Using William Shakespeare's "All the world's a stage" monologue from As You Like It—viewing life as a performance that relies on the past to contextualize the present—the narrator in Katie Kitamura's Audition appears to exist as both actor and audience, simultaneously experiencing and perpetrating the plot in her performance of life. Aging has caused her to lack concrete memories, resulting in the inability to understand her role in interpersonal relationships without the context of previous interactions. This work argues that in acting as both an observer of and a character within her story, Audition's narrator's misunderstanding of the past leads to a conflicting perception of the present and demonstrates that memories exist as the crux of human identity. URL for poster: **Click here**

11	**The Progressive Digging task: a naturalistic assay of effort-based food motivation in male mice** ***Milo Duch*** with: Karla Mendez Vasquez, Jacob Calle, Mohammad Elawa, Jacob Lee, Wilmer Montero, Christa Piccorelli, Jo-Elle Rodriguez, Sherry Zhumi **Advisor:** *Joshua Cordeira, Biology* The progressive ratio (PR) task is a widely used measure of effort-based food motivation, but it relies on operant conditioning rather than natural behaviors. We developed a progressive digging (PD) task that leverages the natural foraging behavior of mice to assess food motivation. In the PD task, mice retrieve a buried food reward by digging through progressively deeper layers of bedding, with total bedding displaced serving as a measure of effort. We validated the PD task by testing the same male C57BL/6N mice under fed and fasted conditions in both the PD and PR tasks. Baseline effort was stable and showed a moderate, non-significant correlation between tasks. Fasting significantly increased effort in both tasks, with a larger effect in the PD task. These findings indicate that the PD task is a reliable and more sensitive tool for measuring effort-based food motivation, providing a naturalistic complement to traditional operant tasks. URL for poster: **Click here**
12	**Not my Mitogenome: Using the MinION to Sequence Arachnid Mitogenomes** ***Landon Fitzgerald*** with: Natalie Ali, Jazlynn Trimandilis **Advisor:** *Carlos Santibanez-Lopez, Biology* Biological diversity is a crucial part of life on Earth. Human society and natural evolution of the planet has caused a major loss of diversity. Our project begins with conservation of the diversity as we know it. An importand part of this conservation is knowing a species' genome sequence. There are very few species with fully sequenced genomes because of the cost of the sequencing. We aimed to sequence the mitogenomes of nine arachnids using the MinION. The MinION allows researchers to bring the lab with them in the field which eliminates many of costly and timely parts of sequencing full genomes, a major step in conservation. URL for poster: **Click here**

13	**Humanity and Artificial Intelligence Through Film** ***Kate Jackson*** **Advisor:** *Brian Clements, Honors program* Within the encompassing field of A.I. technology, a growing number of people and institutions are focused on creating A.I. systems equipped with intelligence, emotion, and consciousness. Creating human-like Artificial Intelligence (A.I.), may just be the world's most ambitious goal to date. Yet, with such rapid development, it is hard to pinpoint how human beings truly feel about A.I. advancements and the many looming, hypothetical challenges that accompany it. An analysis of A.I. "creationist" themed film is one way of deciphering human opinion on the subject. By watching and analyzing 14-28 A.I. "creationist" movies, released between 1980 and 2023, inferences can be made on how human beings really feel about the prospect of human-like Artificial Intelligence. These films express our greatest hopes and fears in the digital age – but also – what it means to be human. URL for poster: **Click here**
14	**Comparative Analysis of Poland vs. Japan** ***Daniel Joseph*** with: Drew Colesworthy **Advisor:** *Rotua Lumbantobing, Economics* This project analyzes Poland and Japan through the framework of coordinated and transitioning market economies. It compares how each country's institutions shape productivity, growth, and inequality in different ways. Poland's economy has been influenced by market reforms, EU integration, and state policy, while Japan's economy has been shaped by long-term coordination among firms, banks, labor, and the government. This project will use macroeconomic and sectoral data to identify key drivers of value creation in both countries, highlighting the winners and losers, and explaining differences in their economic outcomes. URL for poster: **Click here**

15	**Voices in Gifted Education: Parent and Student Perspectives of a Pull-Out Gifted Program** ***Anne Joyce*** with: Marcia A. B. Delcourt, Laura Main, Holly Kincaid **Advisor:** *Marcia Delcourt, EdD in Instructional Leadership, Department of Education* This qualitative case study was used to explore how gifted secondary school students and their parents perceived the affective competencies embedded in the curriculum of a pull-out gifted program. Although part-time enrichment models purport to address the social-emotional needs of high-ability learners, there is limited research about how students internalize these skills and transfer them to general education classrooms and broader social contexts. Participants included 25 students in grades 6–11 and their parents. A thematic analysis approach was used to examine the data from a series of semi-structured individual interviews with the participants. Findings revealed seven themes highlighting essential program components that promote both intrapersonal and interpersonal competencies, such as leadership, self-awareness, self-advocacy, and goal setting. The results of this study provide insight into the affective impact of pull-out gifted programming and offer recommendations for educators seeking to improve the effectiveness of their programs. URL for poster: **Click here**
16	**Agentic AI Framework for Histopathological Breast Cancer Detection Using Wavelet Multi-View Learning and Spatial Transcriptomics** ***Nikita Karim*** **Advisor:** *Xiaodi Wang, Computer Science* Breast cancer diagnosis using histopathological images is challenging due to the complexity of tissue structures and tumor heterogeneity. This research proposes an agentic AI framework that integrates wavelet-based multi-view learning for improved cancer detection. Histopathology images are decomposed using wavelet transforms to generate multiple frequency-based representations that capture both cellular details and broader tissue patterns. Each representation is analyzed using deep learning models to identify malignant regions. An autonomous AI agent evaluates model performance across these views and selects the most informative features to improve classification accuracy. The framework also incorporates spatial transcriptomic data to connect molecular information with visual tissue features, providing additional biological context for diagnosis. By combining multi-resolution image analysis with agentic decision-making, this approach aims to support pathologists with more reliable and interpretable breast cancer detection. URL for poster: **Click here**

17

Probabilistic Optimization of Stochastic Emergency Medication Systems Using Machine Learning and Queueing Theory

Jahmaro Gordon
with: Nikita Karim

Advisor: *Xiaodi;*
Shahab Band Wang, Computer Science

Timely delivery of emergency medications depends on efficiently managing stochastic patient demand and limited healthcare resources. These systems can be modeled as queueing processes with random arrivals and service times. In this work, we formulate the emergency medication system as a stochastic optimization problem built on queueing theory and statistical machine learning. Let patient arrivals follow a Poisson process with rate λ , and service times be exponentially distributed with rate μ, yielding an M/ M/1 or M/M/ c queue. The system state evolves according to a continuous-time Markov chain, and steady-state probabilities are derived to characterize system congestion. We define an optimization objective to minimize expected wait time and system cost: $min\ E[W(\theta) + \alpha C(\theta)]$ where $W(\theta)$ represents expected waiting time derived from queueing metrics, $C(\theta)$ denotes resource allocation cost, and θ encodes decision variables such as staffing levels and service rates. Queueing performance measures are computed using: $Wq = \lambda / \mu(\mu - \lambda)\ for\ \lambda < \mu$. Machine learning models are incorporated to estimate stochastic parameters λ and μ from historical data, enabling adaptive optimization under non-stationary demand. The system dynamics are further represented in matrix form using transition rate matrices of Markov chains, allowing linear algebraic analysis of steady-state behavior and system stability. This integrated framework combines probabilistic modeling, queueing theory, and machine learning to solve a stochastic optimization problem that dynamically improves emergency medication delivery. Results demonstrate reduced wait times and improved system efficiency compared to static parameter models, highlighting the effectiveness of data-driven stochastic optimization in healthcare operations.

URL for poster:
Click here

18	**The Implementation of a Boys' Ice Hockey Program From the Coaches' Perspective** ***Matthew K. Kelly*** with: Marcia A. B. Delcourt, Kelly Holtz, Kaitlyn Kakadeles Messina **Advisor:** *Marcia Delcourt, EdD in Instructional Leadership, Department of Education* Amateur athletics are ingrained in American society. Boys' ice hockey remains one of the more unique athletic offerings. For example, the recruitment pathways for players, formation of teams, membership in organizations outside of high school, access to facilities, and ranking systems of teams represent some of the nuances impacting the sport. The Burke-Litwin change model was used to understand the complexity of factors affecting the implementation of an Interscholastic Athletic Conference (IAC) for boys' ice hockey in a northeastern state. Using a mixed methods model, data received from boys' ice hockey head coaches was gathered regarding their experiences within an IAC. The results indicated that participation costs and future pathways in the sport of ice hockey are external issues that need to be addressed. Additionally, internal factors, such as rules and regulations impact the sport at the high school level. URL for poster: **Click here**
19	**Predicting WCSU Planetarium Attendance: The Accuracy of Pre-Registration and Actual Attendance** ***James Kielkucki*** with: Alton Spencer **Advisor:** *Noreen Grice, Astronomy* At the Western Connecticut State University Planetarium, astronomy education extends beyond traditional coursework to include planetarium programming as a means of community outreach. After a multi-year closure, the university astronomy instructor and the WCSU Astronomy Club revitalized the facility in 2025 by hosting nine monthly planetarium shows designed to foster local engagement. As part of this revitalization, we implemented a pre-registration process for reserving a seat at each of our free monthly shows. By asking guests to sign up in advance, our goals were to foster a sense of personal commitment among the audience to attend programs and to increase attendance reliability, while ensuring we did not over extend the capacity of the 40-seat limit in the planetarium theater. To measure the efficacy of these efforts, descriptive statistics were used to analyze the registration data, and our conclusions are presented here. URL for poster: **Click here**

20	**Examining Relationships Between Precipitable Water and Tropical Cyclone Precipitation in the Continental United States** ***Cameron Kurasz*** **Advisor:** *Erica Bower, Meteorology* This study examines the relationship between precipitable water (PWAT) and precipitation rate (PRATE) in Hurricane Helene (2024), and Harvey (2017), two recent, prolific rainfall-producing storms. The High-Resolution Rapid Refresh (HRRR) model analyses were examined to determine the relationship between precipitable water and tropical cyclone precipitation. The HRRR 1-hour forecast PRATE was used a proxy for observed precipitation. Hurricane Helene exhibited a strong positive relationship between PWAT and rainfall rate indicating that higher atmospheric moisture corresponds to higher precipitation in discrete locations. On the other hand, Hurricane Harvey produced extreme rainfall totals with a weaker PWAT and PRATE relationship. The calculated correlation coefficients reflected this difference. This shows the importance of mesoscale complexities leading to catastrophic flooding. Ongoing work will extend this analysis to Hurricanes Florence (2018) and Hurricane Sally (2020). URL for poster: **Click here**
21	**The Impact of Mixed Reality Simulations On Music and Non-Music Pre-Service Teachers** ***Antonia Madison*** with: Marcia A. B. Delcourt, Jody Piro, Catherine O'Callaghan, Eric Gundel **Advisor:** *Marcia Delcourt, EdD in Instructional Leadership, Department of Education* This study was used to explore self-efficacy and anxiety of music and non-music pre-service teachers within the context of using mixed reality simulations (MRS) to deliver lessons during a teaching methods course. Previous research indicated that music education students may perform better than their peers in MRS, displaying behaviors such as use of professional language, improvisation, and overall confidence. The theoretical foundations for this study were rooted in self-efficacy for teaching and performance anxiety. Results from applying an explanatory convergent mixed methods design indicated that for these music and non-music majors, there were no statistically significant differences in teachers' sense of efficacy or anxiety scores. When interview responses were compared for these two groups of coeds, emerging themes included coping, expectations for teaching, identity as a student and emerging professional, prior experiences, and self-efficacy. The main influence of self-confidence was prior experience as a teacher, counselor, or coach. URL for poster: **Click here**

22	**The Differences in Disparity between Nigeria and Chile** ***Christian Majeste*** with: Yumin Park **Advisor:** *Rotua Lumbantobing, Economics* A comparative analysis of the economic systems of Chile and Nigeria. Both countries are resource-based, with Nigeria focusing on its oil reserves and Chile being a bigger player in mining. By focusing on the results of the inequality for both countries. Nigeria suffers mostly from extreme income inequality as well as gender inequality. Chile suffers from multi-dimensional poverty and disaster inequality. URL for poster: **Click here**
23	**The Short-Term Effect of Salinity on Soil Organic Carbon in Pond Sediment** ***Hannah McCabe*** with: Hannah Reynolds **Advisor:** *Hannah Reynolds, Biology* Road salt runoff poses concerns of lower diversity and community changes in freshwater communities. Past studies have focused on community changes at higher salinity levels (>1000 ppm); however, these are higher than traditional freshwater ecosystems (<1000 ppm). Our study tested how salinity affects percent soil organic carbon (%SOC) of pond sediment, by 1) measuring %SOC between September and December, 2) testing how exposure to salt solutions in microcosms affected %SOC over a 14-day period, and 3) repeating the second experiment over six weeks. We found that monthly %SOC varied with significant change in %SOC between months ($p<0.05$). Over six weeks, time, concentration, low salt, and light, decreased %SOC ($p<0.05$), while light x day increased %SOC (<0.05). These findings highlight the importance of sampling time and contribute to the understanding of how lower salinity affects %SOC. URL for poster: **Click here**

24	**Fairfield County Bank and The New Banking Environment: An Analysis on Risk, Growth, and Community Impact** ***Ritvika Misra*** with: Digna Alcantara, Akua Atakora, Joseph Dean, Razi Naouali **Advisor:** *Daniel Berta, Finance* This paper is submitted for the Community Bank Case Study Competition and addresses the central research question: how do external economic factors impact the business of banking? The case study examines how Fairfield County Bank (FCB), a mutual savings bank established in 1871 and headquartered in Ridgefield, Connecticut, has sustained over 154 years of uninterrupted operation and remained stable through changing economic conditions. The research focuses on FCB's financial performance, interest rate risk management, lending strategy, and capital position from 2021 to 2025, a period of rapidly rising interest rates. Using data primarily from the bank's Uniform Bank Performance Report and interviews with senior leadership, the study analyzes how FCB adapted to these challenges. The findings suggest that FCB's conservative management style, strong capital levels, and focus on relationship-based lending helped limit risk and maintain stability, even as earnings declined during the rate cycle. URL for poster: **Click here**
25	**Due Process Denied: Noncitizens and Discrimination** ***Minhee Mok*** **Advisor:** *Michaela Flippin, JLA* In the U.S. Constitution, Due Process is a vital, fundamental right promised to the people. Due Process prevents the government from depriving, "any person of life, liberty, or property without due process of law." (U.S. Const. amend. V). This unambiguous language has recently been challenged on the grounds that it should not apply to noncitizens. Noncitizens include legal permanent residents and undocumented immigrants. While the Constitutional language does not exclude noncitizens from this right, studies and caselaw reveal that the U.S. has grappled with this issue during discriminatory periods in its past. This research explores how challenges to this fundemental right substantively undermine the U.S. Constitution. URL for poster: **Click here**

26	**Mining the Sting: Finding Microbial Gold in Scorpion Venom Gland Transcriptomes** ***Grace Morin*** **Advisor:** *Carlos Santibanez-Lopez, Biology* Traditionally, scorpion venom glands were thought to be sterile environments, maintained by the presence of antimicrobial compounds and limited nutrient availability. However, recent studies have revealed the presence of bacteria within these glands. This study characterizes the venom gland microbiome of several scorpion species by leveraging publicly available transcriptomic datasets from Sequence Read Archive (SRA). By performing taxonomic profiling of non-host reads across scorpion lineages, I identified a complex and taxonomically broad bacterial community within this scorpion structure. These findings suggest a symbiotic relationship between scorpions and their microbiome. Understanding these microbial niches provides a novel framework for bioprospecting and the discovery of next-generation antimicrobial compounds. URL for poster: **Click here**
27	**Belonging to Two Worlds** ***Emelie Myhill*** **Advisor:** *Heather Levy, English* Misinterpretation by Ledia Xhoga, shows the identity issues and vulnerabilities that immigrants can face. The protagonist calls both the United States and Albania home, yet she also feels true to only half of herself in each. Without a strong identity, due to her feeling split between America and Albania, she is very vulnerable and seeks identity in other things, such as helping people. But as we see throughout the book, this lack of identity and over-giving repeatedly proves harmful to her. This analysis argues that this work highlights an often unconsidered vulnerability immigrants face, which is that being part of two cultures can cause identity issues that make someone vulnerable and exploitable by those around them. URL for poster: **Click here**

28	**Beetle Diversity and Conservation in an Eastern New York Fen** ***Matt Naczi*** **Advisor:** *Dorothy Christopher, Biology* The Northeastern United States hosts a rich diversity of beetles (*Insecta: Coleoptera*), and many that are associated with wetlands. Ecological studies have established that beetles contribute a major portion of wetland insect biomass. However, no comprehensive study has been made of the diversity of wetland-associated beetles in North America. This project represents an ongoing effort to fill this gap in our understanding of the natural world. Results have uncovered several fascinating trends and support the hypothesis that the Rove Beetles (*Family: Staphylinidae*) are the most abundant beetles in wetlands. Characterizing the diversity of beetles in any habitat is critical to understanding their roles in supporting ecosystem health and function. This work highlights the need to protect beetles and all insects, but especially those that are restricted to certain habitat types. It is imperative that we increase our efforts to protect rare insect communities and their habitats. URL for poster: **Click here**
29	**Germany vs. Canada: Two Economies, Two Playbooks** ***Razi Naouali*** with: Catherine Escobar **Advisor:** *Rotua Lumbantobing, Economics* This project puts Germany and Canada side by side to show how two strong economies can be built on completely different foundations, from Germany rebuilding after getting destroyed in both World Wars to Canada growing with the advantage of being far more resource-rich. By comparing immigration, inequality, political structure, and overall economic organization, it looks at how history and national context shape two countries that might seem similar at first, but actually play by very different rules. URL for poster: **Click here**

30	**Evolving Mathematical Conversations: a Mixed-Methods Study of Student Discourse and Higher-Order Thinking** ***Katelynn A. Oviatt*** with: Marcia A. B. Delcourt, Reine Issa, Wes DeSantis **Advisor:** *Marcia A. B. Delcourt, EdD in Instructional Leadership, Department of Education* This mixed-methods study was used to investigate changes in middle school students' discourse within a student-centered environment. In the quantitative strand, classroom recordings of conversations were analyzed to determine differences in the number and types of remembering/understanding (R/U) and higher-order thinking (HOT) responses and questions demonstrated by students at the beginning and end of a unit in mathematics. Discourse segments were coded for cognitive level to examine patterns of growth in students' reasoning and problem-solving behaviors. The qualitative strand was used to explore how students perceived their own mathematical thinking after participating in group problem-solving sessions. Together, these complementary strands provided a comprehensive understanding of how students experienced collaboration and cognitive challenge through both measurable and perceived growth in their mathematical reasoning. Initial results indicated that over time there were statistically significant increases in students' mathematical discourse and the number of questions aimed at understanding the content. URL for poster: **Click here**
31	**The Impact of Professional Development, Data-Driven Feedback, and Coaching with Paraprofessionals** ***Alexa Perrefort*** with: Marcia A. B. Delcourt, Katherine Roe, Lisa Daigle **Advisor:** *Marcia A. B. Delcourt, EdD in Instructional Leadership, Department of Education* Paraprofessionals play a critical role in supporting students with disabilities, particularly in implementing strategies that promote engagement and learning. Unfortunately, these individuals are often not adequately prepared to perform their role. This study was used to examine the impact of training and coaching/feedback strategies on paraprofessionals' use of wait time provided after a question is posed and type of question asked (knowledge/ comprehension, higher order thinking). Using a mixed-methods approach, the researcher collected data from three observations, two feedback and coaching sessions, and individual interviews with five volunteer paraprofessionals. Paired-comparisons were conducted between sessions 1 and 3 to examine types of questions asked and wait time used. Data from 2 non-parametric tests were analyzed using a Bonferroni adjustment, $p < .025$. Both wait time and the number of questions reflecting higher order thinking improved over time. Paraprofessionals spoke positively about the training and coaching/data-driven feedback meetings. URL for poster: **Click here**

32	**The Early Germanic People:Migration, Romans,Merovingian and Carolingians.** ***Gustavo Alexander Pimentel Castellanos*** **Advisor:** *Katherine Allocco, History* This research will center on early Germanic people between 1500 BCE and 500 BCE, specifically, their migrations and settlements. These include: Northern Germany, the South of Scandinavia, areas of the Baltic Sea, northwest Europe, and southeast Europe, including the South of the Danube River and the Carpathian Mountains. The implications of contact with the Romans, Celts, and other locals will also be explored, as will the impact of the syncretism between the Romans and the Germanic people, especially with regard to Julius Caesar. The transition of the Merovingian and the Carolingian peoples from tribal communities to kingdoms, creating the geographic, political, religious, linguistic, and economic foundations of the European continent, will also be discussed, as will the lasting significance of this Germanic migration. URL for poster: **Click here**
33	**Synthesis of JAK3 Inhibitors as Candidates for Treatment of Rheumatoid Arthritis** ***Tanner Poissant*** **Advisor:** *Nicholas Grecco, Chemistry* Rheumatoid arthritis is a chronic autoimmune disorder characterized by inflammation and degradation of synovial joints caused by excessive proinflammatory cytokine production from activated T-cells. This can lead to persistent inflammation, cartilage degradation, and irreversible bone erosion. The JAK/STAT signaling pathway regulates cytokine expression, making JAK inhibitors promising therapeutic agents. Selective inhibition of JAK3 is preferred because JAK3 is primarily expressed in lymphocytes, while inhibition of JAK1 or JAK2 is associated with adverse side effects including anemia and cardiovascular diseases. Therefore, the development of selective JAK3 inhibitors is an important strategy for improved rheumatoid arthritis treatment. This project focuses on the synthesis of decorated 7-deazapurines at the 4 and 7 positions with vinylsulfonylpyrrolidine and nitrophenyl groups. Three target compounds will be prepared to evaluate how structural modifications affect binding affinity. Previous studies proved that modifying substituents on this scaffold allowed exploitation of hydrophobic pockets within the JAK3 active site, resulting in compounds with improved potency, selectivity, and in vivo anti-inflammatory activity. Biological activity was evaluated using a luciferase-based binding assay to determine IC_{50} values for JAK3 inhibition and compare potency to known inhibitors reported in the literature. URL for poster: **Click here**

34	**Replacing Coal in the PJM Interconnection Electrical Grid** ***Adam Psenicnik*** **Advisor:** *Stavros Christofi, Mathematics* Pennsylvania-New Jersey-Maryland (PJM) Interconnection is an independent systems operator (ISO) or electrical grid manager that covers 67 million people over much of the Northeast, Midwest, and mid-Atlantic. The goal is to replace coal power using the cheapest combination of solar, wind, and nuclear power within the PJM system. This is done using derivative free optimization methods such as Nelder-Mead and stochastic diffusion search with a purely mathematical approach used as well for a comparison. While considering factors in storage requirements, types of storage, storage decay, power output decay, and growing power demand. Along with an ablation test to see how an optimal solution using solar and wind alone will compare to an optimal solution using all three sources. As well as showing how different combinations of power alter storage requirements despite equivalent total power produced. URL for poster: **Click here**
35	**Skillsetter Simulation Training in Graduate Addiction Counseling: Confidence, Satisfaction, and Self-Evaluation Accuracy** ***Yadira Reinoso*** **Advisor:** *Mary Murphy, M.S. Addiction Studies* This study explored the effectiveness of SkillSetter, a computer-based counseling simulation, in supporting skill development among graduate students in the WCSU M.S. in Addiction Studies program. Eight students completed seven modules over five weeks focused on counseling microskills such as active listening, reflection, and client engagement. Findings showed a notable increase in counseling confidence from baseline (M = 5.78) to follow-up (M = 6.87), with a large effect size (d = 0.82). Students also reported high satisfaction and engagement (M = 2.61, on a scale from 0 to 3), particularly valuing the flexibility to pause and re-record responses. Despite these gains, differences between perceived confidence and observed performance suggested that self-assessment accuracy is still developing in early training. Overall, the results support simulation-based learning as an effective and supportive tool for building both counseling skills and reflective awareness. URL for poster: **Click here**

36	**El Pase del Niño Viajero in Azuay, Ecuador: Preservation of Cultural Heritage and Personal Experience** ***Kimberly Rodriguez*** **Advisor:** *Galina Bakhtiarova, World Languages and Composition* This project explores the cultural phenomenon called El Pase del Niño Viajero in Ecuador that takes place annually as cultural and religious celebration on December 25th in a small rural town Gañansol in Azuay Province. As the daughter of a family with roots in Ecuador, it was my pleasure to take part in my family's cultural tradition and contribute to the preservation of cultural heritage both in Ecuador and within the Ecuadorian community in Danbury. In my video presentation, I will explore the cultural and religious roots of this annual event, the preservation of cultural heritage in Ecuador and amongst the members of the diaspora in Connecticut, the role of local leaders and their counterparts from the Ecuadorian diaspora in Connecticut, and my own experience as an active participant and a student of culture. URL for poster: **Click here**
37	**The Effects of a Minset Program on Science Process Skills and Creative Productivity of Students in Technical Education and Career System High School** ***John P. Ryan*** with: Marcia A. B. Delcourt **Advisor:** *Marcia Delcourt, EdD in Instructional Leadership, Department of Education* The purpose of this study was to explore the effects that a mindset learning program had on the self-efficacy for creative productive behavior (CPB), self-perceptions of intelligence (Theories of Intelligence, TOI), and science process skills (SPS) of students from two technical and career high schools in a northeastern US state. This research was conducted using a pretest-posttest quasi-experimental, non-equivalent design to examine how the independent variable of program type, participation or non-participation in the mindset curriculum, affected 198 ninth grade students regarding the dependent variables. Analyses revealed that while there were no statistically significant differences between the groups for CPB or TOI mean scores, students did improve in three out of 15 SPS categories, including the need to measure accurately, draw conclusions, and control for outside variables when developing an experiment. The SPS instrument also called attention to technical skills in need of improvement for all students. URL for poster: **Click here**

38	**From Island to Innovation Hub: Singapore and Ireland Compared** ***Abe Sari*** with: Ty Cole **Advisor:** *Rotua Lumbantobing, Economics* Ireland and Singapore, though small, have achieved strong economic growth but follow different capitalist models. Ireland's economy is driven by multinational corporations in pharmaceuticals, technology, and finance, supported by foreign investment. In contrast, Singapore uses a state-led approach, focusing on advanced manufacturing, logistics, and financial services. This study compares their sectoral structures and institutions. The findings show that Ireland relies on external capital for growth, while Singapore emphasizes state coordination and domestic development, leading to a more diversified and resilient economy. URL for poster: **Click here**
39	**Who's that Micro? Solving Bacterial Mysteries with Next-Generation Sequencing** ***Samantha Schlierf*** with: Daytona Scherb, Annalee Holcomb **Advisor:** *Carlos Santibanez-Lopez, Biology* It is important to note that bacteria play a vital role in biodiversity by regulating arthropod populations, contributing to trophic dynamics, and serving as indicators of ecosystem health. We can generate genetic data to help support biodiversity knowledge efforts. This study aimed to implement a new protocol for sampling several arthropods using the MinION sequencer to obtain Bacterial sequences. Next-generation sequencing technologies, such as the MinION, offer a rapid, efficient, and cost-effective way to explore microbiomes. In this project, we used the MinION to sequence nine arthropod hosts to obtain their microbiomes. URL for poster: **Click here**

40	**A Super-Earth and Two Long-Period Sub-Neptunes around the Young K-Dwarf TOI-6710** ***Alton Spencer*** **Advisor:** *Noreen Grice, Department of Biology* Young (<1 GYR) exoplanet systems provide useful case studies to characterize planets in their earliest history. We identify 3 candidate signals around the K-Dwarf TOI-6710 with NASA's TESS mission. A combined analysis of the star's rotational period, stellar isochrones, and velocity dispersion constrains the age of the system to 330 (±100) MYR. Using statistical modelling and ground-based observations, we rule out false positive scenarios and confirm all 3 planets: an inner hot Super-Earth (Pb=2.1d) and two long-period Sub-Neptunes (Pc=34.2d, Pd ≥99.2d). We only identified two transits of TOI-6710 d with TESS photometry, and further observations were only sufficient to rule out orbits shorter than 99 days. TOI-6710 is sufficiently bright to enable follow-up characterization of its three planets with ground and space-based instrumentation. As the longest-period and coolest (≤322 K) transiting Sub-Neptune around a young star, TOI-6710 d is a unique target for atmospheric characterization with the James Webb URL for poster: **Click here**
41	**Can antibiotics help the brain respond to GLP-1 in mice fed high-fat food?** ***Ryan Stillman*** with: Ryan Stillman, Milo Duch **Advisor:** *Joshua Cordeira, Biology* Glucagon-like peptide-1 (GLP-1) is a gut–brain hormone that suppresses food intake (produces hypophagia) by acting peripherally (in the body) and centrally (in the brain). Eating high-fat food reduces peripheral sensitivity to GLP-1, impairing appetite control. Whether this impairment can be reversed by enhancing central (brain) access to GLP-1 is unknown. We tested the hypothesis that antibiotic treatment, which increases blood–brain barrier permeability and elevates circulating GLP-1 levels, can restore GLP-1–induced hypophagia in mice fed high-fat food. Mice were fed high-fat food for six weeks before oral antibiotic treatment. Food intake and meal microstructure (size and frequency) were assessed before and after treatment, and the contribution of GLP-1 signaling was evaluated using Exendin-9 to block GLP-1 receptors. Results will be presented. Because GLP-1 signaling is targeted by many current weight-loss drugs, understanding where and how GLP-1 acts may help guide the development of more precise treatments for obesity. URL for poster: **Click here**

Judges

Hasan Arslan	JLA
Christel Autuori	Holistic health
Galina Bakhtiarova	World Languages
Eileen Campbell	Nursing
Josh Cordeira	Biology
Aisha Chahal	Nursing
MarieElen Cordisco	Hospital
Patricia Cumella	Nursing
Marcia Delcourt	Education
Jessica Eckstein	Communication
Maureen Ferrell	HPX
Michaela Flippin	JLA
Kristin Giamanco	Biology
Nicholas Greco	Chemistry
Noreen Grice	Astronomy
Jessica Gutheil	Education
Krista Heyburck	HPX
Carol Huang	Finance
Stephanie Kuhn	Psychology
Aura Lippencott	Instructional Design, Faculty Development
Bernadette Ludwig	Sociology
Rosie Luther	Library
Rotua Lumbantobing	Economics
Jeanette Lupinacci	Nursing
Thomas Miller	JLA
Lorrie-Anne Monte	Ed Psy
Mary Murphy	Psychology/Addiction Studies
Ellen Ober	AccessAbility Services
Jennifer O'Brien	Library
Amy Parent	Sciences/ life sciences/chemistry
Linda Passaro	Chemistry
Julie Perrelli	Dean of Student Affairs / HPX
Judith Prieto	Chemistry
Hannah Reynolds	Biology
Forest Roberstson	Chemistry
Scott Russell	HPX
Divya Sharma	JLA
Dylan Sprague	Library

Alicja Stannard	HPX
Brian Stankus	Chemistry
Brian Stevens	Library
Sean Stevens	LIbrary
Jack Tom	Art
Dan Weltman	Business
Michelle Young	Health Services
Xinxuan Zhang	PAM

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Carl Cozma
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Gabi DiMarco
Jackie Ellis
Verannie Figueiredo
Theodora Lazaridis
Tori Lyon
Jayden Lythcott
Shailyn Matos
Grace Miller
Anyeli Morales
Mike Mrzyglod
Maria Neves
Jacob Nyitrai
Alex Pelletier
Dakota Perez
Tionni Smith
Ryan Stillman

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