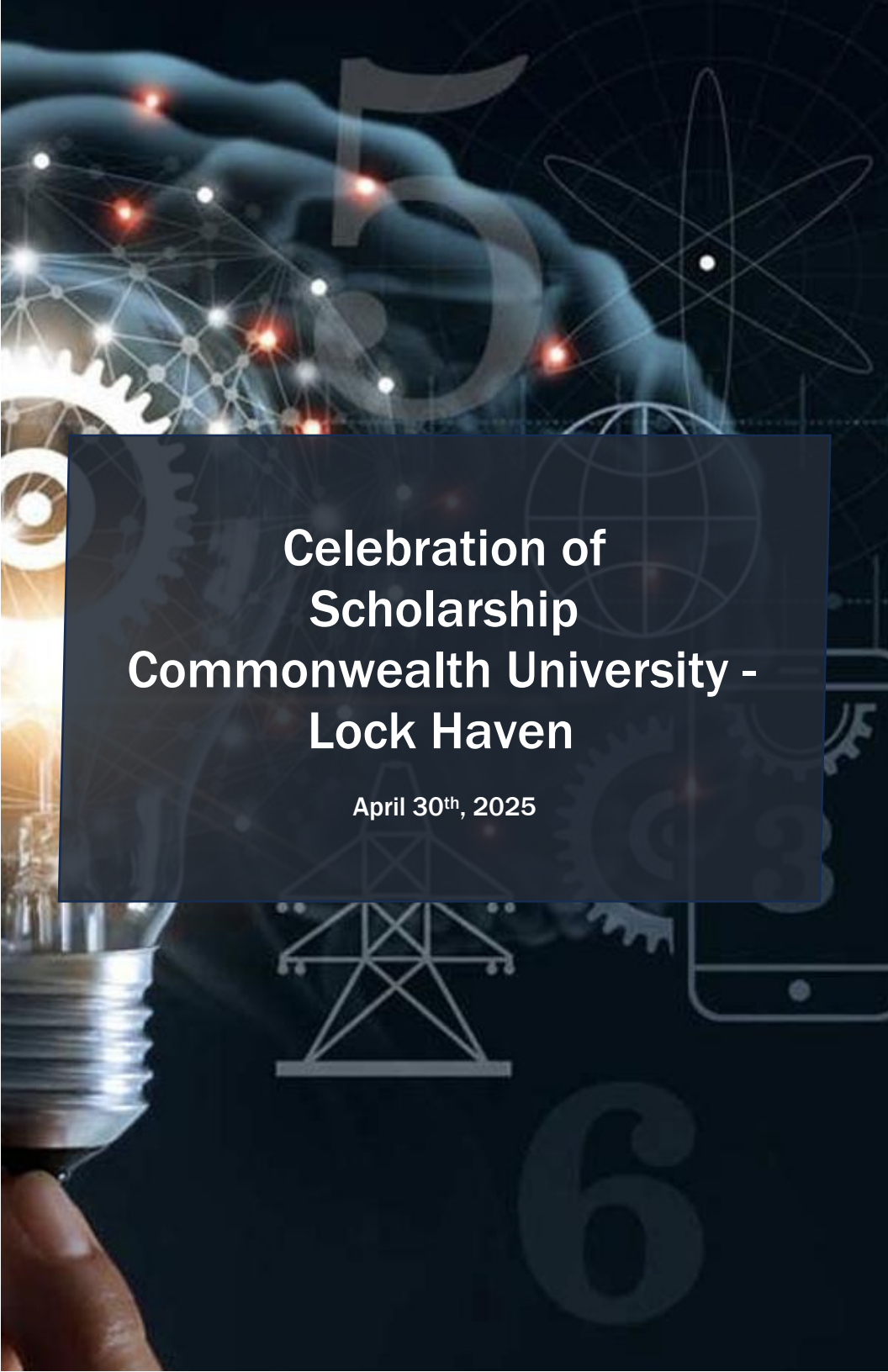

Celebration of Scholarship Commonwealth University - Lock Haven

April 30th, 2025

Welcome Message from the Provost

Welcome to the Celebration of Scholarship, a daylong event that highlights academic excellence and innovation at Commonwealth University. The projects on display represent a range of scholarly and creative endeavors across various formats by our hard-working and determined students.

Each project you'll encounter today pushes the boundaries of knowledge, sparks new conversations, and takes inspiration from fresh ideas. Whether through posters or oral presentations, our students are sharing the best of their scholarly and creative pursuits. We invite you to dive in: ask questions, start conversations, and forge connections. These students aren't just displaying their work – they are shaping the future as our next generation of leaders, creators, researchers, innovators, and colleagues. Your engagement and encouragement help fuel their journeys toward meaningful and impactful careers.

Sincere thanks are extended to everyone involved in planning and organizing the Celebration of Scholarship, especially the students and their faculty mentors. Special appreciation is extended to the Celebration of Scholarship committee – Greg Koehle, Eric Lippincott, Angela Boswell, David DeVallance, Liz Dickinson, Wren Fritsky, Jillian Boyer, and Ashley Strouse – for making this event possible.

Enjoy your day supporting our exemplary student scholars!

Dr. Michelle Kiec
Provost and Senior Vice President for Academic Affairs
Commonwealth University of Pennsylvania

SCHEDULE AT A GLANCE

Commonwealth University – Lock Haven
Celebration of Scholarship
April 30, 2025

9:00 AM – 10:45 AM Oral Presentations

Session 1: International Education
East Campus J209
Moderator: Dr. Steven Granich

Session 2: Women, Gender, and Sexuality Studies Minor – Capstone Panel
East Campus J201
Moderators: Dr. Nicole Burkholder-Mosco and Dr. Lisette Schillig

11:00 AM – 12:45 PM Poster Presentations

East Campus Gymnasium

1:00 PM – 2:45 PM Oral Presentations

Session 3: Biology and Chemistry Research Presentations
East Campus G112
Moderator: Dr. David DeVallance

Session 4: Technological Advances in Educational Delivery
East Campus G108
Moderator: Dr. Angela Boswell

Program of Events

Commonwealth University – Lock Haven
Celebration of Scholarship
April 30, 2025

ORAL PRESENTATIONS

9:00 AM – 10:45 AM **Oral Presentations**

Session 1: International Education
East Campus J209
Moderator: Dr. Steven Granich

> "New student abroad course: Physicists of England and Scotland"
> Dr. Michael Cullin, Physics and Environmental Sciences: Biochemistry, Chemistry, Engineering, Geography, Geology, and Physics
>
> "A model for interprofessional service-learning programs that creates sustainable change"
> Jennifer Bell, MHS, PA-C, Physician Assistant Studies
> Dr. Amy Way, Biological and Health Sciences
>
> "Study abroad opportunities for CU students"
> Rosana Campbell, Director, Center for Global Engagement

Session 2: Women, Gender, and Sexuality Studies Minor – Capstone Panel
East Campus J201
Moderators: Drs. Nicole Burkholder-Mosco and Lisette Schillig

> Student panelists:
> Owen Beury
> Rebecca King
> Isabella Witmer

POSTER PRESENTATIONS

11:00 AM – 12:45 PM **Poster Presentations**
East Campus Gymnasium

Avery Bassett
Criminal Justice

> "Inside the Criminal Mind"
> This poster presents concepts and ideas from Stanton Samenow's book Inside the Criminal Mind as part of an Independent Study project for criminal justice.

Zachery Beck and Gavin Gray
Computer Science

> "A Meta-Analysis of Data Science and Artificial Intelligence"
> A Meta-Analysis of Data Science and Artificial Intelligence by looking at a collection of papers from google scholar

Kathleen Billett
Environmental Geoscience

> "A Comparative Study of Heavy Metals next to Railroad tracks and a Highway."
> The objective of this study was to compare the amount of heavy metals in soil next to railroad tracks and soil next to a highway to the environmental screening level (ESL) and probable effects concentration (PEC). Five soil samples were taken a mile along train tracks and five soil samples were taken a mile along a highway. An XRF analysis was done on each soil sample to see the contents of the soil. Every soil sample had higher levels of lead than the environmental screening level. Two samples along the highway exceeded the probable effects concentration number. One of the railroad samples was exactly 128 parts per million which is the probable effects concentration. Arsenic within the highway soil samples were less than the environmental screening level. All of the soil samples along the railroad

tracks exceeded the environmental screening level for arsenic. Every single soil sample exceeded the environmental screening level for barium. Two of the highway samples exceeded the environmental screening level for nickel. With the samples collected by the railroad tracks four exceeded the environmental screening level and one exceeded the probable effects concentration. Mercury was only found in the samples next to the railroad tracks and every single sample exceeded the environmental screening level and the probable effects concentration. Chromium exceeded the environmental screening level in every soil sample taken. Zinc was higher than the environmental screening level in every sample. Copper exceeded the environmental screening levels in every sample taken. The samples taken by the railroad tracks had higher amounts of copper and one of the samples exceeded the probable effects concentration. The samples taken by the railroad tracks overall had a higher average of chromium, copper, nickel and arsenic while the samples taken by the highway had a higher average of lead and zinc.

Cora Bulles, Elijah Lenhart, and Hailey Anderson
Biological and Health Sciences

"Simulation of acid mine drainage effect on Procambarus clarkii (crayfish)"

Acid mine drainage (AMD) is a synthetically occurring phenomenon that has significantly impaired the water quality of the Susquehanna River. AMD lowers the pH of surface waters through the release and leaching of sulfuric acid and other dissolved heavy metals. Consequently, decreased pH can change the inherent habitat properties of many freshwater species, cause behavioral changes, and, in some cases, result in unnatural mortality events. Despite long-term historical impacts, restoration activities have dramatically improved the quality of water in the West Branch of the Susquehanna River, leading to the return of many aquatic species, including crayfish. The purpose of this study was to evaluate three different physiological

metrics of AMD on crayfish health. This project represents a collaboration of three students employing different approaches to characterize crayfish health, including: metabolism, hemolymph protein content, and critical thermal maxima.

Braedon Campbell
Biological and Health Sciences

"Crossroads of Healthcare: United Kingdom Physician Associates"
The General Medical Council regulations for physician associates (PAs) in the United Kingdom passed on February 2024 and The GMC began regulating PAs on December 2024. The new regulations will allow PAs to prescribe medications and request radiographic scans, which PAs have been able to do in the US since 1980. However, leading up to this legislation and subsequently after it there has been significant backlash from doctors and some of the public about the fear of PAs replacing physicians and the risk of scope creep (i.e. PAs gaining more responsibilities and taking away tasks from physicians). These concerns hold some legitimacy due to recent cases of professional negligence and misconduct by PAs. Through analyzing the current role of PAs in the UK, PA frustration and MD backlash, this paper will provide recommendations that could allow a positive working relationship between PAs and MDs while addressing the concerns of both sides.

Madison Colella, Kailynn Smith, and Luke Dresch
Biological and Health Sciences

"Application of Modified IDEXX® DST for Identification of Antibiotic-Resistant Indicator Bacteria in Surface Waters"
Antibiotic resistance has become a global public health concern due to the overuse and misuse of antibiotics in agriculture and human health settings. Bacteria that evolve to resist treatments by commonly prescribed antibiotics become increasingly more difficult to treat in patients with bacterial infections, and being exposed to

these strains of bacteria can be dangerous. Exposure may come from recreational use of bodies of water containing these bacterial strains. Three local surface waters (Lucas Run, Big Fishing Creek, and Bald Eagle Creek), commonly used recreationally, were sampled and analyzed for the potential presence of two target species of indicator bacteria (Escherichia coli and Enterococcus faecalis). A novel modified IDEXX DST® system was employed to assess the bacterial growth in the presence of three separate antibiotics (vancomycin (VAC), trimethoprim (TMP), and imipenem (IMI)). The isolated bacteria (18 TMP-resistant, 13 IMI-resistant, and 24 VAC-resistant isolates) were presumptively identified to the species level using traditional microbiological diagnostic techniques. This included the assessment of bacterial growth on various selective media and identifying the minimum inhibitory concentration (MIC) of antibiotics against the bacteria. Additionally, results indicated site and seasonal variations, with Big Fishing Creek showing the highest bacterial counts and Lucas Run the lowest in amended samples. Further confirmation of species was performed using 16s ribosomal RNA molecular diagnostic techniques and DNA sequencing analyses on certain isolates; 13 isolates were confirmed to be E. coli, and six E. faecalis or E. faecium. Further research will include analyzing each bacterial strain for the presence of targeted antibiotic resistance genes and possible studies on the transfer of genes between species of bacteria.

Sophia Dorey and Dr. Daniel Spooner
Biological and Health Sciences

"The Impact Climate Change has on Phenological Phases of Plants"

Climate change is an issue that impacts numerous biological factors, including habitat loss, shifts in animal migration, and changes in plant phenology. We frequently observe an impact on plant-pollinator relationships and other organisms in which they interact due to these changes. Yet little is known about how phenology is altered due to broad changes in climate.

Especially with respect to phases in plant phenology. Using data collected from the primary literature, we investigated variation of phenological periods in osmanthus fragrans, a small flowering tree mainly found in Asia. We asked if the timing of phenological events have been shortened, delayed, prolonged over the last 30 years.

Ljos Dresch
Biological and Health Sciences

"Examining the Rapid Increase in Type-2 Diabetes Mellitus"
The prevalence of type-2 diabetes mellitus amongst general care patients has become of great concern for the medical community. This reflects the global increasing trend for diabetes, with rates doubling over the past 2 decades. This research paper examines the underlying causes contributing to type-2 diabetes mellitus, and will focus on genetic predisposition, lifestyle factors, and environmental influence. The role of diagnostic tests in catching early signs of diabetes, such as A1C and blood glucose levels, will be examined. Current treatment mechanisms, from medications to lower blood glucose even to medications aimed at protecting other organ systems (such as lisinopril to protect renal function), will also be discussed. This paper will also explore potential prevention strategies aimed at mitigating this growing health crisis, on both a clinical and global-consumer scale.

Connor J Duffus and Dr. Daniel Spooner
Biological and Health Sciences

"Genetic connectivity between populations of Arapaima, a large migratory fish in South America"
Climate change and habitat loss have impacted the global distribution of many species. The Amazon is over 3,900 miles long and is home to some of the most spectacular freshwater species in the world, such as the Paraiba and Amazonian red-tailed catfish. However, Arapaima is one of the largest freshwater fish in the

world and holds scientific and cultural significance in the Amazon. But understanding the genetic basis of Arapaima populations is needed to better manage the impacts of human activities. We used published data from Izeni Pires Farias to examine genetic connectivity and allelic diversity among populations in Brazil, Peru, and Colombia to examine historical and current connectivity and genetic variability from 22 sampling locations. We then compared genetic variability among tributaries and main channels.

Kaleb Force
Computer Science
"Time Series Analysis of Population Growth"

Virginia Katherine Gavek and Alec Madden
Psychology

"How Color and Acute Stress Affects Memory Recall" People who read passages with warm-toned words with time constraints are likely to answer questions correctly and recall distracting words; however, passages with cool toned words cause more correctly answered questions but produce lower recall of distracting words. Being placed under a time stressor may increase word recall but not the number of correct questions. Findings from 114 participants and a series of parametric tests suggest word coloration and distractions have an influence on recall ability.

Annabelle Gormont
Biological and Health Sciences

"miRNA Biomarkers for Neurodegenerative Disorders" As the global human population increases, noncommunicable diseases (i.e. cancer, cardiovascular disease, chronic respiratory illnesses, and diabetes) are becoming more prominent. One of the most notable increases in the prevalence of chronic illnesses would be the increase in neurodegenerative disorder development. Early diagnostic tools are being developed to improve the detection and treatment of these disorders. Currently

diagnostic techniques for neurodegenerative disorders can be invasive, which makes early detection difficult. The goal is to create less invasive techniques by using less-invasive adjacent areas (i.e. blood samples) as indicators for disease development; epigenetic markers could be potential indicators for the diagnosis of the disease. More specifically, micro-RNA (miRNA) is a well-known mechanism of epigenetic changes and the focus of this research. miRNA has the capability of blocking translation of messenger RNA (mRNA) or degrading it entirely which has the potential to be a cause for the development of neurodegenerative disorders. The data in this study was collected from the literature by Kos et. al. in 2022 to investigate the relationship of peripheral blood miRNA and the concentration of miRNA in the brain as a biomarker.

Annabelle Gormont
Biological and Health Sciences

"Combatting Period Poverty in Rural Jamaica"
Period poverty is a global issue that has risen from not only the lack of resources and facilities but also due to the lack of health literacy. As the awareness of period poverty increases, the importance of menstrual health management is gaining attention. Organizations and governments all over the world are attempting to implement programs that will be the solution to period poverty. These programs provide menstrual hygiene products, WASH facilities, and provides reproductive education to the community. This study investigates the implementation of menstrual underwear and the future introduction of menstrual cups to a rural Jamaican community. The feasibility and acceptance of the products are surveyed and analyzed for future studies.

Gavin Gray and Zachery Beck
Computer Science

“Student Performance Factors”
A general analysis of the different factors that affect the performance of students. Using the students' GPA and

test score to determine which factors affect them the most, such as sleep, home life, caffeine intake, etc.

Clarissa Haak and Dr. Daniel Spooner
Biological and Health Sciences

"Identifying the Causes of Lead Concentrations from the Bones of Raptor Species"
Lead exposure is a worldwide problem with bird species being especially targeted due to having a wide range of diets and having migration patterns. The question that was tested was whether the main source of lead exposure in raptor species could be a result from diet bioaccumulation or from eating carrion with bullet fragments. Data was collected through literature research. The presence of carrion in a raptor species diet correlates with the concentration of lead found in the dry weight of raptor bones. This shows that the presence of carrion within a raptor species diet, with an emphasis on ungulate carrion, leads to an overall increase in the concentration of lead in raptor species. There were two outliers in the data that did not match the overall trend. The American Kestrel and the Eastern Screech Owl had high bone lead concentrations for raptors that consume no carrion in their diet but majorly consume invertebrates like earthworms. More research into other raptors and bird species with invertebrate consumption could prove useful.

Clarissa Haak, Elizabeth Haak, and Dr. Amy Kutay
Biological and Health Sciences

"Preparation of Bird Museum Specimens"
Museum study skins are essential in biodiversity and morphological research. The presentation provides an overview of the process used in preparing bird museum specimens. A few of the species prepared over a few semesters include wood warblers, owls, hawks, and waterfowls. Further preparation of museum study skins will support future scientists in evolutionary and morphological research.

Elizabeth Haak and Clarissa Haak, Dr. Loretta Dickson, and Dr. Amy Kutay
Environmental, Geographic, and Geologic Science

"Effect of Lithology and Heavy Metal Concentrations in Pennsylvania Springs"
Pennsylvania springs are commonly used as a water source but are known for having high concentrations of heavy metals. The question that was tested was whether heavy metal contaminants could result from the land use and lithology for a specific site. Spring sites were selected through the Pennsylvania GEOlogic Data Exploration surveys by the DCNR and had easy roadside accessibility. Sediment and aquatic vegetation samples were collected at each site. Macroinvertebrate taxa scores were calculated for each site. Collected samples were run through x-ray fluorescence to determine the heavy metal concentration in parts per million. The presence of higher levels of heavy metal contamination correlated with the sites that had sandstone lithology. Site 4 had high levels of Zinc and Site 5 had high levels of Lead. The causes of these high levels are unknown. More research would further justify the causes of heavy metal contaminants in public Pennsylvania springs.

Meaghan Hartman
Chemistry

"Quality control of membrane protein reconstitution into the lipidic cubic phase for biophysical studies"
The lipidic cubic phase (LCP) is spontaneously formed by mixtures of water and the monoacylglycerol, monoolein. The stability of LCP in the presence of sodium trichloro acetate was explored in a concentration dependent manner by assessing three criterion that characterize proper phase behavior (optical transparency, non-birefringence and viscoelastic properties). The viscosity of the LCP has not been characterized quantitatively; it has only been described to have the consistency of toothpaste. We developed a gel viscometer that is inexpensive and non-destructive. Mass is added to the top of the apparatus until a linear velocity

of 1 µL/s is produced. The mass is related to the viscosity of the substance. The study was conducted with LCP samples of varying TCA concentrations in addition to several substances of known viscosity. Purification protocols and structural studies on membrane proteins almost always employ detergents or chaotropic solutions to stabilize the protein outside of the lipid bilayer. Ideally these solutions promote complete solubilization of the protein of interest as minor amounts of soluble or insoluble aggregates can impede structural and functional studies. Current methods of evaluating membrane protein aggregation include size exclusion chromatography and analytical ultracentrifugation. Herein we develop an assay for assessing the extent of protein aggregation utilizing the technique of chemical cross-linking. Specifically, we have developed a protocol which utilizes the membrane permeable chemical cross-linking reagent disuccinimidyl suberate that is capable of generating covalent cross-links between amino groups on proteins if the reacting groups are within 11 Å. With the addition of cross-linking reagent, soluble aggregates can be detected using SDS-PAGE or removed from solution by centrifugation. In this study we chose to evaluate the aggregation behavior of caveolin-1 and small ubiquitin-like modifier (SUMO)-Glycophorin A in a variety of different solubilizing conditions to pinpoint the best conditions for promoting solution stability.

Landon Avery Hetrick and Blake Little
Math, Computer Science, and Digital Forensics

"Analysis of the Top 50 Bestselling Books yearly from 2009-2019"

This project takes a closer look at bestselling books from 2009 to 2019 to uncover interesting trends and patterns. Using Python and data from an existing dataset, it analyzes things like how many books were fiction vs. nonfiction, average user ratings, book prices, and how often certain titles appeared on the bestseller list. The program lets users explore specific years to see what top-rated books were like in terms of cost and popularity,

and even estimates potential profits based on reviews and prices. It shows how average ratings have changed over time. Overall, this analysis offers an insightful look at what makes a book successful and how readers have responded to different titles over the years.

Jaden Kodack and Aaron Shicora
Computer Science

"MLB Batter Statistics Analysis"
Linear regression to analyze the relationship between a player's batting average (AVG) and other features like home runs (HR), runs batted in (RBI), and strikeouts (SO), ANOVA analysis, and Clustering

Dr. Amy Kutay and BIOL432/BIOL532 Ornithology Class
Biological and Health Sciences

"Bird Species of a Special Concern Project"
This is a collection of students' projects in which they report on a bird species of special concern. The individual projects may represent endangered species, threatened species, or species in the Commonwealth for which there is conservation concern.

Jerry Lambert and Dr. Daniel Spooner
Biological and Health Sciences

"PFAS Effects on Fish Diet"
Contaminants have become a major problem within streams, waterways and oceans around the world. An emerging group of contaminants known as Polyfluoroalkyl substances (PFAS) has become an emerging pollutant of concern and is used by most people unknowingly in everyday life. Simple things such as nonstick cookware, clothing, and food packaging are all sources of PFAS which are known as "forever chemicals" often staying in trace amounts for life. PFAS has accumulated in large amounts within waterways and has accumulated within the animals that call these ecosystems home. Although we think PFAS bioaccumulates in fish, we do not know whether the diet

itself can influence the nature of PFAS bioaccumulation. We conducted a study by dissecting fish exposed to three different PFAS exposure sources (sediment, water, and biofilm) and a control. All fathead minnows and golden shiners were collected from a past experiment of PFAS effects on an ecosystem by Dr. Spooner. Through fish dissection, we hope to better understand the immediate and long-term effects that these contaminants will have on the organisms within our waterways.

Elijah Lenhart and Cora Bulles, Hailey Anderson
Biological and Health Sciences

"Simulation of acid mine drainage effect on Procambarus clarkii"

Acid mine drainage (AMD) is a synthetically occurring phenomenon that has significantly impaired the water quality of the Susquehanna River. AMD lowers the pH of surface waters through the release and leaching of sulfuric acid and other dissolved heavy metals. Consequently, decreased pH can change the inherent habitat properties of many freshwater species, cause behavioral changes, and, in some cases, result in unnatural mortality events. Despite long-term historical impacts, restoration activities have dramatically improved the quality of water in the West Branch of the Susquehanna River, leading to the return of many aquatic species, including crayfish. The purpose of this study was to evaluate three different physiological metrics of AMD on crayfish health. This project represents a collaboration of three students employing different approaches to characterize crayfish health, including; metabolism, hemolymph protein content, and critical thermal maxima.

Alexa Lloyd
Biological and Health Sciences

"Cognitive Neuroscience of Aging"

I completed an independent study this semester, reading "The Cognitive and Social Neuroscience of Aging" by Dr. Angela Gutchess. This poster will summarize the

main findings/learnings from this book, and I will highlight implications for the future of cognitive neuroscience.

Alexa Lloyd and Kyla Fanning
Psychology

"The Effects Emotion and Personal Reactivity Have on Memory Accuracy"
This study analyzes how emotional reactivity affects memory. Induced into an emotional state, 137 participants viewed words that varied in emotional charge, completed recall tasks, and took the Perth Emotional Reactivity Scale. A significant difference was seen in those with neither reactivity type remembering neutrally valanced words less. These findings signify those who are not emotionally reactive allocate less resources to neutral stimuli, which may have a benefit for survival during dangerous situations.

Tatum Malone
English Education

"Teaching Practicum"
This proposal aims to give a summary of what got me into teaching, my most significant teaching experiences throughout my student teaching semester, and a final reflection on what I enjoyed and what I would do differently. This proposal will give examples of student work varying from different classes, demonstrate the unit plan I created for my students during my Practicum, and highlight things I had to teach that I did not like, but helped me recognize the differences I would make in my own classroom.

Angel Mandoza
Computer Science

"Multimodel Machine Learning on the Iris Dataset"
This project applies machine learning techniques to the Iris dataset for classification, clustering, and dimensionality reduction. Models like Random Forest

and SVM achieved high accuracy in predicting species. Principal Component Analysis was used to visualize data in 2D and 3D, K-means clustering and silhouette analysis helped identify optimal groupings. The study highlights the power of combining methods for insightful data analysis.

Halie Marriot
Psychology

"College Relationship Sensitivity: Influences of Family Stability and Socioeconomic Status"
This study explored how familial stability and socioeconomic status (SES) influence college students' perceptions of romantic relationships. Participants completed a survey featuring demographic questions, four relationship scenarios varying in depth and intentionality, and follow-up questions assessing their perceptions. It was hypothesized that individuals from lower SES backgrounds and unstable families would view relationships as less stable. Results revealed a significant main effect of scenario depth and intentionality (Wilks' $\lambda = .37$, $F(1, 124) = 213.60$, $p < .001$, $\eta^2 = .63$), indicating that intentionality had more impact on participants' perceptions when the transgression was surface-level. However, familial stability and SES showed no significant effect on relationship perception. These findings suggest that the nature of relationship transgressions may play a larger role in perception than background factors like SES or family stability.

Stephen McMillan
Biological and Health Sciences

"CML Cancer"
My poster will talk about CML cancer. It will include what this cancer is, how it spreads, and what are some treatments that can help cure or slow down the cancer.

Evie J Rembold, Dr. Ashley Lesniak, and Dr. Curt B Dixon
Biological and Health Sciences and Rehabilitation Sciences

"Effect of Incorporating Plyometric Training into a Resistance Training Program"

Plyometric (PLYO) training is a style of training used to improve muscular power, speed, coordination, and overall athletic performance. Purpose: To determine if adding (PLYO) training into an existing resistance training (RT) program will impact vertical jump performance. Methods: 9 men (Age: 21.1 ± 1.6 yr, Height: 180.0 ± 4.6 cm; Mass: 94.2 ± 18.3 kg; Body Fat: 17.9 ± 7.0%) and 7 women (Age: 20.4 ± 1.0 yr; Height: 166.9 ± 25.8 cm; Mass: 75.3 ± 20.3 kg; Body Fat: 25.2 ± 11.6%) who were currently performing RT, participated in this study. Baseline testing (PRE) was conducted over two days. Day 1 included demographic data, maximal vertical jump height tests (static jump, countermovement jump (CMJ), right and left leg CMJ) and a 60-jump test to assess fatigue factor. On Day 2, subjects completed a Reactive Four Jump Test to determine explosive leg power factor and a maximal leg press for lower-body strength. All jumps were completed using the Just Jump Mat. Following the pre-testing, subjects were given an 8-week PLYO protocol to perform twice a week concurrently with their existing RT program. The PLYO exercises included a series of common hops, skips and jumps progressing from 72 to 106-foot contacts. Upon completion of the PLYO protocol, subjects repeated all assessments (POST). Paired samples t-tests were used for statistical comparison. Results: There was a significant change in left leg CMJ (PRE: 31.3 ± 7.6, POST: 33.4 ± 8.3 cm; $p = .012$) and lower-body strength (PRE: 279.3 ± 102.4, POST: 302.6 ± 97.9 kg; $p < .001$). No significant changes were seen in any other jump height tests. There were no significant changes observed in fatigue factor (PRE: 76.9 ± 39.2, POST: 71.5 ± 18.6 %; $p = .500$), explosive leg power factor (PRE: 0.83 ± 0.32, POST: 0.83 ± 0.28; $p = .852$). CONCLUSION: The addition of PLYO to a subject's current RT program had little to no impact on vertical jump performance. Significance/Novelty: This study used RT subjects

(minimum of 6 months training experience) to eliminate potential neuromuscular adaptations often observed at the beginning of an exercise program in untrained subjects which may impact vertical jump performance.

Darian Pflueger
Environmental Geological and Geographical Sciences

"The Effects of AMD in Clearfield County Soils and Waters"
AMD, abandoned mine drainage, is one of the biggest environmental issues we have in Clearfield County. I decided to go around to multiple effected areas and take both water and soil samples to test the kinds of heavy metals found in them. I also went to major rivers and creeks to see if the smaller tributaries that were effected the most by AMD and see how they influenced the soils and pH along with TDS of the major ones. The results that I found were incredible. It is truly amazing what we cannot see with the naked eye when it comes to our water and soils.

Eve Ryan, Emma Stellfox, Grayson Rudy, and Levi Gilbert
Psychology

"The Impact of Disturbances and Sense of Control on Performance in a Test-Taking Environment"
The researchers examined how disturbances impact students' sense of control and test performance. Thirty-three undergraduate students completed two tests, one with the disturbance of a confederate and the other with no disturbance. The results indicated a significant difference in the number of questions answered correctly when a confederate was present. Future research could examine the impact of classroom size and competitiveness on test performance.

Adam Seasholtz, Dr. Ashley Y Lesniak, and Dr. Curt B Dixon
Biological and Health Sciences and Rehabilitative Sciences

"The Impact of Being Fasted vs Fed on Submaximal and Maximal Treadmill Running"

PURPOSE: To determine any potential physiological or performance impact of being fed vs fasted on a one-mile run. Additionally, to evaluate the presence of non-random conscious adjustments in intensity during this self-paced treadmill run. METHODS: 14 physically active participants consisting of 12 males and 2 females (Age: 21.9 ± 2.5 yrs; Height: 179.7 ± 6.8 cm; Mass: 74.6 ± 10.0 kg; Body Fat: 15.0 ± 4.5%) completed this study. During the first visit, demographic information was collected, followed by a treadmill graded exercise test to volitional fatigue using the Bruce protocol. During the subsequent two visits in a counterbalanced order, participants visited the laboratory under fasted conditions (12-16 hours overnight) or fed conditions (1-2 hours prior to visit). Participants completed a treadmill protocol which involved 10 minutes of submaximal walking/jogging at 60% of their determined VO2max, immediately followed by a max-effort mile run, where free modulation of speed was permitted. Speed and elapsed time were hidden from each participant's view during the mile, but distance was visible. VO2 and heart rate (HR) were continuously assessed throughout the exercise, along with ratings of perceived exertion (overall and peripheral; RPE-O and RPE-P). Blood lactate was measured both before and directly after exercise completion. RESULTS: There was no significant difference in average VO2 (Fed: 24.4 ± 5.1, Fast: 24.6 ± 4.0 ml·kg·min-1; p = .644), HR (Fed: 137.6 ± 5.4, Fast: 138.5 ± 8.8 beats·min-1; p = .658), RPE-O (Fed: 8.3 ± 2.1, Fast: 8.2 ± 1.8; p = .770), or RPE-P (Fed: 8.4 ± 2.2, Fast: 8.5 ± 1.9; p = .722) between fasted and fed conditions during the 10-minute submaximal exercise bout. During the max-effort mile, peak VO2 was higher under fed conditions compared to fasted (Fed: 45.9 ± 7.6, Fast: 44.5 ± 7.4 ml·kg·min-1; p = 0.048). There was no difference between time to completion (Fed: 8.22 ± 2.27, Fast: 8.34 ± 2.16 min; p = .518), average VO2 (Fed: 40.0 ± 7.4, Fast: 38.8 ± 6.4 ml·kg·min-1; p = .120), post-lactate (Fed: 8.1 ± 3.1, Fast: 7.0 ± 2.7; p = .173), HR (Fed: 181.5 ± 7.1, Fast: 180.3 ± 11.1 beats·min-1; p = .602), RPE-O (Fed: 14.2 ± 1.9, Fast: 14.6 ± 2.3; p = .303), or RPE-P (Fed: 14.0 ±

2.0, Fast: 14.5 ± 2.1; p = .052) or any other measured variables. CONCLUSION: Peak oxygen consumption increased during max-effort aerobic treadmill running under fed conditions compared to fasted, but no differences in physiological variables were observed during the controlled warm-up. Running intensity appeared to be voluntarily increased between 80-90% of exercise completion in the majority of participants in both conditions.

Clayton Simon and Dr. Joseph Calabrese
Biological and Health Sciences

"Dental Health in Felis Catus: A Microbial Perspective" The oral microbiota of healthy Felis catus (domestic cats) was compared to that of Felis catus with dental issues such as plaque buildup and possible gingivitis. The mouths of both groups were swabbed then the samples were grown on TSA plates at 32° Celsius. Bacteria were isolated from these enrichment plates and grown in TSA working stocks. A variety of traditional diagnostic tests (morphological, biochemical, and physiological) were performed to identify the bacteria samples to the genus level.

Aften Stimer
Chemistry

"Development of Detergent-Free Methods of Membrane Protein Reconstitution into the Lipidic Cubic Phase" The lipidic cubic phase (LCP) which is spontaneously formed by mixtures of water and the monoacylglycerol, monoolein, has garnered much attention as it provides a native-like bilayer with interpenetrating aqueous channels that has facilitated the crystallization of numerous membrane proteins. Proteins are typically stabilized in detergent containing solutions and then are combined with monoolein to reconstitute the protein into LCP. Unfortunately, detergents can destabilize LCP when present at a high enough concentration and cannot be easily removed. In this work, the stability of LCP the in the presence of sodium trichloro acetate, which is

used in our lab to solubilize membrane proteins, was explored in a concentration dependent manner by assessing three criterion that characterize proper phase behavior (optical transparency, non-birefringence and viscoelastic properties). Utilizing the recently developed 'cubicon' method which involves precipitating the LCP by adding excess buffer, we show that chaotropic salts can be easily removed. Excess buffer is drawn off and the resulting denaturant free precipitate can be converted back to protein-laden LCP by the addition of a small amount of monoolein. Using steady state fluorescence spectroscopy, we show that fluorescently labeled lipid (NBD-DMPE) and protein (mCherry-glycophorin A transmembrane domain fusion) can be incorporated into LCP starting from concentrated chaotropic solutions and that the concentration of these species in the LCP can be increased by performing multiple rounds of reconstitution. Importantly, we identify conditions mild enough to preserve the mCherry structure and solubilize the glycophorin A transmembrane domain, indicating that our method is gentle and could be generally applicable. Incorporation of 1,2-dioleoyl-sn-glycero-3-phospho-L-serine (DOPS) and cholesterol in caveolin-1 cross-linked LCP samples for oligomerization studies. DOPS was utilized to adjust the LCP channel size to fit the protein (caveolin-1).

Summer Strauss
Biological and Health Sciences

"Amica Center"
This poster will be a summary of a Honors Seminar trip to the Amica Center, which is an agency in Washington D.C. that helps immigrants. It will discuss the legal and social services that immigrants receive at the agency. The poster will provide success stories of immigrants from the agency, and how the Amica Center has helped them as immigrants in the United States.

Rylie Swartwood and Dr. Daniel Spooner
Biological and Health Sciences

"Plants under Polygraph"
Our ecosystems are not as diverse as they once were, largely because humans have made wholesale changes to ecosystems (e.g. Logging of the mountains). As such, we have actively tried to conserve what's left of the integrity of ecosystems, a difficult challenge given to the extent of disruption. An underappreciated aspect of conservation relates to Undefined metrics of perception, behavior, and cognition implants. Detection, measurement and interpretation of such phenomenon is virtually unheard of. Despite a plethora of behavior studies documenting relationships amongst animal species, we have no data on potential cross kingdom-level cognitive interactions. The purpose of this study was to determine if plants exhibit behavioral responses to animals exposed to physiological stressors. In addition, we wanted to evaluate if plant responses differed in the presence or absence of humans.

Ava Tomko and Dr. Daniel Spooner
Biological and Health Sciences

"Species interactions and population abundance of native and non-native ladybugs"
Pollinators are an important part of our ecosystem; by moving pollen and fertilizing flowers, they contribute to a balanced environment. Recently, however, there has been concern over a decline in pollinator populations. Loss of pollinators would disrupt agriculture, biodiversity, and the overall maintained balance of ecosystems. Lady beetles, for example, are pollinators that may have shown recent decline. Lady beetles also aid in control of pests such as aphids; they are essential for maintaining a balanced ecosystem/ environment. However, we are unsure of what causes this decline; factors such as climate change, changing landscape or species interactions may influence pollinator population decline. We analyzed a long-term data set that encompassed various native and nonnative ladybug species to investigate species interactions and their relation to native ladybug population decline. We used a

linear regression analysis to evaluate the relationship between two lady beetle species, Coccinella septempunctata (invasive) and Hippodamia parenthesis (native). We found that there was not a strong relationship between the decline of native species in relation to invasive species abundance within the years 2007 to 2020. We also analyzed two habitats from the given data set, alfalfa and spring wheat to exam if habitat had a contributing factor in species abundance. There was not enough evidence to demonstrate a relationship between habitat and species abundance.

Jacob Alan Watson, Dr. Charles Teeples, and
Dr. Sidney Wilkerson-Hill
Chemistry

"Investigating the Mechanism of Dialkyl Sulfone Cyclopropanation Reactions using Stereochemical Probes"

Small molecules containing gem-dialkylcyclopropanes are prevalent in natural products and are often found in commercially available drugs. Gem-dialkylcyclopropanes are even common in daily household items such as agrochemicals and pesticides, indicating their major importance in society. One modern strategy for the synthesis of gem-dialkylcyclopropanes utilizes dialkyl sulfone anions as carbene equivalents. However, the mechanism of ring closure for sulfone cyclopropanation reactions is not known. The two mechanistic possibilities include the SN2 ring closure with backside attack, and SN1-like ionization followed by ring closure. Identifying the stereochemical outcome in the ring closure step of the sulfone cyclopropanation reaction could provide strong support for one of these mechanisms. To this end, conditions were developed for the cyclopropanation of symmetric 1,1-diarylalkenes in the presence of NaNH2 in tetrahydrofuran at 70 degrees Celsius, using 2 different symmetric 1,1-diarylalkenes and 3 different dialkyl sulfones. Epoxide ring opening reactions using dialkyl sulfone anions were optimized with the goal of obtaining chiral alcohols, which could lend access to

chiral, non-racemic substrates that can undergo ring closure.

Chaniya Wigfall and Dr. Daniel Spooner
Biological and Health Sciences

"Assessing Biofilm Susceptibility to a Historical Antimicrobial: A Study on S. epidermidis and S. aureus"
Bacteria in biofilms are known to be highly resilient to antimicrobials and are therefore major contributors to chronic infections. Staphylococcus epidermidis and Staphylococcus aureus are two of the most common bacteria found on the skin and are often implicated in skin infections. Due to rising antibiotic resistance, recent research has increasingly focused on alternative treatments. In this study, we analyzed data from a previous experiment that tested an ancient medicament on both single-species and dual-species biofilms. The data were used to assess the net change in colony-forming units (CFUs) before and after medicament exposure, in order to evaluate its effect on each bacterial species. These findings may offer valuable insight into the potential of historical remedies as viable alternatives in the fight against antibiotic-resistant infections.

Emily Winton and Dr. Daniel Spooner
Biological and Health Sciences

"Effects of the Invasive Crown-of-Thorns Starfish on the Health of the Great Barrier Reef"
The Great Barrier Reef is a globally important ecosystem. The Great Barrier Reef has many stressors, one of them includes the invasive crown-of-thorns starfish, which is known to impact coral reefs. We do not know if the starfish have a direct impact on the health of the reef. The purpose of this study was to use data from the literature to evaluate how starfish influenced the well-being of the reef. A correlation analysis was used to determine whether there was a relationship between the presence of the crown-of-thorn starfish, and the amount of dead or live coral cover. Our analysis indicated that

there was little to no relationship between the number of starfish and the amount of live or dead coral cover. An ANOVA was conducted to determine whether there was a difference in the average number of starfish in recovering, active, or no outbreak sections of the reef. The results from this test demonstrated that there was a difference in the number of starfish among reef sections. Based on tests using data from literature, the crown-of-thorn starfish does not appear to have a direct effect on the health of the Great Barrier Reef.

Isabella Witmer
Criminal Justice

This poster presents a review of literature on pornography and violence against women as well as offers insight into future research projects on this topic. It is part of an Independent Study project for the WGSS minor.

Carson Workman
Environmental Geoscience

"Investigation about potential pollution in the upper section of the McElhattan watershed using XRF analysis and Water Analysis."
Capstone involving an investigation to determine if the upper section of the McElhatten watershed had any pollution from agricultural runoff or pollution from public activities within the area. Soil samples and water samples were collected at said locations. Soil samples were then analyzed using XRF (X-ray fluorescence). The water samples were analyzed using "Hach" TNT, TDS, and PH devices.

1:00 PM – 2:45 PM **Oral Presentations**

Session 3: Biology and Chemistry
East Campus G112
Moderator: Dr. David DeVallance

> "Investigating the mechanism of diakyl sulfone cyclopropanation reactions using stereochemical probes"
> Jacob Watson (student presenter)
> Dr. Charles Teeples (REU Mentor) and Dr. Sidney Wilkerson-Hill (REU PI) (UNC-Chapel Hill)
>
> "Development of methodology for assessing bacteria in PFAS-contaminated surface waters in central Pennsylvania"
> Samantha Fike (student presenter)
> Biological and Health Sciences
>
> "Characterizing the transport and fate of PFAS compounds in stream ecosystems using re-circulating mesocosms."
> Dr. Daniel Spooner
> Shayla Graham and Alexis Rennix (student presenters)
> Biological and Health Sciences

Session 4: Technological advances in educational delivery
East Campus G108
Moderator: Dr. Angela Boswell

> "Application of artificial intelligence in clinical assessment"
> Dr. Stephen Gitonga
> Nicole Messercola (student presenter)
>
> "Incorporating standardized patient encounters into athletic training education"
> Drs. Eric Lippincott and Jody Russell
>
> "Harnessing low-cost interactive technology for online course delivery"
> Dr. Marian Tzolov

SAVE THE DATE!

Commonwealth University-Lock Haven
Celebration of Scholarship
April 29, 2026

This event was coordinated by Greg Koehle and Eric Lippincott, with help from Angela Boswell, David DeVallance, Elizabeth Dickinson, and Wren Fritsky. A special thank you to Jillian Boyer and Ashley Strouse.

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Thank you for your support!!