



PennState
York

Exhibition of Undergraduate Research and Creative Accomplishments

April 13, 2021
Noon-1:00 p.m.

Exhibition Program



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Penn State York
Exhibition of Undergraduate Research and Creative Accomplishments

Welcome to Penn State York's seventh annual multidisciplinary showcase of Undergraduate Research and Creative Accomplishments! This campus enjoys a long tradition of student and faculty excellence in all forms of scholarship and creativity in the finest tradition of the University. Whether you are presenting your work today, perhaps for the first time, or simply supporting student learning outside the classroom, your presence is a powerful acknowledgement of the value of a Penn State education.

Beyond all measure, the 2020-2021 academic year has presented heretofore unimaginable challenges at so many levels. You are commended for the persistence and resourcefulness you have demonstrated to be successful in your classes and for finding time to make original scholarly contributions in your respective areas of study. In so doing, you have demonstrated what being a Penn Stater is really all about.

This year, eleven student projects are showcased. The projects represent scholarship and creativity in the humanities, in the social and behavioral sciences, and in the natural sciences. It is my hope that, as we continue to grow as a campus, our students will take even greater advantage of the numerous and variegated learning opportunities we offer. The milestones that you achieve here will follow you and place you in a favorable light as your career progresses.

One final note of appreciation is due to the dedicated faculty who supported these projects through an unprecedented global health crisis. Please do not assume that your efforts have gone unnoticed; indeed, they have not. The administration thanks the faculty, and the students whom they mentor, for the innovative and entrepreneurial ways in which you have risen to meet this challenge. Without the tireless engagement of faculty, staff, and students, an excellent event such as this would not be possible.

I wish each of you health, happiness, and continued academic success.

Robert E. Farrell, Jr.

Robert E. Farrell, Jr., Ph.D.
Director of Academic Affairs
Professor of Biology

Information

The 2020-21 Exhibition of Undergraduate Research and Creative Accomplishments at Penn State York will be held virtually for the first time. 11 students have submitted abstracts and will be available via Zoom on April 13, 2021 from noon to 1:00 p.m. Contained in this program, are the titles, presenters, mentors, and a brief abstract of the research. Also included is a Zoom URL for each project. On April 13, you are encouraged to follow the links and join the Zoom rooms where the students will be presenting a summary of their research in a manner similar to an in-person poster session. You are encouraged to ask the students any questions that you would like and feel free to visit all the poster sessions that you care to see.

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ScholarSphere link to the entire collections of presenters and posters....

<https://scholarsphere.psu.edu/resources/a60afbf3-2aef-45b0-bc0e-8146dff76aec>

Arts and Liberal Studies Unit

Title: The Stigma of Mental Disorders in the Media

Presenter: Ariel Barbera

Mentor: Dr. Jennifer Nesbitt

ScholarSphere Link: <https://scholarsphere.psu.edu/resources/b0d14847-382a-47ec-aa1d-970cd3032052>

Zoom Link: <https://psu.zoom.us/j/96019090347?pwd=cnBMVnZHZnBKbGtFOEhsQ3h1QTUzZz09>

Abstract: How can we use different forms of literature to eliminate stigmas against mental illness and gender-based trauma caused by harmful portrayals throughout the media and pop culture? By examining different mental disorders in four novels that focus on mental illness, this project explains how contemporary authors use novels to protest against stereotypes of mental illness. The authors use literature to accurately portray symptoms and to bring attention to triggers for mental illness, which helps the audience gain a clearer understanding of how these illnesses function. Further, this project studies the statements the authors make regarding their intent, which shows that the authors are motivated by a desire to explain why these stigmas and stereotypes exist, since many portrayals in the entertainment industry do more harm than good. The four novels in this study focus on different mental disorders, which will be important in understanding the stigma. Michael Ford's *Suicide Notes* focuses on the trauma homosexuals experience and problems with suicidal thoughts. Sam J. Miller's *The Art of Starving* is about the dangerous aspects of eating disorders. Katherine Glasgow's *Girl in Pieces* focuses on gender-based trauma with the main character feeling suicidal after experiencing rape. Neal Shusterman's *Challenger Deep* dives into the complex mind of an individual experiencing schizophrenia. This research concludes that harmful portrayals of mental disorders hurt individuals who experience these illnesses in real life, and these novels can promote a greater understanding of and compassion for people struggling with mental illness.

Title: The Unseen Potential Behind the Graphic Novel

Presenter: Isabel Barbera

Mentor: Dr. Jennifer Nesbitt

ScholarSphere Link: <https://scholarsphere.psu.edu/resources/99a415e9-f563-4a56-bf81-a779b208bbf3>

Zoom Link: <https://psu.zoom.us/j/95560978443?pwd=OHJoY0toVUJmYk3bFlYl11KL0JJUT09>

Abstract: Graphic novels are popular with readers, but in the college curriculum they are often disregarded as “picture books.” How can the existing research and analysis behind graphic novels be used to eliminate this stigma, and contribute to including these books in our curriculum? This project studies the history of the graphic novels’ stigmatization, and asserts the benefits of including them regularly in the school curriculum. Because graphic novels descend from comic books, they have been stigmatized as “easy reads” for younger audiences. However, recent research shows that graphic novels are beneficial in introducing a different form of literary analysis through their usage of art and perspective. Despite negative critical receptions, graphic novels can make a difference for modern day students because they can provide a different way for students to examine storytelling, learn history and ethics, and offer a new perspective for analyzing literature. Using both established graphic novels like *Watchmen* and *Maus*, as well as newcomers like *Speak* and *Boxers and Saints*, the project demonstrates how students can benefit from the inclusion of graphic novels in their curriculum. The project concludes that as the ever expanding forms of storytelling grow, it is important to consider that the inclusion of new mediums, such as the potential behind graphic novels and how they can be used as a substantial medium for education, are essential for students.

Title: The Ways Youth Sports Address Gender Issues in Student Athletes

Presenter: Kara James

Mentor: Dr. Robert Foschia

ScholarSphere Link: <https://scholarsphere.psu.edu/resources/825da977-42dc-4462-af63-6e1ce0e0c97b>

Zoom Link: <https://psu.zoom.us/j/96806102067?pwd=L3dmODF5YWd3SjdvNnpRUmpOdGgzQT09>

Abstract: This study will have an emphasis on the ways in which sports address gender issues in young girls. There are ample studies on why children drop out of sports, but there is limited research within the past decade that focuses on dropout rates in young girls. This study would determine how gender differences in sports change the reason kids drop out, specifically how they affect middle and high school-aged girls. I spent last semester conducting independent research on this dropout phenomenon. I reviewed more than forty articles regarding this issue and categorized the most frequently addressed. Through my research, I have found five core issues pertaining to Gen Z dropout rates, particularly in females from ages twelve to sixteen. These are material constraints, limited coaching and mentorship, social issues, a strong emphasis on academic success, and lack of enjoyment. Specifically, this study will determine how gender in youth sports impacts these five areas and how Gen Z athletes respond to them.

Title: Value Based Recruiting: Pilot Study

Presenter: Alexis Morales

Mentor: Dr. Joe Downing

ScholarSphere Link: <https://scholarsphere.psu.edu/resources/aa0f7d1a-21b4-49fe-8838-5fbef73b5c3a>

Zoom Link: <https://psu.zoom.us/j/94300032567?pwd=NkFHbTVqV2lySFIEUWkL1h2V1JLQT09>

Abstract: Little research exists around the decision-making process that high school golfers use when deciding where to play golf at college. This pilot study has two objectives: (1) to use peer-reviewed research to help identify the values that such athletes look for within a college golf team, and (2) to develop a new recruiting video to highlight such values. To the end, the study interviewed one high school athlete and did a best practice search of numerous college golf recruiting videos. The initial data found that three of Rokeach's (1968) core values—family, community, and coach mentoring—were prominent. Next, the researcher implemented these values into a recruitment video targeted at high school golfers. Future work in this project will include testing the video's messaging content's effectiveness on a stratified sample of high school golfers.

Title: Korean War: The President, the General, and the Soldier

Presenter: Robert Reynolds

Mentor: Jonathan Price

ScholarSphere Link: <https://scholarsphere.psu.edu/resources/beaa9062-a60e-4f34-92ad-cfbf1843b557>

Zoom Link: <https://psu.zoom.us/j/97238488719?pwd=Z3k1cXpXeU1kR3lKWfPmDG16clRldz09>

Abstract: The United States of America, on the cusp of unprecedented economic and global influence after World War II, was faced with the self-appointed task of the containment of Communism and its throttling grip across the globe. This research explores the impact of the new strategic and geopolitical challenge the United States faced through the actions of its President, Top Pacific Commander, and a young man drafted to fight America's forgotten war.

Social/Behavioral Sciences/IST Unit

Title: What do Penn State York students think about homelessness?

Presenter: Amy Bishay

Mentor: Dr. Sukhdeep Gill

ScholarSphere Link: <https://scholarsphere.psu.edu/resources/50df247e-f850-4a2d-b62a-b6a6cc0ae404>

Zoom Link: <https://psu.zoom.us/j/96978070469?pwd=azFGTjkycnp5bm01UWRuUmVxd2REZz09>

Abstract: Success of a nation depends on the collective flourishing of the whole population. As Gandhi said, “A nation’s greatness is measured by how it treats its weakest members”. Since 2008, the rate of homelessness in the U.S. has increased by 61 percent and an estimated 13,000 U.S. individuals experiencing homelessness die every year (Smiljanic, 2021). Caring for this segment of the population depends on policies that are shaped by how we, as a society, view such hardships. Therefore, this study aimed to explore Penn State York (PSY) students’ knowledge and perceptions of people facing homelessness, as well as their ideas for combatting it. We collected data from thirty-one students using online surveys in spring 2021. Overall analyses revealed that students had limited knowledge about the prevalence of homelessness (13 percent correct responses). Similarly, 47 percent knew the estimated number of children and veterans (20 percent) experiencing homelessness. A majority (80 percent) knew about the low life expectancy rates for homeless individuals. On average, students reported that people are homeless because of poor decisions ($M = 2.7$) and can find jobs and change their lives ($M = 2.5$). A majority of students (87 percent) noted that taxpayer dollar should be used to help this group. Respondents suggested several strategies to help them including more shelters, jobs and job training opportunities, and rehabilitation programs responsive to their specific needs. There were no differences in student perceptions based on sex, year in college, major, ethnicity, or annual household income.

Title: Improving Voting with Blockchain

Presenter: Jack Taylor

Mentor: Bill Cantor

ScholarSphere Link: <https://scholarsphere.psu.edu/resources/2b26d843-c343-4097-ae64-cf2e885d645c>

Zoom Link: <https://psu.zoom.us/j/96466883296?pwd=OXJPWnVoSDdNY1ZPWkJqenlISnphUT09>

Abstract: The current conventional voting process/system has been in the news lately. The main concerns have been the lack of transparency, the lack of access, and the accuracy of the vote count. Whether these are all legitimate concerns or not is not the point, the lack of confidence in the system is. Mail-in votes can be altered or stolen, election officials can count inaccurately, and computers can be hacked. This research is to investigate the possibility of using the power of blockchain to solve these issues. When you hear of blockchain, people assume you are talking about Bitcoin or, “Isn’t blockchain the same thing as Bitcoin?” “Isn’t this what criminals use?” Blockchain is one of the underlying technologies that enable the success of cryptocurrencies such as Bitcoin. This research proposes to use blockchain in conjunction with private/public key cryptography to allow everyone to see what votes were cast and what votes were counted without revealing the voter information. At the same time, the voter would be able to track their own vote and ensure that it was accurate and was properly counted. The biggest advantage of utilizing blockchain is allowing the public to see their own individual verified vote and see the final counts in real-time.

Natural and Mathematical Science and Engineering Unit

Title: Using Bioinformatic Approaches to Assess Homology and Map Protein Domains of Putative Spider Circadian Rhythm Genes

Presenter: Hunter Haggett and William Christopher Roe

Mentor: Dr. Jessica Petko

ScholarSphere Link: <https://scholarsphere.psu.edu/resources/ae2c1251-47c4-44cd-9894-30dce5b0ab75>

Zoom Link: <https://psu.zoom.us/j/96184308584?pwd=eVVhb2NrWU9XRUIZRkVTQS9ua055UT09>

Abstract: Internal biological clocks allow organisms to adjust their behavior and physiology to the external environment. While circadian (daily) rhythms are affected by environmental stimuli (such as light, temperature...etc.), they tend to be driven by a conserved set of endogenous molecular mechanisms. While most animals use these innate controls to follow a daily period close to 24 hours without environmental time cues (constant darkness), spiders have species specific daily periods that deviate significantly from this norm ranging from 18-29 hours. Differences in the molecular clockwork could be a contributor to the variation observed in spider periods. While the identity and function of circadian regulators in insects have been well characterized, these regulators have not yet been studied in spiders. The goal of this study was to identify putative circadian regulators in spiders and to analyze and compare domain structures of these proteins to their orthologs in other invertebrates. Using bioinformatic approaches, we identified spider orthologs for six central circadian rhythm regulatory proteins. Domain structures were comparable between spiders, insects, and crustacean orthologs, however some differences were observed in location and number of nuclear localization and export sequences. These results support the existence of an ancestral circadian clock pathway that may function similarly in spiders as in other invertebrates. This study has set the stage for future functional analyses of these proteins in vitro and in vivo.

Title: Synthesis of Cellulose Acetate Derivatives

Presenter: Asik Hanif

Mentor: Dr. F. Andrew Landis

ScholarSphere Link: -

Zoom Link: <https://psu.zoom.us/j/95802482683?pwd=aWJSSFI2Zk0za053dkhjUINieE5hdz09>

Abstract: This experiment was conducted to fulfil the requirements for a Chem 212 honors project. Cellulose was reacted with acetic anhydride to form cellulose triacetate. After the product was recovered, some of the ester groups were hydrolyzed to form cellulose diacetate. These two products were cast into thin films and tested using infrared spectroscopic analysis. The hydrolytic stability of the films will be compared by observing the change in mass of the films over time.

Title: The Effect of Developmental Stress of Growth in *Parasteatoda tepidariorum*

Presenter: Juan Sanchez Caba

Mentor: Dr. Jessica Petko

ScholarSphere Link: <https://scholarsphere.psu.edu/resources/dc335fd4-48b0-46f6-aa69-0f478fc9ad1b>

Zoom Link: <https://psu.zoom.us/j/93991289263?pwd=NXlOTXlTUTBhM3Jhelh4cEJKRDhJQT09>

Abstract: Cellular chemical signals help organisms respond or adapt to environmental stresses throughout their lifetime to optimize survival and reproduction. In invertebrates, two neurotransmitters, octopamine and serotonin influence various life sustaining behaviors such as predation, predator avoidance, and mating and are also critical for stress induced changes in behavior and physiology (ex. immune function). A previous study conducted in the nematode worm, *C. elegans*, demonstrated that starvation, a stressor, at crucial developmental periods altered the levels of these neurotransmitters, and resulted in abnormal growth and behavior of male worms. In this study, we sought to determine whether the common house spider *Parasteatoda tepidariorum* (*P. Tep.*) is susceptible to the effects of developmental starvation through analysis of growth, adult behavior, and expression of serotonin and octopamine synthesizing enzymes and receptors. Here we report that growth was affected by developmental starvation during the juvenile and adult stages. We are currently analyzing expression and behavioral data to determine if these processes were also affected by this stressor.

Title: The Impact of Wildfire on the Lizard Malaria Parasite, *Plasmodium mexicanum*

Presenter: Huntur Woodard

Mentor: Dr. Anne Vardo-Zalik

ScholarSphere Link: <https://scholarsphere.psu.edu/resources/48bf5202-8f5e-496f-88a3-0884686504ba>

Zoom Link: <https://psu.zoom.us/j/93900738541?pwd=YUxNNmg1NGNlK1VrRTRrSWZCYjN1dz09>

Abstract: Hopland, California is site to the longest-term study on a wildlife malaria pathogen where the lizard malaria parasite, *Plasmodium mexicanum*, naturally infects the western fence lizard, *Sceloporus occidentalis*. In summer 2018, more than half of the site was devastated by wildfire. We aimed to determine if/how the wildfire affected the overall prevalence of malaria and if the genetic diversity of the parasite was significantly different compared to the diversity present before the fire. Samples from the year prior to the fire (2017, N=432) were compared with those collected the year following the fire (2019, N=423). Overall, there was no significant change in parasite prevalence across the field station (13.6% vs. 14.7%, 2017 and 2019 respectively, $p=0.59$). However, we did notice some prevalence changes among sites, so while the overall malaria prevalence remained similar, the patterns of malaria infection among sites did change. We are currently analyzing samples for diversity at 4 polymorphic microsatellite loci to determine if the fire had effects on infection complexity (number of coinfecting genotypes) and/or allelic diversity.