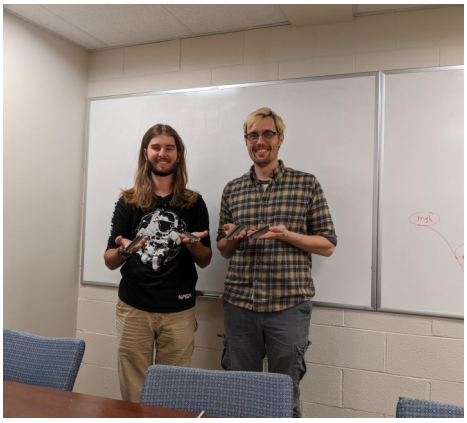
Student Research, Scholarship and Creative Activities Grant 2022-2023 Recipients

Undergraduate and Graduate students in any major or program at SRU are invited to apply for up to $1,500 to support independent research or a scholarly project to be conducted in collaboration with a faculty or staff mentor. Research is defined in a broad context to include any scholarly, creative, entrepreneurial, or civic activity and is not limited to the traditional concept of laboratory studies in the sciences. The goal of this program is to support and promote high-quality student/faculty collaborative research, scholarship and creative activity.



Eric Frohnapfel
Dr. Louis Christensen

College of Engineering & Science
Physics & Engineering

Title: Experimental Air Heating System for Internal Convective Heat Transfer Research

Amount Awarded: $1,500

Abstract: Heat transfer from fluid flow through channels, called internal convection, is the most used method of heat dissipation in commercial applications. However, internal convection is difficult to characterize because the traditional equipment required to do so is expensive and limits the geometry of the channels or the material that the channels are made of. This project endeavors to design and produce a device that will enable future undergraduate research into characterizing internal convection via a wall calorimeter technique and a FLIR A700 thermal imaging camera. The testing apparatus built for this project will be able to precisely control the air mass flow rate and air temperature of air that is sent through the test channels of various geometries and materials. Throughout the building of this apparatus, the student will gain hands-on experience with the engineering design process and will be introduced to topics important to his planned career in aerodynamics design.

Victoria Hudson
Brandon Yeropoli
Dr. Joseph Fiedor

College of Engineering and Science
Physical Therapy

Title: Diversity of Skin Tone Representation in Physical Therapy Textbooks

Amount Awarded: $1,484

Abstract: Textbooks are a fundamental educational resource for students in higher education. Prior studies have found lighter skin tones to be represented at a rate disproportionately higher than that of the general human population. No known evidence exists regarding the diversity of skin tone representation in Physical Therapy textbooks. The purpose of this study is to examine images in required textbooks utilized in the first year of study in the Doctor of Physical Therapy program at SRU. Researchers will quantify the diversity of skin tone in images depicting human structures in these textbooks, using a standardized scale. The results of this study may provide insight for educators, textbook publishers, and authors regarding a need for diversifying the images used with respect to skin tone. This study may also offer evidence of need for a more comprehensive investigation of physical therapy textbooks.

Tonnie Craft
Dr. Ethan Hull

College of Education
Physical & Health Education

Title: Can We Improve Soccer? An Examination of the Strategy of Heading the Soccer Ball

Amount Awarded: $1,500

Abstract: Soccer is the most popular game in the world with the straightforward object of scoring goals in the opposing team's net by moving the ball down the field. Teams use a variety of methods to maintain possession while moving the ball down the field such as passing, dribbling, and heading. This study examines headers in relation to possession time. Data on possession time will be collected by watching soccer matches on streaming services and recording data. After the data has been collected, two researchers meet to review and solve discrepancies. Pilot data from England's top league shows that headers result in a turnover rate of over 70% indicating that heading the ball decreases possession time, thereby decreasing their chance for goal scoring opportunities and winning outcomes. This study may decrease the number of unnecessary headers from the game, and subsequently decrease the likelihood of brain injuries.

David Grimm
Dr. Christopher Maltman

College of Engineering & Science
Biology

Title: Taxonomic Classification TSed Te1, A Bacterium Isolated from Acid Mine Drainage

Amount Awarded: $1,500

Abstract: Identification and classification of new bacterial isolates is a critical component of microbiology. It helps expand our understanding of the microbial world as well as identify new bacterial isolates with potentially useful abilities. To this end, we will set forth to complete the official taxonomic classification of the bacterial isolate TSed Te1, which was found in acid mine drainage. This bacterium was originally isolated for its ability to resist and reduce increased concentrations of the highly toxic metalloid oxyanions tellurite and selenite. High level bacterial resistance to these compounds has been sought after for potential use in bioremediation of contaminated environments as well as possible use in biological recovery of elemental Tellurium and Selenium from industrial e-waste, such as solar panels. Proper classification of TSed Te1 will aid in our understanding of not only the diversity of the microbial world, but also potentially lead to green methods of environmental remediation.

Isabella Jones
Dr. Tim Oldakowski

College of Liberal Arts
Languages, Literatures, Cultures, and Writing

Title: Dear Reader

Amount Awarded: $865

Abstract: The purpose of this civic activity project is to promote literacy for students grades 9-12 at a regional high school by offering students an in-school and after-school Young Adult book study. By collaborating with an in-service teacher to facilitate the multi-modal discussions, students will have the opportunity to engage with texts and their peers in a meaningful way beyond the required curriculum. They will also apply multiple modes of analysis with the tests. While this falls under the category of research for the proposal research will not be conducted, as this is a civic engagement.

Joseph Beil
Dr. Iuri Santos

College of Engineering & Science
Physics & Engineering

Title: Dewatering AMD Sludge with EKG

Amount Awarded: $1,500

Abstract: Acid mine drainage treatment in the Appalachian region produces a sludge containing Rare Earth metals that are valuable to society. In order to extract these metals from the sludge, dewatering the sludge is necessary. This research proposal intends to evaluate a novel dewatering method called electrokinetic geosynthetics applied to AMD sludges. The research outcomes are the comparison of the EKG benefits to AMD dewatering and cost analysis based on power consumption to generate a high solids content REEenriched product ready for REE-extraction. If proven effective, EKG will improve the dewatering of REEenriched sludges, thus considerably reducing the cost of manufacturing REE in the region.

Sonnet Robertson
Dr. Xindi Sun

College of Engineering & Science
Physics and Engineering

Title: Gelation of In-Situ Gel of Porous Media during Dual-injection Process

Amount Awarded: $1,500

Abstract: Hydrogels as plugging agents have been applied in many oil/gas reservoirs to control fluid flow in channels/fractures and divert fluid to target zones/areas. They have been extensively and successfully used in the oil and gas industry to enhance recovery. Hydrogels have superior injectivity and can penetrate deeply in fractures to form sufficient in-depth plugging. However, due to high mobility, gels may flow into both large and small fractures simultaneously if used the traditional singe well injection method, which can cause near-wellbore damage. To overcome the near wellbore damage problem and improve in-depth deliverability, we propose using a dual-fluid dual-well injection method to place in-situ gel into the in-depth.

Zachary Coletti
Alana Colvin
Dr. Mustafa Casson

College of Engineering & Science
Physics & Engineering

Title: Wolf Creek Fieldwork

Amount Awarded: $1,480

Abstract: The Wolf Creek archaeological site, located in the Miller Woods Nature Preserve in Butler County, Pennsylvania, was first registered by Dr. Stanley Lantz in 1975 and has been excavated periodically by SRU faculty, students and members of the Butler County community in the decades since. Analysis of artifacts from the site suggest that the area was occupied periodically through the Late Archaic (*ca*. 4000 years ago) and Early Woodland (*ca*. 1000 years ago) Periods. Historical records document that existence of an indigenous community knowns as Kuskuski in the area at the time of colonial expansion and settlement in the 17th and 18th centuries (Skirboll & Hanson, 1996, pp. 54-67). The original site, located between the site's namesake creek and a stand of sugar maple trees, was excavated in the 1980s; however, all artifacts and excavation documentation were lost. This funding will be used for completing preliminary analyses of artifacts recovered from that class to better understand the prehistorical use of the landscape at Wolf Creek.

Collette Grossman
Dr. Elise Somers

College of Health Professions
Physician Assistant Studies

Title: Sun Safety and Obesity Prevention for Underserved Populations

Amount Awarded: $1,500

Abstract: This project will help to provide supplies and education about sun protection and childhood obesity to new and expecting mothers at The Life Center, a pregnancy center in Venango County. This project will enhance the students learning while servicing vulnerable populations in an underserved local community.