RESEARCH EXPERIENCE FOR TEACHERS PROGRAM

During this 7-week full-time, research experience, teachers work with a faculty member on an authentic research project and receive professional development virtually by the Penn State Center for Science and the Schools (CSATS) to help translate the experience to the classroom. Teachers will conduct their research either in-person or virtually based on the research placement and the teacher’s location. There are a variety of placements to choose from, but teachers will be placed based on their areas of interest and courses taught.

PROGRAM ELIGIBILITY

- Must be a secondary STEM teacher with at least 3 years of full-time teaching experience
- Must commit to implementing a classroom research project during 2022 - 2023 school year

PROGRAM BENEFITS

Stipends
$5000 stipend for the summer program and developing a classroom research project to implement during the academic year
$1500 stipend for implementing the classroom research project with students during the academic year

Conference presentation
Option to present at M.J. Murdock Partners in Science Conference in San Diego, CA, January 2023 (up to $600 travel stipend)

Classroom materials
Receive up to $1000 stipend for materials and resources needed to implement the classroom research project

Graduate course credit
Opportunity to earn up to 3 graduate credits through Penn State (SCIED 597) - ask about this!

Deadline extended!
May 15, 2022
Visit our website for more information and to apply!

www.csats.psu.edu

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**Agricultural and Energy Engineering**

Consortium for Cultivating Human And Naturally regenerative Enterprises (C-CHANGE) seeks to optimize the production of renewable natural gas and its byproducts through anaerobic digestion of herbaceous biomass and manure on farms in the upper Midwest and mid-Atlantic regions. Note: This placement will be conducted virtually with potential for in-person work.

**Bioinformatics**

This project will focus on gene regulation and transcription factor binding to introduce concepts in bioinformatics. Participants will learn how to computationally process DNA sequencing data, map regulatory events, and analyze their features. Note: This placement is preferred to be in-person at University Park, but could be offered virtually.

**Chemistry Research**

This placement, funded by the National Science Foundation, will allow a secondary STEM teacher engage in a research project with Dr. Abu Assaduzzaman, Assistant Professor of Chemistry at Penn State Harrisburg. The teacher placed in this project will mathematically model the thermodynamics and rate of a chemical reaction, and calculate the activation energy for the interactions. Specifically, the teacher will model the interaction between a small ice cluster and mercury molecules, an important reaction in Mercury deposition on snow/ice surfaces.

**Estuarine Metabolism**

This project aims to better understand the regional effects of climate change by exploring the biogeochemistry (the cycling of nutrients) of the Chesapeake Bay through analysis of estuarian rates of cellular respiration and photosynthesis. Note: This placement is being offered virtually, with an opportunity for some in-person field work.

**Architectural Engineering**

This placement engages secondary STEM teachers in a research experience with a faculty member in architectural engineering. These researchers consider both the human experience in buildings as well as building system efficiency. Science topics include indoor air quality, lighting effectiveness, thermal comfort, and energy efficiency. Note: This placement is being offered virtually.

**Biomedical Engineering**

Building on fundamentals of physics and anatomy, this project will focus on using a computational model understand how the effects of musculoskeletal injury and how treatment can improve function. Note: This placement is being offered in-person at University Park or virtually.

**Electrical Engineering**

The Multi-agent Networks Laboratory aims to develop distributed algorithms for swarms of mobile robots (e.g., drones and autonomous cars) which are capable of sensing, computing, communicating and actuating. The algorithms allow the robots to collectively accomplish missions, which are beyond the capabilities of individual robots, through local information sharing and decision-making in dynamically changing, uncertain and adversarial environments. Note: This placement is being offered in-person at University Park or virtually.

**Meteorology**

This project aims to better understand and document the daytime evolution of the planetary boundary layer - the lowest layer of the atmosphere that is in contact with the Earth’s surface and varies in depth from a few tens of meters at night to a few km during the day. This important atmospheric layer will be observed using data from National Weather Service dual-polarization radars and from small weather balloons launched from Penn State. Teachers will assist in data collection and data processing. Note: This placement is being offered in-person at University Park.

**Materials Engineering**

This program engages secondary teachers with a faculty member in materials science/engineering or electrical and computer engineering that work on the ASSIST project (https://assist.ncsu.edu/). This project aims to develop wearable sensors that run on energy harvested from the environment. Note: This placement is being conducted virtually or in-person at NC State.