2023 Undergraduate Summer Research Program

**Graphene on any surface: one-step fabrication of antibacterial surgical implants**
Advisor: Mostafa Bedewy, mechanical engineering & materials science
Student: Nathan Carney, industrial engineering *(John C. Mascaro Scholar)*

**Urban Permaculture**
Advisors: Kevin Bell, bioengineering
Corey Flynn, bioengineering
Student: Paloma DiBella, geology & environmental science *(John C. Mascaro Scholar)*

**Functional Magnetic Materials for Energy Efficient Magnetocaloric Cooling**
Advisor: Markus Chmielus, mechanical engineering & materials science
Student: Emma Spatz, mechanical engineering & materials science *(John C. Mascaro Scholar)*

**Energy-efficient processors, sensors, and systems for space-based sensing and computing**
Advisor: Alan George, electrical & computer engineering
Student: Guhan Kumaran, electrical & computer engineering *(John C. Mascaro Scholar)*

**Testing algorithms for electric power grid operation**
Advisor: Oliver Hinder, industrial engineering
Student: Zekun Yang, industrial engineering *(John C. Mascaro Scholar)*

**Using Machine Learning Models to Identify Wildlife Species in Field Recordings**
Advisors: Justin Kitzes, biological sciences
Student: Tabea Schneider, biological sciences *(John C. Mascaro Scholar)*

**Developing Speculative Inference to Increase Energy-Efficiency of IoT Systems**
Advisor: Stephen Lee, computer science
Student: Ziyu Xia, computer science & mechanical engineering & materials science *(John C. Mascaro Scholar)*

**Antireflective Coatings and Surfaces for Concentrated Solar**
Advisor: Paul Leu, industrial engineering
Student: Fanbo Feng, mechanical engineering & materials science *(John C. Mascaro Scholar)*

**ESG related metrics in management compensation schemes**
Advisor: Mark Ma, business
Student: Declan Kelly, industrial engineering *(Douglas Condon Scholar)*

**Decarbonizing Chemistry with Renewable Electrons**
Advisor: James McKone, chemical & petroleum engineering
Student: Isabella Hughes, chemical & petroleum engineering *(John C. Mascaro Scholar)*

**Applying Principles of Clinical Psychology to the Climate Crisis**
Advisor: Kirsten McKone, psychology
Student: Anvi Joshi, psychology *(John C. Mascaro Scholar)*

**Generating knowledge graphs to reduce combinatorial complexity of data-driven methods**
Advisor: Natasa Miskov-Zivanov, electrical & computer engineering
Student: Haomiao Luo, mechanical engineering & materials science *(John C. Mascaro Scholar)*
Co-localized Enzymes for Enhanced Biodegradation of Environmental Contaminants
Advisor: Paul Ohodnicki, mechanical engineering & materials science
Student: Zisong Wang, mechanical engineering & materials science (John C. Mascaro Scholar)

Modeling democratic resiliency of civic networks and evaluating policy interventions against civic disengagement and social unraveling
Advisor: Amin Rahimian, industrial engineering
Student: Xinyue Du, industrial engineering (John C. Mascaro Scholar)

Green Engineering
Advisor: Joaquin Rodriguez, chemical & petroleum engineering
Student: Melanie Hong, chemical engineering (John C. Mascaro Scholar)

Developing Climate Leaders
Advisor: Julia Santucci, GSPIA
Student: Mina Kimak, geology & environmental science (John C. Mascaro Scholar)

Implementing Sustainable Development Goals in Pittsburgh
Advisor: Jackie Smith, sociology
Student: Livia Daggett, political science & philosophy (John C. Mascaro Scholar)

Practical optimization of traffic signals to reduce fuel consumption and vehicular emissions
Advisor: Alek Stevanovic, civil & environmental engineering
Student: Noah Kochavi, computer engineering (Charles and Linda Sorber Scholar)

Environmental Inequality and Disasters Research
Advisor: Fernando Tormos-Aponte, sociology
Student: Ruochong Zhu, industrial engineering (John C. Mascaro Scholar)

A Loopy Way to Hydrogen
Advisor: Götz Veser, chemical & petroleum engineering
Student: Hannah Zucco, chemical & petroleum engineering (John C. Mascaro Scholar)

Design spinel ferrite magnetic adsorbents for water purification
Advisor: Guofeng Wang, mechanical engineering & materials science
Student: Zhengkai Chen, mechanical engineering & materials science (John C. Mascaro Scholar)

Co-localized Enzymes for Enhanced Biodegradation of Environmental Contaminants
Advisor: Meng Wang, civil & environmental engineering
Student: Sophie Brazydola, chemistry (Charles and Linda Sorber Scholar)

Forest Carbon Credit Programs: Who Participates and What are the Effects on Forests?
Advisor: Jeremy Weber, economics
Student: Adam Usmanov, mathematics (Douglas Condon Scholar)

Design of high-performance composite materials for sustainable structural applications
Advisor: Wei Xiong, mechanical engineering & materials science
Student: Xinyu Wan, mechanical engineering & materials science (John C. Mascaro Scholar)

Developing Electrical Interfaces for Phototonic A.I. Hardware
Advisor: Nathan Youngblood, electrical & computer engineering
Student: Alli Hastings, mechanical engineering & materials science (Frank and Daphna Lederman Scholar)

Sustainable photopolymer 3D printing
Advisor: Xiayun Zhao, mechanical engineering & materials science
Student: Ethan Tost, mechanical engineering & materials science (John C. Mascaro Scholar)