



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 Vesper, 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

Students: 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 Photonic 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*)