

- 1. Reducing Emissions - Fuel Consumption Reduction Technologies for Pittsburgh Port Authority Buses**  
*Advisor: Matthew Barry, mechanical engineering & materials science*
- 2. Silk-based flexible/wearable electronics: towards sustainable fabrication and materials engineering**  
*Advisor: Mostafa Bedewy, industrial engineering*
- 3. Energy-efficient synthesis of carbon nanotubes by rapid thermal chemical vapor deposition**  
*Advisor: Mostafa Bedewy, industrial engineering*
- 4. Laser-induced graphene: towards understanding proximity effects in patterned graphitization of polymers**  
*Advisor: Mostafa Bedewy, industrial engineering*
- 5. Developing energy audit features of smart phones**  
*Advisor: Mike Blackhurst, university center for urban and social research*
- 6. Validating citizen science tools used to identify lead water lines**  
*Advisor: Mike Blackhurst, university center for urban and social research*
- 7. Additively manufacturing layered structures and characterizing magnetocaloric properties of for high efficient magnetic refrigeration**  
*Advisor: Markus Chmielus, mechanical engineering & materials science*
- 8. Ni-Mn-Ga magnetic shape memory alloys for power generation applications**  
*Advisor: Markus Chmielus, mechanical engineering & materials science*
- 9. Energy-efficient processors, sensors, and systems for space-based sensing and computing**  
*Advisor: Alan George, electrical & computer engineering*
- 10. Chemical semantics and its implications on environmental transport, fate, and toxicity**  
*Advisors: Leanne Gilbertson and Carla Ng, civil & environmental engineering*
- 11. The rise of diversity in academia: How did it emerge and how do we promote future growth in STEM fields?**  
*Advisors: Leanne Gilbertson and Carla Ng, civil & environmental engineering*
- 12. Small & Mighty: Exploring nature to identify bacteria capable of degrading a new generation of environmental contaminants**  
*Advisor: Sarah Haig, civil & environmental engineering*
- 13. Structural Design with Bamboo**  
*Advisor: Kent Harries, civil & environmental engineering*
- 14. Capturing and storing energy from hurricane waves with a piezoelectric device**  
*Advisor: Katherine Hornbostel, mechanical engineering & materials science*
- 15. Capturing carbon dioxide from the ocean with a membrane device**  
*Advisor: Katherine Hornbostel, mechanical engineering & materials science*

- 16. Reducing frictional energy losses in transportation and industry: Surface coatings and the effect of surface roughness on friction**  
*Advisor: Tevis Jacobs, mechanical engineering & materials science*
- 17. Using acoustic sensors and machine learning to locate birds and bats in the field**  
*Advisor: Justin Kitzes, Department of Biological Sciences*
- 18. Durable Antireflective, Anti-Soiling and Self-Cleaning Solar Glass**  
*Advisor: Paul Leu, industrial engineering*
- 19. Simulating First Solar Cadmium Telluride Solar Cells**  
*Advisor: Paul Leu, industrial engineering*
- 20. New materials to enable radical electrification of the commodity chemical industry**  
*Advisor: James McKone, chemical & petroleum engineering*
- 21. Designing new ways to test the performance of large-scale battery technologies**  
*Advisor: James McKone, chemical & petroleum engineering*
- 22. Smarter Riversheds – real-time sensor networks**  
*Advisor: David Sanchez, civil & environmental engineering*
- 23. Recirculating Aquaculture – managing water quality in a closed system**  
*Advisor: David Sanchez, civil & environmental engineering*
- 24. Wind Prediction over Complex Terrain**  
*Advisor: Inanc Senocak, mechanical engineering & materials science*
- 25. Campus-Wide Sustainability Dashboard**  
*Advisor: Aurora Sharrard, Director, University Office of Sustainability*  
*Faculty collaborators: Drs. Melissa Bilec & Michael Blackhurst, plus interactions with Pitt Facilities Management*
- 26. Increasing the Structural Resilience of Reinforced Concrete through Bio-Remediation**  
*Advisor: Max Stephens, civil & environmental engineering*
- 27. Making more with less: “Greening” the process industry via process intensification**  
*Advisor: Goetz Vesper, chemical & petroleum engineering*
- 28. Going with a Bang: Cavitation reactors as highly efficient concept for production of specialty chemicals**  
*Advisor: Goetz Vesper, chemical & petroleum engineering*
- 29. What the Frack: Designing nanocatalysts for responsible use of natural gas**  
*Advisor: Goetz Vesper, chemical & petroleum engineering*
- 30. 3D printing of graded alloys for sustainability improvement in fossil fuel engineering**  
*Advisor: Wei Xiong, mechanical engineering & materials science*
- 31. Post-processing design on superalloys by additive manufacturing for NASA space technology missions.**  
*Advisor: Wei Xiong, mechanical engineering & materials science*
- 32. Graphene-based composite materials for high performance thermoelectric devices**  
*Advisor: Minhee Yun, electrical and computer engineering*

**33. Developing a novel photopolymer based additive manufacturing machine (3D Printer) for high-resolution applications**

*Advisor: Xiayun Zhao, mechanical engineering & materials science*

**34. Real time measurement and control for directed energy deposition (DED) based metal additive manufacturing**

*Advisor: Xiayun Zhao, mechanical engineering & materials science*