Mascaro Center for Sustainable Innovation

2004-2018 Past Participants in Undergraduate Summer Research

2018 Participants

Protein-based nanomanufacturing: Using silk and hydrophobins for sustainable lithography
Megan Black, mechanical engineering & materials science
Advisor: Mostafa Bedewy, industrial engineering

Microstructure and properties of sintered magnetocaloric materials for efficient magnetic refrigeration
Rafael Rodriguez, mechanical engineering & materials science
Advisor: Markus Chmielus, mechanical engineering & materials science

Magnetogaloric effect of binder jet printed Ni-Mn-Ga magnetic shape memory *alloy*
Aaron Acierno, mechanical engineering & materials science
Advisor: Markus Chmielus, mechanical engineering & materials science

Energy-efficient processors, sensors, and systems for space-based sensing and computing
Sridhar Reddy Velagala, electrical engineering and computer science
Advisor: Alan George, electrical & computer engineering

Designing efficient electrocatalysts devices atom by atom
Sarah Newton, chemical & petroleum engineering
Advisor: John Keith, chemical & petroleum engineering

Black silicon solar cells
Sooraj Sharma, mechanical engineering & materials science
Advisor: Paul Leu, industrial engineering

Nanofabricated interfaces for electrochemical catalysis
Julia McKay, chemical & petroleum engineering
Advisor: James McKone, chemical & petroleum engineering

Capturing tidal energy using smart materials
Katrina Haidari, mechanical engineering & materials science
Advisor: Katherine Ong, mechanical engineering & materials science

Smarter Riversheds – Real-time environmental sensors networks
Kathleen Beaudoin, civil & environmental engineering
Advisor: David Sanchez, civil & environmental engineering

Feeding a Growing World: Towards a novel process for ammonia synthesis
Eyram Akabua, chemical & petroleum engineering
Advisor: Goetz Veser, chemical & petroleum engineering

Making more with less: "Greening" the process industry via process intensification
Trevor Devine, chemical & petroleum engineering
Advisor: Goetz Veser, chemical & petroleum engineering

Green electronics – Low-Power memory device on transparent nanopaper substrate
Nolan Ardolino, mechanical engineering & materials science
Advisor: Feng Xiong, electrical and computer engineering

3D Printing of Graded Alloys for Energy Efficiency in Aerospace Materials Manufacturing
Noah Levine, mechanical engineering & material science
Advisor: Wei Xiong, mechanical engineering & material science

2017 Participants

Water desalination through reactive extraction
Madeleine Hamrick, Chemical & Petroleum Engineering

Advisor: Eric Beckman, Chemical Engineering

Pittsburgh Water Microbiome
Austin Kuntz, Bioengineering
Advisor: Kyle Bibby, Civil & Environmental Engineering

Additive manufacturing of energy-saving and energy producing materials
Colleen Hilla, Materials Science & Engineering
Advisor: Markus Chmielus, Mechanical Engineering & Materials Science

Development of Next Generation Nano-Antimicrobials
Cole D'Aurizio, Mechanical Engineering
Advisor: Leanne Gilbertson, Civil & Environmental Engineering

Unlocking energetically efficient water oxidation for ozone disinfectants
Angela Leo, Chemical & Petroleum Engineering
Advisor: John Keith, Chemical & Petroleum Engineering

Machine Learning Blueprints for Green Chelating Agents
Ethan Henderson, Chemical & Petroleum Engineering
Advisor: John Keith, Chemical & Petroleum Engineering

Black silicon etching for solar cells
Maxwell Lindsay, Materials Science & Engineering
Rafael Rodriguez, Materials Science & Engineering
Advisor: Paul Leu, Industrial Engineering

Electrochemistry for sustainable energy conversion and storage
James Hughes, Chemical & Petroleum Engineering
Dean Miller, Chemical & Petroleum Engineering
Advisor: James McKone, Chemical Engineering

Integrating Sustainable Design in Engineering Education
Kaleigh Smith, Mechanical Engineering
Advisor: David Sanchez, Civil & Environmental Engineering

Desalination using polymer crystallization
Joseph Hamm, Chemical & Petroleum Engineering
Advisor: Sachin Velankar, Chemical Engineering

Feeding a Growing World: Towards a Novel Process for Ammonia Synthesis
Eric McElhinny, Chemical & Petroleum Engineering
Kendra LaVallee, Chemical & Petroleum Engineering
Advisor: Goetz Veser, Chemical & Petroleum Engineering

Automated growth of two-dimensional materials for green electronics
Joji Bronner, Computer Engineering
Advisor: Feng Xiong, Electrical and Computer Engineering

2-D and nanomaterials for Energy Applications
Connor Herring, Chemical & Petroleum Engineering
Advisor: Minhee Yun, Electrical and Computer Engineering

2016 Participants

Use of Equilibrium Chemical Reactions to Enhance Desalination and Heat Transfer Processes
Emily Connor, Chemical and Petroleum Engineering
Advisor: Eric Beckman, Chemical and Petroleum Engineering

Pittsburgh Water Microbiome Project
Marissa Drobitch, Civil and Environmental Engineering
Advisor: Kyle Bibby, Civil and Environmental Engineering

Additive Manufacturing of Magnetocaloric Materials for High-efficiency Cooling
Katerina Kimes, Mechanical Engineering and Materials Science
Advisor: Markus Chmielus, Mechanical Engineering and Materials Science

Piezoelectric Foams for Energy Harvesting
Noah Perryman, Mechanical Engineering and Materials Science
Advisor: William Clark, Mechanical Engineering and Materials Science

Development of Stable Nano-Emulsions as a Sustainable Alternative to Conventional Fertilization Practices
Jasmine Toney, Chemical and Petroleum Engineering
Advisor: Leanne Gilbertson, Civil and Environmental Engineering

Mechanical Test Methods for Full-Culm Bamboo
Jelani Virgo, Civil and Environmental Engineering
Advisor: Kent Harries, Civil and Environmental Engineering

Black Silicon Solar Cells
Bradley Pafchek, Mechanical Engineering and Materials Science
Advisor**:** Paul Leu, , Industrial Engineering

Carbon Nanotube Based Fuel Cells
Anthony Galante, , Industrial Engineering
Advisor: Paul Leu, , Industrial Engineering

Renewable Energy Integration on the Electric Power Grid
Julia Cope, Electrical and Computer Engineering
Advisor: Thomas McDermott, Electrical and Computer Engineering

Sustainable Energy Generation Using Microbial Fuel Cells
Emily Klonicki, Civil and Environmental Engineering
Advisor: David Sanchez, Civil and Environmental Engineering

Sustainable Design within Engineering Education
Cameron Beichner, Mechanical Engineering and Materials Science
Advisor: David Sanchez, Civil and Environmental Engineering

Design of Lightweight 3D Printed Lattice Structured Parts
John Wallace, Mechanical Engineering and Materials Science
Advisor: Albert To, Mechanical Engineering and Materials Science

Dirt to Diamonds: CO_2 Conversion to Chemicals and Fuels
Patrick Asinger, Chemical and Petroleum Engineering
Isaac Mastalski, Chemical and Petroleum Engineering
Advisor: Goetz Veser, Chemical and Petroleum Engineering

2015 Participants

Pittsburgh Water Microbiome
Lucy Powell, Biological sciences
Advisor: Kyle Bibby, Civil and Environmental Engineering

On the Sustainability of Forests in PA: how disease, Bambi, & logging threaten regional forest health
Kyle Suess, Biological Sciences
Advisor: Walter Carson, Biological Sciences

Electrochemical Degradation of Persistent Organic Compounds
Alexandra Abram, Chemical and Petroleum Engineering
Advisor: Di Gao, Chemical and Petroleum Engineering

Buckling Behaviour of Full-culm Bamboo
James Bumstead, Civil and Environmental Engineering
Advisor: Kent Harries, Civil and Environmental Engineering

Computational modeling of CO_2 capture and conversion
Ronald Reynolds, Chemical and Petroleum Engineering
Advisor: Karl Johnson, Chemical and Petroleum Engineering

Understanding Complexity and Resilience in Engineered Systems
Andrew Beck, Chemical and Petroleum Engineering
Advisor: Vikas Khanna, Civil and Environmental Engineering.

Fabrication of new nanomaterials for solar cells
Thomas Werkmeister, Engineering Science
Sean McCarthy, Mechanical Engineering and Materials Science
Advisor: Paul Leu, Industrial Engineering

Black Silicon
Mohamed Kashkoush, Industrial Engineering
Advisor: Paul Leu, Industrial Engineering

Data Collection and Analysis of Energy Demands for Sustainable Buildings
Matthew Abbott, Industrial Engineering
Advisor: Thomas McDermott, Electrical and Computer Engineering

Cost-Effective Renewable Energy Integration on Electric Utility Systems
Taeyoung Lee, Electrical Engineering
Advisor: Thomas McDermott, Electrical and Computer Engineering

Sustainable Design within Engineering Education
John Walker, Civil and Environmental Engineering
Advisor: David Sanchez, Civil and Environmental Engineering

Sustainable Energy Generation using Microbial Fuel Cells
Troy Salvatore, Civil and Environmental Engineering
Advisor: David Sanchez, Civil and Environmental Engineering

Mechanical behavior of Novel 3D Printed Cellular Structures for Lightweight Applications
Joseph Brown, Mechanical Engineering and Materials Science
Advisor: Albert To, Mechanical Engineering and Materials Science

Clean and efficient production of energy and chemicals via "chemical looping"
Charles Hansen, Chemical and Petroleum Engineering
Advisor: Goetz Veser, Chemical and Petroleum Engineering

The Ugly Side of Nano: Towards Understanding Nanotoxicity
Julie Hartz, Chemical and Petroleum Engineering
Sarah Casne, Chemical and Petroleum Engineering**.**
Advisor: Goetz Veser, Chemical and Petroleum Engineering

Harnessing microbial power for waste-to-energy biotransformation
Lisa Stabryla, Engineering Science
Advisor: Na Wei, Civil and Environmental Engineering

2014 Participants

Microbiome of Pittsburgh Drinking Water
Maia Hoffman, Chemical Engineering *(Heinz Scholar)*
Advisor: Kyle Bibby, Civil and Environmental engineering

Dynamic Life Cycle Assessment of a Net-Zero Energy Building
Naomi Anderson, Civil and Environmental Engineering *(Heinz Scholar)*
Advisor: Melissa Bilec, Civil and Environmental Engineering

Sustainable Healthcare – Focus on Greenhouse Gas Emissions and Product Design
Delia Scoville, Biochemistry, Oberlin College *(Heinz Scholar)*
Advisor: Melissa Bilec, Civil and Environmental Engineering

Resilience in large scale networks: Implications for critical infrastructure
Trent Dillon, Mechanical Engineering and Materials Science *(Condon Scholar)*
Advisor: Vikas Khanna, Civil and Environmental Engineering

Hybrid Hydrophobic/Hydrophilic Surfaces for Boiling Enhancement
Emma Sullivan, Mechanical Engineering and Materials Science *(Heinz Scholar)*
Advisor: Mark Kimber, Mechanical Engineering and Materials Science

Electrodeposition of oxide semiconductors for solar-fuel conversion
Matthew Duff, Mechanical Engineering and Materials Science *(Bevier Scholar)*
Michael Masley, Mechanical Engineering and Materials Science *(NSF Scholar)*
Advisor: Jung-Kun Lee, Mechanical Engineering and Materials Science

Nanostructures for Solar Cells
Dalton Hale, Industrial Engineering *(Bevier Scholar)*
Donald Voland, Engineering Science *(NSF Scholar)*
Brendan O'Brien, Industrial Engineering *(NSF Scholar)*
Lincoln Walton, Engineering Science *(NSF Scholar)*
Advisor: Paul Leu, Industrial Engineering

Non-Boolean Electronic Circuits for Low Power Computation
Natalie Janosik, Electrical and Computer Engineering *(Heinz Scholar)*
Advisor: Steven Levitan, Electrical and Computer Engineering

Nanoscale Characterization of Solar Cells
Brandon Contino, Electrical and Computer Engineering *(Bevier Scholar)*
Advisor: Guangyong Li, Electrical and Computer Engineering

Case Studies for Sustainable Systems Modeling
Stephanie Cortes, Electrical and Computer Engineering *(Bevier Scholar*)
Advisor: Tom McDermott, Electrical and Computer Engineering

High Efficiency Cook Stove for the Kuna Yala of Panama
Allison McCurdy, Mechanical Engineering and Materials Science *(Bevier Scholar)*
Jessica Schneider, Mechanical Engineering and Materials Science *(Bevier Scholar)*
Advisor: Laura Schaefer, Mechanical Engineering and Materials Science

Towards Understanding Nanoparticle Toxicity
Kimaya Padgaonkar, Chemical and Petroleum Engineering *(MCSI scholar)*
Advisors: Goetz Veser, Chemical and Petroleum Engineering
Ipsita Banerjee, Chemical and Petroleum Engineering

Chemical Looping – A Flexible Approach Towards Process Intensification
Jonathan Hughes, Chemical and Petroleum Engineering *(Frank & Daphna Lederman Scholar)*

Natalie Isenberg, Chemical and Petroleum Engineering *(Bevier Scholar)*
Advisor: Goetz Veser, Chemical and Petroleum Engineering

‘ Gre ening ’ H o mo g eneo u s C a t a ly sis t hro ug h Na no co nfine me nt
Bronson Lockwood, Chemical and Petroleum Engineering *(Bevier Scholar)*
Advisor: Goetz Veser, Chemical and Petroleum Engineering

Too Valuable To Burn: Utilizing Shale Gas for Chemicals Production
Jeffrey Schallick, Chemical and Petroleum Engineering *(Bevier Scholar)*
Advisor: Goetz Veser, Chemical and Petroleum Engineering

2013 Participants

Understanding resilience in energy production landscapes: changes in the coupled hydrologic system
Angela Anderson, Civil Engineering *(Heinz Endowments Scholar)*
Robert Wallace, Chemical Engineering *(Bevier Scholar)*
Advisor: Dan Bain, Geology

Sustainable Science and Engineering Education
Jayne Marks, Civil Engineering *(Heinz Endowments Scholar)*
Advisor: Melissa Bilec, Civil & Environmental Engineering

High-Performance Building Automation and Design
Corey Woloschin, Civil Engineering *(Heinz Endowments Scholar)*
Advisor: Melissa Bilec, Civil & Environmental Engineering

Design of Oil-Absorbing Media for Environmental Cleanup
Andrew Kittka, Chemical Engineering *(Heinz Endowments Scholar)*
Advisor: Di Gao, Chemical & Petroleum Engineering

Evaluating the environmental sustainability of infrastructure compatible hydrocarbon biofuels
Karen Kaminsky, Chemical Engineering *(Frank and Daphna Lederman Scholar)*
Advisor: Vikas Khanna, Civil and Environmental Engineering

Enhancing efficiency of pool boiling
Ed Kraft, Mechanical Engineering *(Heinz Endowments Scholar)*
Advisor: Mark Kimber, Mechanical Engineering & Materials Science

Core-shell Photoelectrochemical Cells for Solar Hydrogen Production
Thomas Nilson, Engineering Science *(Bevier Scholar)*
Colin Detweiler, Materials Engineering *(NSF Scholar)*
Advisor: Jung-Kun Lee, Mechanical Engineering & Materials Science

Extremely Affordable Solar Cells
Brendan O’Brien, Industrial Engineering *(Scalise Industries Scholar)*
Miriam Rathbun, Mechanical Engineering *(NSF Scholar)*
Advisor: Paul Leu, Industrial Engineering

All-solution-processed solar cells
Samantha Small, Computer Engineering *(Douglas Condon Scholar)*
Christian Bottenfield, Engineering Physics *(NSF Scholar)*
Advisor: Guangyong Li, Electrical and Computer Engineering

Nanotoxicity – The other side of nano
Brittany Givens, Chemical Engineering *(Bevier Scholar)*
Advisor: Goetz Veser, Chemical & Petroleum Engineering

Nanoencapsulation- A novel approach towards energy efficient processes
Joshua Maskrey, Chemical Engineering *(Bevier Scholar)*
Advisor: Goetz Veser, Chemical & Petroleum Engineering

NSF: International Research Experiences for Students
Evaluation of bamboo-to-bamboo connections
Andrew Beck, Chemical Engineering
Eric Belski, Mechanical Engineering
Rebecca Glucksman, Civil Engineering
Steven Marusic, Chemical Engineering
Advisor: Kent Harries, Civil and Environmental Engineering

2012 Participants

Chemical looping reforming- A novel, efficient process for CO_2 utilization
Louis Miller, Chemical Engineering (Frank and Daphna Lederman scholar)
Martin Roberts, Chemical Engineering (Roberta Luxbacher scholar)
Advisor: Goetz Veser, Department of Chemical and Petroleum Engineering

Critical Materials: Resilience and Sustainability Implications for the U.S. Economy
Berlyn Hubler, Chemical Engineering (Construction Financial Management Assoc. scholar)
Greg Zaimes, Physics (Bevier Scholar)
Advisor: Vikas Khanna, Department of Civil and Environmental Engineering

Wireless sensor networks for environmental monitoring research
Brian McGlynn, Civil and Environmental Engineering (Scalise Industries scholar)
Advisor: Xu Liang, Department of Civil and Environmental Engineering

Extremely affordable solar cells to address energy poverty
Peter Brendel, Industrial Engineering (Scalise Industries scholar)
Ibrahim Chebib, Electrical and Computer Engineering (Douglas Condon scholar)
Advisor: Paul Leu, Department of Electrical and Computer Engineering

Assessment of the green infrastructure installations occurring in Schenley Park
Trevor Bublitz, Civil and Environmental Engineering (Bevier Scholar)
Bruk Berhanu, Civil and Environmental Engineering (Bevier Scholar)
Advisor: Dan Bain, Department of Geology

Point-of-use water treatment technologies for low-income communities in the less developed world
Douglas Kopp, Civil and Environmental Engineering (Bevier Scholar)
Advisor: Ian Nettleship, Department of Mechanical Engineering and Materials Science

Energy-efficient filtration
Alyssa Kunkel, Chemistry (Bevier Scholar)
Christina O'Donnell, Chemical and Petroleum Engineering (Bevier Scholar)
Advisor: Haitao Liu, Department of Chemistry

NSF: International Research Experiences for Students
Bamboo Gridshells
Katherine Brown, Chemical Engineering
Patrick Eells, Mechanical Engineering and Materials Science
Michael Nites, Industrial Engineering
Mathew Pagliassotti, Electrical and Computer Engineering
Abigail Stein, Civil and Environmental Engineering
Chris Zimmerman, Bioengineering
Advisors: Dr. Bhavna Sharma, Dr. Kent Harries and Michael Richard

2011 Participants

Self-powered Sensors for Energy Efficient Buildings
Kent Berthoud, Physics & Astronomy

Advisor: Dr. Buddy Clark

Microalgae as Fuel
George Zaimes, Physics Department
Advisor: Dr. Vikas Khanna

Nano-characterization of Silver-nanoparticles deposited on Porous Ceramics or Geopolymers for Sustainable low-cost ceramic water filters
Michael Melia, Mechanical Engineering & Materials Science
Advisor: Dr. Ian Nettleship

Comparative life cycle analysis for bamboo portal frame construction
Marianne Choi, Civil & Environmental Engineering
Ahra Kwon, Chemical & Petroleum Engineering
Oren Lawit, Chemical & Petroleum Engineering
Preston Macready, Civil & Environmental Engineering
Chad Ringel, Chemical & Petroleum Engineering
Jennifer Zettl, Civil & Environmental Engineering
Advisors: Drs. Kent Harries, Melissa Bilec, Bhavna Sharma and Michael Richard

Exploring Smart Materials for Reducing Energy Demands in Buildings
Minao Shen, Mechanical Engineering & Materials Science
Advisor: Dr. Buddy Clark

Enabling the Utilization of Nanoporous Aluminum for Sustainable Structures by Understanding its Mechanical Properties
Jiaxiang Tao, Civil & Environmental Engineering
Advisor: Dr. Albert To

Net-zero Energy School Buildings- Development of the Education Module
Tylor Balson, Industrial Engineering & **Ellis Mays,** Civil & Environmental Engineering
Advisor: Dr. Bhavna Sharma

Smart Grid Control Methodology Development for Integrated Generation Management
Ansel Barchowsky, Electrical & Computer Engineering
Advisor: Dr. Greg Reed

Resource Recovery from Waste Water
Matt Weschler, Civil & Environmental Engineering
Advisor: Drs. Amy Landis and Willie Harper

Controls and Dynamic Life Cycle Assessment
Peter Stegman, Electrical & Computer Engineering
Advisor: Dr. Alex Jones

2010 Participants

An Analysis of Humanitarian Logistics Relief in Haiti
Matthew Yandura, Industrial Engineering
Advisor: Dr. Brian Norman

Construction Success Factors for Net Zero Energy Homes
Katelyn Ryan & Michael Sweriduk, Civil & Environmental Engineering
Advisor: Dr. Melissa Bilec

Biological Processes Involved in Water Quality
Christine Currie, *Columbia University* & **Patrick Saboe,** *University of New Haven*
Chemical and Petroleum Engineering
Advisor: Dr. Willie Harper

Designing Self-Healing Materials
Chet Gnegy, Electrical Engineering
Advisor: Dr. Anna Balazs

Biofuels Grown on Marginal Lands
Christopher Rovensky, Chemical Engineering
Emily Wolff, Civil & Environmental Engineering
Julie Schalles, Mechanical Engineering & Materials Science
Advisor: Dr. Amy Landis

End– of-Life Compostables
Nicole Ostrowski, Mechanical Engineering & Materials Science
Nicholas Stamatakis, Industrial Engineering
Advisors: Drs. Amy Landis and Melissa Bilec

Exploration of New Designs in Energy Harvesting
Jon Bumstead, Mechanical Engineering, Physics, Astronomy
Matt Paterson, Mechanical Engineering & Materials Science
Advisor: Dr. Buddy Clark

Green Roof for Soldiers and Sailors
Marianne Choi, Civil & Environmental Engineering
Advisor: Dr. Jason Monnell

Icing and Condensation at Superhydrophobic Surfaces
Michael Malencia, Engineering
Advisor: Dr. Di Gao

Improving the Durability of Sustainable Ceramic Water Filters for Low-income Communities
Daniel Walsh, Mechanical Engineering & Materials Science
Advisor: Dr. Ian Nettleship

Kingsley- Alternative Construction Opportunities
Madeline Allen-Sandoz, Civil & Environmental Engineering
Matthew Balsbaugh, Environmental Studies
Ryan Carmichael, Engineering
Advisors: Drs. Melissa Bilec, Vanessa Gomes Da Silva, Maristela Gomes Da Silva

Oleophobic and Hydrophillic Coatings for Chemical Free Cleaning and Water-oil Separation
Benjamin Dickinson, Chemical & Petroleum Engineering
Advisor: Dr. Di Gao

Optimization and Life Cycle Assessment
Oliver Green, Civil & Environmental Engineering
Kyle Shatzer, Civil Engineering, *Carnegie Mellon University*
Advisors: Dr. John Brigham, Amy Landis, Melissa Bilec

Physical and Mechanical Modeling of Complex Biomaterials: Bamboo
Gautam Vangipuram, Bioengineering
Advisors: Drs. Kent Harries and John Brigham

Pool Boiling Enhancement for Nanostructured Surfaces
Mike Kristufek, Mechanical Engineering & Materials Science
Advisor: Dr. Mark Kimber

Smart Grid Control Methodology Development for Integrated Generation Management
Ansel Barchowsky, Electrical & Computer Engineering
Christopher Lippert, Mechanical Engineering & Materials Science
Advisor: Dr. Greg Reed

The Copper Coil: Design of a New Household Water Storage System for the Less Developed World
Joseph Landry, Mechanical Engineering & Materials Science
Advisor: Dr. Ian Nettleship

Two Sides of "Nano": Carbon Capture with a Nanoencapsulated Sorbent
Christopher DiAndreth, Chemical & Petroleum Engineering
Advisor: Dr. Goetz Veser

Two Sides of "Nano": Toxicity of Free and Encapsulated Nanomaterials
Craig Stevenson, Chemical & Petroleum Engineering
Advisor: Dr. Goetz Veser

Solar Power in Vietnam
Chris Thai, Mechanical Engineering and Materials Science
Advisor: Dr. Laura Schaefer

2009 Participants

Children's Hospital Green Building Metrics
Matthew Geary, Civil and Environmental Engineering
Advisor: Dr. Melissa Bilec

City of Pittsburgh- LED Life Cycle Assessment
Douglas Hartley Civil and Environmental Engineering
Cassandra Jurgens Civil and Environmental Engineering
Eric Zatcoff Civil and Environmental Engineering
Advisors: Drs. Melissa Bilec and Joe Marriott

Electricity Reduction for Development Properties- New & Existing
Matt Kaminski Civil and Environmental Engineering
Kathleen Kessler Civil and Environmental Engineering
Abigayle Sterle Civil and Environmental Engineering
Advisors: Drs. Melissa Bilec and Joe Marriott

Energy Harvesting for Improved Power Management in Buildings
Anthony Machi, Mechanical Engineering and Materials Science
Advisor: Dr. Buddy Clark

Life Cycle Inspired Chemical Design
James Cregg Chemical Engineering
Michaelangelo Tabone Chemical Engineering
Advisors: Drs. Eric Beckman and Amy Landis

Microbial Fuel Cells
Charles Covel
Jessica Gardner
David Rounce
Electrical and Computer Engineering
Advisors: Dr. Minhee Yun and David Sanchez

New Microstructural Designs for Low-Cost Ceramic Water Filters
Nicole Ostrowski, Mechanical Engineering and Materials Science
Advisor: Dr. Ian Nettleship

Sustainable Disinfection

Jennifer Howells, Civil and Environmental Engineering
Advisor: Dr. Leonard Casson

Synthesis of Functional Core-Shell Nanomaterials for Clean Energy Production
Rebecca Byrnes, Chemical & Petroleum Engineering
Advisor: Dr. Goetz Veser

2008 Participants

Development of Biofuels for Atmospheric Tempature Supply in Diesel Vehicles
Maura Koehle &Todd Moyle
Chemical & Petroleum Engineering
Advisor: Dr. Eugene Wagner (chemistry)

East Liberty Development Project
James Ostendorf
College of Arts and Sciences
Scott Streiner
Computer Engineering
Wafa Koubaa
Chemical & Petroleum Engineering
Advisors: Drs. Laura Schaefer & Melissa Bilec

Processing & Properties of Renewable Polymers based on Thermoplastic Starch
James Goetz, Chemical Engineering (Penn State University)
Advisor: Dr. Sachin Velanker

Remediation Potential of Biofuel Feedstocks
Bradley Harken, Civil & Environmental Engineering
Advisors: Drs. Laura Schaefer, Melissa Bilec, Amy Landis, Eugene Wagner

Development of Nanocomposite Materials via Metal Impregnation for Clean Energy Production
Nicole Hoehn, Chemical & Petroleum Engineering
Advisor: Dr. Goetz Veser

Methodology for Assessing Material Resistance Factors for Structural Bamboo
Derek Mitch, Civil & Environmental Engineering
Advisor: Dr. Kent Harries

A Risk Assessment of Sea-Level Rise as a Coastal Hazard for Regions of the Pacific
Mary Beth Oshnack, Civil & Environmental Engineering
Advisor: Dr. Kent Harries

Microstructure Analysis of Clay Ceramic Materials treated with Silver Nanoparticles for us in Low Cost Water Filters in Brazil
Nicole Ostrowski (IRES), Mechanical and Materials Science Engineering
Advisor: Dr. Ian Nettleship

Fabrication of Dye-Sensitized Solar Cells
Paul Shin, Civil & Environmental Engineering
Advisor: Dr. Di Gao

Catalytic Microreactors for Clean, Decentralized Combustion Reactions
Tim Tallon, Chemical & Petroleum Engineering
Advisor: Dr. Goetz Veser

2007 Participants

Investing the Potential use of Untreated Waters for Cooling Tower Make up in Coal Power Plants
Scott Duda, Civil and Environmental Engineering (Cornell)
Advisor: Dr. Radisav Vidic

Ceramics Processing and the Usefulness and Effectiveness of Ceramic Materials in Environmental and Energy Efficiency Application
Benjamin Groth, Materials Science and Engineering
Advisor: Dr. Ian Nettleship

Research the Degradation of Building and Infrastructure Materials Caused by Environmentally Harmful Substances
Kyle Kaminski, Civil and Environmental Engineering
Advisors: Drs. Julie Vandenbossche and Robert Ries

Study of the Safe and Controllable Combustion of Hydrogen
Angela Noll, Chemical & Petroleum Engineering
Advisor: Dr. Goetz Veser

Mapping of Average Groundwater Levels Across the US
Heather Pry, Civil and Environmental Engineering
Advisor: Dr. Xu Liang

Automated Biodiesel Production: Design of Distributed/ Greener Energy Systems
Justin Sciulli, Mechanical Engineering
Advisor: Dr. Jeff Vipperman

Watershed Modeling for the Sustainability of Panther Hollow Run
Adam Smelko, Bioengineering
Advisor: Dr. Dan Budny

Water Purification via Micrometer-sized Structures Synthesized by Hierarachial Self-assembly of Nanoparticles
Kevin Tamm, Chemical Engineering
Advisor: Dr. Di Gao

Use of Piezoelectric Materials to Create a Self-powered Occupancy Sensor for Sustainable Buildings
Andrew Thornburg, Mechanical Engineering
Advisor: Dr. Buddy Clark

2006 Participants

Study into the Use of Bamboo as a Hazard Mitigating Construction Material
Mark Beacraft, Civil & Environments Engineering
Advisor: Dr. Kent Harries

Ethical Sustainability Surrounding the Brazilian Charcoal Industry
Aaron Beamguard, Computer Engineering
Advisor: Dr. Larry Shuman

Using Rainwater to Solve Bangladesh's Tainted Water Problem
Andrew Corris, Chemical Engineering
Advisors: Drs. Eric Beckman and Robert Parker

Development of Effective Cooling Strategies for Oxy-fuel/Hydrogen Turbine Systems
Todd Locker, Mechanical Engineering
Advisor: Dr. Laura Schaefer

Minimizing Aluminum Toxicity from Acid rock Discharges
Evan Murphy, Environmental Engineering
Advisor: Dr. Ron Neufeld

Filtration at the Nanoscale: Environmental Protection, Water Purity and Nanoparticle Transport
Patricia Nichols, Materials Science and Engineering
Advisor: Dr. John Barnard

Water Transport and Use in Irrigation
Phae Papas, Chemical & Petroleum Engineering
Advisor: Dr. Robert Parker

Design and Development of Super Water and Oil Repellent Surfaces
Tyler Price, Chemical & Petroleum Engineering
Advisor: Dr. Di Gao

Vandergrift Revitalization
Steven Hein
Bioengineering
Yi Zhuang
Industrial Engineering
Advisor: Dr. Lisa Weiland

2005 Participants

Ramifications of Design of a Non-Chlorine Alternative for PVC
Jewel Barber & Robert Brasington, Chemical Engineering
Advisor: Dr. Eric Beckman

Nanoparticles and their Interactions with Water
Elizabeth Clark, Materials Science and Engineering
Advisor: Dr. John Barnard

Investigating Alternate Sources of Lighting for a Household Environment
Andrew Corris, Chemical Engineering
Advisor: Dr. Marlin Mickle

Cement Bonded Wood Composites
Molly McClelland, Civil and Environmental Engineering
Advisor: Dr. Amir Koubaa

Analysis of the Shrinkage Characteristics of High Slag Mixes and the Influence of Ambient Temperatures on the Hydration Process of Slag Mixes
Angela Heinzman, Civil and Environmental Engineering
Advisor: Dr. Julie Vandenbossche

Evaluating the Use of Phytoextraction by Arsenic-accumulating Ferns & Grasses as a Means of Water
Monica Higgins &Arica Santucci, Civil and Environmental Engineering
Advisor: Dr. Radisav Vidic

Self-Healing of Surface Coatings for Green Construction
Benjamin Slavin, Computer Engineering
Advisor: Dr. Steven Levitan

2004 Participants

How Plants can be Identified and Classified as Phytoremediating Agents and Finding relevant Application of Their Use in Land and Water Reclamation
Chantal Blake, Civil and Environmental Engineering
Advisor: Dr. Joseph MacNeil, Chatham College

Proper Materials and Structure for Optimum Performance of Green Roofs in South Western PA

Daniel Bliss, Civil and Environmental Engineering
Advisor: Dr. Robert Ries

Green Structural Neurology- A Nervous System for Green Buildings
Justin Keogh, Electrical Engineering
Advisor: Dr. Marlin Mickle

Examining the Green Buildings of Healthcare Structures
Brett Rettura, Bioengineering
Advisors: Drs. Kim Needy & Robert Ries

Self-Healing of Surface Coatings for Green Construction
Benjamin Slavin, Computer Engineering
Advisor: Dr. Steven Levitan