



Sample Project Abstracts

Columbus State Community College, OH

Project: Aquavive's Ripple Effect – Transforming Water Protection

Aquavive offers water security with real-time pollution detection. It stands at the forefront of water safeguarding, offering an innovative solution to address the pressing challenge of water pollution. Our mission, aligned with the United Nations' "2030 Agenda for Sustainable Development," emphasizes the vital role of clean water and sanitation in human prosperity. With our cutting-edge pollution detection buoy system, we seek to revolutionize water protection by providing real-time monitoring of vital water parameters. Crafted from aircraft aluminum for durability, our buoys operate discretely and are anchored securely to riverbeds. Complemented by a user4 friendly app-based tracking system, individuals can pinpoint pollution sources and events directly from their smartphones. Aquavive's impact extends beyond economic and environmental benefits to prioritize public health as a fundamental human right. By curbing pollutants in waterways, we aid disease prevention, enhance community well-being, and engage youth in STEM education around water conservation. Join us in our mission to ensure clean water access for all and safeguarding community and ecosystem health for generations to come.

County College of Morris, NJ

Project Name: Doing the MOST with NBD-QC

During the COVID-19 pandemic, energy prices hit historic lows. However, subsequent years witnessed a significant surge in demand, leading to price increases and destabilization of energy markets. This surge also revealed vulnerabilities in the natural gas and oil supply chains. Currently, fossil fuels dominate the energy market, posing environmental harm and nonrenewable. Therefore, there is an urgent need for advanced alternatives. To address this challenge, innovation and advancement are essential. We advocate for developing environmentally safe and renewable energy sources such as solar power, which can significantly contribute to the global market and ecological health. Our proposal introduces a molecular solar thermal (MOST) system utilizing a chemical reaction between norbornadiene to form the compound quadricyclane. This system can capture light energy as heat through photo-chemical reactions and convert 80% of the stored heat into usable energy via conduction, surpassing the effectiveness of current silicon cells, which typically operate at around 20%. This system offers cost-effectiveness, non-toxicity, and emission-free operation, providing a safe and efficient means to enhance the world's energy supply.

Dallas College, TX

Project: Autonomous Monitoring for Blaze Emergency Response (AMBER)

From 2013 to 2022, there have been an average of 61,410 wildfires per year, burning approximately 7.2 million acres of land annually. AMBER's mission is to detect and alert first responders of wildfires before they escalate to protect homes, businesses, and lives. Our product uses infrared cameras and autonomous drones to detect wildfires and safeguard farmland, national parks, and urban areas. Upon detecting early warning signs of potential fires, AMBER can quickly track and report the situation to emergency services, enabling rapid response. AMBER uses its infrared cameras to detect smoke, abnormal heat readings, or other early signs of wildfire. Additionally, AMBER is equipped with a transceiver to contact and send data to local authorities, solar panels to generate power, and machine learning for real-time data analysis. Improving upon conventional wildfire detection systems, AMBER can autonomously deploy a drone to fly to the flagged location and confirm the necessity for a rapid emergency response. After confirming the wildfire, the drone provides first responders with high-resolution imagery and precise location data on the fire, so that firefighters arrive on the scene fully prepared to extinguish the blaze.