Title of Research Fellow Project
Development of a remote aquatic monitoring station using an Arduino programmable logic controller

Faculty/Staff Supervisor
Nicholas Mauro, Assistant Professor of Physics

Description of Research Project
Long-range studies of the environmental conditions in aquatic ecosystems are extremely important in gauging the effect of climate change on these sensitive environments. In order to facilitate these studies, we will be building off previous work in our group to develop a remote environmental data collection station. This station will utilize a programmable logic controller (based on the Arduino microprocessor) that is designed to be placed in an aquatic environment year round, continuously collecting and sharing relevant environmental data, including the temperature, water levels, and acidity of the environment. The station design includes on-board data storage, data processing, wireless data transfer and solar power systems

Description of Student Opportunity
Our primary objectives will be to design, build and produce these stations for field testing. The interested research student will work to integrate the many subsystems necessary for operation with the guidance of faculty. There will be an emphasis on developing computer code for the logic controller, 3-d printing of components, and development of the various electronic subsystems.

Benefits to the Student
The student will get a hands-on introduction to a sophisticated yet ubiquitous microprocessor that is utilized in many applications across multiple disciplines. There will be opportunities to learn a programming language, work with solar panels, design and build a data management system all with the aim of collecting environmental data in a remote location. The student will be introduced to interesting and important engineering and science problems relevant to the work.

Benefits to the Supervising Faculty/ Staff Member
The benefits to the faculty are enormous! Having an enthusiastic and dedicated student will advance the project that the faculty member finds enormously compelling.

Research Fellow Qualifications
Enthusiasm and interest are the only non-negotiable requirements of a student on this project. No previous experience with these computer programming, electronics or environmental studies is required. Successful candidates will have a strong desire to learn more and work thoughtfully and diligently. Previous research experience is not needed but the student should expect to develop research skills in this project. While this would be a great opportunity for a Physics or Computer Science major, any student interested in collaboration, creative problem solving, climate change and engineering would be welcome to apply.