**DENIN Environmental Scholars Internships**

Dates of internship: February 7, 2021 – May 10, 2021, or June 1, 2021-Aug, 2021

Location: Harker ISE Lab and DBI, University of Delaware, Newark, DE 19711

Number of positions available: 1-2

Faculty Mentor: Deb Jaisi

Graduate Student Mentor: Spencer Moller

Professional Staff Mentor: Katelyn Gray

**Project Title: Phosphorus cycling in the Murderkill River**

**Research Description:**

This project aims to identify the concentration and composition of phosphorus in the Murderkill River along its flow direction over different seasons. Because different sources of phosphorus enter waterways and their proportions vary in both time and space, detailed analyses of the changes and measurement of isotope fingerprints from each source allow a quantitative understanding of the impact of different sources on the water quality.

**Research Tasks:**

Interns are expected to participate in 1-2 field trips for the collection of waters using boats. The majority of the task will involve the separation and purification of phosphorus from waters, which requires frequent handling of big volumes (8-10L) of waters at various treatment and centrifugation processes. The separated phosphorus will be further processed for chemical, isotope, and microscopic analyses.

**Student Learning Objectives: Professional and Research Skills**

This internship focuses on the development of the following professional and scientific skills.

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| Broad Professional Skills | Specific Skills |
| Planning and time management | Ability to set and complete specific goals of varying scope |
| Work independently | Independent work ethic - work independently to problem-solve |
| Collaborative skills | Learning to complete tasks efficiently and effectively with others |
| Express ideas in writing and verbally | Communicate with diverse audiences - Development of impactful poster and oral presentations. Honing ability to deliver scientific results/impacts to people of interdisciplinary background. |
| Broad Scientific Research Skills | **Specific Skills** |
| Understand scientific terms | Analytical method on separation of phosphorus, quantitation and characterization |
| Literature analysis | Ability to effectively find and utilize scientific manuscripts related to environmental and water chemistry |
| Use scientific tools | Centrifuge, spectrophotometer, scanning electron microscopy, and other physical and chemical techniques |
| Recognize simple patterns in research data | Applying phosphorus chemistry concepts to qualitative and quantitative data. |
| Apply research tools and techniques in research experiments | Selective extractions, quantitation of P to investigate sources and processes. |
| Analyze research data | Excel, Origin, and instrument-specific software utilization to form quality figures and drawings. |
| Understand, apply, and explain scientific concepts and theories | Freedom to generate questions and plan methods for addressing challenges. Learning to effectively communicate results through oral presentations and report writing. |

**Prerequisites:**

Introductory experience with chemistry.

**Work Environment and Expectations:**

Laboratory environment: Harker ISE Lab and DBI. Hours are flexibly determined between student and mentor. Students will work part-time during the fall and spring semesters and full-time during summer. Students will also participate in a retreat, communications workshop, and end of internship spring symposium.

**Stipend:**

$3,500 (Direct deposit is required).

**Funding Source:**

National Science Foundation, Delaware EPSCoR Track I

**How to apply:** <https://ugresearch.udel.edu/PUB_Program.aspx>