Opportunity Title: Forming Mercury Sulfide Crystals Over a Range of Geochemical Conditions (2 internships)
Opportunity Reference Code: DOE-MSIPP-18-2-ORNL

Organization U.S. Department of Energy (DOE)

Reference Code DOE-MSIPP-18-2-ORNL

How to Apply A complete application must include the following to be considered:

- Completion of all required fields in the application and successful application submission
- Undergraduate or graduate transcripts as appropriate
- Two recommendations

If you have questions, send an email to Kerri Fomby at kerri.fomby@orau.org. Please include the reference code for this opportunity in your email.

For technical questions, please contact Eric Pierce at pierceem@ornl.gov.

Application Deadline 1/12/2018 11:59:00 PM Eastern Time Zone

Description The Minority Serving Institutions Partnership Program (MSIPP) Internships is a new program to promote the education and development of the next generation workforce in critical science, engineering, technology, and math (STEM) related disciplines that complement current and future missions of DOE national laboratories. The MSIPP Internship program is designed to provide an enhanced training environment for next generation scientists and engineers by exposing them to research challenges unique to our industry.

MSIPP Interns will be given the opportunity to complete Summer Internships aligned with ongoing U.S. Department of Energy Office of Environmental Management (DOE-EM) research under the direction of a host national laboratory. The internship will be performed at the host national laboratory, utilizing their facilities and equipment under the guidance of a research staff member.

Minority Serving Institutions are institutions of higher education enrolling populations with significant percentages of undergraduate minority students.

Project: The successful candidates will lab scale experiments focused on the formation of Zn and Hg sulfide crystals in static experiments over a range of geochemical conditions. Responsibilities include data collection and analysis, interpretation, and publication of experimental results.

Remediation of diffuse mercury source zones poses a unique challenge at a wide range of the 3000 mercury-contaminated sites globally. The existence of diffuse sources is particularly challenging in remediating a low-order stream system (i.e., East

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Fork Poplar Creek [EFPC]) located in Oak Ridge, Tennessee. The EFPC ecosystem received large point-source discharges during the 1950 and 1960s. Although upstream mercury discharges to EFPC have declined, mercury release persists from point and diffuse sources within the industrial facility where mercury was used and from diffuse downstream sources, such as contaminated bank soils. Previous studies identified the presence of mercury sulfide (HgS) in EFPC bank soils, but the processes that govern HgS formation remain unclear. Research activities will include the use of microscopy techniques including scanning electron microscopy, transmission electron microscopy, and scanning probe microscopy measurements as well as general laboratory based sulfidation experiments.

In addition to sulfidation experiments and microscopy measurements, the interns will also have the opportunity to participate in other projects being performed. These include supporting microscopy analyses on weathered borosilicate mineral and glasses. The laboratory scale experiments will involve conducting static and flow-through experiments using atomic force microscopy to develop a mechanistic understanding of solid-fluid reactions. Responsibilities include data collection and analysis, interpretation, and publication of experimental results.

Location: This internship will be located at Oak Ridge National Laboratory.

Salary: Selected candidates will be compensated by either a stipend or salary, and may include one round trip domestic travel to and from the host laboratory. Stipends and salaries will be commensurate with cost of living at the location of the host laboratory. Housing information will be provided to interns prior to arrival at the host laboratory, and will vary from lab to lab.

Application Deadline: January 12, 2018

Expected Start Date: The program is 10 weeks in duration, starting May 21, 2018. Start date is flexible based on laboratory and candidate availability.

Qualifications

Eligible applicants must:

- Be a citizen of the United States,
- Be at least 18 years of age**,**
- Currently enrolled as a full-time undergraduate or graduate student at an accredited Minority Serving Institution, http://orise.orau.gov/msipp/documents/approved-msi-school-list.pdf,
- Working toward a science, technology, engineering, or

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mathematics (STEM) degree,

- Have an undergraduate or graduate cumulative minimum Grade Point Average (GPA) of 3.0 on a 4.0 scale, and
- Pass a drug test upon selection to participate in the MSIPP

  *The process and timing for drug testing varies from lab to lab. Use of Marijuana/Cannabis or its derivatives if prescribed is legal in some states. However, having these drugs in your system is NOT legal at United States Federal Contractor sites and National Laboratories.

Required Knowledge, Skills, Work Experience, and Education

Successful candidates will:

- Be current undergraduate or graduate students pursuing a degree in a geochemistry, mineralogy, nanotechnology, chemistry, physics, or related field.

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Currently pursuing a Bachelor's Degree or Master's Degree.
- **Overall GPA:** 3.00
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (12 👁)
  - **Earth and Geosciences** (21 👁)
  - **Environmental and Marine Sciences** (2 👁)
  - **Physics** (16 👁)
  - **Science & Engineering-related** (1 👁)

Affirmation

I certify that I am at least 18 years of age and a US citizen, and am currently enrolled as a student in a degree seeking undergraduate or graduate program in a STEM field at an accredited Minority Serving Institution (MSI).