

Opportunity Title: Mercury Sulfide Mineral and Borosilicate Glass
Environmental Transformations

Opportunity Reference Code: DOE-MSIPP-17-2R-ORNL

Organization U.S. Department of Energy (DOE)

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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@ornl.gov. Please include the reference code for this opportunity in your email.

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

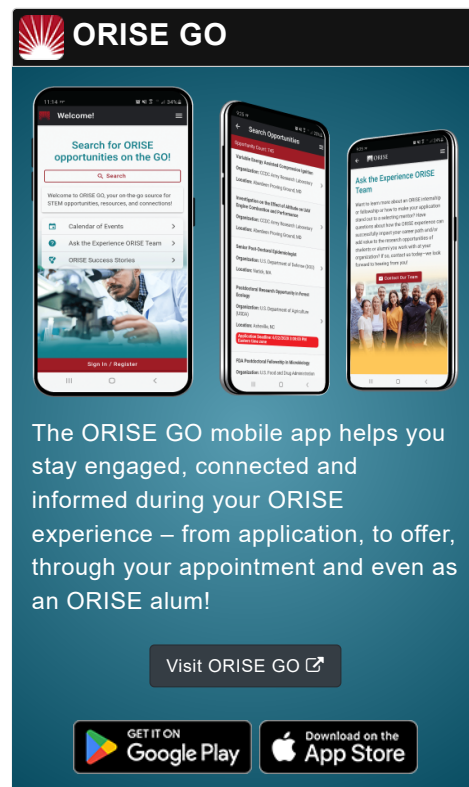
Application Deadline 3/27/2017 12:00:00 AM Eastern Time Zone

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.

The Environmental Sciences Division (ESD), <http://www.esd.ornl.gov>, at Oak Ridge National Laboratory (ORNL), <http://www.ornl.gov>, has an immediate opening for two undergraduate research interns in geochemistry, chemistry, environmental science, geology, soil chemistry, or a related field. 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.

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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 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 Lab.

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: March 27, 2017

Expected Start Date: May 15, 2017

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.ornl.gov/sepreview/msipp/Approved%20MSI%20>

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[School%20List%202017.pdf](#),







- Working toward a science, technology, engineering, or mathematics (STEM) degree,
- Have an undergraduate 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 student in Geochemistry, Chemistry, Environmental Science, Geology, Soil Chemistry, 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 )
 - **Engineering** (27 )
 - **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).