Opportunity Title: Investigating Metal Anion Coordination Dynamics in Radioactive Tank Waste
Opportunity Reference Code: DOE-MSIPP-17-7R-PNNL

Organization U.S. Department of Energy (DOE)

Reference Code DOE-MSIPP-17-7R-PNNL

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 Sabrina Hoyle at sabrina.hoyle@pnnl.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.

Project: Energy Frontiers Research Center (EFRC) led by Pacific Northwest National Laboratory (PNNL) is focused on interfacial dynamics in radioactive environments and materials (IDREAM). The vision of IDREAM is to master molecular-to-mesoscale chemical and physical phenomena at interfaces in complex environments characterized by extremes in alkalinity and low-water activity and driven far from equilibrium by ionizing (γ,β) radiation. Aluminum from nuclear fuel cladding plays a commanding role in high level radioactive waste (HLW) chemistry. In HLW solids e.g. Al(oxy)hydroxides the coordination geometry of Al(III) and incorporated Fe(III) and Cr(III) is octahedral (Oh), whereas in highly alkaline solution coordination is predominantly as tetrahedral (Td) hydroxyanions e.g. Al(OH)4-. This project will focus on developing strategies to determine the structural and dynamic properties of water-solvated tetrahedral and

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octahedral anions (Al, Cr, Fe) in highly alkaline systems, and molecular-level controls on the transition between these structures and other geometries.

Location: This internship will be located at Pacific Northwest National Lab.

Salary: Selected candidate 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: June 5, 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.orau.gov/sepreview/msipp/Approved%20MSI%20School%20List%202017.pdf,
- Working toward a science, technology, engineering, or 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 a current undergraduate or graduate student and have a background in Chemistry, or closely related field.

Desired Knowledge, Skills, Work Experience, and Education

It is desirable for the candidate to have:

- Experience using spectroscopic characterization tools, along with general inorganic chemistry experimental skills required for working with alkaline, concentrated solutions at high temperature and under controlled atmosphere conditions.
- The candidate should have good communications skills, including scientific writing.

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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 👁)

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).