

Opportunity Title: Quantifying Uncertainties of Flow and Transport Using Applied Math and Computer Modeling

Opportunity Reference Code: DOE-MSIPP-16-09-LANL

Organization U.S. Department of Energy (DOE)

Reference Code DOE-MSIPP-16-09-LANL

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

- Completion of all required fields in the application
- Undergraduate transcripts
- One Recommendation (minimum)

If you have questions, send an email to Elizabeth Nelson at Elizabeth.Nelson@ornl.gov. Please include the reference code for this opportunity in your email.

Application Deadline 3/16/2016 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.

This study focuses on quantifying uncertainties of flow and contaminant transport in subsurface because of the uncertainty of material interfaces. It is well-known that porous media in subsurface, consisting various hydrostratigraphic units that differ in hydraulic properties, are spatially heterogeneous, and that the hydraulic properties of these media are highly uncertainty, partially due to limited data available. Substantial studies have been done in literature on quantifying the uncertainty of flow and transport due to the uncertainty of hydraulic parameters, while research on the effect of uncertain interfaces among hydrostratigraphic units remains untouched. This work will be significant in solving many practical problems, such as predicting transport and fate of pollutants in the environment, remediation of contaminated sites, and waste treatment and disposal.

This work involves mathematical derivations of stochastic flow/transport equations, numerical implementation, and code verification using synthetic cases. Some preliminary work has been done and is promising. The student is expected to write manuscripts for publication in leading journals.



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Qualifications The successful candidate should be a graduate student studying applied math, statistics, computational sciences or geosciences. Fluency in one or more programming languages is strongly preferred.

Eligibility Requirements:

1. Be currently enrolled as a full-time undergraduate or graduate student at an accredited Minority Serving Institution *see criteria for Minority Serving Institutions here <http://srnl.doe.gov/msipp/internships.htm>
2. Be working towards a science, technology, engineering, or mathematics (STEM) degree
3. Have an undergraduate cumulative minimum Grade Point Average (GPA) of 3.0 on a 4.0 scale
4. Be a United States citizen
5. 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.
6. Reference must be received by March 6, 2016 at 11:59 PM ET

For more information about The Minority Serving Institutions Partnership Program (MSIPP) Internships, please visit <http://srnl.doe.gov/msipp/internships.htm>

To see all MSIPP position postings visit: www.orise.orau.gov/MSIPP

- Eligibility Requirements**
- **Citizenship:** U.S. Citizen Only
 - **Degree:** Bachelor's Degree or Master's Degree.
 - **Overall GPA:** 3.00
 - **Discipline(s):**
 - **Chemistry and Materials Sciences** ([12](#) )
 - **Computer, Information, and Data Sciences** ([16](#) )
 - **Earth and Geosciences** ([21](#) )
 - **Engineering** ([27](#) )
 - **Environmental and Marine Sciences** ([14](#) )
 - **Life Health and Medical Sciences** ([45](#) )
 - **Mathematics and Statistics** ([10](#) )
 - **Physics** ([16](#) )
 - **Science & Engineering-related** ([1](#) )

Affirmation I certify that I am pursuing or have completed coursework towards a degree in science, technology, engineering, mathematics, or a related field.