

Opportunity Title: Metal Oxides Deposition by Atomic Layer Deposition for Gas Sensor

Opportunity Reference Code: DOE-MSIPP-17-5-ANL

Organization U.S. Department of Energy (DOE)

Reference Code DOE-MSIPP-17-5-ANL

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 Lisa Reed at lisareed@anl.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: Various metal oxide (MOX) nanocrystals (NCs)/carbon nanotube (CNT) chemo-resistors have been investigated in order to design sensitive exhaled breath gas sensors. The MOX NCs/CNT-based sensors lack of fast recovery time, long-time stability, and low selectivity to humidity, limiting their utility. The purpose of the project is to determine which MOX deposited by atomic layer deposition (ALD) at different temperatures will cause the CNTs to be most reactive to methane and less selectivity to humidity. The most challenging aspect of the project is to understand the procedure for depositing MOX (ZnO, TiO₂,




The ORISE GO mobile app helps you stay engaged, connected and informed during your ORISE experience – from application, to offer, through your appointment and even as an ORISE alum!

Visit ORISE GO

GET IT ON Google Play

Download on the App Store

Opportunity Title: Metal Oxides Deposition by Atomic Layer Deposition for Gas Sensor

Opportunity Reference Code: DOE-MSIPP-17-5-ANL

Al₂O₃) or multilayers of these oxides by ALD at different temperatures without inducing major surface modifications. Higher deposition temperatures could affect the metal electrodes and MOX interface so the fabrication flow would need to be modified and stencil masks should be used for metal electrodes after MOX deposition. We have to understand the mechanism of these modifications and how they affect the sensitivity of the sensors.

Location: This internship will be located at Argonne 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.ornl.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 in Materials Science, Materials Science Engineering, Environmental

Opportunity Title: Metal Oxides Deposition by Atomic Layer Deposition for Gas Sensor

Opportunity Reference Code: DOE-MSIPP-17-5-ANL

Health, Nanotechnology, or related field.

It is desirable for the candidate to have:

- Materials Science experience.
- SEM experience.

**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 👁)
 - **Engineering** (27 👁)
 - **Environmental and Marine Sciences** (1 👁)
 - **Life Health and Medical Sciences** (45 👁)
 - **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).