

**Opportunity Title:** Post-doctoral Researcher: Methane Selective Inorganic

Sensing Layer R&D

**Opportunity Reference Code:** NETL-2015-11-1-Ohodnicki

**Organization** National Energy Technology Laboratory (NETL)

**Reference Code** NETL-2015-11-1-Ohodnicki

**Application Deadline** 11/9/2016 12:00:00 AM Eastern Time Zone

**Description TITLE:** Post-doctoral Researcher: Methane Selective Inorganic Sensing Layer R&D

**DEPARTMENT:** U.S. Department of Energy

**AGENCY:** National Energy Technology Laboratory (NETL)

**LEVEL:** Post-doctoral

**POSITION INFORMATION:** 1 year appointment, full time (40 hours per week) with the possibility of extension.

**CLOSING DATE:** November 9, 2016

**DUTY LOCATION:** Pittsburgh, PA

**WHO MAY BE CONSIDERED:** United States Citizens, LPRs, & Foreign Nationals with appropriate approval which includes F-1 OPT with EAD (STEM extension not valid), J-1 Exchange Visitor, and LPR with EAD.

#### **SUMMARY:**

A post-doctoral researcher is sought for research and development of methane selective sensing layers for end-use application in a range of sensor devices including optical, electrochemical, and microwave-based sensor platforms. The researcher will be responsible for depositing and characterizing a range of inorganic thin films including oxides, nanoparticle incorporated oxides, and others using techniques that include wet chemistry based thin film deposition and physical vapor deposition (sputtering, evaporation, etc.). Electronic, optical, and electrochemical properties will be characterized to evaluate the potential for deployment in a range of sensor devices for selective methane sensing. Excellent communication skills and the desire to research in an interdisciplinary team environment are highly desired. The researcher will be expected to produce high-quality scientific publications and to contribute to new intellectual property development. Specific examples of responsibilities include:

1. Deposition of inorganic thin films using wet-chemistry based sol-gel and physical vapor deposition techniques.
2. Characterization of optical, electronic, and electrochemical properties using a combination of electrical testing equipment, optical spectrometers, and electrochemical testing systems.
3. Design and utilization of automated gas sensor testing systems for characterizing responses of thin films as well as fabricated sensor devices that utilized deposited films.
4. Characterization of film microstructure and phase identity using x-ray diffraction and electron microscopy techniques and surface science



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characterization using x-ray photoelectron spectroscopy.

**KEY REQUIREMENTS:**

- PhD in materials science, applied physics, chemistry, chemical engineering, or related fields with direct experience in thin film inorganic materials for chemical sensing applications.
- Expertise with thin film deposition and characterization techniques including sol-gel chemistry, physical vapor deposition (sputtering, evaporation, etc), optical spectroscopy, electrical property measurements (Van-der Pauw measurements), x-ray diffraction, electron microscopy, x-ray photoelectron spectroscopy, and electrochemical testing (EIS, cyclic voltammetry, etc.).
- Experience with optical and electronic thin film property modeling.

**HOW TO APPLY:**

Applicants should apply through the Oak Ridge Institute for Science and Education (ORISE) program. The ORISE Program provides opportunities for undergraduate students, recent graduates, graduate students, postdoctoral researchers, and faculty researchers. NETL utilizes the ORISE program to support research within NETL's Office of Research & Development.

- Interested applicants should complete the online application at <http://www.ornl.gov/netl/>
- In the online application list **Paul Ohodnicki** as your requested mentor. This will associate your application with this job posting. Please send a CV to [Paul.Ohodnicki@netl.doe.gov](mailto:Paul.Ohodnicki@netl.doe.gov)
- If you have additional questions please contact Nancy Andres, [nancy.andres@netl.doe.gov](mailto:nancy.andres@netl.doe.gov), who is the NETL ORISE program contact.

**Eligibility  
Requirements**

- **Degree:** Doctoral Degree.
- **Discipline(s):**
  - **Chemistry and Materials Sciences** ([12](#) )
  - **Communications and Graphics Design** ([1](#) )
  - **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](#) )
  - **Other Non-Science & Engineering** ([13](#) )
  - **Physics** ([16](#) )
  - **Science & Engineering-related** ([1](#) )
  - **Social and Behavioral Sciences** ([28](#) )