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Postdoctoral Research Associate – Control of hysteresis in driven nanoscale materials

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Date: Jan 12, 2019

Location: Oak Ridge, TN, US, 37830

Company: Oak Ridge National Laboratory

Requisition Id 398

Purpose:

The Center for Nanophase Materials Sciences (CNMS) is seeking a Postdoctoral Research Associate to support research directed toward understanding and control of hysteretic materials. The goals are to reveal physical mechanisms of nanoscale phenomena that depend on the past states of the system, control over thermochemical, electrochemical and quasiparticle "breakdown" on the nanoscale, and development of Scanning Probe Microscopy, theory and materials for on-demand hysteresis beyond ferroelectrics.

As a Postdoctoral Research Associate, you will contribute to research in these areas using Atomic Force Microscopy (AFM) imaging and spectroscopy in ultra-high vacuum (UHV) and controlled environments, incorporating multiple local stimuli (electric field, pressure, thermal, time. Research will focus on compositional, dielectric and electronic changes in binary oxides, charge-ordered insulators and ionic conductors. The research provides exciting opportunities for development of your experience and scientific vision. The position resides in the Scanning Probe Microscopy Group within the Center for Nanophase Materials Science (CNMS) of the Physical Sciences Directorate at the Oak Ridge National Laboratory (ORNL).

Major Duties/Responsibilities:

In this position, you will:

- Work as part of a dynamic team conducting research that advances our understanding of nanomaterials and leads to the development of new capabilities, maintaining a high level of scientific productivity
- Manage and operate UHV and controlled environment microscopes combining AFM with multiple stimuli
- Explore functional material properties in-situ via scanning probe and electron spectroscopy methods
- Perform data analysis and utilize and contribute to open source tools developed in-house for data and image analysis
- Present research and publish scientific results in peer-reviewed journals
- Ensure compliance with environment, safety, health and quality program requirements
- Maintain a strong commitment to the implementation and perpetuation of values and ethics

Basic Qualifications:

- A PhD in Condensed Matter Physics or a closely related field, completed within the last five years

Preferred Qualifications :

- A strong background in solid-state and condensed matter physics, including electronic structure, crystallography, defect chemistry and transport properties
- A strong background in ferroic (ferroelectric/ferromagnetic/ferroelastic) materials

- Demonstrated experience with scanning probe microscopy
- Excellent interpersonal, oral, and written communication skills in English
- A strong record of productive and creative research demonstrated by publications in peer-reviewed journals and presentations at scientific conferences
- Familiarity with ultra-high vacuum systems
- Experience with pulsed laser deposition of oxide heterostructures and in situ characterization using surface analytical techniques
- A background in instrument development and a detailed understanding of SPM equipment
- Capability for innovative research with minimal supervision and the ability to work collaboratively in a team environment and interact effectively with a broad range of colleagues
- Willingness to learn new analytical tools and approaches including scientific programming and machine learning methods
- Knowledge of a programming language (such as python or Matlab) for scientific data analysis, and some knowledge of basic machine-learning methods.

Other Information:

The appointment length will be up to 24 months with the potential for extension. Initial appointments and extensions are subject to performance and availability of funding.

For consideration, please apply via our website at ORNL Careers. Please provide a list of publications when applying for this position. Three letters of reference are required and can be uploaded to your profile or emailed directly to PSDrecruit@ornl.gov. Please include the title of the position in the subject line.

This position will remain open for a minimum of 5 days after which it will close when a qualified candidate is identified and/or hired.

We accept Word (.doc, .docx), Adobe (unsecured .pdf), Rich Text Format (.rtf), and HTML (.htm, .html) up to 5MB in size. Resumes from third party vendors will not be accepted; these resumes will be deleted and the candidates submitted will not be considered for employment.

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