Postdoctoral Research Associate in Force Based Scanning Probe Microscopy

Center for Nanophase Materials Sciences
Physical Sciences Directorate
Oak Ridge National Laboratory

ORNL08-113-CNMS

Project Description:
The Center for Nanophase Materials Science (CNMS) at Oak Ridge National Laboratory (ORNL) is seeking candidates to fill postdoctoral positions in the field of force-based scanning probe microscopy in ultra high vacuum and liquid environments. This program takes advantage of recently developed R&D100 Award winning Band Excitation Scanning Probe Microscopies, including new spectroscopic modes for studies of energy dissipation and energy transfer, nanoscale thermal and electromechanical imaging of a wide range of materials, including oxides and polymers. This position provides an opportunity to join an experienced team to develop methods and applications in directions such as dynamic SPM and new control modes, identification and control of static and dynamic ferroelectric phenomena at nanometer scale, molecular unfolding spectroscopy, electromechanical probing on single-molecule level, and time-resolved measurements. The CNMS (http://cnms.ornl.gov/) is a collaborative nanoscience user research facility established by the Office of Science, U.S. Department of Energy. The CNMS has a diverse spectrum of nanoscience research activities including emphasis on synthesis and characterization of complex oxides, polymers, catalysts, and nanostructures. The Scanning Probe group has six microscopes with capabilities developed at ORNL for imaging functional properties. The candidate will work closely with ORNL's surface scientists, SPMers, theorists, and electron microscopists (including in-situ SPM-STEM).

Qualifications: This position requires a Ph.D. in the physical sciences, with an emphasis on atomic force microscopy (dynamic methods, multifrequency SPM, protein unfolding, high-resolution liquid and UHV). The successful applicant must demonstrate experience in the experimental application, development, and quantitative interpretation of modern scanning probe techniques. A working knowledge of MatLab/LabView is an advantage. The applicant must have the ability to work in a team and interact effectively with a broad range of colleagues. In addition, the candidate will be involved in the CNMS user program, with wide opportunities for scientific collaborations. Excellent oral and written communication skills are required, and presentations and publication of scientific results in peer-reviewed journals are expected. Demonstrated ability to communicate in English to an international scientific audience is essential. All degree requirements must be completed before starting the appointment.

How to Apply:
Qualified applicants may apply online at https://www2.orau.gov/ORNL_POST/. All applicants will need to register before they can begin the online application. For complete instructions, on how to apply, please see the instructions at http://www.orau.gov/orise/edu/ornl/orni-pdpm/application.htm. When applying for this position, please reference the position title and number. Questions regarding the position can be directed to Dr. Sergei V. Kalinin, serqei2@ornl.gov. Applications will be accepted until October 1, 2008 or until the position is filled.

This appointment is offered through the ORNL Postgraduate Research Participation Program and is administered by the Oak Ridge Institute for Science and Education (ORISE). The program is open to all qualified U.S. and non-U.S. citizens without regard to race, color, age, religion, sex, national origin, physical or mental disability, or status as a Vietnam-era veteran or disabled veteran.

References:

S.V. Kalinin et al, *Intrinsic Single Domain Switching in Ferroelectric Materials on a Nearly-Ideal Surface*, PNAS **104**, 20204 (2007).

S. Jesse et al, *Direct imaging of Spatial and Energy distribution of Nucleation Centers in Ferroelectric Materials*, Nature Materials **7**, 209 (2008).

S.V. Kalinin et al, *Probing the role of single defects on the thermodynamics of electric-field induced phase transitions*, Phys. Rev. Lett. **100**, 155703 (2008).