



Our User Science Shapes the Future

2012 Users Meeting
Advanced Photon Source
Center for Nanoscale Materials
Electron Microscopy Center

Short Course: Functional Imaging with Ambient Atomic Force Microscopy

Recent developments in energy-relevant nanoscience & nanotechnology areas such as graphene, carbon nanotubes, photovoltaics, and batteries require understanding not only structure of the materials at the nanometer level, but also their physical electrical, thermal, and mechanical properties. Scanning probe microscopy is one of the few techniques that allows examination of material's structure and properties at sub-100 nm resolution. The goal of this Short Course is to acquaint participants with recent developments in ambient scanning probe microscopy. In the morning, the Short Course starts with short lectures, followed by functional imaging of materials performed by industry professionals in the afternoon, and finishes by measuring properties of the samples provided by workshop participants in the late afternoon. Participants must contact Maxim Nikiforov (maximnik@anl.gov) with a description of the samples prior to arrival. Late afternoon spots for sample trials will be distributed on first-come first-served basis.

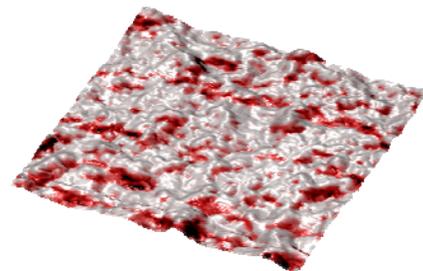
The presenters are academic researchers and AFM industry practitioners focused on the measurement techniques that are required for understanding structure and properties of energy-related materials. They include:

- Advancements in electrical property measurements using environmental control (S. Xu, Agilent).
- Electrical, mechanical, and functional characterisation of materials using Peak Force tapping AFM (I. Armstrong, Bruker Nano)
- Material characterization via AFM based chemical, mechanical and thermal analysis (K. Kjoller, Anasys Instruments)
- Nanomechanical and functional properties of energy storage materials (R. Proksch, Asylum Research)
- Single-pass Kelvin probe microscopy with phase modulation (S. Magonov, NT-MDT Development Inc.)
- Quantitative conductivity and mechanical properties mapping of solar cell materials (M.P. Nikiforov, ANL)
- Visualization of ferroelectric domain behavior using atomic force microscopy (S. Hong, ANL)
- Probing nanoelectronic materials and devices with conductive atomic force microscopy (M. Hersam, Northwestern University)
- Tip-based nanomanufacturing and nanostructure characterization (J.R. Felts, W.P. King, University of Illinois at Urbana Champaign)

Hands-on sessions include:

- Nanomechanical properties mapping (AM-FM) and/or electrochemical strain mapping for batteries.
- Single-pass Kelvin Force Microscopy with phase modulation
- Materials properties mapping using PeakForce
- Thermal analysis using AFM
- Conductive AFM

The Short Course will be held at the Center for Nanoscale Materials at Argonne National Laboratory on May 10, 2012. Registration for the meeting is required with an additional \$50 short course fee. The number of short course participants is limited, advance registration is required.



For more information and registration, please check the meeting web site at <http://usersmeeting2012.conference.anl.gov/> or contact organizer at maximnik@anl.gov.

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