

Center for Nanophase Materials Sciences

Advanced Electron Microscopy Workshop:
Aberration-Corrected STEM Imaging, Spectroscopy, and
In Situ Microscopy

September 18-19, 2014

Workshop Organizers:

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Recent advances in electron microscopy now allows for the correlation of materials functionality with unparalleled spatial, spectral, and temporal resolutions. The aim of this workshop is to discuss the latest developments of aberration corrected STEM imaging, spectroscopy, and *in situ* and operando microscopy methods, that are being used to elucidate the role of structural defects and transport that control the physical properties and behavior of materials. The workshop is supported by the Center for Nanophase Materials Sciences at Oak Ridge National Laboratory.

Agenda

Thursday September 18, 2014

8:30 – 9:20 AM Continental Breakfast
9:20 – 9:30 AM Opening Remarks (Ray Unocic)

Session I: Advances in *In situ* Electron Microscopy

9:30 – 10:00 AM *Robert Klie*
In situ Characterization near Atomic-resolution using
Aberration-Corrected STEM

10:00 – 10:30 AM *Nicholas Schneider*
Radiation Chemistry in Liquid Cell Electron Microscopy

10:30 – 11:00 AM *Raymond Unocic*
Synthesis of Nanostructured Materials with *in situ* Liquid and
Electrochemical Cell Microscopy

11:30 – 12:00 AM *Dan Gardiner*
System Solutions for In Situ Electron Microscopy

12:00 – 1:30 PM Lunch on your own

1:30 – 2:00 PM *Larry Allard*
Atomic-Resolution Electron Microscopy at High Temperatures
and Pressures, via MEMS-based Closed-Cell Gas Reactor
Technology

2:30 – 3:00 PM *Miaofang Chi*
Design Bimetallic Pt-TM Nanocatalysts at Atomic-scale for Fuel
Cells

3:00 – 3:30 PM *Bethany Hudak*
Direct Observation of the Vapor-Liquid-Solid Mechanism in
Reverse

3:30 – 4:00 PM Bus to Advanced Microscopy Laboratory

4:00 – 5:30 PM Tour of AML - Hands on Demos

Friday September 19, 2014

8:30 – 9:30 AM Continental Breakfast

Session II: Understanding Materials Functionality with Theory and Characterization

9:30 – 10:00 AM *Juan Carlos Idrobo*
Novel Spectroscopy Techniques in Aberration-corrected STEM

10:00 – 10:30 AM *Wu Zhou*
Single atom Imaging and Spectroscopy with Low kV Aberration-corrected STEM

10:30 – 11:00 AM *Rohan Mishra*
Tango of Atomic-scale Theory and Electron Microscopy to Reveal Dilute Magnetism in High-Tc Superconductors

11:00 – 11:30 AM *Mark Oxley*
Interpretation and Quantification of Electron Microscopy: The Essential Role of theory

11:30 – 1:00 PM Lunch on your own

1:00 – 1:30 PM *David Cullen*
Correlating Catalyst Structures with Bulk Properties through Analytical Aberration-corrected Electron Microscopy

1:30 – 2:00 PM *Danna Qian*
Understanding Intercalation Material for Batteries: A Microscopic View

2:00 – 2:30 PM *Qian He*
Catalyst Design via Electron Microscopy

2:30 Closing Remarks (Juan Carlos Idrobo)