U.S. DEPARTMENT OF ENERGY | Office of Science

Office of Science User Facilities

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Division of Materials Sciences and Engineering
Basic Energy Sciences

Bridging Research Interactions through Collaborative Grants in Energy (BRIDGE)

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Office of Science User Facilities

- The Office of Science supports a broad range of open access Scientific User Facilities.
- The facilities include synchrotron light sources, neutron sources, nanoscale science research centers, electron-beam microcharacterization centers, supercomputers, and facilities for environmental and atmospheric studies.
- In 2010 over 26,000 researchers used SC User Facilities.
- Facility access is obtained through the submission and approval of a “user proposal”.
- Information on “calls for proposals” for SC User Facilities can be found on the facility website.
- Proposals are reviewed for scientific merit, feasibility and safety.
- If approved, there is no charge for users conducting non-proprietary research. The expectation is that results are to be published in the open literature.
- Access for proprietary research is also available on a full cost-recovery basis.
- User program coordinators and staff scientists at the facilities are available to assist users at all stages of the process.
- For details on SC User Facilities go to: http://science.energy.gov/user-facilities/

SC User Facilities for BRIDGE

- Office of Science Facilities relevant to the BRIDGE FOA are supported by the ***Office of Basic Energy Sciences (BES)***, the ***Office of Biological and Environmental Sciences (BER)*** and the Office of ***Advanced Scientific Computing Research (ASCR)***

- **BES Facilities:**
  - X-Ray Light Sources (APS, NSLS, ALS, SLAC, LCLS)
  - Neutron Sources (Lujan, HFIR, SNS)
  - Nanoscale Science Research Centers (CNMS, CINT, CFN, CNM, MF)
  - Electron-Beam Microcharacterization Centers (NCEM, EMC, ShaRE)

- **BER Facilities**
  - Environmental Molecular Sciences Laboratory

- **ASCR**
  - NERSC, ALCF, OLCF

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Center Websites

Center for Nanophase Materials Sciences

U.S. DOE Nanoscale Science Research Center

An Office of Science User Facility

- CNMS Home
- About CNMS
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- Becoming a User
- Working at CNMS
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- Other DOE/BES User Facilities
- DOE Basic Energy Sciences

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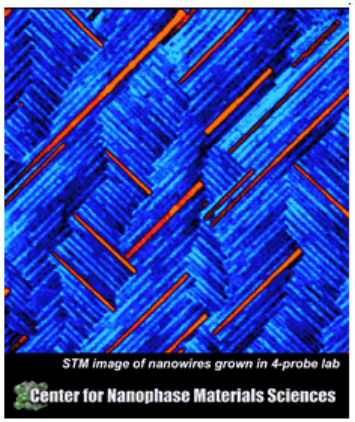

Call for Proposals ** OPEN **

Submission deadline

May 2, 2012

HOLD THE DATES

2012 CNMS User Meeting

September 14, 2012

Oak Ridge, Tennessee

NOTE: Related workshops will begin September 12-13, 2012

Submit your ideas for improving CNMS

Recent Highlights

- Correlating Electronic Transport to Atomic Structures in Self-Assembled Quantum Wires
- Expression Optimization and Synthetic Gene Networks in Cell-free Systems
- Tunable Metallic Conductance in Ferroelectric Nanodomains
- Supramolecular Self-Assembly of π-conjugated Hydrocarbons via 2D Cooperative CH/π Interaction
- PS-*b*-P3HT Copolymers as P3HT/PCBM Interfacial Compatibilizers for High Efficiency Photovoltaics

Recent News

- "Technique Creates Piezoelectric Ferroelectric Nanostructures," *Newswise*
- "ORNL microscopy explores nanowires' weakest link," *PhysOrg.com*
- "Cummings appointed to two NSF advisory boards"
- "Coatings Influence Nanoparticle Toxicity," *Chemical & Engineering News*
- "Nanoscale Metallic Conductivity Demonstrated in Ferroelectrics," *Science Daily*
- Introducing the *2012 CNMS User Executive Committee*

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Basic Energy Sciences User Facilities

Unique research facilities *and* scientific expertise for ultra high-resolution characterization, synthesis, fabrication, theory and modeling of advanced materials

- **Nanoscale Science Research Centers**
  - *Center for Functional Nanomaterials (BNL)*
  - *Center for Integrated Nanotechnologies (SNL & LANL)*
  - *Center for Nanophase Materials Sciences (ORNL)*
  - *Center for Nanoscale Materials (ANL)*
  - *Molecular Foundry (LBNL)*
- **Electron-Beam Microcharacterization Centers**
  - *Electron Microscopy Center for Materials Research (ANL)*
  - *National Center for Electron Microscopy (LBNL)*
  - *Shared Research Equipment Program (ORNL)*

- **Available to all researchers at *no cost* for non-proprietary research, regardless of affiliation, nationality, or source of research support**
- **Collaboration with facility scientists an optional potential benefit**
- **Access based on external peer merit review of brief proposals**
- **Coordinated access to co-located facilities to accelerate research cycles**
- **Instrument and technique workshops offered periodically**
- **A variety of on-line, on-site, and hands-on training available**
- **Proprietary research may be performed at full-cost recovery**

- **Light sources**
  - *Stanford Synchrotron Radiation Laboratory (SLAC)*
  - *National Synchrotron Light Source (BNL)*
    - *National Synchrotron Light Source II under construction*
  - *Advanced Light Source (LBNL)*
  - *Advanced Photon Source (ANL)*
  - *Linac Coherent Light Source (SLAC)*
- **Neutron sources**
  - *Manuel Lujan, Jr. Neutron Scattering Center (LANL)*
  - *High Flux Isotope Reactor (ORNL)*
  - *Spallation Neutron Source (ORNL)*

http://www.science.doe.gov/bes/suf/user-facilities

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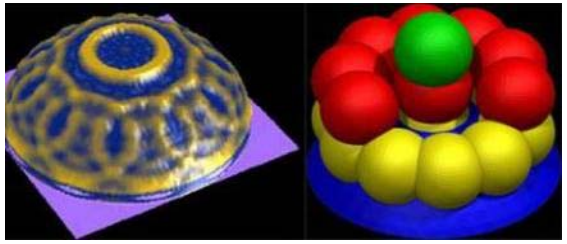
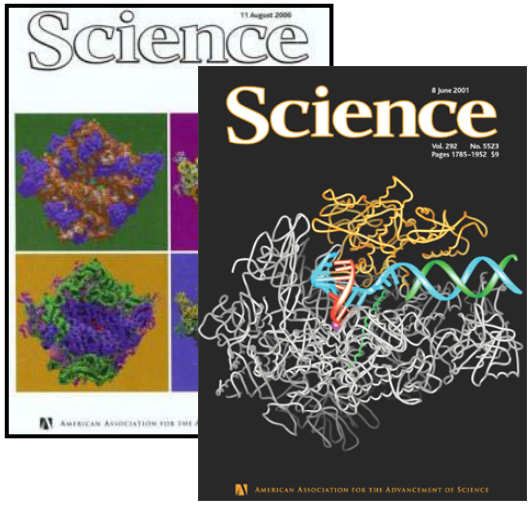
Seeing atoms:
Providing national user facilities for probing materials at the atomic scale

X-ray scattering

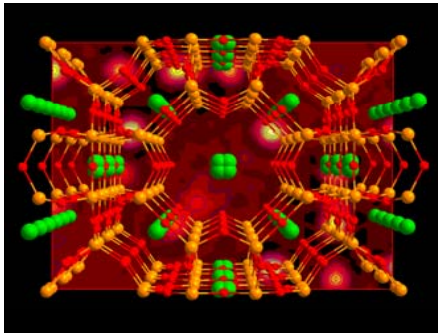


AlNiCo quasicrystal structure

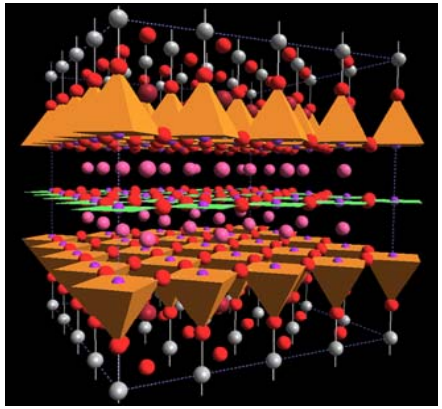


Molecular machines of life

Neutron scattering

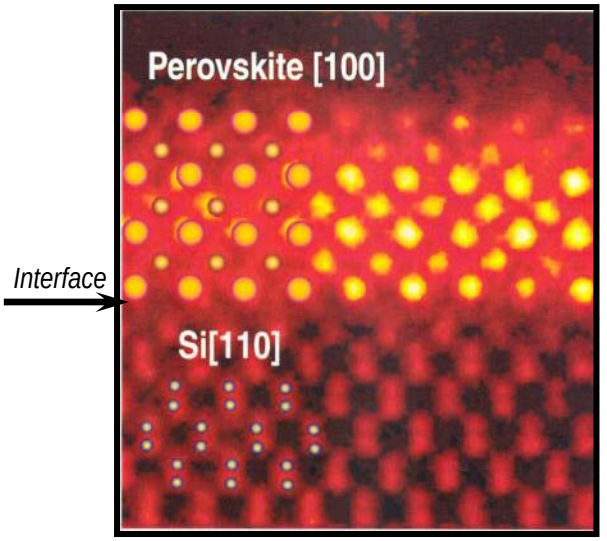


Zeolite catalyst



High Tc superconductor

Electron Scattering



Transmission electron microscope image showing an abrupt interface and low defect density for the ferroelectric $SrTiO_3$ on Si.

Biological and Environmental Research (BER)
Environmental Molecular Sciences Laboratory

EMSL is a multi-disciplinary multi-instrument user facility bringing novel and state of the art tools and staff expertise to address energy and environmental challenges.

- Molecular Science Computing
- Electron, Ion and Optical Microscopy and Diffraction
- High Field Magnetic Resonance – NMR and EPR
- Surface and Interface Spectroscopy and Spectrometry
- Thin Film Deposition and Micro-fabrication
- Cutting Edge Mass Spectrometry
- Subsurface Flow and Transport
- Cell Isolation and Bio-systems Analysis

For more information about EMSL and available research opportunities, visit emsl@pnl.gov or contact Terry Law, User Support Manager (terry.law@pnnl.gov; 509-371-6003)

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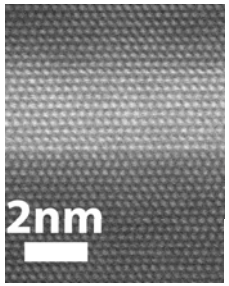
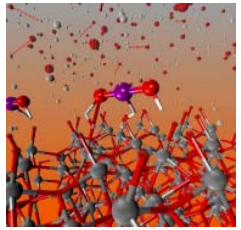
EMSL – Unique suite of advanced tools for materials and interfaces

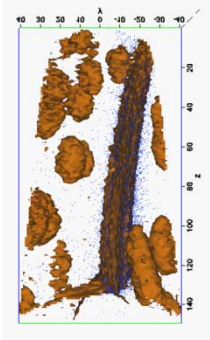
State of the art high resolution **electron microscopy** of thin films and interfaces



High Performance Computing Infrastructure along with a full suite of chemical **computational codes** and close **coupling of theory, modeling and experiment**

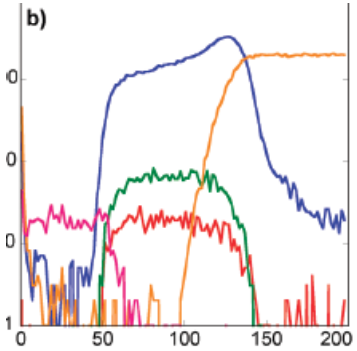


Atom Probe Tomography
3d images of atom distribution and **buried interfaces**

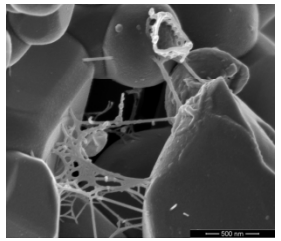


Novel capabilities for **in situ, real-time** and **controlled environment** measurements in TEM, XRD and NMR – solids, interfaces and liquid environments

Surface and interface composition and **chemistry** plus depth **distribution**



Helium **Ion Microscopy**
Large depth of field good for insulators



www.emsl.pnnl.gov

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DOE Office of Advanced Scientific Computing Research (ASCR) High End Scientific Computing Facilities

High Performance Production Computing --

National Energy Research Scientific Computing Center (NERSC) at Lawrence Berkeley National Laboratory

- Delivers high-end capacity computing to entire DOE SC research community
- Over 3000 users and 400 projects

Leadership Computing –

Leadership Computing Centers at Argonne National Laboratory (ALCF) and Oak Ridge National Laboratory (OLCF)

- Delivers highest computational capability through *Innovative and Novel Computational Impact on Theory and Computation (INCITE)* program
- Approximately 300 users and 25-30 projects at each center

OLCF Oak Ridge Leadership Computing Facility

- **Available to all researchers at *no cost* for non-proprietary research, regardless of affiliation, nationality, or source of research support**
- **Access to user support**
- **Access based on external peer merit review of brief proposals**
- **Technical workshops offered periodically**
- **A variety of on-line, on-site, and hands-on training available**
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http://science.energy.gov/user-facilities

Please visit the Office of Science Website for additional information