



EnviroSync

An organization of environmental science users of synchrotron radiation facilities

2007 EnviroSync Workshop: Assessing Synchrotron Radiation Capabilities and Future Needs for Molecular Environmental Science and Low-Temperature Geochemistry

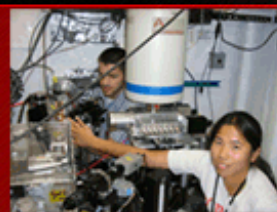
23-24 July 2007 Rockville, MD

Sponsorship: DOE – BES (N. Woodward)
DOE – BER (R. Hirsch)
NSF – EAR (D. Lambert)



EnviroSync

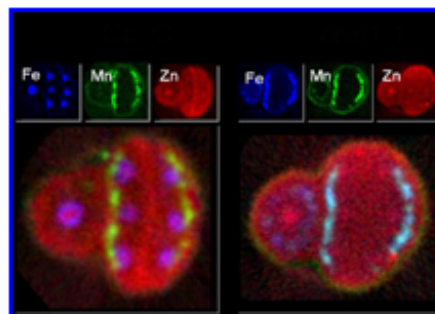
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Synchrotron Science Highlights

X-ray microprobes provide unique capabilities for determining chemical speciation by using microbeam applications of X-ray absorption spectroscopy, X-ray fluorescence and X-ray diffraction.



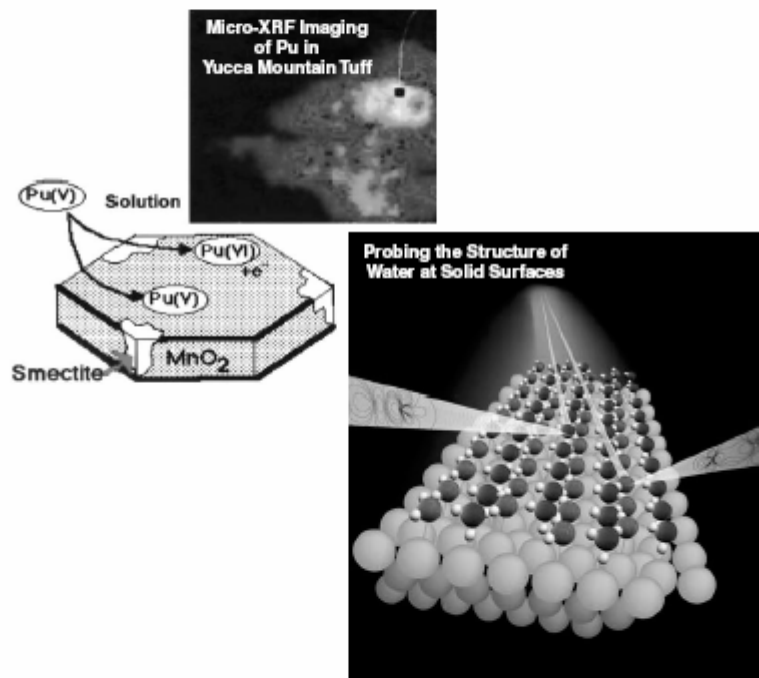
This month's science highlight focuses on beamline X26A at the National Synchrotron Light Source at Brookhaven National Laboratory.

[Science Highlights-NSLS-Beamline X26A](#)

To the left- Fluorescence microtomography of *Arabidopsis thaliana* seeds from a wild type strain (COL-0) and a mutant strain in which the vacuolar iron uptake transporter VIT1 is disrupted (Kim et al. 2006).

2003 Report of EnviroSync – A National Organization of
Environmental Science Users of Synchrotron Radiation Sources

Molecular Environmental Science:
An Assessment of Research
Accomplishments, Available Synchrotron
Radiation Facilities, and Needs



Prepared in part for the Department of Energy under contract DE-AC03-76SF00515

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Stanford Synchrotron Radiation Laboratory
Stanford University, Stanford, California 94309

Last major report

- Released in late 2003
- 23 co-authors
- All US synchrotron facilities
- Recommendations resulted in new user support at the DOE-supported synchrotrons

Why Now?

- Development of SR resources requires planning and advocacy
- Last assessment of SR-MES/LTG fields several years ago
- New synchrotron planned -- NSLS II
- Major upgrade planned at APS
- Spear 3 upgrade at SSRL completed 2004; LCLS in 2009
- MES beamline 11.0.2 at ALS became operational 2003
- MES/LTG usage increasing at all synchrotrons
- Other communities are also planning for future

Workshop Goals

Purpose:

1. Assess current capabilities for MES/LTG research at US synchrotrons
2. Assess current usage of these facilities by community
3. Identify overarching scientific drivers affecting the MES/LTG SR community
4. Identify SR needs for future MES/LTG research, including new directions
5. Propose and prioritize recommendations to meet community needs

Goals:

1. Inform program managers of federal funding agencies of capabilities, opportunities, and community needs
2. Inform directors of synchrotron facilities and design teams of needs
3. Inform broader scientific community of opportunities

Dissemination of workshop findings (options):

1. White paper
2. Article published in open literature (e.g., exec summary in addition to 1)
3. Focused reports (for individual synchrotron facilities, funding agencies, etc.)

Schedule – Monday, 23 July

8:00 – 8:30 Check-in and Continental Breakfast

8:30 – 8:45 Welcome, Introductory Remarks, Charge to Workshop (R. Reeder)

Facility Reports

8:45 – 9:00 Advanced Light Source (D. Shuh)

9:00 – 9:15 Advanced Photon Source (K. Kemner)

9:15 – 9:30 Center for Advanced Microstructures & Devices (A. Roy)

9:30 – 9:45 National Synchrotron Light Source (T. Lanzirotti)

9:45 – 10:00 Stanford Synchrotron Radiation Laboratory (J. Bargar)

10:00 – 10:15 Synchrotron Radiation Center (C. Hirschmugl)

10:15 – 10:30 Cornell High Energy Synchrotron Source (E. Fontes)

10:30 – 11:00 Coffee Break

Design Team Reports for Planned Upgrades

11:00 – 11:20 Conceptual plan for NSLS II (S. Dierker)

11:20 – 11:40 Conceptual plan for APS upgrade (D. Mills)

11:40 – 12:00 Vision for environmental and geochemistry research capabilities at SSRL and LCLS (J. Stohr)

12:00 – 1:20 Lunch-(provided)

Science Talks - “Opportunities for New Research Directions”

1:20 – 1:40 Ultrafast x-ray science (A. Lindenberg)

1:40 – 2:00 Surface/interface scattering (P. Fenter)

2:00 – 2:20 Imaging (C. Jacobsen)

2:20 – 2:40 Spectromicroscopy (D. Shuh)

2:50 – 5:30 Working Group Break-out Meetings (Group leaders in bold)

A. Bulk spectroscopy: XAS, IR, XSW, RIXS, XRS (**O’Day**, Roy, Sparks, Fendorf, Ravel, Northrup, Hess)

B. Hard x-ray microprobe/tomography (**Lanzirotti**, Sutton, Bertsch, Bostick, Fitts, Nico, Scheckel)

C. Spectromicroscopy (**Jacobsen**, Kemner, Shuh, Myneni, Hirschmugl)

D. Bulk scattering: SAXS/WAXS/Total scattering (**Parise**, Soderholm, Gilbert, Webb, Lindenberg, Heaney)

E. Surface & interface scattering (**Fenter**, Sturchio, Waychunas, Brown, Eng)

6:30 – 8:30 Dinner

Schedule – Tuesday, 24 July

7:45 – 8:30 Continental Breakfast

Working Group Reports and General Discussion

8:30 – 8:50 Bulk spectroscopy: XAS, IR, XSW, RIXS, XRS (P. O'Day)

8:50 – 9:10 Hard x-ray microprobe/tomography (A. Lanzirotti)

9:10 – 9:30 Bulk scattering: SAXS/WAXS/Total scattering (J. Parise)

9:30 – 9:50 Spectromicroscopy (C. Jacobsen)

9:50 – 10:10 Surface & interface scattering (P. Fenter)

10:10 – 10:30 **Coffee Break**

10:30 – 11:00 MES/LTG Community Building and Access (S. Sutton, G. Brown)

11:00 – 12:30 Working Groups: revise rough drafts of working group reports, complete tabulation of statistics.

12:30 – 1:30 **Lunch – (provided)**

1:30 – 2:15 Presentation of draft workshop report and final discussion (J. Bargar)

2:15 – 2:45 EnviroSync business: forthcoming action items and time lines (Facility upgrade timelines), future meetings.

2:45 Thank you and adjournment (R. Reeder)