

SMALL-ANGLE SCATTERING SHORT COURSE 2008

“BEYOND R_G ”

JUNE 28-JULY 2, 2008

ADVANCED PHOTON SOURCE, ARGONNE NATIONAL LABORATORY

The objective of the Small-Angle Scattering Short Course 2008 is to raise the capabilities of the small-angle scattering (SAS) community by providing an intermediate-level course for those in need of a better understanding of SAS theory, and techniques utilized at the APS.

The SAS short course offers an overview of SAS theory, capabilities, and data reduction and analysis tools to enable the community to submit highly effective beam-time proposals and to facilitate better utilization of the resources at the APS.

The course includes hands-on experiments at a selected APS small-angle x-ray scattering facility, and data reduction and evaluation.

Participants are expected to have attained at least a post-doctoral-level education and are encouraged to have a defined experimental program so that they can collect data for a set of samples that they bring.

Lecturers will be available during hands-on workshops for one-on-one discussion and experiments. A CD (for Windows systems) with examples of data reduction and analysis software, which participants will be able to use during and after the workshop, will be provided. Participants are encouraged to bring their own notebook computers.

**SEE OTHER SIDE FOR
COURSE INFORMATION**

Registration fee: \$0 (free)

Number of participants is limited to 25. If needed, organizers reserve the right to select participants.

Registration details: <http://small-angle.aps.anl.gov>

Registration opens: February 15, 2008

Registration deadline: May 15, 2008

Information about acceptance of registration will be sent to participants before May 22, 2008

Participants will be responsible for their own transportation, accommodations, and meal costs.

A limited number of rooms has been reserved at the Argonne Guest House: <http://www.anlgh.org/>

Phone: 800.632.8990 or 630.739.6000

Fax: 630.739.1000

Email: argonne-guest-house@anl.gov

Participants are responsible for reserving these rooms.

SAS INTEREST GROUP

Argonne National Laboratory
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<http://small-angle.aps.anl.gov/>

COURSE SCHEDULE

June 28: (Optional) Experiments

June 30-July 2: Lectures, data reduction, and modeling

SYLLABUS

Small-Angle Scattering Fundamentals

Sample Preparation and Experiments

Overview of Available Instrumentation and Techniques

Data Reduction Tools

Data Analysis Tools

Scientific Lectures on SAS in Materials Science, Chemistry, Biology,
and Polymer Science

Strategies to Write Successful Beam-Time Proposals

SPEAKERS

Dale Schaefer (University of Cincinnati)

Sunil K. Sinha (University of California, San Diego)

Thiyaga P. Thiyagarajan (Argonne)

David Tiede (Argonne)

Randall E. Winans (Argonne)

Byeongdu Lee (Argonne)

Jan Ilavsky (Argonne)

Peter R. Jemian (Argonne)

PARTICIPATING BEAMLINES

Bonse-Hart USAXS: 32-ID (XOR, <http://usaxs.xor.aps.anl.gov>)

Pinhole SAXS: 5-ID (DND-CAT, <http://www.dnd.aps.anl.gov/>)

12-ID (XOR, <http://www.bessrc.aps.anl.gov/>)

18-ID (Bio-CAT, <http://www.bio.aps.anl.gov/>)

Details on the beamlines: http://small-angle.aps.anl.gov/aps_beam_lines.html

EXPERIMENTAL TECHNIQUES

USAXS (32-ID), Materials Science SAXS, Bio SAXS

SOFTWARE

“Irena” & “Nika” (<http://usaxs.xor.aps.anl.gov/staff/ilavsky/index.html>)

NIST SAS package (http://www.ncnr.nist.gov/programs/sans/data/red_anal.html)

ATSAS (<http://www.embl-hamburg.de/ExternalInfo/Research/Sax/software.html>)

ILLUSTRATIONS

Background: USAXS data from monosized distribution of silica spheres
(courtesy of Jan Ilavsky, Argonne).

Top image: Small-angle scattering from aerogel as a function of axial or radial strain
(courtesy of Johannes Pollanen, Northwestern University).

Middle image: Speckle pattern from coherent beam scattering of an aerogel
(courtesy of L. Lurio, Northern Illinois University).

Bottom image: Key polyethylene crystalline and lamellae deformation mechanisms
(courtesy of Brian Landes, Dow Chemical).

