

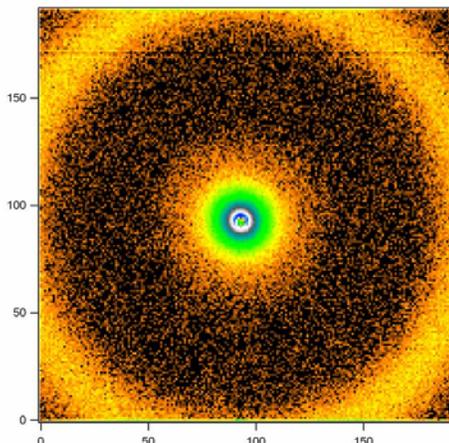
Neutron Sciences Progress at Oak Ridge National Laboratory May 2007

Summary

- A call for experimental proposals for nine instruments at High Flux Isotope Reactor (HFIR) and Spallation Neutron Source (SNS) was issued June 1, 2007; see <http://neutrons.ornl.gov> for more details.
- HFIR Cycle 408 began on May 13, 2007 and was completed on June 9 with nine experiments performed on the three triple-axis instruments. Cycle 409 will begin June 27.
- SNS neutron operations will resume June 21, 2007.
- UT-Battelle, LLC. named Thom Mason to be the new director of Oak Ridge National Laboratory effective July 1, 2007; Thom is currently the Associate Laboratory Director for Neutron Sciences. Ian Anderson, currently Director of the Neutron Scattering Science Division, was named Interim Associate Laboratory Director for Neutron Sciences and Interim Director of the Spallation Neutron Source also effective July 1. While Ian serves in this role, Ken Herwig will be acting as the Director of the Neutron Scattering Science Division.

Instruments and Users

- 32 experiment proposals for the three HFIR triple axis instruments were reviewed and a schedule of recommended experiments was prepared for HFIR reactor cycles 408-409. During the HFIR cycle 408, the three thermal triple axis spectrometers HB-1, HB-1A and HB-3 were operational, and a total of nine experiments were performed by in-house research staff and 12 external users. The experiments included studies of high temperature superconductors, manganese and ruthenium oxides, heavy fermions and low dimensional materials. At HB-1 a new focusing monochromator mechanism was aligned, tested and used throughout the reactor cycle.
- For HFIR's Residual Stress Diffractometer NRSF2 on beam line HB 2B, instrument testing and calibration have been successfully completed and preliminary mapping of residual strains with EPRI were initiated. The first days of the cycle were used for commissioning and service of the monochromator. Most of the studies were preliminary and laying the foundation for more extensive experiments in the next couple cycles; they involved 8 external users.
- After the reactor came up with the new cold source supplying long wavelength neutrons to the guide hall, commissioning began on the two small angle neutron scattering instruments at HFIR (SANS). Both the BES funded 40m SANS (on beamline CG-2) and the BER funded Bio-SANS (on beamline CG-3) are being commissioned in parallel by scientists from both beam lines. Beam profiles and intensity measurements have been measured at several locations along the beamline. The velocity-selectors, evacuated selectable guide sections, and apertures were aligned. Both one-meter SANS detectors are counting neutrons and the user interface is maturing. Initial runs on calibration samples have provided information on the selected wavelengths. Final alignment of the moveable guides, detailed detector calibration, and measurements of the instrument resolution will continue during the next reactor cycle. First user experiments are expected to begin in the following reactor cycle.
- The first data from the HFIR Bio-SANS instrument is pictured below: a standard calibration sample of a polymer blend. While instrument not fully calibrated and optimized, initial results look promising.



- The first users have successfully submitted new proposals, and completed web-based courses for site access and safety training. Classes of practical safety factors were attended by HFIR users in advance of their experiments. As a result of the recent call for proposals for the next cycles, we have received 18 proposals for 87 days. The call for proposals for HFIR Cycle 410A ends June 18.
- Phase 1 installation of the VULCAN neutron guide was completed. The crew worked through the weekend during a major shut-down and successfully installed and aligned the 1st guide piece in 2.5 days; this enabled the completion of the rest of the guide installation within the scheduled shut-down. Participants in this effort are pictured below: Dan Varnell, Marc Shoemaker, Gary Hamm, George Rennich, Xun-Li Wang, Ducu Stoica, and Philip Weber. Installation of VULCAN's 2-ton crane began in the cave and installation of front-end shielding was completed for the shutdown period.



- The TOPAZ spectrometer received first delivery of stacked shielding blocks and the installation of front end shielding was completed. The carriage for first guide subassembly was installed and tested: the carriage with the guide housing rolls in position on rails carrying the guide vacuum housing and guide. See photo below:



- A successful conceptual design review was held for the VISION spectrometer on BL 16b. VISION is optimized to characterize molecular vibrations in a wide range of crystalline and disordered materials over a broad energy range. Leading-edge studies involving scientific disciplines such as nanotechnology, catalysis, biochemistry, geochemistry, and condensed/soft matter science will all benefit from the enhanced performance and properties of VISION.
- The first delivery of the CNCS guide has arrived and the first 12 meters of guide sections have been installed.

- The beam line bender for the EQ-SANS on SNS beam line 6 is installed. See photo below.



- Plans continued for an exhibit and other promotional materials at the American Crystallographic Association annual meeting in Salt Lake City, July 21-26. A flyer will be distributed to all meeting attendees promoting the 2008 ACA annual meeting in Knoxville.

Employment Opportunities

- The following positions are in the Neutron Sciences Directorate or are related to neutron scattering: Click on "View Open Positions" at <http://jobs.ornl.gov/> for additional details
 - SNS Structural Design Engineer, Job ID 2431
 - Polymer Morphologist , Job ID 2415
 - SNS Controls Group Leader, Job ID 2391
 - SNS Controls Team Leader, Job ID 2389
 - SNS Electrical Designer/ CAD Coordinator, Job ID 2383
 - SNS HVAC / Piping Design Engineer, Job ID 2382
 - CNMS Research Staff for Macromolecular Complex Systems, Job ID 2371
 - CNMS Synthetic Polymer Chemistry Technical Staff, Job ID 2369
 - Simulation of Subsurface Processes, Job ID 2356
 - SNS Research Accelerator Division Beam Instrumentation Technician, Job ID 2354
 - SNS Research Accelerator Division Computing Integration Group Leader, Job ID, 2350
 - Neutron Scattering Instrument Scientist (Magnetism Reflectometer), Job ID 2262
 - NSSD Electrical Engineer, Job ID 2225
 - SNS Vacuum Engineer, Job ID 2202
 - SNS Mechanical Designer , Job ID 2194
 - SNS Cryogenic Systems Engineer, Job ID 2065
- **Neutron Scattering Postdoctoral Fellowship Positions with ORNL through Oak Ridge Associated Universities** [description available at <http://www.ornl.gov/orise/edu/ornl/postneeds.htm>]:
 - Dynamic nuclear polarization at SNS [ORNL07-46-NSSD]
 - Software development for commissioning of the VULCAN engineering diffractometer at SNS [ORNL07-17-NSSD]
- **Research Assistant: Molecular & Structural Biochemistry** with North Carolina State University and SNS. To apply for this posting, please visit <https://jobs.ncsu.edu> and search for position 01-57-0706.

Operations

- The High Flux Isotope Reactor (HFIR) restarted with cycle 408 on May 13, 2007. Following successful completion of power ramp-up testing, full power operations were achieved on Wednesday May 16. The cycle ended June 9. Cycle 409 will begin June 27.

- Neutron production at the SNS will begin again June 21. Initial users are expected to participate on the first three instruments during this cycle ending in mid-September.

Future meetings of interest to SNS and HFIR users

- American Crystallographic Association, 2007 Annual Conference, July 21-26, 2007, Salt Lake City, UT, <http://www.biochem.utah.edu/aca2007/>
- *Renewable Energies for a Global Economy*, Experimental Program to Stimulate Competitive Research (EPSCoR) Program Review Workshop, July 23-25, 2007, Golden, CO. <http://www.orau.gov/epscor2007>.
- Use of Neutrons for Diffraction/Materials Characterization/Engineering, Denver X-ray Conference, July 30-August 3, 2007, Colorado Springs, CO; <http://www.dxcicdd.com/07/callforpapers.htm>.
- *SKIN2007 - Studying Kinetics with Neutrons* (joint with NMI3), September 27-28, 2007, University of Göttingen, Germany; http://neutron.neutron-eu.net/n_nmi3/n_networking_activities/SKIN2007
- *Residual Stress Summit*, October 2-4, 2007, Oak Ridge, TN; <http://batman.mech.ubc.ca/~residualstress/>
- **ORNL User Week, October 8-12, 2007**
 - *SNS-HFIR Users*, October 8-10, 2007, Oak Ridge, TN
 - *Center for Nanophase Materials Sciences Users*, October 10-12, 2007, Oak Ridge, TN
 - *SHaRe Users*, October 10-12, 2007.
- Sessions on biointerphases and magnetism during the AVS-54 International Symposium, October 13 – 18, 2007, Seattle, WA, <http://www.avs.org>.
- Materials Research Society Fall Meeting, November 26-30, 2007, Boston, MA, http://www.mrs.org/s_mrs/sec.asp?CID=4749&DID=164574
- American Crystallographic Association, *Annual Meeting*, May 31-June 5, 2008, Knoxville, TN
- International Conference on Neutron Scattering, May 3-7, 2009, Knoxville, TN.

Deadlines for proposal submission at other U.S. neutron facilities

- Lujan Neutron Scattering Center of the Los Alamos Neutron Science Center (LANSCE) is accepting proposals for the run cycle scheduled to begin the week of October 1, 2007. The deadline for proposal submission is 6:00 p.m. (1800) Mountain Daylight Time, Tuesday, June 26, 2007. Details are at <http://www.lansce.lanl.gov/news/2007Call.html>.