

Neutron Sciences Progress at Oak Ridge National Laboratory June 2007

Summary

- The call for experimental proposals for nine instruments at High Flux Isotope Reactor (HFIR) and Spallation Neutron Source (SNS) will close at 6AM EDT, July 16, 2007; see <http://neutrons.ornl.gov> for more details.
- HFIR Cycle 409 began June 27 and will conclude July 20.
- SNS neutron operations resumed June 21 and will continue to September 9.

Instruments and Users

- During HFIR Cycle 408, there were 320 samples irradiated in the HFIR for external users. The primary external customers were the Naval Research Laboratory, National Security, and the Nevada Test Site. There were additional samples irradiated for internal users, primarily for isotope production and instrument calibration.
- Significant progress is visible in the construction of VULCAN's external facilities. The suspended floor, both the shield doors, and the cave roof were installed. The base layer of asphalt for the drive and parking lot was laid, and use of the truck bay has already begun. The VULCAN website http://neutrons.ornl.gov/instrument_systems/beamline_07_vulcan/news.shtml has additional information.



The shield doors and the suspended floor were installed.



The VULCAN cave roof was completed.

- Plans were initiated for first JINS sabbatical for Dr. Julia Chen, LSU, to work with Jason Hodges using POWGEN3 and ARCS.
- An Instrument Advisory Team for the Quasi-Laue Single Crystal Diffractometer, IMAGINE, has been formed. Contact Flora Meilleur, flora_meilleur@ncsu.edu, for more details.
- An Instrument Development Team is being formed to build a high resolution cold neutron inelastic spectrometer at the High Flux Isotope Reactor. The expectation is a world-class spectrometer with capabilities complementary to or exceeding others now available or under construction in North America. The inaugural IDT meeting is scheduled for August 23 – 24 at ORNL with the goal of articulating the scientific case and user demand for the instrument. Contact Lori Frye, fryela@ornl.gov, for meeting details.
- The DOE-SC review of the SING2 group of instruments was completed with a recommendation to proceed with Critical Decision -1 (CD-1) approval; this refers to the preliminary baseline range of the project.
- At the DOE EPSCoR Program Review Workshop on “Renewable Energies for a Global Economy” in Golden, Colorado, July 23-25, 2007, ORNL will provide information on the capabilities of its user facilities to R&D in renewable energy.
- If you are attending the American Crystallographic Association annual meeting in Salt Lake City, July 21-26, please visit booth 113. We will be describing capabilities at the ORNL user facilities, and the

flyer below will be distributed to all meeting attendees promoting the 2008 ACA annual meeting in Knoxville.



Awards

Researchers at Oak Ridge National Laboratory won six R&D 100 Awards in 2007; these are given annually by R&D Magazine to the year's most technologically significant new products. One of those awards is for the Pharos Neutron Detector System, developed by Richard Riedel of ORNL's Neutron Scattering Science Division, Ronald Cooper of the Neutron Facilities Development Division and Lloyd Clonts of the Engineering Science and Technology Division. Pharos is a small low-power neutron detection system that can be used to identify nuclear materials at airports and harbors. Pharos can determine from what direction and distance neutrons come from, allowing it to track targets after they have been identified. It has large-area detector coverage, extremely low power requirements and digital communication capability. The awards will be presented October 18 in Chicago.



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
 - Software Engineer, ID 2459
 - SNS CNCS Instrument Scientist, ID 2455
 - SNS ARCS Instrument Scientist, ID 2454

- SNS Neutron Scattering Instrument Scientist, ID 2453
- SNS Control Room Shift Supervisor, ID 2448
- Associate Laboratory Director - Neutron Sciences, ID 2432
- SNS Structural Design Engineer, ID 2431
- Polymer Morphologist , ID 2415
- SNS HFIR Instrument Support Manager, ID 2410
- SNS Controls Group Leader, ID 2391
- SNS Controls Team Leader, ID 2389
- SNS Electrical Designer/ CAD Coordinator, ID 2383
- SNS HVAC / Piping Design Engineer, ID 2382
- CNMS Research Staff for Macromolecular Complex Systems, ID 2371
- CNMS Synthetic Polymer Chemistry Technical Staff, ID 2369
- Simulation of Subsurface Processes, ID 2356
- SNS Research Accelerator Division Beam Instrumentation Technician, ID 2354
- SNS Research Accelerator Division Computing Integration Group Leader, ID, 2350
- Neutron Scattering Instrument Scientist (Magnetism Reflectometer), ID 2262
- NSSD Electrical Engineer, ID 2225
- SNS Vacuum Engineer, ID 2202
- SNS Mechanical Designer , ID 2194
- SNS Cryogenic Systems Engineer, 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]
- **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) began Cycle 409 on June 27 and is scheduled to end July 20.
- Neutron production at the SNS began again June 21. A major effort in the April/May downtime was made to modify the injection region to reduce beam loss. All 14 modulators were tested to 1550 μ s, 30 Hz, rated peak power and 1350 μ s, 60 Hz, rated peak power; this was the first time the modulator system performed at full design specifications! With 60-Hz capable modulators, extensive testing was conducted of all SC RF cavities at 60 Hz for the first time. The action items from the final Accelerator Readiness Review required to increase the beam power beyond 100 kW have been completed; approval has been received for full power operations. Initial users are expected to participate on the first three instruments during this cycle ending September 9. For the period July 5-11, 2007, we've delivered 12.851 MH-hrs of beam to the target, with 168 hours of scheduled beam to target and 14.7 hours of downtime, for 8.75% downtime, or 91.25% efficiency.

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.ornl.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>.
- High resolution cold neutron inelastic spectrometer Instrument Development Team meeting, August 23-24, 2007, Oak Ridge;
- *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.