

Neutron Sciences Progress at Oak Ridge National Laboratory May 2008

Summary

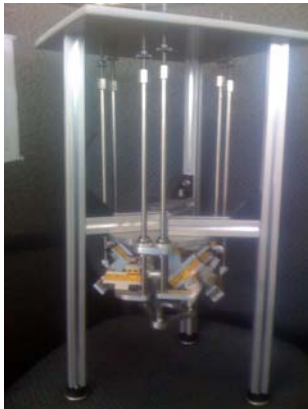
- HFIR Cycle 415 began June 4, 2008, and will end June 30, 2008.
- SNS resumed neutron production on April 2, 2008, and plans to finish the present run cycle on July 10, 2008.
- Dean Myles was selected to be the director of the Neutron Scattering Science Division and Ken Herwig was named to be the deputy division director. Both appointments are effective July 1, 2008.

Instruments and Users

- The first published paper containing data from the Backscattering Spectrometer (BASIS, SNS BL-2) was written by G. Ehlers et al., entitled "Frustrated spin correlations in diluted spin ice $\text{Ho}_{2-x}\text{La}_x\text{Ti}_2\text{O}_7$," and appeared in *J. Phys.: Condens. Matter* 20 (2008) 235206.
- In tests at the Spallation Neutrons and Pressure instrument (SNAP, SNS BL-3), the Paris-Edinburgh pressure cell was cooled to 26K (see the image below left). SNAP will be available for general users during the experimental period beginning September 2008 – February 2009.



- The 5 Tesla actively shielded asymmetric magnet "Slim SAM" ran very well during its first user experiment at the Backscattering Spectrometer (BASIS, SNS BL-2). It is the first actively shielded magnet for neutron scattering. See the photo above right as Slim SAM is transported to BASIS.
- For the TOPAZ single crystal diffractometer (SNS BL-12), the sample positioning stand parts were received and assembled and characterization of positioning setup begun. The stand is pictured below left. The TOPAZ cave is being constructed; see the image below right. The completed wall adjoins the Fundamental Physics instrument (SNS BL-13). The cave will be about 9 feet wide, 15 feet high, and 30 feet long; the left wooden frame behind the ladder encloses the neutron guide from the target and right wooden frame contains the connections to the chopper and other upstream equipment.





- Finished installation of SANS sample enclosure box at General Purpose SANS (HFIR, CG-2) and automatic sample changers and apertures at CG-2 and Bio-SANS (HFIR, CG-3) in HFIR cold-guide hall. The photos above show the CG-3 sample enclosure box and a detailed view of the sample changer.
- Through May 2008, HFIR has 135 unique users on 7 instruments and SNS has 68 unique users on 3 instruments.
- There were 17 attendees of the Joint Instrument Development Team meeting of MaNDi (Macromolecular Diffractometer) and TOPAZ (Single Crystal Diffractometer), May 30, 2008, in Knoxville, TN.
- About 250 attendees of the annual meeting of the American Crystallographic Association toured the Spallation Neutron Source on June 1, 2008.

Operations

- HFIR was not operated during May allowing time to perform scheduled refueling, maintenance, and infrastructure upgrades. Cycle 415 began on June 4, 2008, and is scheduled to end on June 30, 2008. The goals for the High Flux Isotope Reactor in FY 2008 include operation for 6 cycles with >90% predictability. Cycle 415 is the fifth cycle this fiscal year. Predictability so far is 100%. HFIR cold neutron scattering science capability improvements continued during the May outage including completion of new sample enclosure boxes, automatic sample changers, and apertures on both SANS instruments; completion of a shield wall in preparation for a new neutron optics test station at CG-1; and continued installation of the US-Japan Cold Triple Axis Spectrometer at CG-4C.
- The SNS accelerator turn-on for the Operating Cycle 2008-2 began March 24, 2008, with neutron production beginning on April 2, 2008, and plans to finish the present run cycle on July 10, 2008. The maximum beam power delivered in May was 523 kW. There were a total of 152 MW-Hrs of beam delivered in May. Beam neutron production for Operating Cycle 2008-3 will begin August 21, 2008.
- The SNS schedule in the coming months may be perturbed by the planned, but undetermined end of life of the first mercury target. This foreseen operational event will cause the shutdown of SNS for about two weeks while a new target is installed. Users will be notified as soon as possible and rescheduled to a future time. Our goal is to predict the target end of life and schedule future target replacements within normal maintenance periods.

Employment Opportunities

Positions in the Neutron Sciences Directorate or related to neutron scattering are available for browsing.

Click on "View Open Positions" at <http://jobs.ornl.gov/>.

- NScD Software Engineer, ID 2917
- Mechanical Designer, ID 2935
- **Neutron Scattering Postdoctoral Fellowship Positions with ORNL through Oak Ridge Associated Universities** [description available at <http://www.ornl.gov/orise/edu/ornl/postneeds.htm>]:
 - Postdoctoral Research Associate Experimentalist in Neutron Sources Mechanical Engineering, [ORNL08-81-NFDD]
 - Postdoctoral Research Associate in Beam Instrumentation [ORNL08-73-NSSD]
 - Post-Masters Associate: Bio-SANS Beam Line [ORNL08-69-CSD]
 - Post Doctoral Fellow: Bio-SANS Beam Line [ORNL08-68-CSD]
 - Postdoctoral Research Associate in Neutron Scattering - SNAP [ORNL08-60-NSSD]
 - SNS Instrument Development Fellowship [ORNL08-51-NSSD]
 - Postdoctoral Research Fellow in Neutron Scattering – ARCS [ORNL08-32-NSSD]
 - Postdoctoral Research Associate: Protein Structure, Function & Dynamics [ORNL08-30-CSD]
 - Postdoctoral Research Associate: Molecular Computational Modeling [ORNL08-22-CSD]
 - Postdoctoral Research Associate: Virus Structure and Function, [ORNL08-21-NSSD]

- Postdoctoral Research Fellow in Neutron Scattering [ORNL08-11-NSSD]
- Neutron Scattering Postdoctoral Research Fellow [magnetic nanoparticles] [ORNL08-08-NSSD]
- Computational Molecular Biophysics [ORNL08-01-BSD]
- Neutron Scattering Postdoctoral Research Fellow [Macromolecular Diffractometer] [ORNL07-82]
- Beam Instrumentation Post-Doc [ORNL07-64-NSD]
- **Other Postdoctoral Fellowships**
 - **Clifford G. Shull Fellowship** – The goal of the Shull Fellowship is to attract new scientific talent to ORNL for the development of its neutron science program. We are looking for candidates with exceptional ability who are capable of developing innovative research programs and who show the promise of outstanding science leadership. **Applications will be accepted July 1 – December 12, 2008.** For additional information about the Fellowship, see <http://neutrons.ornl.gov/shullfellowship/> or contact Bob Martin at martingr@ornl.gov.
 - **Instrument Development Fellowship** - This fellowship opportunity is for the development of novel neutron instrumentation and instrument components to be used for neutron science at ORNL or other U. S. neutron centers. For additional information, see the website at <http://www.ornl.gov/orise/edu/ornl/postneeds.htm> for position ORNL08-51-NSSD.
 - **Neutron Scattering at Università degli Studi di Roma “Tor Vergata”** – This involves development of new instrumentation concepts and methodology in neutron spectroscopy at the eV energies and in our scientific activities in the field of dynamics in hydrogen bonded, quantum and complex fluids at facilities including SNS. See “Open Position 2” at <http://www.centronast.com/archives/category/job-opportunities> for more details.
- **Educational and Research Experiences:** ORNL has educational programs covering many scientific disciplines with the education continuum from pre-college through postgraduate including teachers and faculty. The main link to all of these programs is <http://www.ornl.gov/orise/edu/ornl/>

Future meetings of interest to SNS and HFIR users

- Annual review and workshop of the DOE Experimental Program to Stimulate Competitive Research (DOE EPSCoR), July 22-24, 2008, Oak Ridge, TN. <https://www.ornl.gov/epscor2008/>
- Neutron Powder Diffraction and Rietveld Refinement Workshop, July 18, 2008, North Carolina State University, Raleigh, NC. <http://www.ne.ncsu.edu/events/NPD/index2.html>.
- Denver X-ray Conference Workshop on Introduction to Rietveld; Combined Use of X-rays and Neutrons, August 4-5, 2008, Denver, CO. <http://www.dxcicdd.com/08/callforpapers.htm#workshops>.
- Dynamics of Soft Matter, Dec 4-6, 2008, tentative, Boston MA. Contact Al Ekkebus at ekkebusae@ornl.gov for details.
- International Conference on Neutron Scattering, May 3-7, 2009, Knoxville, TN. Contact Al Ekkebus at ekkebusae@ornl.gov for details.
- 20th Annual VM Goldschmidt Conference June 14-18, 2010, in Knoxville, TN. This is the largest meeting held for geochemists world-wide.