

Neutron Sciences Progress at Oak Ridge National Laboratory December 2007

Summary

- HFIR Cycle 412 began December 18, 2007, and ended January 9, 2008. HFIR Cycle 413 will begin February 6, 2008.
- SNS neutron operations began November 15 and are now at a power level of 170 kW.
- **Call for Proposals:** The electronic proposal submission system began accepting submissions starting January 7, 2008, and will be open until 11:59 p.m. ET, Monday, January 28, 2008. . This call will cover the experimental period at HFIR and SNS beginning March 2008 through August 2008. See the website <http://neutrons.ornl.gov> for more details.

Instruments and Users

- Commissioning of the HFIR SANS instruments continues.
- The brightness of the HFIR cold source was measured using a time-of-flight technique. The measured brightness exceeded predictions and is at least equivalent with the ILL horizontal cold source between 2 Å and 10 Å.
- **User feedback solicited:** Comments are requested from users on needed capabilities for laboratories at both the SNS and HFIR. At SNS, these labs will be on the second and third floors of the Central Laboratory and Office Building. At the HFIR, these labs will be in the guide hall near the cold source instruments. These labs will serve both internal and general users. Please send a description of these needed capabilities to Chrissi Schnell, schnellca@ornl.gov. For example, what kind of wet chemistry sample preparation do you want? What on-site sample alignment or characterization capabilities are needed before the experiment?
- The sample vessel for the POWGEN3 powder diffractometer (SNS BL-11A) arrived. See the image located below left.



- All scattering tank sections of the Extended Q-range Small-Angle Neutron Scattering Diffractometer (EQ-SANS, SNS BL-6) have been received. See image above center.
- At ARCS (Wide Angular-Range Chopper Spectrometer, SNS BL-18), 112 8-pack He-3 detectors, totaling 896 detectors, were installed in the vacuum tank; see the image above right.
- Newly arrived sample environment equipment included: 7-Tesla vertical field magnet, ILL orange cryostat and 5 closed cycle refrigerators. In addition, a top-loading closed cycle refrigerator was tested that provides a temperature range from 10-500K with minimal gradient across the sample.

Awards and Honors

- ORNL Director **Thom Mason** was elected fellow of the American Physical Society (APS). He was cited by the APS's Division of Condensed Matter Physics for his career in condensed matter physics with a focus on neutron scattering science.

- **Bryan Chakoumakos**, leader of the Single Crystal Diffraction Group of the Neutron Scattering Science Division, was elected a fellow of the Mineralogical Society of America.

Operations

- The High Flux Isotope Reactor refueling and maintenance outage, which began on October 2, 2007, was concluded on November 14 with the beginning of Operating Cycle 411. Installation and alignment of the HB-4 cold neutron guides in their new common casing assembly was accomplished during this outage. Major reactor maintenance and reliability improvement work was also accomplished during this time. A wireless network was installed in the HFIR beam room that will enable convenient network access for neutron scattering users.
- SNS cycle 2008-1 began on November 5, 2007, and ends on February 3, 2008. The target cryogenic moderator system heat exchanger re-orientation is showing favorable performance since the upgrade during the last shutdown. During November 2007, over 90% of the requested neutron production beam time was delivered. The initial run power was 120 kW and we plan to ramp up to 340 kW during the run period. Construction of Target Building Mezzanine and CLO-Target Building pedestrian bridge began in November 2007 with a scheduled May 2008 completion date.

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.

- Computational Fluid Dynamics (CFD) Engineer, ID 2690
- Neutron Diffraction Instrument Scientist (TOPAZ), ID 2656
- SNS Instrument Scientific Associate, ID 2649
- SNS Neutron Scattering Sciences Division Director, ID 2631
- SNS Magnet Engineer, ID 2622
- Clifford G. Shull Fellowship Program, ID 2603
- SNS Instrument Development Fellowship, ID 2602
- SNS HFIR Instrument Support Manager, ID 2410
- **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 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 Associate: Bio-inspired Membrane Systems [ORNL08-20-CSD]
 - Postdoctoral Research Associate: Biopolymer Structure [ORNL08-19-CSD]
 - 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-NSSD]
 - Neutron Scattering Postdoctoral Research Fellow [EQ-SANS] [ORNL07-72-NSSD]
 - Beam Instrumentation Post-Doc [ORNL07-64-NSD]
 - Control System Programmer [ORNL07-32-SNS]
- **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 and the application process is <http://www.ornl.gov/orise/edu/ornl/>
- **ORNL 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 are being accepted.** For additional information about the Fellowship, see <http://neutrons.ornl.gov/shullfellowship/> or contact Bob Martin at martinrg@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://neutrons.ornl.gov/jobs/inst_dev_fellow_071004.pdf. Application deadline is January 31, 2008. For more information, contact Bob Martin at martinrg@ornl.gov.

Future meetings of interest to SNS and HFIR users

- Workshop on Neutron Scattering Education, March 27-28, 2008, Washington, D.C.
- American Conference on Neutron Scattering, May 11-15, 2008, Eldorado Hotel, Santa Fe, NM.
<http://www.lansce.lanl.gov/acns2008/index.html>
- American Crystallographic Association, *Annual Meeting*, May 31-June 5, 2008, Knoxville, TN.
<http://neutrons.ornl.gov/conf/aca2008/contact.shtml>
- International Conference on Neutron Scattering, May 3-7, 2009, Knoxville, TN.
- 2009 annual meeting of the DOE Experimental Program to Stimulate Competitive Research (DOE EPSCoR), proposed for Oak Ridge, July 2009.