

Neutron Sciences Progress at Oak Ridge National Laboratory October 2007

Summary

- HFIR Cycle 411 began November 14.
- SNS neutron operations began November 15 with a power level of 120 kW.
- The next call for proposals for the HFIR and SNS neutron scattering facilities will be from December 10, 2007, to January 18, 2008.
- The HFIR Restart issue of *The Neutron Pulse* newsletter is available at http://neutrons.ornl.gov/pubs/neutron_pulse_2007_vol8_no2_hfir.pdf.

Instruments and Users

- Commissioning of the HFIR SANS instruments continues.
- Data reduction application software is now available to users external to ORNL.
- The Spallation Neutrons and Pressure Diffractometer (SNAP, SNS BL-3) completed the project milestone of installing the detector frame with 18 Anger camera modules. The personnel protection system installation is ongoing in preparation for the Instrument Readiness Review on November 29, 2007.



- The Cold Neutron Chopper Spectrometer (CNCS, SNS BL-5) completed 7 meters of guide installation during the recent shutdown and began assembly of detector modules.



- During its closeout session, the Neutron Scattering Science Advisory Committee endorsed language encouraging development of the science case for two letters of intent presented to the NSSAC: IMAGINE (quasi-Laue diffractometer), and the high resolution cold neutron inelastic spectrometer. Both instruments are identified for HFIR.

User Statistics FY 2007

High Flux Isotope Reactor

- 72 badged users, 43 first time users
- 1178 facility operating hours delivered to users
- Support provided by BES (30), other DOE (13), Homeland Security (2), NSF (16), Industry (8), and other (4)
- 14 students, 18 postdocs
- "This is a fantastic facility with very helpful staff. I look forward to continuing studies at this facility. Overall it was (an) excellent visit for us".

Spallation Neutron Source

- 24 badged users, 24 first time users
- 540 facility operating hours delivered to users
- Support provided by BES (10), other DOE (5), NSF (2), NIH (3), Industry (1), and other (4)
- 10 students, 4 postdocs
- "A chemical lab is needed to the sample preparation." "It would be nice to have a cafeteria at the SNS building."

Awards and Honors

- Two ORNL researchers have been elected fellows of the American Association for the Advancement of Science, announced Friday by the AAAS Council. Neutron Scattering Science Division Senior Corporate Fellow **Herb Mook** is cited for his "pioneering experiments using neutron scattering in materials that test theories leading to understanding of novel physics and new directions of research." Vanderbilt professor **Peter Cummings**, Principal Scientist of the Center for Nanophase Materials Science, was cited for his "outstanding contributions in research, for extraordinary service to his profession, and for national leadership in the emerging field of theoretical and computational nanoscience." They will be recognized as new fellows at the AAAS annual meeting in February.
- Ronald A. Crone, director of the Research Reactor Division, was honored at UT-Battelle's Awards Night on November 16, 2007, with the award for Administrative and Operational Leadership at the director level for outstanding leadership in successfully re-starting the High Flux Isotope Reactor. Crone also received the Director's Award for Laboratory Operations among all of those honored in Laboratory Operations category.

Operations

- HFIR cycle 410 was completed at 1342 on October 2 to begin a planned six-week maintenance outage. This outage continues at the end of October. 1986.83 MWd was accumulated over Cycle 410, which consisted of three sub-cycles to accommodate HB-4 neutron beam measurements. In addition to neutron scattering research, Cycle 410 supported the irradiation of 112 capsules for isotope production and materials studies. In addition, 51 neutron activation samples were irradiated and analyzed. A primary focus of the outage activities in October was the installation of the new HB-4 cold guide casings and the guides themselves. The new guide casing will allow the forward guides to be under vacuum rather than a helium environment. This should provide a noticeable gain at the two HFIR SANS instruments. Significant maintenance has also been performed on many reactor and cold source systems in October to ensure continued reliable reactor operation. HFIR resumed operation in FY2008 on November 14, 2007. This will begin a series of six operating cycles through the remainder of the fiscal year. Each cycle lasts 23–25 days.
- SNS cycle 2008-1 began on November 5, 2007, and ends on February 3, 2008. Neutron production is expected to be 941 hours in duration with 205 Megawatt-Hours delivered to Target. Accelerator Physics studies are planned to be 643 hours in duration. These numbers include an expected 80% beam delivery efficiency. We also plan to have 103 hours of planned maintenance during the run period. The initial run power is expected to be 120 kW and we plan to ramp up to 340 kW during the run period.

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 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]
- **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 will be accepted until January 15, 2008; however, for full consideration applications should be received by December 31, 2007.** 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 November 30, 2007.** For more information, contact Bob Martin at martinrg@ornl.gov.

Future meetings of interest to SNS and HFIR users

- Materials Research Society Fall Meeting, November 26-30, 2007, Boston, MA.
http://www.mrs.org/s_mrs/sec.asp?CID=4749&DID=164574
- 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.