Neutron Sciences Progress at Oak Ridge National Laboratory
April 2008

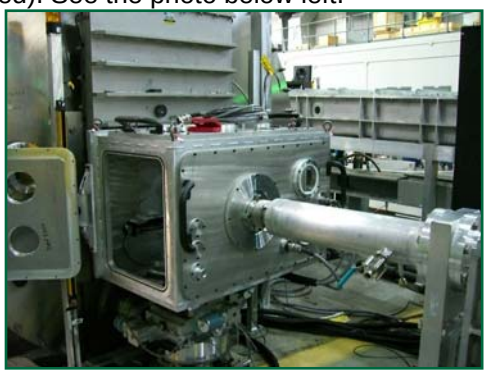
Summary

- HFIR Cycle 414 ended April 19, 2008; HFIR Cycle 415 will begin June 4, 2008, and will end June 26, 2008.
- SNS resumed neutron production on April 2, 2008, and plans to finish the present run cycle on July 10, 2008.
- The Call for Proposals for HFIR and SNS ends June 20, 2008, and covers the period September 2008 through February 2009. http://neutrons.ornl.gov/users/Proposal_Flyer_050808.pdf
- The 2008 National School on Neutron and X-ray Scattering will be held at Oak Ridge and Argonne National Laboratories on September 24 - October 11, 2008. http://www.dep.anl.gov/nx/ .

Instruments and Users

- Joint SNAP/COMPRES meeting held April 14-15, 2008, in Oak Ridge. Two full days of science and instrumentation talks were attended by 60 participants from USA, Canada, France, Germany, UK, Japan and China. Focus areas included the use of high pressure and combined extreme environments using synchrotron X-rays and neutrons.
- A book series on neutron scattering with Springer was formally announced. Details are available at http://www.springer.com/series/8141.
- The draft report of the Workshop on Neutron Scattering Education held on March 27-28, 2008, was distributed to workshop participants. This draft report was also discussed at the American Conference on Neutron Scattering on May 13. Information about the workshop and presentations are available on the web site at: http://neutrons.ornl.gov/workshops/nse2008/WorkshopAgenda.pdf
- Continued installation of US-Japan Cold Triple Axis Spectrometer (HFIR CG-4C) in the HFIR Cold Guide Hall. See photo below left.

- Started installation of neutron optics test station at CG-1 in HFIR cold-guide hall. See photo above right.
- The incident shielding for Fine-Resolution Fermi Chopper Spectrometer (SEQUOIA, SNS BL-17) is fully installed up to 18 m (where the Fermi choppers will be located). See the photo below left.



- Installation of SANS sample enclosure box continues at the General Purpose SANS (HFIR CG-2) in HFIR Cold Guide Hall. See photo above right.
- The first milli-Kelvin experiment was performed on the Backscattering Spectrometer (BASIS, SNS BL-2).

- A conceptual design review was held to baseline the proposed Zeemans instrument at SNS. This instrument will enable a wide range of experiments including single crystal and powder diffraction, reflectivity, SANS, and inelastic scattering under magnetic field conditions above 30 Tesla.
- The 2008 National School on Neutron and X-ray Scattering will be at Oak Ridge and Argonne National Laboratories on September 24 - October 11, 2008. Lectures will include basic tutorials on the principles of scattering theory and the characteristics of the sources. Seminars will be held on the application of scattering methods to a variety of scientific subjects. Students will conduct four short experiments at the Advanced Photon Source, Spallation Neutron Source, and High Flux Isotope Reactor facilities. Details are at http://www.dep.anl.gov/nx/ .
- Through April 2008, HFIR has 135 unique users on 7 instruments and SNS has 42 unique users on 3 instruments.
- The final enclosure wall panels have been poured for the POWGEN3 powder diffractometer (SNS, BL-11A).

Operations

- HFIR Cycle 414 began on March 26, 2008, and ended April 19, 2008. The goals for the High Flux Isotope Reactor in FY 2008 are operation for 6 cycles with >90% predictability. Cycle 414 is the fourth cycle this fiscal year. Predictability to date is 100%. A total of 67 in-vessel irradiation capsules were installed for Cycle 414 to support medical isotope research, fusion reactor material research, and produce commercial isotopes. The end-of-cycle 414 outage will continue through May to refuel and allow HFIR staff the opportunity to perform several equipment and infrastructure upgrades. Cycle 415 will run June 4-26, 2008.
- 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 April was 410 kW. There were a total of 96.8 MW-Hrs of beam delivered in April. Beam power is planned to peak at 750kW at the end of Cycle 2008-2. Neutron production for Operating Cycle 2008-3 will begin August 21.
- 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/.

- **Neutron Scattering Postdoctoral Fellowship Positions with ORNL through Oak Ridge Associated Universities** [description available at http://www.orau.gov/orise/edu/ornl/postneeds.htm]:
  - Postdoctoral Research Associate in Beam Instrumentation [ORNL08-70-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 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]
  - 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 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://www.orau.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.orau.gov/orise/edu/ornl/

Future meetings of interest to SNS and HFIR users

- Diagnosis and Treatment of Problem Structures: A Bruker Workshop on Single Crystal X-Ray Diffraction, May 29, 2008, Knoxville, TN. http://neutrons.ornl.gov/workshops/scxd2008.
- Joint Instrument Development Team meeting of MaNDi (Macromolecular Diffractometer) and TOPAZ (Single Crystal Diffractometer), May 30, 2008, Knoxville, TN. Contact Christina Hoffmann at hoffmanncm@ornl.gov for details.
- American Crystallographic Association, *Annual Meeting*, May 31-June 5, 2008, Knoxville, TN. http://neutrons.ornl.gov/conf/aca2008/contact.shtml
- Annual review and workshop of the DOE Experimental Program to Stimulate Competitive Research (DOE EPSCoR), July 22-24, 2008, Oak Ridge, TN. https://www.orau.gov/epscor2008/
- 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.