



THE NEUTRON PULSE

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Accelerator Front End Installed—SNS Project is Halfway Complete!

Outstanding progress has been made in SNS construction during the last six months, and the project continues on schedule and on budget. Overall, the project is just over 50% complete. All major Conventional Facilities procurements have been awarded, and groundbreaking for the Central Laboratory and Office (CLO) Building took place in August. The CLO is the last building to be started as part of the SNS project.

Major on-site construction has continued safely. On August 22, a luncheon was held at the site to celebrate completion of more than 1 million construction hours without a lost-workday case.

As scheduled, in June of this year Lawrence Berkeley National Lab delivered the front-end system, and installation is almost complete. Control room equipment is being installed in preparation for front-end commissioning, which is scheduled for December 2002. Installation has also begun in the linac and ring tunnels. The prototype cryomodule built by Jefferson Lab for the superconducting portion of the linac exceeds design goals, and cavity production is well under way.

Target installation activities, including installation of the base plate and bulk shielding liner, are proceeding as planned, keeping pace with concrete pouring for the Target Building. Soon, the building itself will begin to rise above its foundation, which is almost complete.

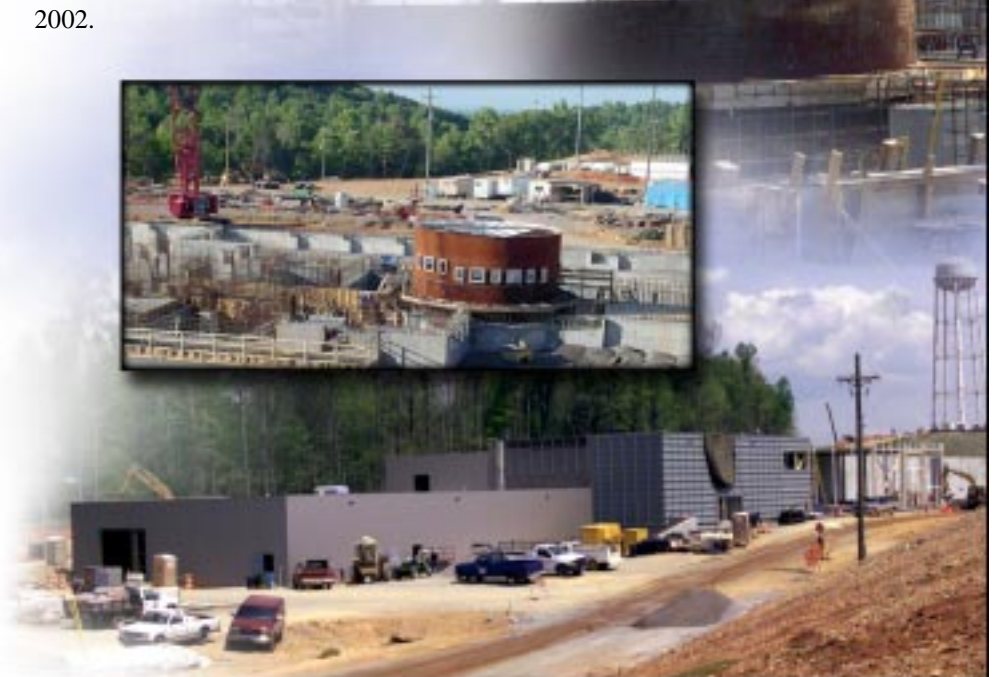


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Regarding instrumentation, SNS now has eight funded instruments, with five others in advanced stages of proposal preparation.

In addition to front-end commissioning, installation of the first drift-tube linac, beneficial occupancy of the Front-End Building, and completion of the global controls design are all scheduled for completion by the end of calendar year 2002.



Director's Comments

Thom Mason
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Progress on the construction site continues at a fast pace, and I find noticeable changes whenever I visit Chestnut Ridge. We continue to have an excellent safety record. Using a consistent environment, safety, and health plan for everyone on the construction site is proving to be a tremendous asset.

This summer, the first American Conference on Neutron Scattering (ACNS) was

held in Knoxville. This was the largest gathering of neutron scatterers ever held in the United States. Many discussions at the ACNS focused on expectations of the user community. In January 2003, I will be meeting with the directors of other neutron facilities to discuss how these goals can be achieved in a coordinated way.

The FY 2003 budget for the SNS is anticipated to be \$225 million; this will keep the project on track for a June 2006 completion. The U.S. Department of Energy proposed this amount earlier this year, and Congress is expected to take final action on the budget in fall of this year.



Construction on the ring tunnel.

Many of you have participated in workshops and reviews concerned with SNS. We value your opinion and appreciate the sacrifices you make to work with us. Together we will make SNS one of the world's finest user facilities.

The NICEST JINS Workshop

Neutrons in Solid-State Chemistry and the Earth Sciences Today and Tomorrow (NICEST), Oak Ridge, Tennessee, March 12-17, 2003

The scientific program for the upcoming Joint Institute for Neutron Sciences (JINS) Workshop will focus on neutron scattering in solid-state chemistry and the earth sciences. The program is being put together with graduate students and inexperienced neutron users in mind, and the only assumption for attendees is that they have a knowledge of basic crystallographic and structural concepts.

The three-day workshop (March 12-15, 2003) will cover the following:

- neutron production and scattering instrumentation;
- structural studies of single crystals, crystalline powders, and disordered materials;
- in situ diffraction studies at elevated temperatures and/or pressures;
- magnetic structure determination;

- inelastic scattering and its utility in studies of phase transitions; and
- texture studies on geological specimens.

The workshop will be followed by in-depth tutorials (March 16-17, 2003) on use of the Rietveld method for structure analysis and structural studies of disordered materials using pair distribution functions derived from neutron-scattering data.

Attendees will have opportunities to

- present posters on their research projects,
- receive feedback from the workshop instructors and instrument scientists on how neutron scattering could be of value to their projects, and
- receive advice on the availability and future of neutron-scattering instrumentation in the United States and how to access facilities as a new user.


Held in Oak Ridge, Tennessee, this workshop is being generously supported by Oak Ridge Associated Universities, the University of Tennessee (UT), University of Virginia, Virginia Polytechnic Institute

and State University, and Oak Ridge National Laboratory (ORNL). See www.sns.gov/jins/NICEST2003 for more information on the workshop and the availability of limited scholarships.

Organizing Committee:

- A. Wilkinson, Georgia Tech, cochair
- N. Ross, Virginia Tech, cochair
- R. Angel, Virginia Tech
- R. Hemley, Carnegie Institute
- J. Jorgensen, Argonne National Laboratory (ANL)
- D. Louca, University of Virginia
- L. Magid, UT/JINS
- A. Navrotsky, University of Calif., Davis
- J. Parise, SUNY, Stony Brook
- B. Toby, NIST
- H. Zur Loye, South Carolina
- A. Ekkebus, SNS

Confirmed Speakers:

- C. Broholm, Johns Hopkins University
- M. Dove, Cambridge
- J. Jorgensen, ANL
- J. Loveday, Edinburgh
- C. Wilson, ISIS
- M. Yethiraj, ORNL 

Guidelines for SNS Instrument Teams

Kent Crawford

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The process to be followed for selection, design, construction, installation, and operation of neutron beam line instruments at SNS is now well defined. The steps in this process are summarized here. Detailed documentation for this process will be available on the SNS users web site (www.sns.gov/users/users.htm) within the next few months.

Letter of Intent: An instrument usually starts out as an idea put forth by a group of interested scientists that would address specific scientific problems. The formal means for bringing such an idea to the attention of SNS is for this interest group to submit a letter of intent (LOI) to the SNS User Services Office. This LOI will be reviewed by the SNS Experimental Facilities Advisory Committee (EFAC), which will make a recommendation as to whether or not the interest group should develop a full scientific proposal. We are open to LOIs at any time. EFAC meets twice a year, in the spring and fall, to review proposals.


Scientific Proposal: If the interest group develops a scientific proposal, it should contain the science case, conceptual design, and performance evaluation for the instrument. The proposal is presented to the EFAC, which will recommend what the next steps should be. EFAC may recommend that the instrument be “approved,” which means it would be welcome as an SNS instrument. If SNS management accepts the EFAC recommendation, a beam line will be temporarily assigned to the instrument. Because of the high demand for beam lines, the assignment will be for a

limited period only, and the beam line assignment and approval can be revoked if no progress is made on the instrument. If the EFAC does not recommend approval of the instrument, it might recommend that further work be done on the science case or the conceptual design. Alternatively, the committee could recommend that pursuit of the instrument be dropped or that other alternatives be pursued.

Funding: Once the scientific proposal for an instrument has been approved by the EFAC, the interest group will need to seek funding for the instrument. Funding can come from SNS or from other sources. If SNS does not provide funding for the instrument, the interest group should organize itself into an instrument development team (IDT) and attempt to secure funding from external sources.

Memorandum of Agreement: Once an IDT has secured funding, it should develop a memorandum of agreement (MOA) describing the relative roles and responsibilities of the IDT and SNS. MOAs are not required for instruments funded by SNS.

Use of neutron beam lines for purposes other than neutron scattering are reviewed by groups other than EFAC. However, the general process to be followed is the same as that outlined here.

Because of regulatory, safety, and operational concerns, all detailed design and procurement of instrument components must follow SNS guidelines, and installation of instruments must be under the control of SNS. Contact the SNS User Services Office (865-241-5644, snsusers@sns.gov) for more information on these requirements, or see www.sns.gov/users/users.htm. 

Instrument Approval Status November 2002

Funded by SNS

- Backscattering Spectrometer (BL* 2)
- Liquids Reflectometer (BL 4b)
- Magnetism Reflectometer (BL 4a)
- Powder Diffractometer (BL 11a)
- Small-Angle Neutron Scattering Diffractometer (BL 6)

MOA Drafted

- Wide-Angle Chopper Spectrometer (BL 18)
- Cold Neutron Chopper Spectrometer (BL 5)
- Engineering Materials Diffractometer (BL 9)

Scientific Proposal Approved

- Disordered Materials Diffractometer (BL 1b)
- Fundamental Physics (BL 13)
- High-Pressure Diffractometer (BL 3)
- High-Resolution Chopper Spectrometer (BL 17)
- HYSPEC (BL 15)
- Single-Crystal Diffractometer (BL 12)

LOI Approved

- Neutron Spin Echo Spectrometer
- VISION Spectrometer

*BL = beam line.

Backscattering Spectrometer – BL 2

Ken Herwig
(630)252-5371 • kherwig@anl.gov



Disordered Materials Diffractometer – BL 1b

Instrument scientist will be determined soon. For additional information on this instrument, contact Kent Crawford, crawfordrk@sns.gov (865)241-6481.

High-Pressure Diffractometer – BL 3

Chris Tulk
(630)252-9881 • ctulk@anl.gov



Magnetism Reflectometer – BL 4a

Frank Klose
(630)252-7468 • fklose@anl.gov



Liquids Reflectometer – BL 4b

John Ankner
(630)252-6408 • jankner@anl.gov



Cold Neutron Chopper Spectrometer – BL 5

Instrument scientist will be determined soon. For additional information on this instrument, contact Kent Crawford, crawfordrk@sns.gov (865)241-6481.

Small-Angle Neutron Scattering Diffractometer – BL 6

Jinkui Zhao
(865)574-0411 • zhaoj@sns.gov



Engineering Diffractometer (VULCAN)

Xun-Li Wang
(865)574-9164 • wangxl@sns.gov



Instrument Layout in the SNS Target Building



Wide-Angle Chopper Spectrometer (ARCS) – BL 18

Doug Abernathy
(630)252-6752 • dabernathy@anl.gov



High-Resolution Chopper Spectrometer (Sequoia) – BL 17

Garrett Granroth
(865)576-0900 • granrothge@sns.gov

Hybrid Spectrometer (HYSPEC) – BL 15

Instrument scientist will be determined soon. For additional information on this instrument, contact Kent Crawford, crawfordrk@sns.gov (865)241-6481.



Fundamental Physics Beam Line – BL 13

Geoffrey Greene
(865)574-8435 • greenegl@ornl.gov



Single-Crystal Diffractometer – BL 12

Christina Hoffmann
(630)252-9885 • choffmann@anl.gov



Powder Diffractometer (POWGEN) – BL 11a

Jason Hodges
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Areas for User and Instrument Support

02-04152/arm



Bruce Gaulin, McMaster University.

VULCAN Funded

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Good news came in June for users of VULCAN, the engineering instrument at SNS. On June 17, 2002, the Canada Foundation -for Innovation announced an award of \$15 million Canadian dollars (~\$10M U.S. dollars) to a group of scientists for the construction of VULCAN at SNS. The award also represents the first foreign investment at SNS. The group, led by Dr. Bruce Gaulin, Brockhouse Chair in the Physics of Materials at McMaster University, represents a partnership between Oak Ridge National Laboratory

(ORNL) and a broad spectrum of neutron-scattering users in Canada under the umbrella of the Canadian Institute of Neutron Scattering. As part of the partnership agreement, ORNL would pursue funding for a high-resolution chopper spectrometer. Instrument development teams for both instruments are being formed, which will consist of scientists from universities, national laboratories, and industry in Canada and the United States. The VULCAN team will hold its first meeting later in 2002 to finalize the design within the new budgetary scope. Together, these two new instruments will offer unprecedented opportunities for this segment of the user community. ✨

SHUG Cosponsors Successful ACNS

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This past June, the SNS-High Flux Reactor (HFIR) User Group (SHUG) and the Neutron Scattering Society of America cosponsored the first American Conference on Neutron Scattering. The overwhelming response from the user community exceeded our most optimistic expectations and bodes well for the future of the field as the new upgrades at HFIR start coming on-line and SNS continues towards an on-schedule completion. The substantial number of student and faculty attendees was particularly gratifying. The meeting provided up to four parallel sessions at times, with excellent presentations throughout, as well as three poster sessions. Neutron science was maintained as the focus of all the sessions. With users, facility staff, and facility directors all coming together in one place, opportunities were plentiful for discussions at all levels and for interactions among various

groups. Comments from attendees were universally complimentary, indicating that a strong positive tone has been set for future meetings. If you were not able to attend this time, we hope you will be able to do so in the future. Finally, we would like to thank the many people who helped make this meeting such a success, particularly the SNS support staff who worked tirelessly to make this a truly outstanding event.

This summer, the SHUG Executive Committee also had the opportunity to discuss and be briefed on the plans and time lines for the restart of the HFIR user program and on the status of SNS. SNS's Al Ekkebus and HFIR's Greg Smith, recently hired from Los Alamos to head the HFIR user program, will be working with SHUG to establish user policies and practices for the January 2003 restart of the HFIR user program. These policies, after inevitable refinement based on experience, will eventually be applied to SNS.

SHUG was pleased to note that SNS and the upgraded HFIR are two of the three top

priorities set forth in the report from the Office of Science and Technology Policy Interagency Working Group on Neutron Sources. We are also pleased with the call for more cooperation among all facilities to maximize productivity of limited resources. Establishment of a regular meeting venue for management of the neutron facilities, as suggested by the report, will foster interfacility cooperation to the benefit of the entire neutron-scattering community in the United States.

This fall SHUG will conduct elections via e-mail to replace six outgoing members of the SHUG Executive Committee. Nominations have been sought, and a slate of candidates is being prepared to reflect the diversity of the user community. This is a particularly important time for user input, as decisions are being made that will affect us all for years to come. The Executive Committee is the voice of the user community, so please make your voice heard, both now by voting when you get the announcement, and in the future by contacting members of the committee with issues and concerns.

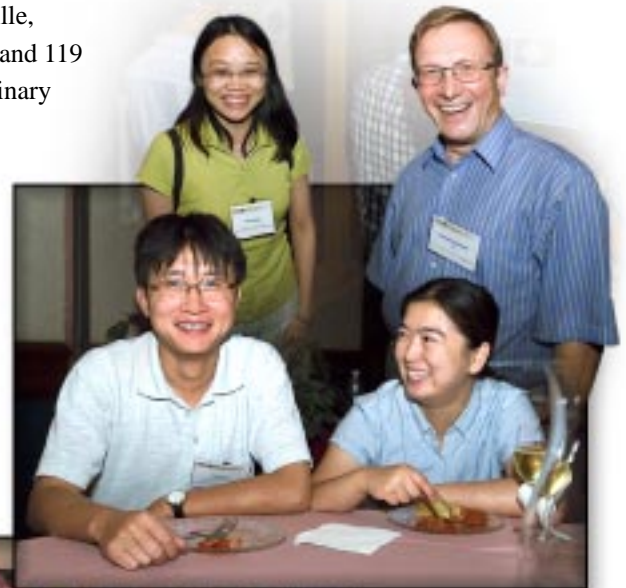
First American Conference on Neutron Scattering—An Indisputable Success!

The Neutron Scattering Society of America (NSSA) organized the first American Conference on Neutron Scattering (ACNS), which was held in June this year in Knoxville, Tennessee. More than 400 scientists and engineers from 32 states, 14 countries, and 119 institutions (including 82 universities) attended the conference. The multidisciplinary ACNS was sponsored by the national neutron centers, with assistance from the National Science Foundation, the U.S. Department of Energy, and the SNS-High Flux Isotope Reactor (HFIR) User Group. SNS and colleagues from Oak Ridge National Laboratory (ORNL) provided local support for the conference.

The ACNS included more than 250 papers in the fields of biology, soft condensed matter, magnetism, instrumentation, fundamental neutron physics, chemistry, and industrial applications, all with the common thread of neutron research. The ACNS also served as a national meeting for present and potential users of the neutron research centers at Argonne, Chalk River, Los Alamos, the National Institute for Standards and Technology, and Oak Ridge and provided an opportunity to gain insight into the capabilities and available instrumentation at these facilities. Tours were provided of HFIR and the SNS construction site at ORNL. Locations for future ACNS meetings will rotate among the North American neutron centers, with the next conference scheduled for 2004.

In his opening remarks, NSSA President James Rhyne announced the establishment of the Clifford G. Shull Prize in Neutron Science. This \$5,000 prize will be awarded every two years, with the first winner to be announced at the 2004 ACNS. Shull shared the 1994 Nobel Prize in physics with Canadian researcher Bertram Brockhouse.

Please visit the ACNS web site (www.sns.gov/acns) to view the program, invited and keynote presentations, and photos from the conference.



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Bertha is used to lift and place large items such as this steel vault door for the Target Building.



"Big Bertha" at the SNS site. This crane, one of the largest in the region, was given to the project by Lawrence Livermore National Laboratory, where it was known as "Manny Ringer."

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