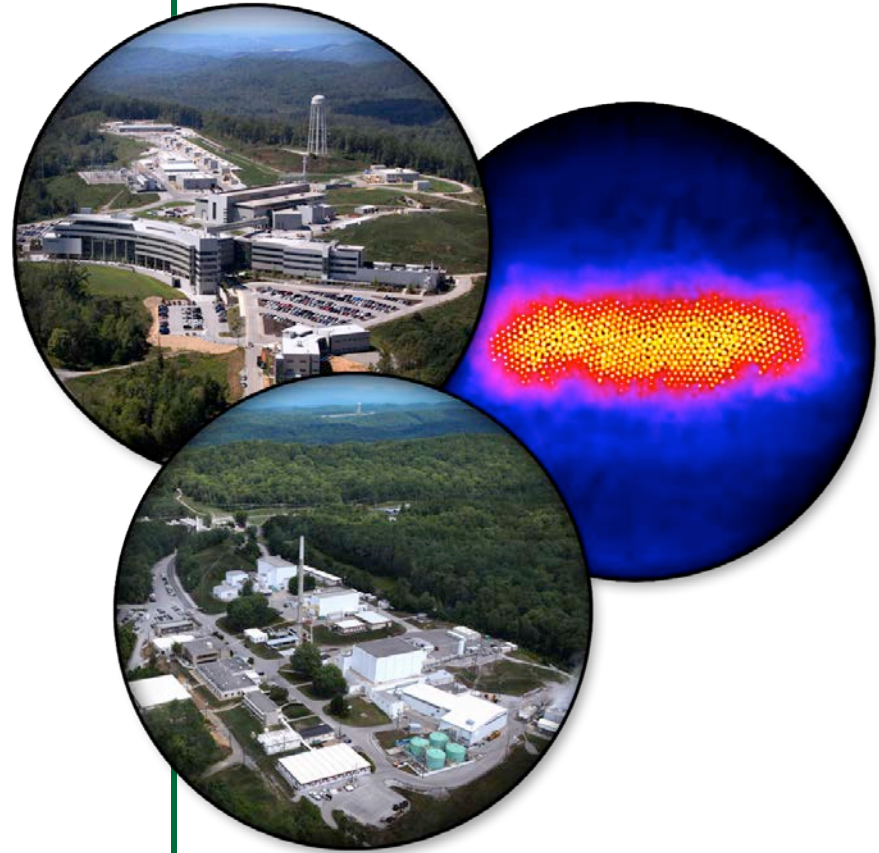


Becoming a Successful Neutron User

Laura Morris Edwards

User Programs and Outreach

Neutrons for Powder Diffraction Workshop
August 27, 2014



DOE and ORNL User Facilities Available for Collaborative Research

- State-of-the-art facilities
- Shared with the science community worldwide
- Offer technologies and instrumentation that are not available elsewhere

ORNL Home to 9 User Facilities

- Building Technologies Research and Integration Center (BTRIC)
- Carbon Fiber Technology Facility (CFTF)
- Center for Nanophase Materials Sciences (CNMS) and Shared Research Equipment (SHaRE) User Facility
- Center for Structural Molecular Biology (Bio-SANS)
- High Flux Isotope Reactor (HFIR)
- Manufacturing Demonstration Facility (MDF)
- National Transportation Research Center (NTRC)
- Oak Ridge Leadership Computing Facility (OLCF)
- Spallation Neutron Source (SNS)



Collaborate with HFIR and SNS

- Numerous opportunities
 - Become a user
 - Join SNS/HFIR User Group (SHUG)
 - Apply to The National School on Neutron and X-ray Scattering
 - Attend workshops and conferences
 - Promote ORISE internships, fellowships, and research participation programs <http://orise.ornl.gov/sep/index.htm>
 - Bring student groups to ORNL
 - Invite ORNL scientists to your campus or institution

Become a User

- Open access based on scientific merit
- Apply for beam time through competitive proposal process
 - Submit proposal using on-line system
 - 2-page statement of research plus sample description
 - 2 calls per year
 - External peer review required
 - Must be technically feasible and safe
- Free of charge if experimental results are intended for publication in the open literature
- Proprietary users are subject to full cost recovery

Neutron Sciences Call for Proposals Due April 13, 2016

Proposals for beam time at Oak Ridge National Laboratory's High Flux Isotope Reactor (HFIR) and Spallation Neutron Source (SNS) will be accepted via the web-based proposal system until **11:59 a.m. (EDT) Noon, Wednesday, April 13, 2016.**

This call is for experiments anticipated to run from July–December 2016.

Information and instructions

To learn more about submitting a proposal for beam time, go to neutrons.ornl.gov/users/ or directly to the proposal system at www.ornl.gov/sci/ums/ipts/. Previously submitted proposals may be used as the basis for new proposals. All proposals will be reviewed for feasibility, safety, and the potential for high-impact science. Before beginning approved experiments, users must complete access and training requirements and ensure that the appropriate user agreements are in place.

AVAILABLE INSTRUMENTS FOR GENERAL USERS

HFIR	SNS
<ul style="list-style-type: none">• HB-1 Polarized Triple-Axis Spectrometer• HB-1A Fixed-Incident-Energy Triple-Axis Spectrometer• HB-2A Neutron Powder Diffractometer• HB-2B Neutron Residual Stress Mapping Facility• HB-2C US/Japan Wide-Angle Neutron Diffractometer (WAND)• HB-3 Triple-Axis Spectrometer• HB-3A Four-Circle Diffractometer• CG-1D Neutron Imaging Prototype Station• CG-2 General-Purpose SANS• CG-3 Bio-SANS• CG-4C Cold Neutron Triple-Axis Spectrometer• CG-4D Image-Plate Single-Crystal Diffractometer (IMAGINE)	<ul style="list-style-type: none">• BL-1A Ultra-Small-Angle Neutron Scattering Instrument (USANS)• BL-1B Nanoscale-Ordered Materials Diffractometer (NOMAD)• BL-2 Backscattering Spectrometer (BASIS)• BL-3 Spallation Neutrons and Pressure Diffractometer (SNAP)• BL-4A Magnetism Reflectometer (MR)• BL-4B Liquids Reflectometer (LR)• BL-5 Cold Neutron Chopper Spectrometer (CNCS)• BL-6 Extended Q-Range SANS (EQ-SANS)• BL-7 Engineering Materials Diffractometer (VULCAN)• BL-9 Elastic Diffuse Scattering Spectrometer (CORELLI)• BL-11A Powder Diffractometer (POWGEN)• BL-11B Macromolecular Neutron Diffractometer (MaNDI)• BL-12 Single-Crystal Diffractometer (TOPAZ)• BL-14B Hybrid Spectrometer (HYSPEC)• BL-15 Neutron Spin Echo Spectrometer (NSE)• BL-16B Vibrational Spectrometer (VISION)• BL-17 Fine-Resolution Fermi Chopper Spectrometer (SEQUOIA)• BL-18 Wide Angular-Range Chopper Spectrometer (ARCS)

For more information on any of these instruments go to neutrons.ornl.gov, or contact the Neutron Sciences User Office, neutronusers@ornl.gov or (865) 574-4600.

Oak Ridge National Laboratory is managed by UT-Battelle for the US Department of Energy.

 OAK RIDGE
National Laboratory

First-time Users Get Started with Our Assistance

- Contact an Instrument Scientist to discuss your research
 - Define the research problem
 - Define the material – composition, form, size, availability
 - Define the experimental conditions (temperature, pressure, magnetic field, etc)
 - Devise a measurement plan
 - Results – mode of presentation and audience
 - Expected timeline

Instrument Scientists Assist First-time and Returning Users

- Provide technical advice, guidance, and assistance
 - Instrument options
 - Sample and experiment preparation
 - Number of experiment days
 - Logistics (scheduling, transporting and storing samples)
 - Proposal preparation tips and assistance
 - Experiment team members
 - Data analysis
 - Publication considerations

Submit Proposal for Beam Time Consideration

- Allow time for review and revisions
- Meet the proposal call deadline
- Expect feedback ~7 weeks from the call close
- Be ready to schedule experiment if approved
 - Identify participating team members
 - Respond to ORNL access approval information
 - Facilitate execution of user agreements
 - Complete required training
 - Confirm sample availability and description and laboratory needs
- Consider reviewer comments if not approved and plan to resubmit this proposal or a new proposal in the next call

Proposal Tips

- Developed using feedback from our Scientific Review Committee
- Reviewed by User Groups
- Posted on our Web Site:
<http://neutrons.ornl.gov/users/proposal-tips.shtml>
- Referenced and linked in the proposal Statement of Research template

Tips for Writing a Good Proposal

- ✓ Contact facility staff before writing and ask them about opportunities for collaboration. Staff are available to:
 - Provide details about the equipment and capabilities, including availability or subscription.
 - Help confirm the feasibility of your approach.
 - Help estimate and justify the amount of facility time you are requesting.
 - Help address why this specific facility is the best choice to meet your requirements.
 - Provide constructive comments on your statement of research.

Contact facility staff early - the number of requests and response time increases as the proposal deadline approaches
- ✓ Include background information on why the proposed experiment is important.
 - Include a precisely defined objective; don't combine loosely related experiments in a single proposal.
 - Clearly articulate the science case; state the problem and its importance.
 - Place your research plan in the context of what others have done are doing. Include references to literature where appropriate.
 - Describe what is particularly innovative about your strategy to address the problem. State why the proposal is timely.

Science at user facilities is diverse and reviewers cover broad areas. Don't assume all reviewers will be experts in your specialty.
- ✓ Address how the experiment will make a difference. Focus on how this particular effort will contribute to the field. Describe the proposed work including samples, methods, and procedures.
 - State clearly and exactly what you are going to synthesize, measure, or calculate.
 - Describe how your sample(s) have been characterized by other methods to ensure phase purity, crystal quality, or specific intrinsic behavior.
 - Provide sufficient detail to demonstrate that you have thought carefully about your plan.
 - Describe the techniques to be used to generate and analyze the data.
 - Demonstrate familiarity with prior work done in this area.
 - Refer to current literature, especially your own work
 - Summarize the key points of cited references and explain how your proposed work fits in.
 - Demonstrate your team's productivity at the facility, if applicable, by describing how the results of previous experiments were used and published.
 - Describe related results (published and unpublished) from work done by your group.
 - Include key data in graphic format.
 - Explain why you need this particular user facility and instrument.
 - Justify the amount of time requested.
 - Identify potential showstoppers and how you plan to avoid them; if you don't identify them, the reviewers will!

Ensure that your facility publication record is current

Show you made good use of prior facility time

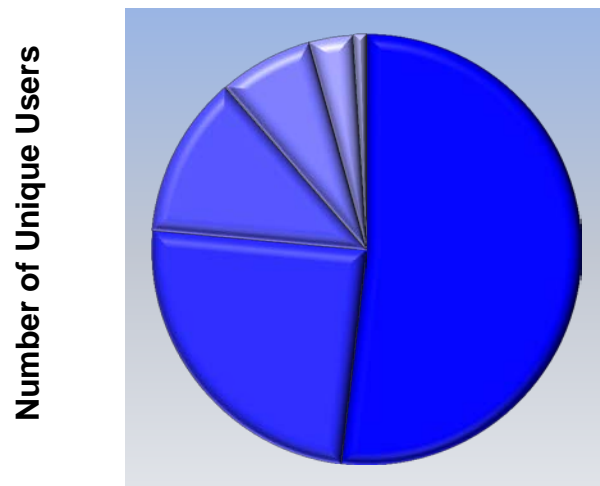
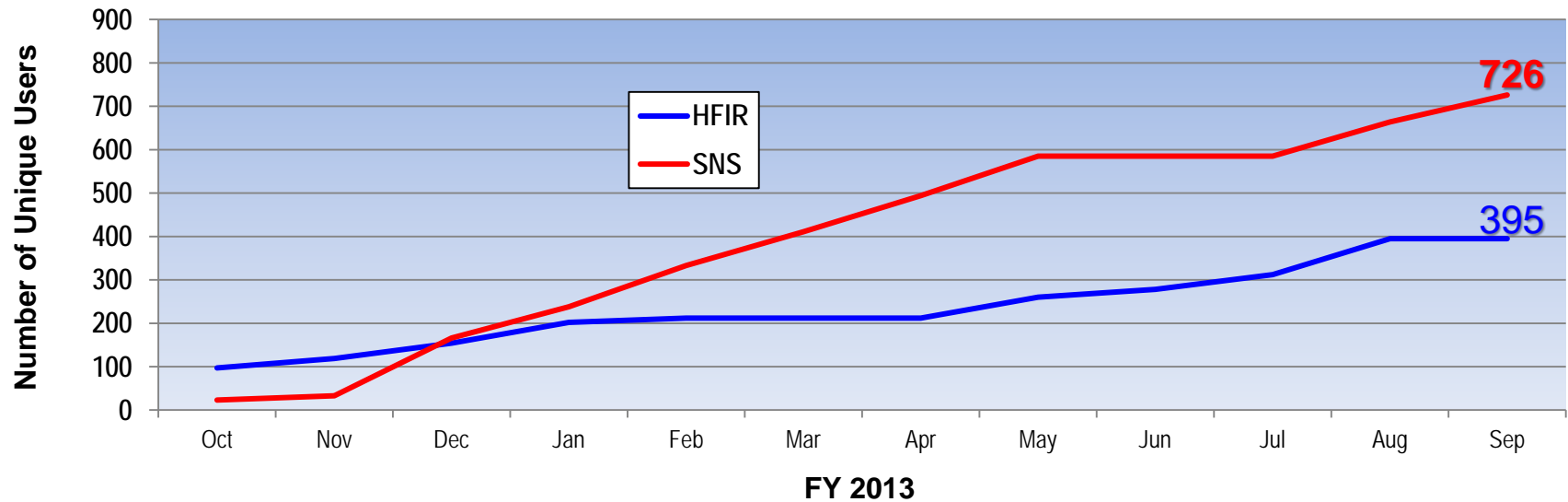
Be clear and specific - not vague or general

Getting Started

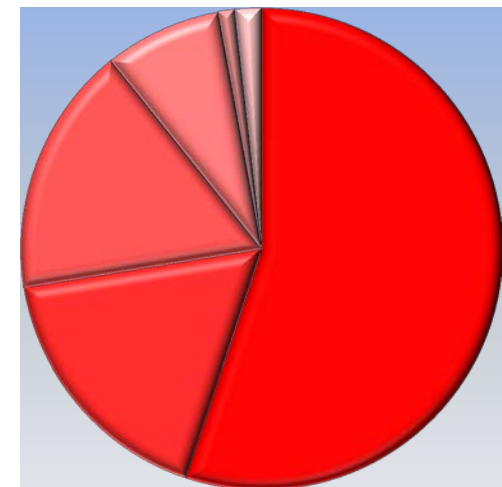
- Access the User Portal to create a user account
<https://user.ornl.gov/>
- Access IPTS (Integrated Proposal Tracking System)
<http://web.ornl.gov/sci/iums/ipts/>
- Templates and guidance available within IPTS

User Program and Community

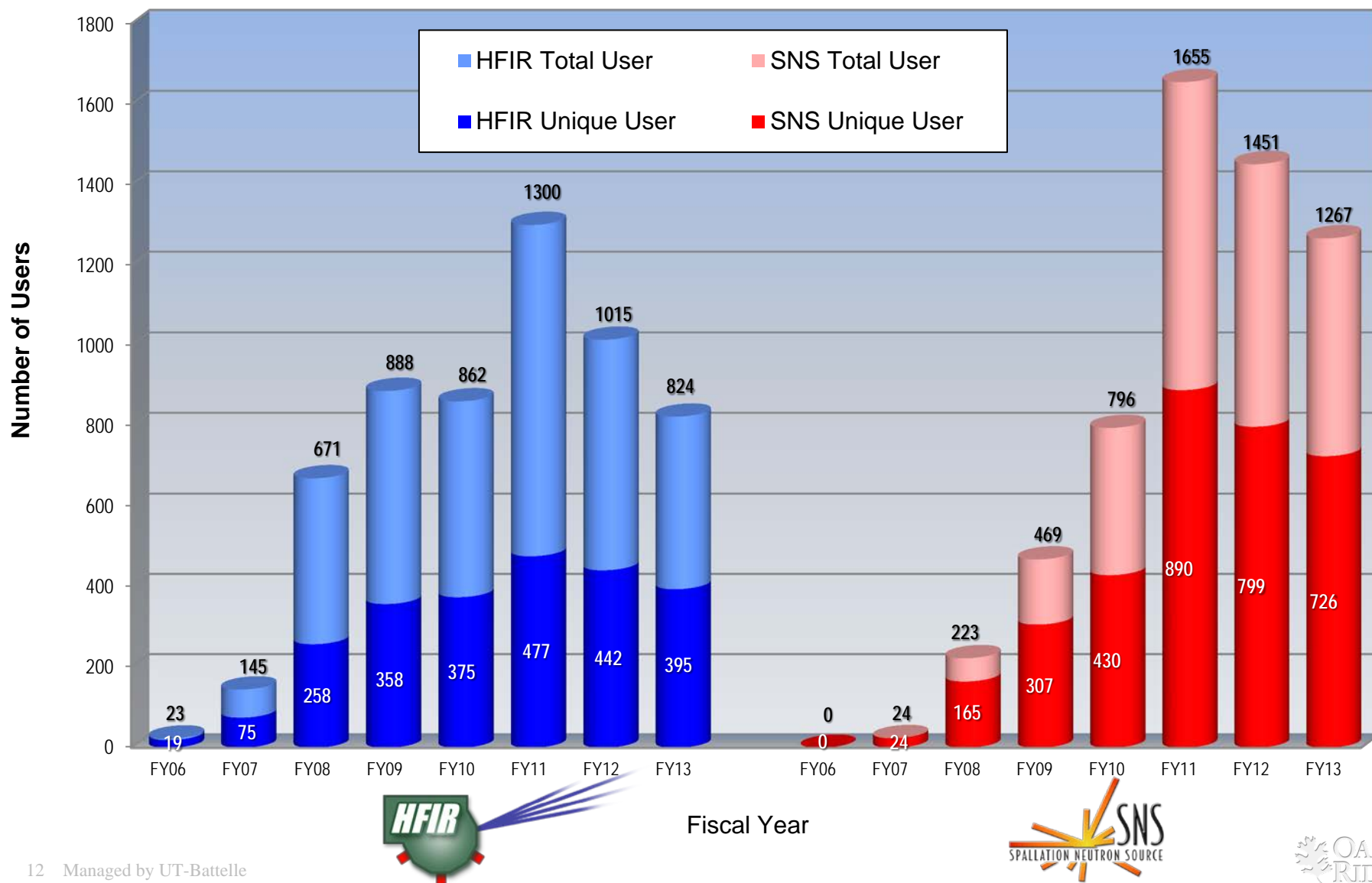
Unique User Statistics – FY 2013



Institution Type			
205	Academic	400	
97	ORNL	126	
48	Foreign Institutions	122	
28	Other DOE Labs	57	
13	Industry	8	
4	Other Gov Labs	13	
0	Other	0	

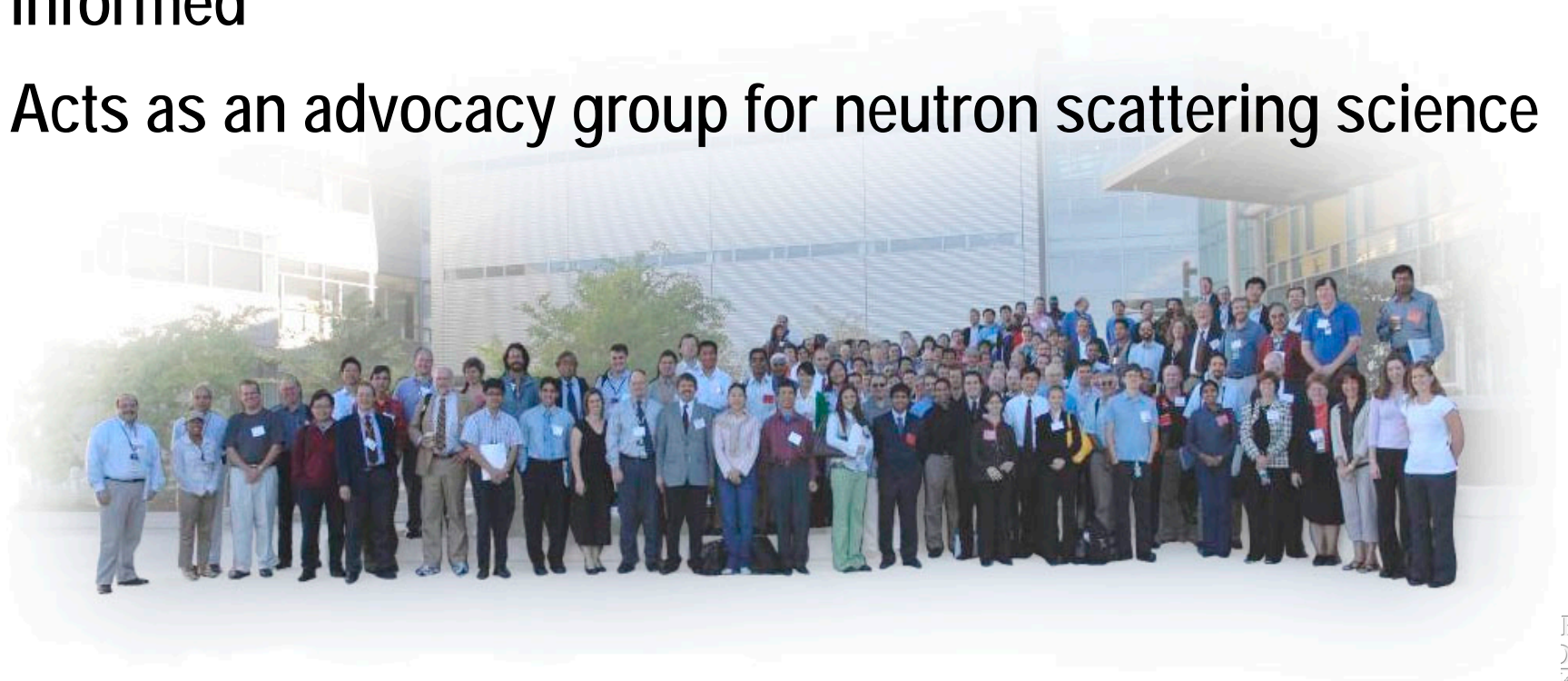


Total & Unique Users FY06-FY13



Join SNS HFIR User Group (SHUG)

- Chartered 1998
- Open to individuals interested in using SNS and HFIR
- Provides input to management on user concerns
- Serves as a forum for keeping the user community informed
- Acts as an advocacy group for neutron scattering science



Learn More About SHUG

- Join on the web site (no cost)
<http://neutrons.ornl.gov/users/shug/>
- Participate in annual meetings held in conjunction with the American Conference for Neutron Scattering (years ending in even number) and at ORNL (years ending in odd number)
- Contact Executive Committee Members – information on our website
<http://neutrons.ornl.gov/users/shug/committee.shtml>
- Become an Executive Committee Member

National School on Neutron and X-ray Scattering

- June 14 - 28, 2014 65 graduate students participated
- Co-hosted by Argonne National Laboratory and ORNL
- Education on utilization of major neutron and x-ray facilities
- Includes lectures, tutorials, and hands-on experiments at ANL's Advanced Photon Source and ORNL's HFIR and SNS
- More information:

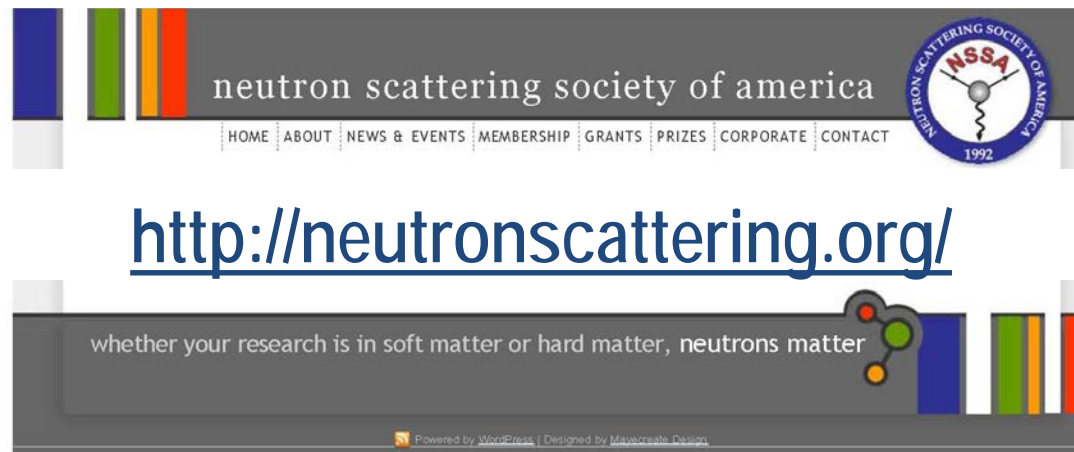
www.dep.anl.gov/nx

neutrons.ornl.gov/nxs/



Join the Neutron Scattering Society of America (NSSA)

- Formed 1992
- Open to individuals interested in neutron scattering research in a wide spectrum of disciplines
- There is no membership cost
- More than 1000 members from 26 countries



Neutron Sources

www.neutron.anl.gov/facilities.html

America

[Centro Atomico Bariloche, Rio Negro, Argentina](#)
[Canadian Neutron Beam Centre, Chalk River, Ontario, Canada](#)
[High Flux Isotope Reactor \(HFIR\), Oak Ridge National Laboratory, Tennessee, USA](#)
[Intense Pulsed Neutron Source \(IPNS\), Argonne National Laboratory, Illinois, USA](#)
[Los Alamos Neutron Science Center \(LANSCE\), New Mexico, USA](#)
[Low Energy Neutron Source \(LENS\), Indiana University Cyclotron Facility, USA](#)
[McMaster Nuclear Reactor, Hamilton, Ontario, Canada](#)
[MIT Nuclear Reactor Laboratory, Massachusetts, USA](#)
[NIST Center for Neutron Research, Gaithersburg, Maryland, USA](#)
[Peruvian Institute of Nuclear Energy \(IPEN\), Lima, Peru](#)
[Spallation Neutron Source, Oak Ridge National Laboratory, Tennessee, USA](#)
[University of Missouri Research Reactor, Columbia, Missouri, USA](#)
[University of Illinois Triga Reactor, Urbana-Champaign, Illinois, USA](#)

Europe

[Budapest Neutron Centre, AEKI, Budapest, Hungary](#)
[Berlin Neutron Scattering Center, Helmholtz-Zentrum, Berlin, Germany](#)
[Center for Fundamental and Applied Neutron Research \(CFANR\), Rez nr Prague, Czech Republic](#)
[Frank Laboratory of Neutron Physics, Joint Institute of Nuclear Research, Dubna, Russia](#)
[FRJ-2 Reactor, Forschungszentrum Jülich, Germany](#)
[FRM-II Research Reactor, Garching, Germany](#)
[GKSS Research Center, Geesthacht, Germany](#)
[Institut Laue Langevin, Grenoble, France](#)
[Interfacultair Reactor Instituut, Delft University of Technology, Netherlands](#)
[ISIS Pulsed Neutron and Muon Facility, Rutherford-Appleton Laboratory, Oxfordshire, UK](#)
[JEEP-II Reactor, IFE, Kjeller, Norway](#)
[Laboratoire Léon Brillouin, Saclay, France](#)
[Ljubljana TRIGA MARK II Research Reactor, J. Stefan Institute, Slovenia](#)
[Risø National Laboratory, Denmark](#)
[St. Petersburg Nuclear Physics Institute, Gatchina, Russia](#)
[Studsvik Neutron Research Laboratory \(NFL\), Studsvik, Sweden](#)
[Swiss Spallation Neutron Source \(SINQ\), Villigen Switzerland](#)
[European Spallation Source \(ESS\)](#)

Asia

[High-flux Advanced Neutron Application Reactor \(HANARO\), Korea](#)
[Japan Atomic Energy Research Institute \(JAERI\), Tokai, Japan](#)
[KENS Neutron Scattering Facility, KEK, Tsukuba, Japan](#)
[Kyoto University Research Reactor Institute \(KURRI\), Kyoto, Japan](#)
[Malaysian Institute for Nuclear Technology Research \(MINT\), Malaysia](#)
[Japan Proton Accelerator Research Complex \(J-PARC\), Tokai, Japan](#)
[China Advanced Research Reactor \(CARR\), Beijing, China](#)
[Chinese Spallation Neutron Source \(CSNS\), Dongwan, Guangdong, China](#)

Oceania

[Bragg Institute, ANSTO, Australia](#)

For More Information

- Visit our web site at neutrons.ornl.gov
- Contact the User Office. We will help you initiate your collaboration.
 - Laura Morris Edwards, edwardslm@ornl.gov or 865-574-2966
 - Neutron Sciences User Office, neutronusers@ornl.gov or 865-574-4600

