

Sample Environment Plans and Progress at the SNS & HFIR

SNS HFIR User Group Meeting

American Conference on Neutron Scattering

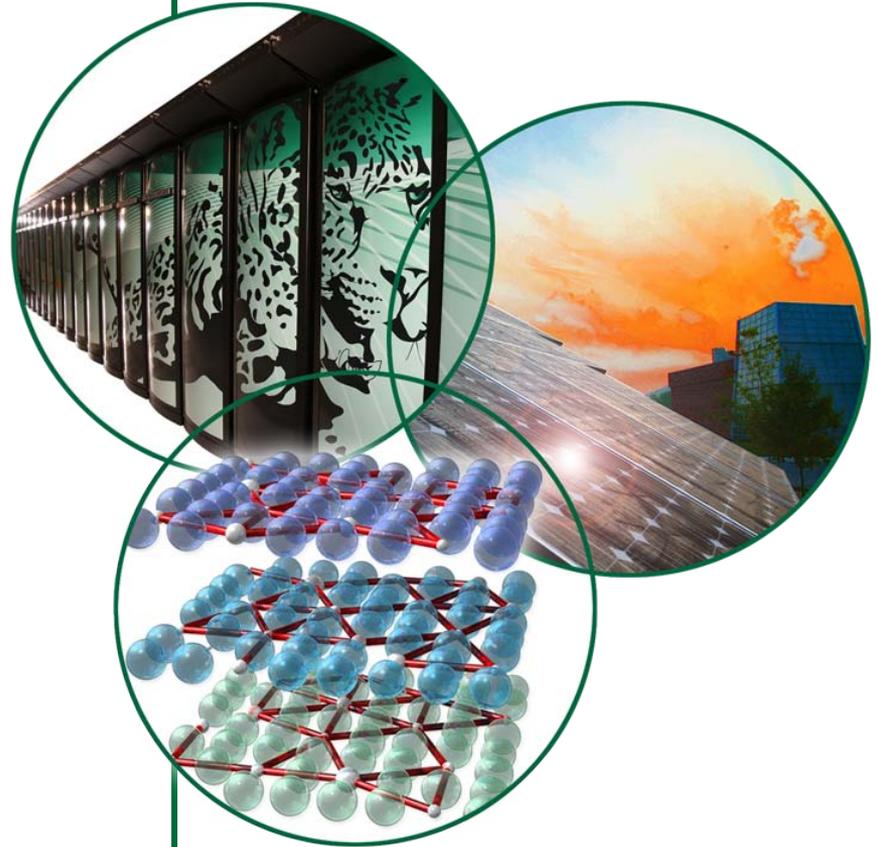
Ottawa, Canada

June 26 – 30, 2010

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Sample Environment Group Leader

Neutron Scattering Science Division

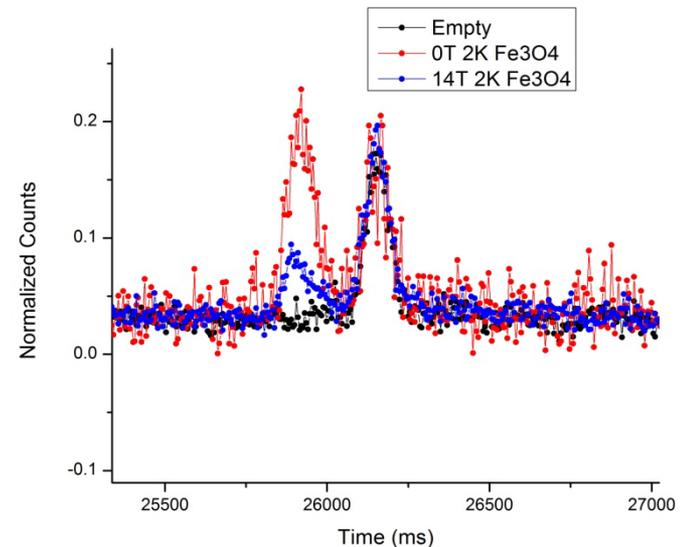


16 Tesla "Fat Sam" is Operational at SNS



The 16T magnet moved to POWGEN on Monday 06/21/2010. The field was ramped up to 14T on Tuesday.

Data showing the (400) reflection of magnetite at $T = 25.9\text{ms}$ ($d = 2.1\text{\AA}$) 2K at zero field and 14T. The intensity difference is most likely due to the Preferred orientation of the powder due to the Presence of the field. The reflection next to it is from the magnet and shows no change in intensity.



Thank You!

- Scientists throughout the community are playing crucial role in improving our sample environment capabilities
 - Feedback
 - SHUG meetings
 - User surveys
 - Sample Environment Steering Committee
 - [Welcoming new members](#)
 - Collaborative development
 - User Partnership for Sample Environment Equipment Development
 - Several projects

Sample Environment Steering Committee

➤ Charge

- Evaluate equipment inventory status
- Recommend resource priorities (purchasing, R&D projects, staffing)
- Help develop Five Year Plan

➤ Membership

- SHUG-nominated reps (presently two – should we have more?)
- One NSSD rep for each instrument group
- NSSD Chief Scientist & Deputy Division Director
- ORNL Center for Nanophase Materials Research – one rep
- Chair: Sample Environment Group Leader

➤ Reports and Recommendations Made to NSSD Deputy Division Director

➤ Meets Monthly at ORNL (external reps join by telecon)

User Partnership for Sample Environment Equipment Development

- Launched in early 2010
- Mini-proposal form and info available on web
- \$20 k materials budget plus travel support
- First round of proposals was evaluated by Steering Committee in May 2010

Projects Underway

- **Ultra High pressure Gas Loading Cell (Carnegie Inst., M. Guthrie)**
- **Crystal De-twinning Clamp Cell (Boston College., S. Wilson)**
- **Air Torch Furnace (Univ. Tennessee, P. K. Liaw)**
- **Electrolyte Chamber (Georgia Tech., G. Yushin)**
- **High Temperature Module for VULCAN Load Frame (UCF, R. Vaidyanathan)**
- **Gas Cell for Single Crystal Diffraction Experiments (U. C. Berkeley, J. Long)**
- **100 Bar Automated Gas Loading System (W. Kentucky Univ., E. Kintzel)**

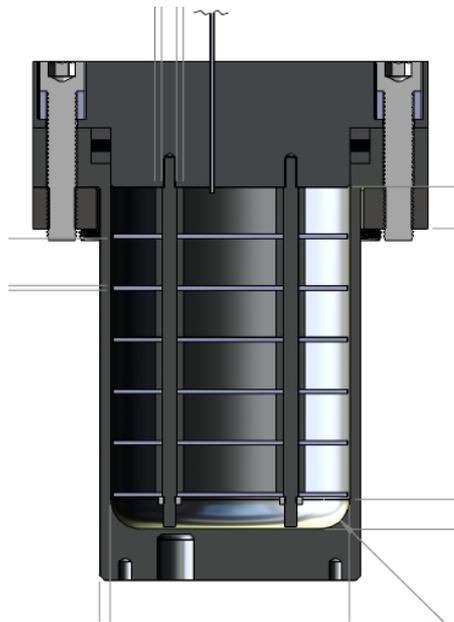
Examples: Instrument-Integrated Standard Environments

- Rotating bottom-loading CCR with low background heat shields for TOF spectrometers
- Horizontal hot-stage CCR for Reflectometry
- SNAP-customized CCR rig
- Vulcan furnace, baby load frame
- Low-Q air furnace



Examples: Special Environments

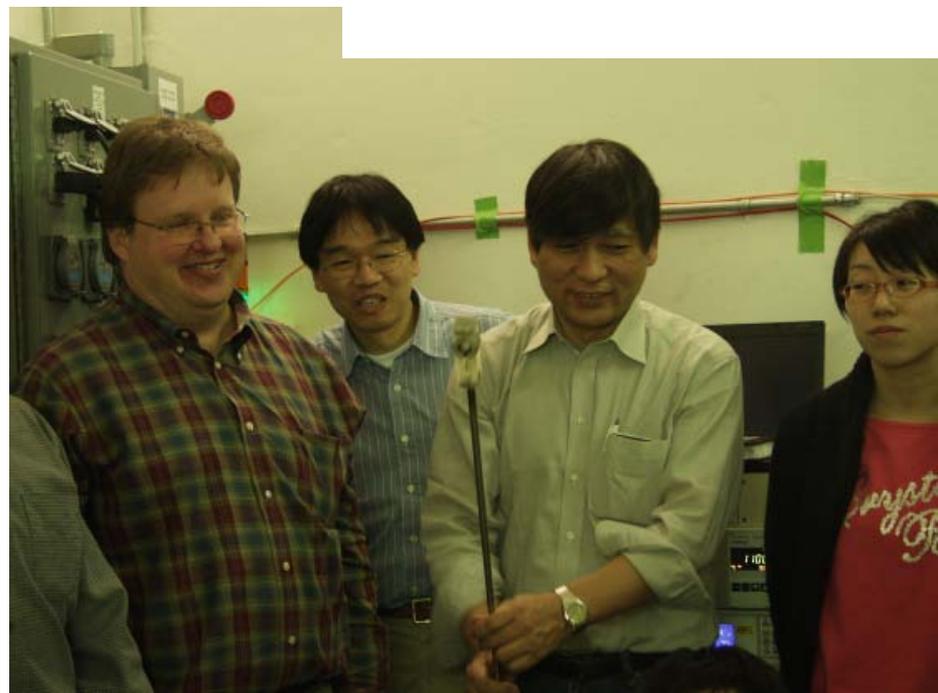
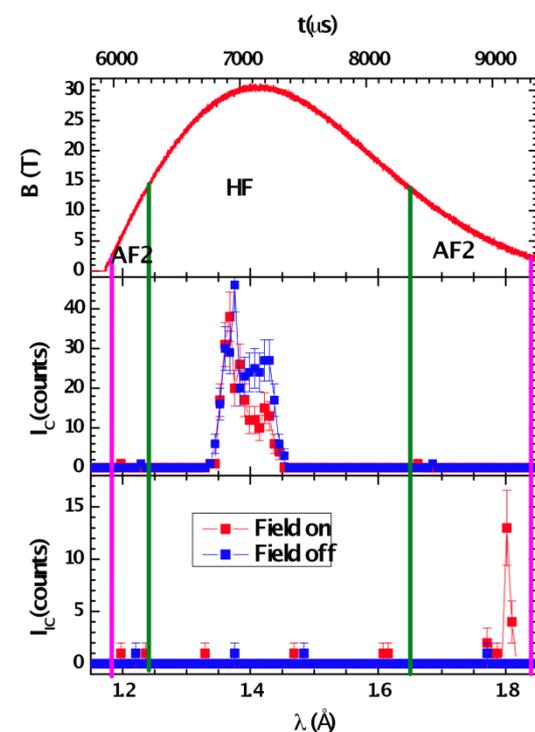
- Sample sticks with gas loading, high current, and photo-excitation capability
- Pressure cells
- High capacity dil-fridge & cell for studying quantum liquids and solids



Examples: Pushing the Limits

- Pulsed magnet collaboration
 - Diffraction at 30 Tesla!
 - Cross-cutting effort throughout NSSD, and international users

- High temperature (3000 C) conical nozzle levitator system
 - New arrival!



So Many Requests!

How Do We Gather, Prioritize and Track Them?

- **The process is open and online at:**
<https://neutrons-shared.ornl.gov/sites/Sample%20Environment%20Steering%20Committee/default.aspx>
 - XCAMS login (same as experiment proposal)

- **SE Steering Committee plays big role**
 - Is your voice heard here?

Thanks for Your Attention

