

**Update:
Joint Institute for Neutron Sciences**

Lee Magid
Acting Director, JINS

March 16, 2004
Oak Ridge, TN

Recent JINS Activities



JINS programs will be known nationally and internationally for their role in scientific discoveries, the strength of their scientific ideas, their contributions to development of extraordinary tools, and their education of the next generation.

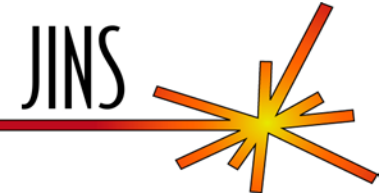
Major activities from September 2003 through March 2004:

- **JINS role in the proposed Neutron and Education Technology Institute (NETI):**
an NSF-STC proposal submitted 2/10/04
- **Novel Instrumentation Concepts:**
a proposed component of JINS as intellectual center
- **JINS and JINS-assisted workshops**
- **Proposal-inciting activities:**
follow-ups to the workshops and the work of the Structural Biology Taskforce
- **Graduate Fellowships**



SNS Campus

Neutron Education and Technology Institute - NETI



Lead Universities: Indiana U. – John Cameron, PI
PSU – Paul Sokol UT – Lee Magid

Other members of the Executive Committee: Baxter, Snow (IU); Robertson (UNL);
Burger (Fisk)

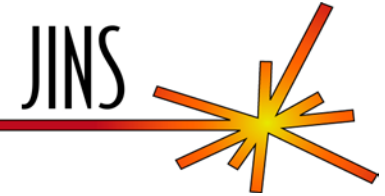
Other universities participating: UIUC, Purdue

UT share: \$3.75M/5 yrs (\$2.8846M req. of NSF; \$0.8654M cost-share)

UT participation in developing enabling technologies that have great potential for
scientific impact in neutron scattering:

- **Optics and imaging** – Egami, Kamyshkov
- **Instrumentation** – Egami
- **Detectors** – Larese
- **Source and Moderators** – Kamyshkov,
Handler

Neutron Education and Technology Institute – NETI, cont.



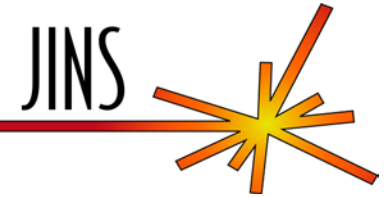
UT participation in education, diversity and outreach programs:

NETI Assistant Director for Education:

JINS Deputy Director for Education is proposed to take this role

- **Virtual Neutron University (VNU)** – Magid, Egami, Larese
- **Scholars in Residence** – Magid, Egami
- **K-12 programs for Students** – Egami, Magid
new module for the Governor's School
- **Evaluation** – French
- **Diversity** – Egami
- **Outreach** – Magid
web portal, traveling exhibit, science museum liaison

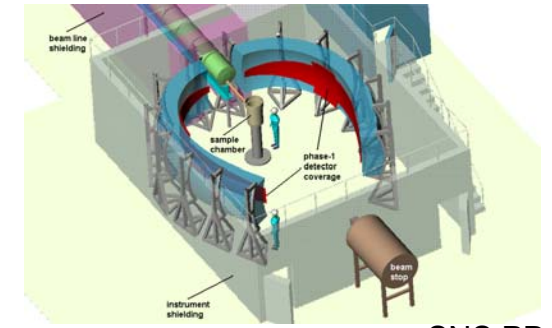
Novel Instrumentation Concepts (NIC) – A JINS Continuing Program Component



June 15-17, 2003: NIC Planning Group met

- **Chair: Mike Rowe, Director of NCNR (Roger Pynn, LANSCE); Ferenc Mezei, HMI and LANSCE; Jack Carpenter, IPNS; Ian Anderson, SNS; Lee Magid, JINS**

**July 30: concept presented to NSF-DMR and DOE-BES;
Mar. 2004, full white paper developed and discussions
Initiated with funding agencies.**



SNS PD

NIC will create an environment where thinking about novel concepts is viewed as an honorable intellectual activity.

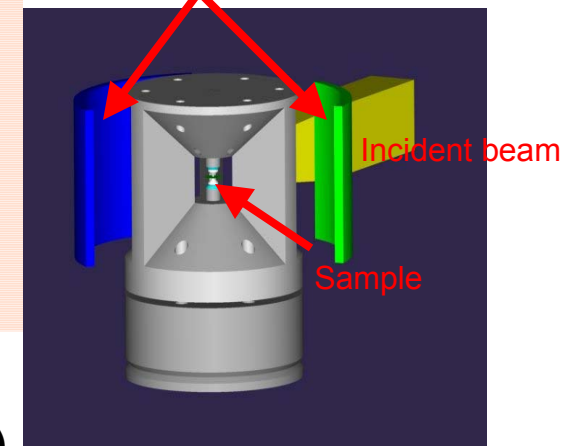
Environment includes:

- science drivers/ideas
- simulation packages
- lash-ups/testing
- junior participants – educate/train the next generation
- access to neutrons/technology
- int./ext. sabbaticals for senior members

**Funding assumptions: 5-year block grant, \$1.7M/yr
plus facilities-based concepts testing - \$1M/yr (largely in-kind)**

High pressure cell

Detectors for SNAP (Hemley)



Scientific Input from the University Community



Recent and Upcoming Major JINS Workshops:

Materials S&E, 10/ 2001- 160 attendees

Biological Systems, 4/2002 – 100 attendees

Solid State Chem./Earth Sci., 3/2003 – 105 attendees
associated short courses – 55 attendees

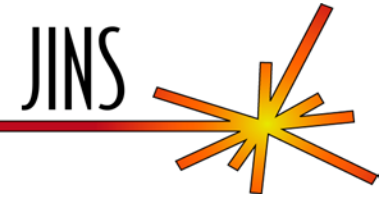
SENSE: Sample Env. for NS Experiments, 9/2003
**NSFChemBio: Neutron Scattering in Chemistry
and at the Chem./Bio Interface**, 9/2003
160 attendees (combined)

Neutrons and Energy for the Future, 6/2004
(satellite of 2nd ACNS conference)

Principal sponsors: *NSF, UT, ORNL/SNS, ORAU, DOE,
UT-B univ., European FP6 - NMI3*



Scientific Input from the University Community, cont.



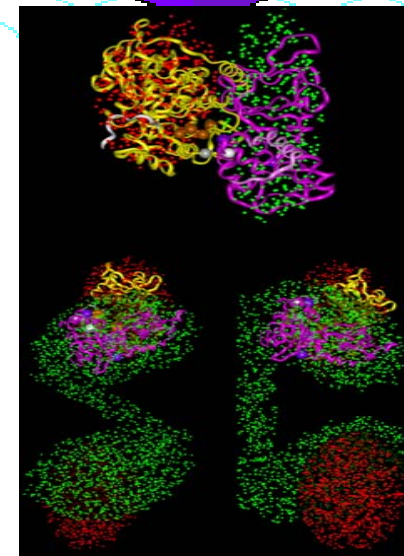
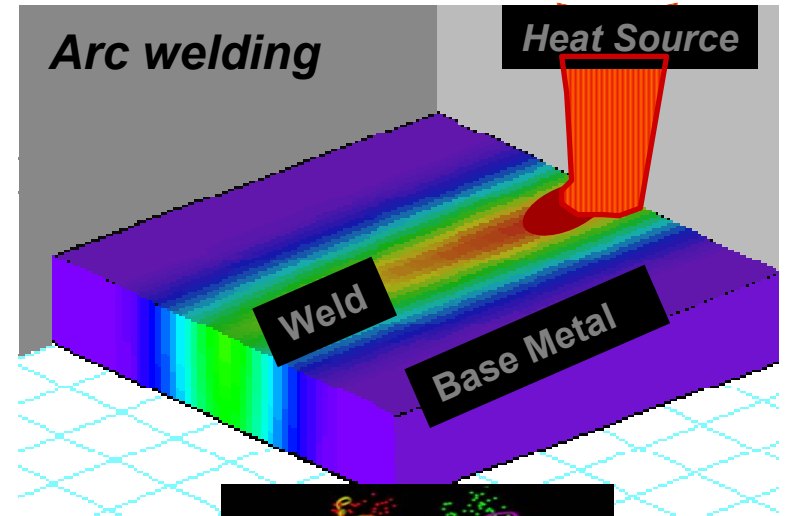
Other workshops/planning activities with JINS participation:

IConUSAS Workshop, 7/2003 – 50 attendees
(incubation of IDT for USANS at SNS)

MANDi Workshop, 10/2003
(refinement of science case for macromol. crystallography)

1st ANSWER Workshop, 11/2003
(mechanical behavior of materials)
JINS partners on their program for workshops, neutron schools, symposia and scientific exch.

PNCMI 2004 – Polarized Neutrons for Condensed Matter Investigations, 6/2004
a satellite of ACNS 2004; overlapping with Neutrons & Energy for the Future



Neutron Scattering for the Chemistry and Chem/Bio Interface



Good mix of current and prospective users

- **came to learn about**
 - Neutrons 101a and b; CNMS; D-lab
 - forefront science using neutrons (cond. phases; thin films/confinement; biology/polymers; catalysis/vibn'l spectros.)
 - current landscape for SE
 - funding opportunities at NSF, DOE, NIH
- **communicate their needs/priorities**
 - instrumentation; SE; supporting labs; isotopic labeling; education
- **agree to stay engaged as champions**
 - ad hoc source of advice for facilities
 - PI's on proposals

NSF will look to the workshop report for guidance and expects to see proposals. -- Joan Frye, NSF-CHE

September 23-25, 2003, Florida State University, Tallahassee, Florida

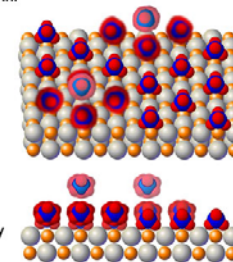


NSF ChemBio
Neutron Scattering for Chemistry and the Chemistry/Biology Interface

Joint Institute for Neutron Sciences Workshop Series

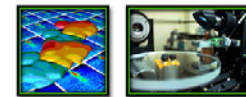
This workshop focuses on scientific grand challenges and the role neutrons can play in chemistry and at the chemistry-biology interface. Graduate students, postdocs and researchers who are new to neutron scattering are especially encouraged to participate. Attendees will learn about applications of neutron scattering and spectroscopy to structure and dynamics in:

- Catalysis; optical, electronic and magnetic materials; batteries; nanoporous solids
- Structure and dynamics of liquids, glasses, complex fluids, thin films, proteins, biomembranes and whole cells
- Molecular behavior under confinement/near interfaces
- Complex self-assemblies of synthetic and biomaterials



This workshop is held in conjunction with the SENSE Workshop, Sample Environments for Neutron Scattering Experiments, on September 24-26. Together, the workshops will:

- Inform the chemistry and chem-bio communities of opportunities—instrumentation and supporting facilities—currently planned for the Spallation Neutron Source (SNS)
- Solicit the community's ideas on the needs for instrumentation, detector development, and sample environment development to support neutron scattering experiments
- Identify the tools needed and outline a path to realization via the formation of concept teams to develop science cases and funding proposals for instrumentation, detectors, sample environment and related laboratory facilities
- Tour of the National High Magnetic Field Laboratory
- Poster session to share research ideas



Confirmed Speakers

Shonda Baker, Harvey-Mudd College
David Baxter, Indiana University
Luc Daemon, Los Alamos
Joanna Krueger, U. North Carolina, Charlotte
Tonya Kuhl, U. California, Davis
John Laese, U. Tennessee and Oak Ridge
Dean Myles, Oak Ridge
Dermot O'Hare, Oxford
John Roof, Chalk River, Canada
Doug Tobias, U. California, Irvine
John Tompkinson, ISIS, UK
Frans Trouw, Los Alamos
Joe Zwaniger, Indiana University

Program Committee

Shonda Baker, Harvey-Mudd College, Co-chair
John Laese, University of Tennessee, Co-chair
Paul Butler, Oak Ridge National Laboratory
W. Ross Ellington, Florida State University
Wayne Goodman, Texas A&M University
Martha Greenblatt, Rutgers University
Jyotsana Lal, Argonne National Laboratory
Lee Magid, University of Tennessee and Joint Institute for Neutron Sciences
James Martin, North Carolina State University
Dean Myles, Oak Ridge National Laboratory
Doug Tobias, University of California at Irvine
John Turner, University of Tennessee

Contacts

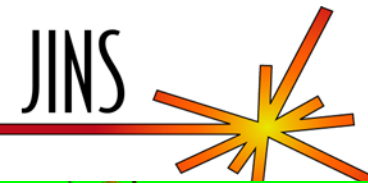
Technical: Lee Magid, 865-974-4228
Local: Janet Patten, 850-644-9651

Sponsored by

National Science Foundation
University of Tennessee/Joint Institute for Neutron Sciences
Florida State University
Oak Ridge National Laboratory/Spallation Neutron Source
Oak Ridge Associated Universities

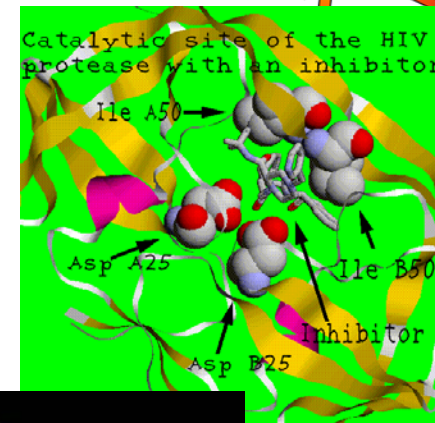
Registration fee: \$200, scholarships for students and faculty, register at http://www.sns.gov/jins/tallahassee_workshops_2003/workshops.htm

NSFChemBio, cont.



Breakout sessions:

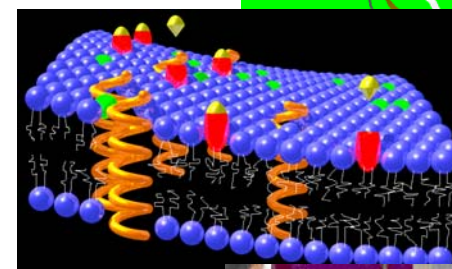
- **support facilities for hard matter**
J. Larese, J. Turner
- **for soft matter**
J. Krueger, P. Butler
- **isotopic labeling**
D. Myles, J. Penfold
- **education**
S. Baker, J. Martin,
J. Zwanziger
- (joint with SENSE)
- SE for polymers/macromol.
- **“conventional” SE**
- for biology



Highest priority for near-term follow-up/proposal(s):

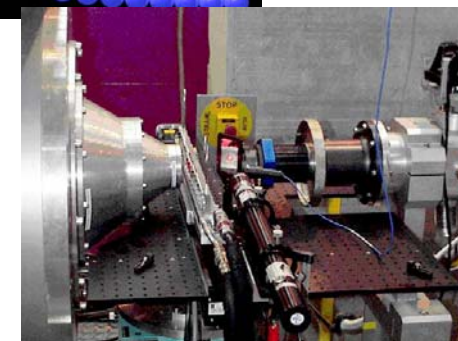
Isotopic labeling facilities – multiple, networked sites

- brainstorming session to be held Mar. 25 at SNS
- draw on existing plans by CSMB (bio. macromolecules) and CNMS (synthetic polymers/polyelectrolytes)
- explore adding add'l small molecule and materials components



J. Katsaras and coworkers, doped “bicelle” system

Mini-symposia organized for the Spring and Fall 2004 national American Chemical Society meetings



Simultaneous DWS and SANS – Schurtenberger and Kohlbrecher

Neutrons and Energy for the Future



June 4-5, 2004 – Washington, DC – joint with NMI3

- fuel cells, advanced batteries, catalysis
- applications of complex fluids in energy
- hydrogen storage; hydrogen in metals
- materials issues in fusion reactors

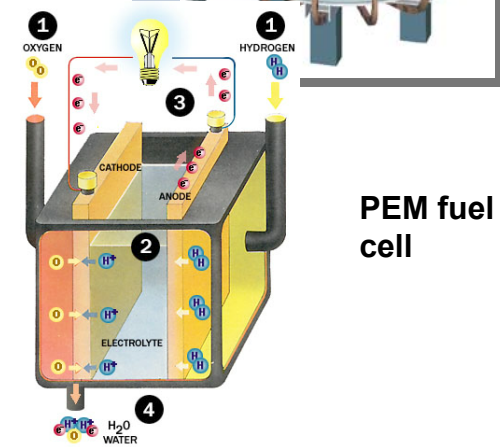
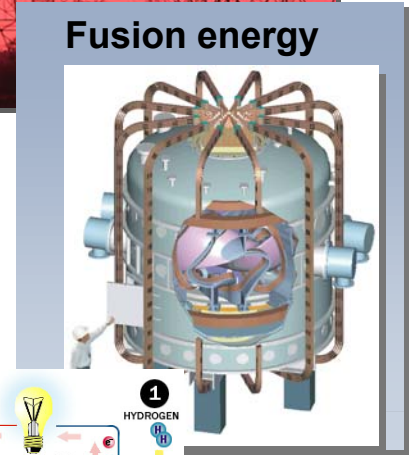
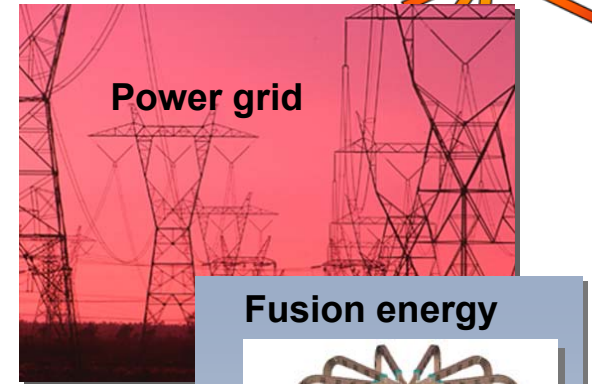
Who should attend:

- current and prospective neutron users from the materials community
- research and technology officers from academia and industry
- policy makers

Presentations will focus on:

- open scientific questions
- facilities' capabilities
- policy/funding perspectives

See www.sns.gov/jins/nmi3/ for details of the agenda and the members of the int'l scientific organizing committee



PEM fuel cell

