COMPRES

http://www.compres.stonybrook.edu

Newsletter

Vol.2 No.1 January 2003, Stony Brook

COMPRES Membership Drive

From the Desk of the President and the Chair

We encourage you to JOIN the COMPRES program. Official membership is given to Institutions. Each Institution names a representative to COMPRES. These representatives define the activities and mission for COMPRES. There is no cost except for your interest and some of your time. A strong membership will give us a strong voice with the funding agencies, and will enable our science to move forward. The website (http://www.compres.stonybrook.edu) gives detailed instructions and help for becoming a member.

We are now building our web site to help the community. Still a work in progress, we will try to set up a section with job opportunities as well as connections to the various national facilities. Please give us information (for example on post doc positions) to post on the web. We are setting up a listserve, a bulletin board, and other web based utilities that we hope will be helpful for our community. We are open to other suggestions as well as criticisms.

Be sure to look at the information regarding the March 22-23 meeting in Miami. Here we hope to craft a document that carries our vision for the future. We hope that we can use this to define our goals to NSF and other federal agencies. ■

— **Jay Bass & Don Weidner**

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Photo to the right: Don Weidner, Chair of the Executive Committee, invites you to become a member of COMPRES at the central office.

COMPRES wants you

Photo by Michael Vaughan

COMPRES wants you

COMPRES Membership Drive

More about the COMPRES

The COMPRES is a community-based consortium that supports research in the materials properties of Earth and planetary interiors with particular emphasis on high-pressure science and technology and related fields. It is charged with the oversight and guidance of important high-pressure laboratories at several national facilities, such as synchrotrons and neutron sources. These have become vital tools in Earth science research. It facilitates the operation of beam lines, the development of new technologies for high-pressure research, and advocates for science and educational programs to the various funding agencies.

Advantages of membership: support for one person from the member institution to attend COMPRES annual meeting; voice in the decision-making process of COMPRES which, in turn, influences the operation of community facilities, infrastructure developments, and prioritization of technical and scientific challenges; visibility in the community.

Disadvantages: NONE. No membership fee is required, but your active involvement is desired.

Benefit to COMPRES: provides a strong voice with the funding agencies, helps COMPRES to better serve the community, and identifies right direction in promoting community science and technology.

Procedure to join: download forms from the web site: http://www.compres.stonybrook.edu/People/Membership/index.html, identify a representative of your institution, request a letter and signature from your Dean or Dean equivalent (sample letters are supplied), send the letter and form to:

Jay Bass, President
The COMPRES Consortium, ESS Building
SUNY, Stony Brook
Stony Brook, NY 11794-2100

COMPRES facilitated facilities and projects

Facilities

- Megabar Synchrotron Center at the National Synchrotron Light Source (Contact: Dave Mao, mao@gl.ciw.edu, Russell Hemley, hemley@gl.ciw.edu, Carnegie Institution of Washington)
- Multi-anvil High Pressure at the National Synchrotron Light Source (Contact: Don Weidner, dweidner@sunysb.edu, State University of New York at Stony Brook)
- West Coast Synchrotron Facilities (Contact: Raymond Jeanloz, jeanloz@uclink.berkeley.edu, University of California at Berkeley)
- GSECARS at the Advanced Photon Source (Contact: Mark Rivers, rivers@cars3.uchicago.edu, Steve Sutton, sutton@cars3.uchicago.edu, Advance Photon Source)
- Neutron Studies at National Facilities (Contact: Nancy Ross, nross@vt.edu,Virginia Tech)

Projects

- Multi-anvil Cell Assembly Development and Production (Contact: Kurt Leinenweber, kurtl@asu.edu, Arizona State University)
- Development of Laser-Heated Diamond Cell (Contact: Thomas Duffy, duffy@princeton.edu, Princeton University, Dion Heinz, heinz@gizmo.uchicago.edu, University of Chicago, Guoyin Shen, shen@Cars.uchicago.edu, Advanced Photon Source)
- Pressure and Temperature calibration (Contact: Yingwei Fei, fei@gl.ciw.edu, Carnegie Institution of Washington)
- Brillouin Lab at the Advanced Photon Source (Contact: Jay Bass, bass@hercules.geology.uiuc.edu, University of Illinois at Urbana-Champaign)

COMPRES Neutron Project

— Nancy Ross

COMPRES is poised to take advantage of the rapidly changing scientific opportunities of the next decade, including a strong geoscience presence at next-generation neutron sources. Although neutron facilities are complementary to synchrotron facilities, progress in high-pressure research involving neutron scattering has traditionally been limited by low signal from the sample. With the development of new and upgraded neutron sources, coupled with instruments capable of delivering the unprecedented intensity with very low backgrounds, major new scientific opportunities will become possible over the next decade. The Spallation Neutron Source (SNS), currently under construction at Oak Ridge, TN (www.sns.gov), is on schedule to be completed in 2006 and will provide the most intense source of neutrons on the planet. With a five-year time horizon for the completion of SNS, new users need to be introduced to neutron scattering methods now to ensure a qualified user base when SNS goes on line. With this in mind, COMPRES is providing funds to broaden the user community of Earth Scientists at neutron facilities (see below).

Why Neutrons?

- *Neutron absorption cross-sections are not electron dependent . . .*

Neutron diffraction can detect hydrogen and other light atoms as easily as heavy atoms, whereas hydrogen atoms are virtually invisible in X-ray diffraction. Site occupancies and order-disorder distributions of atoms or ions with equal or similar numbers of electrons (such as Al^{3+}/Si^{4+}) can be determined directly with neutron diffraction.

- *Neutrons have energies that are similar to the energies of atomic and electronic processes . . .*

Molecular translations, rotations, vibrations and lattice modes, to transitions within the electronic structure of materials can be probed; phonon dispersion curves and phonon densities of states can be determined using inelastic neutron scattering techniques.

- *Neutrons provide an ideal probe to study microscopic magnetism and magnetic structures.*
- *Neutron scattering lengths do not change with scattering vector . . .*

Collection of diffraction data up to large scattering vectors is possible, making the precise determination of bonding geometry more reliable.

- *Neutrons provide a highly penetrating probe . . .*

Complex sample environments such as cryostats, furnaces and pressure cells (some constructed with null scattering materials) can be used and the penetrating power and availability of wide beams allow investigation of texture (preferred orientation) and residual stress analysis of geological materials.

Financial Assistance

Financial assistance is available for Earth Scientists based in a college or university in the United States to carry out neutron scattering experiments and/or to participate in workshops and conferences on neutron scattering (see www.crystal.vt.edu/compres for more details). New users (especially undergraduate and graduate students) will be given highest priority. Please send all requests to Dr. Nancy Ross at nross@vt.edu. ■

COMPRES Coming Events:

- Laser heating working group meeting at the ALS, February 22, 2003, Contact: Simon Clark, smclark@lbl.gov.
- Joint Institute for Neutron Sciences (JINS) Workshop (March 12-16,2003, Oak Ridge, TN): **Neutrons in Solid State Chemistry and Earth Sciences Today and Tomorrow** (http://www.sns.gov/jins/jins.htm)
- Workshop: **Future of High Pressure Mineral Physics**, Newport Beachside Hotel & Resort, Miami, Florida. March 22-23, 2003. (http://www.compres.stonybrook.edu/Meetings/2003-03-22/)
- COMPRES annual meeting, Santa Cruz, June 18-20. Details will be available on the COMPRES web site soon.

Post Doctoral Associates Positions in High Pressure Research

1)Applications are invited for a full-time post-doctoral research associate in the general field of high-pressure mineral physics. Research will involve Brillouin scattering measurements of sound velocities in mantle minerals and/or high pressure x-ray research using synchrotron radiation. Familiarity with high pressure research, especially using diamond anvil cells, x-ray diffraction, and a PhD are required. Experience with Brillouin scattering is desirable but not necessary. The starting date is negotiable but the position is available immediately. Applicants should send a CV, list of publications, and the names of at least 3 references to: Jay Bass, Department of Geology, University of Illinois, 1301 W. Green St., Urbana, IL 61801 (j-bass@uiuc.edu; 217-333-1018). The University of Illinois is an EO/AA employer.

2)The Mineral Physics Institute at Stony Brook University in conjunction with COMPRES grand challenge programs is accepting applications for postdoctoral research associates. The Institute expects to make three such appointments which can begin as early as January 2003. These non-tenured appointments will be for one year with possible renewal for an additional year. Successful applicants will be expected to work with our research programs in high pressure rheology, elasticity and synchrotron X-ray studies using existing facilities in the High Pressure Laboratory and analytical laboratories of the Mineral Physics Institute and *in situ* X-ray diffraction using synchrotron radiation installations at Brookhaven National Laboratory and APS - Argonne National Laboratory. Applications are invited at any time. We encourage candidates to develop a research plan with an Institute staff member. Women and minorities are encouraged to apply. Candidates should send curriculum vita, a statement of research plan, and arrange for three letters of reference to be sent to: Ann Lattimore, Mineral Physics Institute, ESS Bldg. SUNY, Stony Brook, NY 11794-2100 (alattimore@notes.cc.sunysb.edu, 631-632-8213). The University at Stony Brook is an Affirmative Action/Equal Opportunity educator and employer.

Call for the Newsletter Input

The Newsletter is designed to report new happenings around the COMPRES, and more importantly, breakthroughs in the facility development, scientific research and education programs of COMPRES. Please send your input to the COMPRES central office.

Search for Full-Time President/Director of COMPRES

COMPRES, a community-based initiative funded by the National Science Foundation, seeks a President/Director.

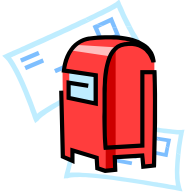
The COMPRES initiative has as its major objectives the facilitation and development of infrastructure for community efforts in geological materials research, much of it at high pressures and temperatures. Examples include support and enhancement of community beam-line facilities, development of standard community experimental protocols and materials sources, and educational outreach activities. The Director will be the Chief Executive Officer, working in conjunction with a steering committee, with the goal to advance the aims of the COMPRES initiative. Initially COMPRES headquarters will be at Stony Brook University/SUNY.

Duties: Interact with funding agencies; oversee COMPRES operations at national facilities; oversee COMPRES development projects; organize and lead COMPRES meetings; oversee COMPRES budget.

Qualifications: Ph.D. in Mineral Physics and national recognition and reputation for accomplishments in this field, as well as demonstrated leadership, administrative abilities and strong interpersonal skills required. Familiarity with the operations of national facilities preferred.

Applications may be sent to:
Dave Walker, Chair of Search Committee
Lamont-Doherty Geological Observatory
Columbia University
Palisades, NY 10964
Email: dwalker@ldeo.columbia.edu

Desired starting date of May 1, 2003. Applications will be accepted until the position is filled. **SUNY/COMPRES is An affirmative action/equal opportunity employer.**



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