The Neutron Scattering Society of America

www.neutronscattering.org

Press Release April 12, 2006

Dr. J. M. Carpenter

is the recipient of the

2006 Clifford G. Shull Prize

of the Neutron Scattering Society of America with the citation:

"For seminal contributions to the development of neutron sources and instrumentation that have had world-wide impact on neutron scattering across a broad range of scientific disciplines, culminating in the optimized design of the Spallation Neutron Source at Oak Ridge."

The Neutron Scattering Society of America (NSSA) established the Clifford G. Shull Prize in Neutron Science to recognize *outstanding research in neutron science and leadership promoting the North American neutron scattering community.* The prize is named in honor of Prof. Clifford G. Shull, who received the Nobel Prize in 1994 with Prof. Bertram Brockhouse for seminal developments in the field of neutron science. The establishment of the prize was announced at the inaugural American Conference on Neutron Scattering (ACNS) in 2002.

Dr. J.M. Carpenter

The nominations were reviewed by a committee of experts in the field of neutron science and the NSSA is pleased to announce that the 2006 recipient of the Shull Prize is **Dr. J. M. Carpenter**, Intense Pulsed Neutron Source Division of the Argonne National Laboratory. The prize and $5000 honorarium will be awarded at the 2006 ACNS, St. Charles, IL, June 18-22, 2006 (http://acns2006.anl.gov/).

Dr. Jack Carpenter has been a pivotal figure in the development of the next generation of neutron sources world-wide. Jack's work pioneered exploitation of the inherent efficiency of the spallation process for the production of neutrons together with the advantages of pulsed operation and time-of-flight measurements for the study of structure and dynamics of materials. His patented design for the moderator-reflector combination is at the heart of

modern neutron source design and his creativity in matching the characteristics of neutron sources to the demands of the instrumentation and ultimately the scientific drivers continue to serve as an example to the international community. Jack's demonstrations of the advantages of the spallation process for neutron production led to the development of the Intense Pulsed Neutron Source at Argonne and KEK in Japan, the success of which paved the way for facilities such as ISIS in the United Kingdom and the Lujan Center at Los Alamos. The success of these facilities led to proposals for more advanced pulsed source facilities such as the Spallation Neutron Source (SNS) at Oak Ridge National Laboratory, AUSTRON in Austria, J-PARC (a KEK and JAERI collaboration) in Japan and the ESS project in Europe.

With a design power of 1.4MW and an upgrade path to more than 2 MW, the SNS is DOE’s flagship facility for neutron research and it will become the leading neutron facility worldwide when fully instrumented. It is fair to say that the US would not now be devoting $1.4B to the construction of the SNS were it not for the groundbreaking work by Dr. Carpenter over a long productive career. In addition to his contributions to source technology, Jack has made seminal contributions to the development of pulsed source instrumentation such as focusing algorithms for time-of-flight powder and single crystal diffractometers and the design of converging multi-aperture collimator for SANS. Indeed Jack's emphasis on the coupled optimization of neutron source performance characteristics and instrument design has greatly increased our ability to exploit pulsed neutron sources as tools for a broad range of scientific endeavor. Jack's advice on technical and strategic issues is widely sought and his input into the design of the SNS, as well as new sources in Japan and Europe, has been invaluable.

In summary, his pioneering development of modern spallation neutron sources, their targets, the decoupled moderator reflector concept, cryogenic moderators, and time-of-flight instruments in general establish Jack Carpenter as a pivotal figure for the present and future of neutron scattering in North America and throughout the world.

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Press Release May 1, 2006

Dr. John Tranquada

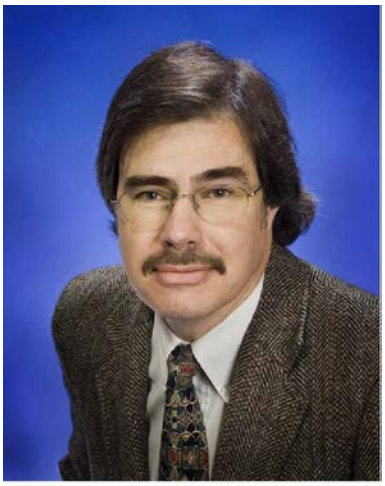
is the recipient of the

2006 Sustained Research Prize

of the Neutron Scattering Society of America with the citation:

"For his outstanding neutron scattering studies of the charge and spin ordering in the high T_c cuprates and related materials"

The Neutron Scattering Society of America (NSSA) established the Sustained Research Prize to recognize a *sustained* contribution to a scientific subfield, or subfields, using neutron scattering techniques. Consideration is given to the impact that the candidate's neutron scattering results have had on the subfield. Preference is given to applicants whose work was carried out predominantly in North America.



Dr. John Tranquada

The nominations were reviewed by a committee of experts in the fields to which neutron scattering contributes and the NSSA is pleased to announce that the 2006 recipient of the Sustained Research Prize is **Dr. John Tranquada**, Leader of the Neutron Scattering Group at Brookhaven National Laboratory. The prize and a $2,500 honorarium will be awarded at the 2006 ACNS, St. Charles, IL, June 18-22, 2006 (http://acns2006.anl.gov/).

Dr. Tranquada entered the field of neutron scattering in the late 1980s. Almost immediately he made important contributions to the field of high T_c superconductors. Indeed, his first paper in the field, which demonstrated antiferromagnetic order in the cuprate $YBa_2Cu_3O_{6+\delta}$, received over 500 citations. This observation provided a clear indication that the underlying antiferromagnetic order in the copper-oxygen planes is a characteristic common to all the cuprates. Subsequently, in a series of experiments performed in the mid-nineties, Tranquada and his co-workers laid the experimental foundations for a revolution in our understanding of charge and spin ordering in strongly correlated materials. This work and Tranquada's subsequent explanation of the charge and spin phenomenology, has had a tremendous and sustained impact in the field of strongly correlated electron physics. It is

universally recognized as one of the defining bodies of work in this field. Dr. Tranquada definitively established his impact on the field of superconductivity by conducting many of the critical experiments leading to the discovery of magnetic "stripes" that formed the basis of much of the theoretical work on the relationship of these stripes to superconductivity.

Dr. Tranquada is currently the Head of the Neutron Scattering Group at the Department of Energy's Brookhaven National Laboratory (BNL) on Long Island. In this capacity he has been responsible for overseeing the transition of this group to a new role following the closure of the High Flux Beam Reactor at Brookhaven. His group now functions as a scientific "user" group both at facilities within the U.S. and in Europe and Japan as well being heavily involved with designing an instrument providing new capabilities for the forthcoming Spallation Neutron Source at Oak Ridge National Laboratory. Tranquada's outstanding contributions to neutron scattering science have been previously recognized by the award of Fellowship in the American Physical Society and with the award of the BNL Research and Development Award, both in 1997.

Dr. Taner Yildirim

is the recipient of the

2006 Science Prize

of the Neutron Scattering Society of America with the citation:

"For his innovative coupling of first principles theory with neutron scattering to solve critical problems in materials science"

The Neutron Scattering Society of America (NSSA) established the Science Prize to recognize a *major scientific accomplishment* or *important scientific contribution within the last 5 years* using neutron scattering techniques. Preference is given to applicants whose work was carried out predominantly in North America.

The nominations were reviewed by a committee of experts in the scientific areas to which neutron scattering contributes, and the NSSA is pleased to announce that the 2006 recipient of the Science Prize is **Dr. Taner Yildirim**, from the NIST Center for Neutron Research. The prize and a $2,500 honorarium will be awarded at the 2006 ACNS, St. Charles, IL, June 18-22, 2006 (http://acns2006.anl.gov/).

Dr. Taner Yildirim

One of the hallmarks of neutron scattering, a powerful analytic method used in scientific research, is the inherent simplicity of the scattering process itself. This simplicity makes possible direct comparisons of theoretical calculations of the expected scattering with experimental observations that can yield a wealth of information about the microscopic properties and structures of a wide variety of technologically important materials. Dr. Taner

Yildirim, who is one of a very few neutron scattering practitioners possessing both strong theoretical skills and deft experimental talents, has used his unusual talents to couple theory and experiment closely and interactively to an unprecedented degree. He has the rare ability to make testable predictions about the properties of materials while simultaneously formulating elegant explanations of experimentally observed quantities in systems ranging from novel superconductors to high-capacity hydrogen storage materials. The power of Dr. Yildirim's approach, and the scientific insight that can be derived from it, is exceptionally well illustrated by a recent study of the important superconductor MgB_2, which has the highest transition temperature of any conventional superconductor. Dr. Yildirim combined first-principles calculations with neutron measurements to demonstrate that the high transition temperature is the result of a particularly anharmonic vibration of the atoms that couples strongly to the electronic states in the system. His results explain not only the origin of the large value of the superconducting transition temperature, but its pressure dependence as well. More recently Dr. Yildirim employed this approach to the problem of hydrogen storage and discovered ways to enhance the uptake of, and the capacity for, hydrogen in a variety of materials including alanates and carbon nanotubes. These results offer the promise of addressing what is widely considered to be the most serious obstacle in the road to the hydrogen economy.

Dr. Yildirim is currently the Team Leader for Computational Neutron Scattering at the National Institute of Standards and Technology Center for Neutron Research in Gaithersburg, Maryland. His outstanding contributions have been previously recognized by the NIST Chapter of Sigma Xi, which awarded him its Outstanding Young Investigator Award in 2002, and by the Department of Commerce, which awarded him a Bronze medal in 2005.