



# The Neutron Scattering Society of America

[www.neutronsattering.org](http://www.neutronsattering.org)

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The Honorable Paul M. Dabbar  
Under Secretary for Science  
U.S. Department of Energy  
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Dear Under Secretary Dabbar:

## Support for a Second Target Station

The Neutron Scattering Society of America (NSSA) strongly endorses the proposal put forth by the Oak Ridge National Laboratory to increase the neutron scattering capabilities available in the United States by building a Second Target Station (STS) at the Spallation Neutron Source (SNS). On behalf of the community of users at U.S. neutron beam facilities, the NSSA wishes to emphasize the high priority of the STS project for the future and vitality of neutron scattering.

The United States played an essential, formative role in the invention of neutron science techniques for materials research in the 1940s and 50s, beginning with the work of Walter Zinn at Argonne National Laboratory and Ernest Wollan at Oak Ridge National Laboratory. Later pioneering work was recognized with the awarding of the Nobel Prize in Physics to Clifford Shull and Bertram Brockhouse in 1994. The NSSA, which draws its members from academia, industry and government laboratories with research interests and achievements that cover a broad range of basic and applied science, is very proud to represent those who continue in this tradition.

Neutrons are an essential probe for matter, having paved the way for historical discoveries in science. Neutron scattering is a key scientific tool, providing unique capabilities for characterizing the structure and dynamics of advanced materials, and in particular for studying soft matter (including biological complexes for diagnostics and therapeutics), complex fluids, magnetic materials, thin films, and disordered and aperiodic structures. Neutrons do not suffer from strong Z-dependent scattering cross sections, thus enabling studies of hydrogenous materials that are key to many energy technologies. Neutron scattering is also important for progress in the manufacture of advanced materials, since neutrons penetrate complex apparatus and can examine materials under processing conditions. World-leading neutron science capabilities are therefore paramount for the United States to maintain its

leadership in the study and development of new materials, which is needed to ensure economic competitiveness and enable innovation.

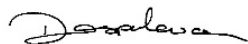
As you know, the Department of Energy (DOE) has invested in developing and operating two world-leading neutron scattering user facilities, the SNS and the High Flux Isotope Reactor. Both facilities are now operating at optimum levels of neutron production with remarkable reliability. Users are doing high-impact science at the forefront of research. The number of neutron users has grown significantly in the 10 years that the First Target Station at SNS has been operational. The number of proposed experiments has equally grown, and the oversubscription rate runs between 300 and 400 %. These are clear trends in the right direction.

However, technical limitations of the present sources prevent the full potential of neutrons being applied to important areas of emerging science. The STS, in combination with the Proton Power Upgrade now under way, will overcome these technical limitations and provide the United States with forefront facilities that will enable ground-breaking new science. Starting the STS now will ensure that the Basic Energy Sciences neutron facilities continue to offer the world's best capabilities for research that can only be done with neutrons.

The global landscape of neutron sources is rapidly evolving and the First Target Station at the SNS will be outperformed in major areas of science in both Asia and Europe within the next decade (within 3 years in Japan with the operation of JPARC and within 10 years in Europe with the completion of ESS). These significant new investments by other nations, in combination with a decrease in the number of DOE-funded neutron scattering facilities in the United States over the last decade, despite the continued growth of the country's neutron scattering user base, make funding the STS project an urgent matter. Delaying STS will result in neutron scattering leadership and science moving to Asia and Europe.

The continued competitiveness of the United States in materials research therefore depends, at least in part, on increased access to neutron scattering facilities. On behalf of the neutron scattering community, the NSSA is fully supportive of the STS project.

Sincerely yours,



Despina Louca

President of NSSA

Maxine S. and Jesse W. Beams Professor of Physics