OAK RIDGE NATIONAL LABORATORY

Second Target Station: Enabling New World-Leading Neutron Science

The Second Target Station (STS) upgrade to the Spallation Neutron Source (SNS) will provide transformative capabilities for advanced studies of a wide range of materials, enabling breakthrough discoveries in many areas of materials R&D. With the STS, the United States will maintain leadership in neutron science, and the high brightness of STS will enable researchers to use neutrons in novel ways that advance the technologies underpinning US energy, economic, and national security. The STS will help researchers develop novel materials for advanced energy technologies; solutions for biotechnology and health, and advanced manufacturing; and other vital applications that help drive our nation's economy.

Benefits of the Second Target Station

- Enable innovative neutron experiments, under more extreme conditions, using smaller samples
- Provide the world's brightest cold (lower-energy) neutrons to study more complex materials
- Facilitate faster data collection to study how materials respond to real-world conditions
- Leverage Oak Ridge National Laboratory's (ORNL's) existing neutron facilities and expertise

100–1,000×
Better performance than existing neutron instruments

22
New independent neutron beamlines

4×
Greater range of usable neutron wavelengths

Neutrons: An Essential Research Tool for Technology, Industry, and More

ORNL has pioneered neutron research since 1944. Today, the Laboratory operates SNS, the most intense accelerator-based pulsed neutron source in the world, and the High Flux Isotope Reactor, a reactor-based neutron source that provides the brightest continuous neutron beams for research in the United States. Because of their unique properties, neutrons have helped improve many technologies, including computers, cell phones, transportation, batteries, medical devices, energy production, cancer treatments, and airport shipping and security.

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