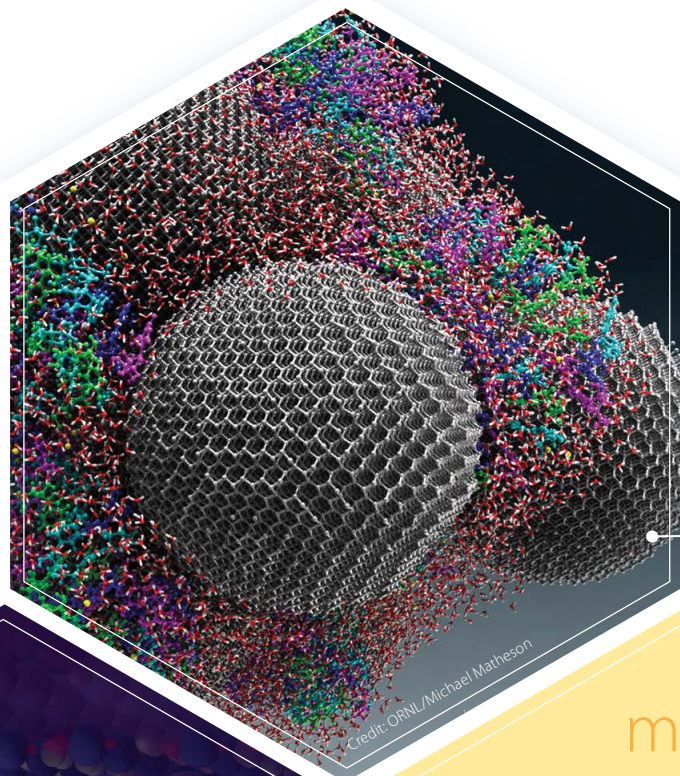


2018

OAK RIDGE
National Laboratory

HIGH FLUX ISOTOPE REACTOR
SPALLATION NEUTRON SOURCE

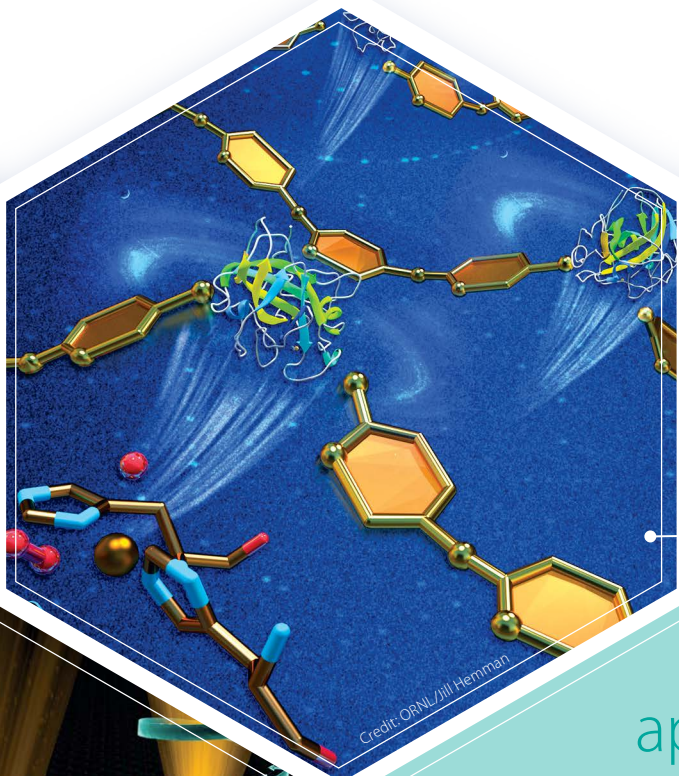


Credit: ORNL/Michael Matheson

jan

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Researchers from ORNL, Wayne State University, and Shanghai Jiao Tong University used neutrons to study nanodiamond particles' hydrophilic properties to enhance tRNA activity, aiming to improve cancer drug delivery, bactericides, and help treat genetic disorders.
DOI: 10.1021/acs.jpcc.6b07511

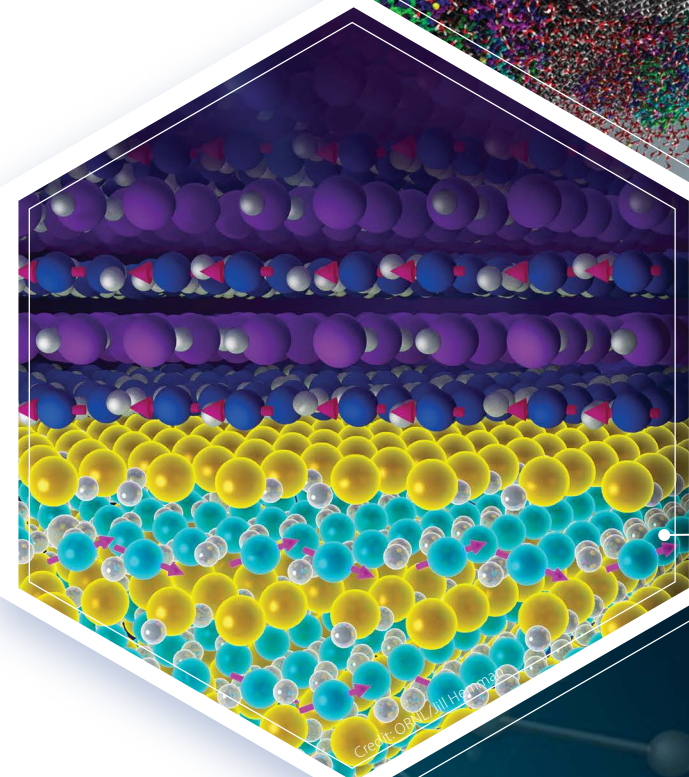


Credit: ORNL/Jill Hemman

feb

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Scientists from ORNL, University of Tennessee, and North Carolina State University used neutrons to help describe molecular oxygen activation by enzymes, which could lead to more efficient enzymatic processing of plant-based materials into biofuels.
DOI: 10.1002/anie.201610502

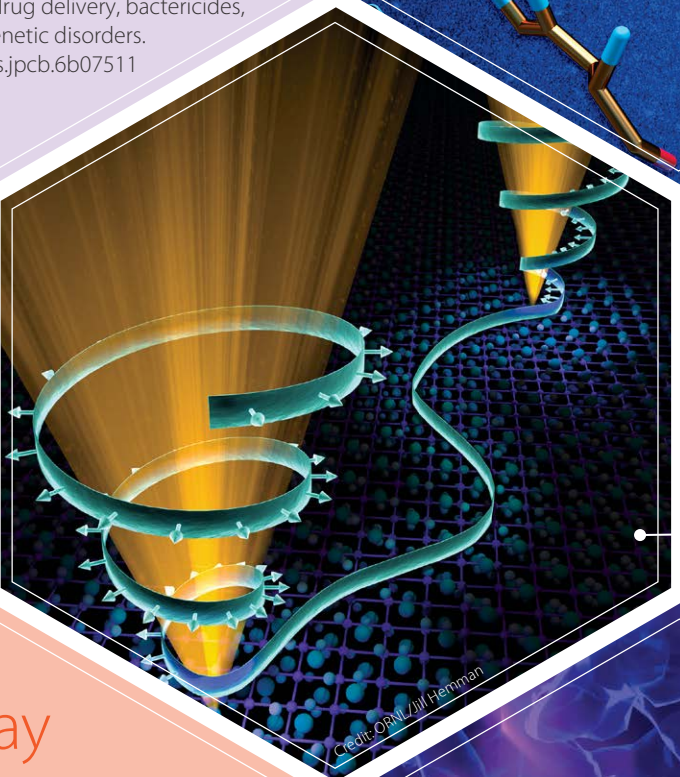


Credit: ORNL/Jill Hemman

mar

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Teams from ORNL, King Abdullah University, University of Manitoba and others employed neutrons to study temperature and layer thickness effects of magnetism in ultra-thin bismuth ferrite for future data storage applications.
DOI: 10.1002/adma.201700790



Credit: ORNL/Jill Hemman

apr

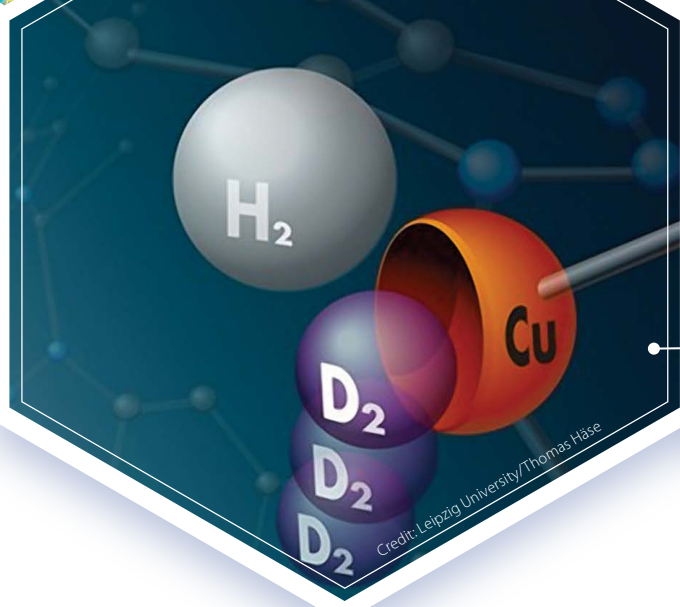
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Neutrons were used by researchers from ORNL, Tulane University, Louisiana State University, National High Magnetic Field Laboratory, University of New Orleans, Los Alamos National Laboratory, and others to study a new state of matter, the Weyl semimetal phase.
DOI: 10.1038/nmat4953

■ Proposal call closes at noon on February 21

This year is the 75th anniversary of ORNL and the 74th anniversary of the first neutron scattering experiments.

The Spallation Neutron Source (SNS) and the High Flux Isotope Reactor (HFIR) at the US Department of Energy's Oak Ridge National Laboratory (ORNL) are Office of Science User Facilities. The SNS accelerator provides the most intense pulsed neutron beams in the world, and the HFIR reactor provides the highest flux reactor-based source of neutrons for research in the United States. Together, these facilities produce neutron beams for instruments specially designed to study the characteristics of materials.

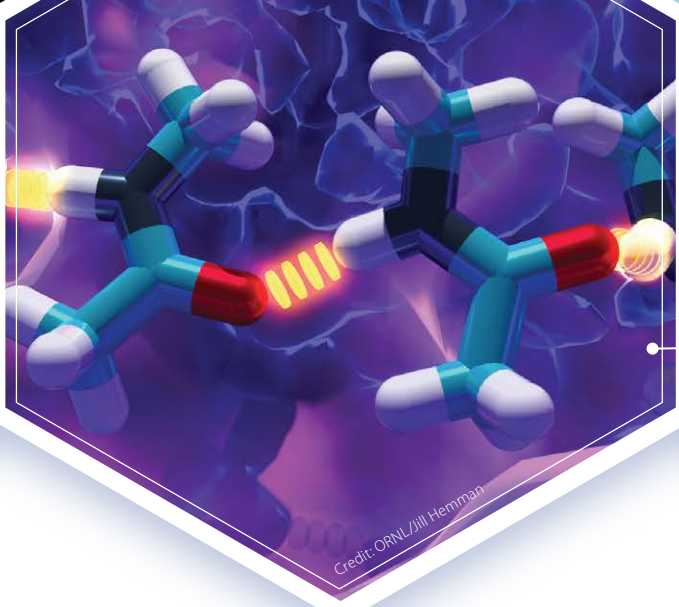


Credit: Leipzig University/Thomas Hase

may

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Scientists from ORNL, Max Planck Institute, Leipzig University, Jacobs University, and Augsburg University used neutrons to show how metal-organic frameworks can capture heavy hydrogen isotopes for use in science and medicine.
DOI: 10.1038/ncomms14496



Credit: ORNL/Jill Hemman

jun

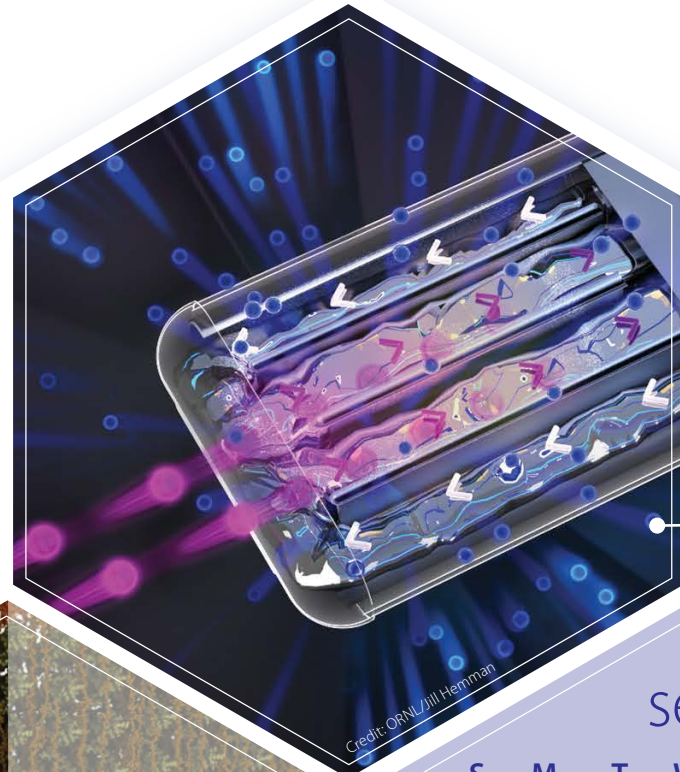
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Researchers from ORNL and the University of Tennessee used neutrons to study how hydrogen bonds affect viscosity of peptides. They saw that flow in a hydrogen bonding liquid relates to changes in network connectivity, which could lead to improved liquid products.
DOI: 10.1039/C7CP04013J

2018

OAK RIDGE
National Laboratory

HIGH FLUX ISOTOPE REACTOR
SPALLATION NEUTRON SOURCE



Credit: ORNL/Jill Hemman

Calendar for July

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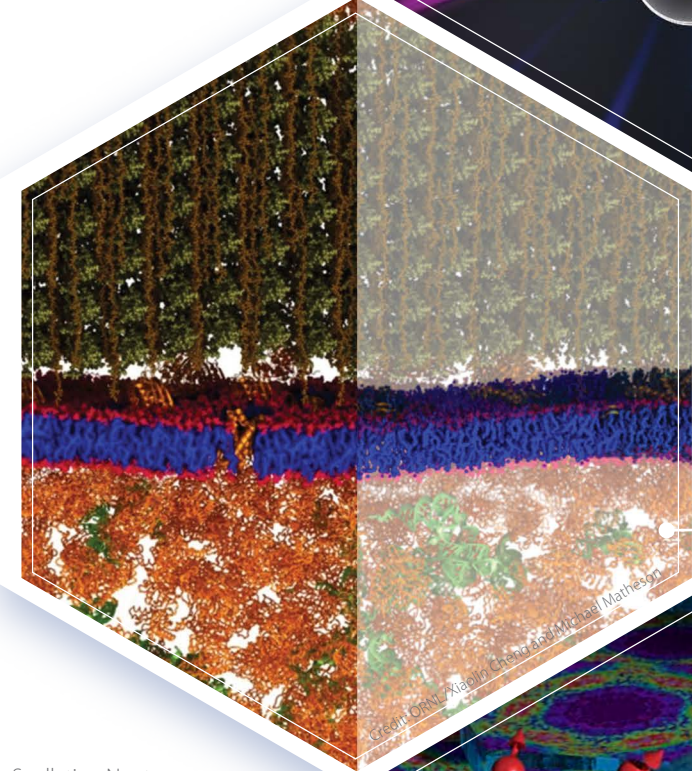
After 10 years of serving scientists from around the world, the SNS remains a leader in developing high-performance mercury targets for neutron experiments, including one of the world's first gas-injection mercury targets using inert gas to help mitigate target wear and tear.
<https://goo.gl/ZN56Y5>



Calendar for August

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Using small angle neutron scattering, scientists from ORNL, NIST, the University of Connecticut, Valparaiso University, and University of Delaware studied hollow polymer nanocapsules, which could be used for nanoreactors, nanosensors, and delivering drugs and imaging agents.
DOI: 10.1021/acs.jpcclett.7b01149



Credit: ORNL/Kristin Casanova and Michael Matheson

Calendar for September

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Researchers from ORNL and University of Tennessee used neutrons and a novel internal contrast method in one of the world's first direct nanoscale examinations of a living cell's membrane. Neutrons' nondestructive properties enabled observing features consistent with the notion of "lipid rafts."
DOI: 10.1371/journal.pbio.2002214



Credit: ORNL/Suzanne Martin

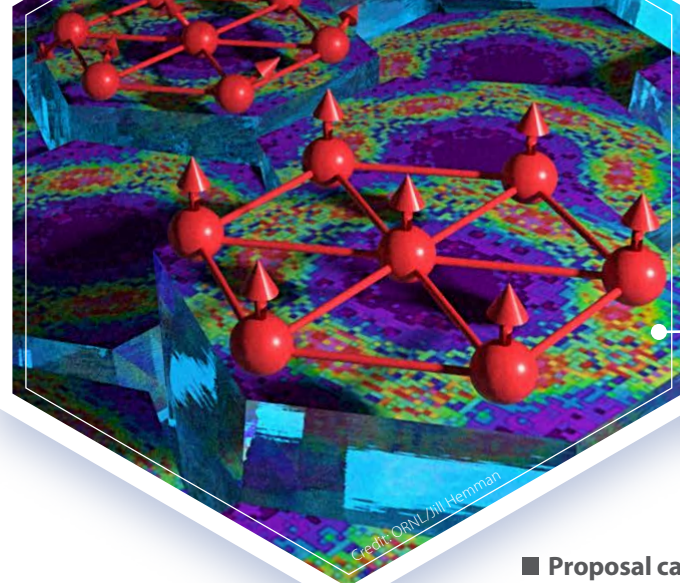
Calendar for October

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Using the world's smallest neutrino detector at the SNS, ORNL and a team of 20 institutions were the first to detect and characterize coherent scattering of low-energy neutrinos off nuclei. Results were measured precisely enough to limit other theoretical models.
DOI: 10.1126/science.aao0990

OAK RIDGE'S
75th

This year is the 75th anniversary of ORNL and the 74th anniversary of the first neutron scattering experiments.

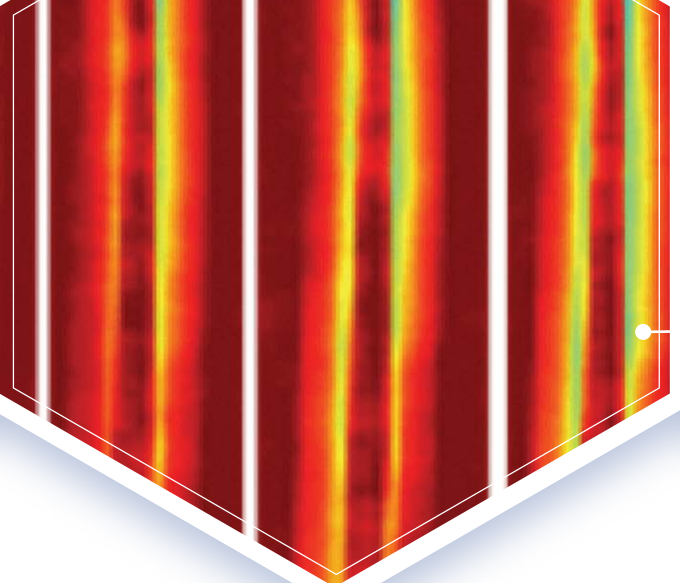


Credit: ORNL/Jill Hemman

Calendar for November

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ORNL scientists partnered with researchers from Georgia Institute of Technology and others using neutrons to study quantum spin liquids and better understand why their magnetic moments exhibit exotic behaviors, such as failing to freeze into ordered arrangements.
DOI: 10.1038/nphys3971



Calendar for December

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Researchers from ORNL, SABIC Houston, State University of New York, and Indian Institute of Technology used neutrons to develop a better way to track the movement and quantity of lithium during battery cycling, which could lead to safer and more efficient batteries.
DOI: 10.1021/acsenerylett.6b00353

The Spallation Neutron Source (SNS) and the High Flux Isotope Reactor (HFIR) at the US Department of Energy's Oak Ridge National Laboratory (ORNL) are Office of Science User Facilities. The SNS accelerator provides the most intense pulsed neutron beams in the world, and the HFIR reactor provides the highest flux reactor-based source of neutrons for research in the United States. Together, these facilities produce neutron beams for instruments specially designed to study the characteristics of materials.

■ Proposal call closes at noon on September 18 (planned)