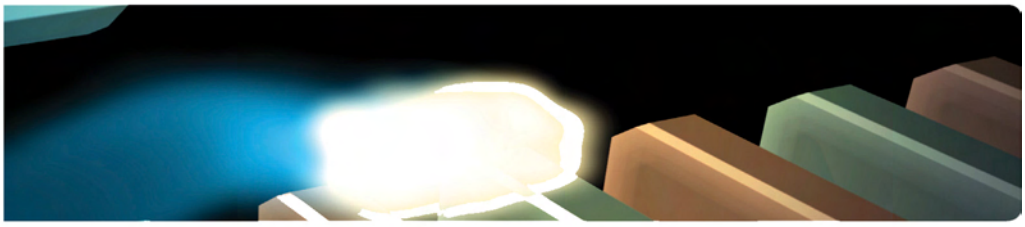
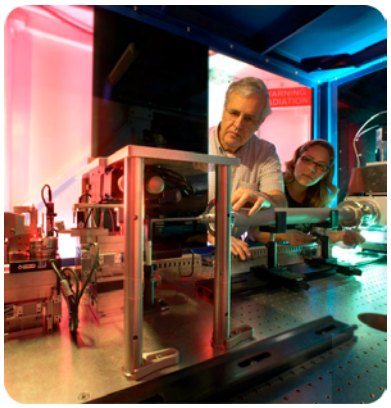
SYNCHROTRON AND NEUTRON FACILITIES

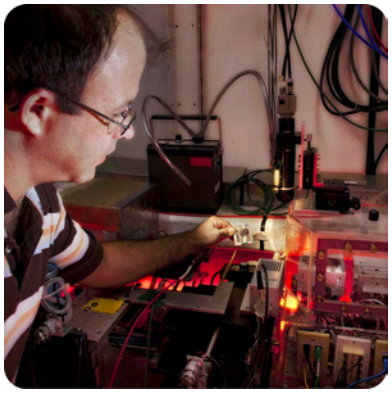


WHAT THEY ARE, WHY THEY MATTER

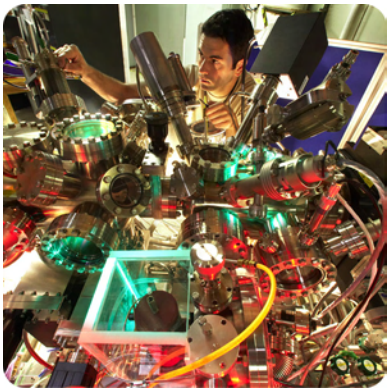


To fully address emerging challenges, scientists must study real materials—learning the intricate details of how they function in order to design **life-saving medicines and cancer treatments**, **radically advanced batteries and engines**, and **novel materials and composites**, to name only a few applications.

This requires **synchrotron and neutron sources**. These facilities allow scientists to investigate materials at the atomic scale, thus enabling them to make groundbreaking discoveries and spur transformational innovations that **create new products and industries**, **generate new jobs**, and **address our energy, national security, and technological needs**.



Thirty-nine **Fortune 500** companies from 24 states use synchrotron and neutron facilities. In all, **more than 21,000 scientists** from leading companies, research universities, laboratories and federal agencies depend on synchrotron and neutron sources. Individual companies and universities cannot build, staff and maintain such facilities. The essential science conducted at synchrotron and neutron sources—**the science that gives our nation a strong competitive edge in innovation**—is only possible through government support.



Synchrotron and neutron facilities also play a critical role in training the **next generation of scientists**, who will help the United States maintain our international competitive edge while improving our quality of life, promoting long-term economic growth and answering fundamental questions in materials physics, chemistry and many other fields.

The Synchrotron and Neutron Users' Group (SNUG) asks you to fund the Department of Energy Office of Science at the proposed FY11 and FY12 levels and support the long-term investment increases proposed in the American Competitiveness Initiative.

SCIENTISTS USE SYNCHROTRON AND NEUTRON SOURCES TO STUDY:

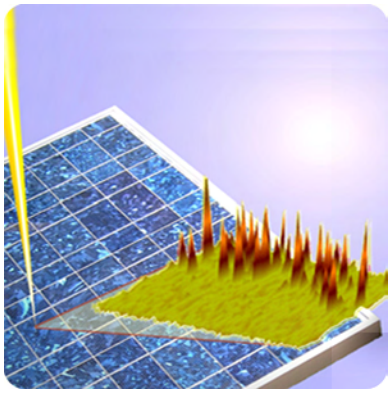
- Detectors to curb the proliferation of nuclear materials
- New biosensors that identify battlefield agents
- Battery materials and designs that could reduce manufacturing costs by 50 percent
- New catalysts that reduce fuel CO_2 emissions and improve gasoline yield from crude oil
- Fuel cells that will produce emissions-free energy and could be used to replace gasoline engines, minimizing our dependence on foreign oil
- Nanoswitches that could make computers 100 times smaller and thin films that could make computer chips 100 times faster
- The structures of therapeutic drug targets, allowing for the rapid design of new life-saving medicines
- The chemical composition of bones, which aid in the understanding of arthritis and osteoporosis
- New ways to prevent the plaque formation seen in Alzheimer's disease

PROVEN SUCCESS
APPLICATIONS DEVELOPED AT THESE FACILITIES:

- More durable, better-performing ceramic materials for medical imaging, lighting and homeland security applications
- Polymers for enhanced drug bioavailability and water purification
- Kaletra®, a world-leading drug for treating AIDS
- Small permanent magnet motors used in car windows, hard drives and speakers
- DeNOx, a catalyst that eliminates NOx emissions from diesel engines
- Ultra-high resolution flat panel displays

The future of America is the research of today.
We ask you to help improve lives and create jobs by supporting synchrotron and neutron sources.

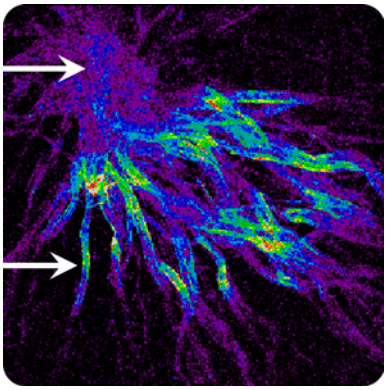
Advanced Light Source (California)
Advanced Photon Source (Illinois)
High Flux Isotope Reactor (Tennessee)
Linac Coherent Light Source (California)
Los Alamos Neutron Science Center (New Mexico)
National Synchrotron Light Source (New York)
Spallation Neutron Source (Tennessee)
Stanford Synchrotron Radiation Lightsource (California)



Mapping the type and location of impurities on the surface of solar cells enables significant improvements to solar cell performance

By analyzing residual stresses in materials, scientists better understand the lifetime and performance of turbines and engines

Understanding how this enzyme converts methane into methanol offers another means to American energy independence



By mapping arsenic in rice roots, scientists seek to reduce arsenic poisoning in regions where soil is naturally contaminated with arsenic

SNUG
Synchrotron and Neutron Users' Group

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