

# SSRL

## STANFORD SYNCHROTRON RADIATION LIGHTSOURCE

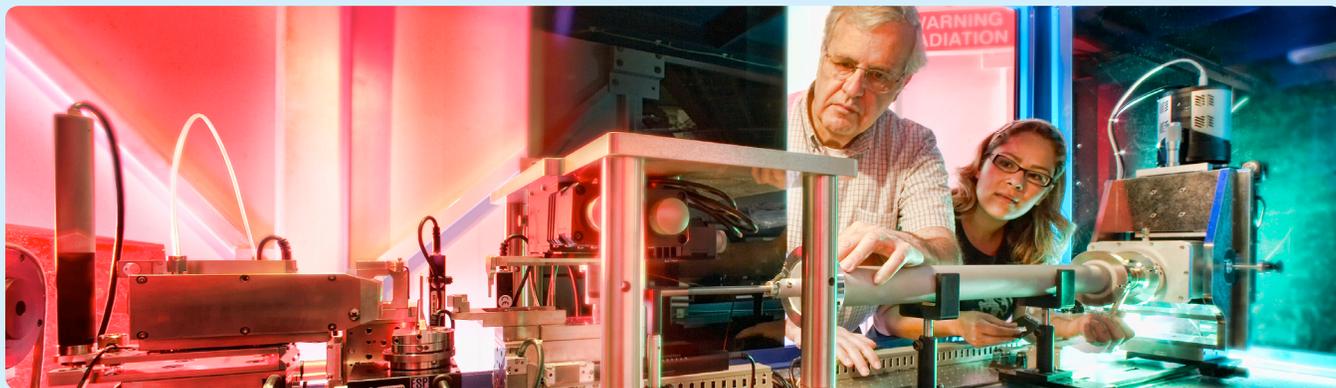
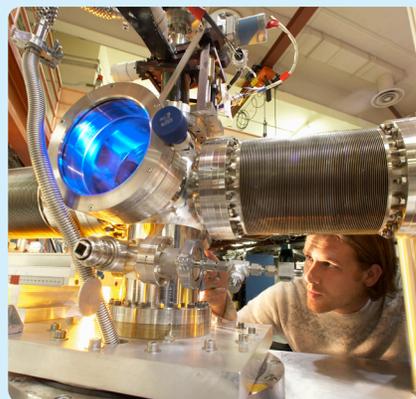
The Stanford Synchrotron Radiation Lightsource at SLAC National Accelerator Laboratory produces extremely bright X-rays used to study our world at the atomic and molecular level. As one of five light sources funded by the U.S. Department of Energy Office of Science, SSRL enables research that benefits every sector of the American economy and leads to major advances in energy production, environmental remediation, nanotechnology, new materials and medicine. SSRL also provides unique educational experiences and serves as a vital training ground for students in the sciences.

### Synergy and Teamwork

With the knowledge gained by viewing materials at SSRL, researchers have improved the design of fuel cells, revealed the very nature of bacteria and viruses, exposed how genetic mutations may cause diabetes, and mapped the structures of proteins for use in biology and medicine.

### Opportunities for Training and Discoveries

SSRL is one of the pioneering sources for photon science research in the world, and is known for its outstanding support and training for tomorrow's scientists and engineers. Scientists conducting research at SSRL represent a diverse community and have published nearly 10,000 scientific papers since the facility began operation in 1974.



SLAC National Accelerator Laboratory, Menlo Park, CA  
Operated by Stanford University for the U.S. Dept. of Energy



[www-ssrl.slac.stanford.edu](http://www-ssrl.slac.stanford.edu)

## Improving Fuel Cells

Cheaper, more efficient fuel cells are on the way thanks to a new form of platinum created by researchers working at SSRL. The material will likely enable broader use of fuel cells that produce emissions-free energy, which could eventually replace gasoline engines and the batteries found in small electronic devices.

## Innovative Solar Cells

A new process that simultaneously combines the light and heat of solar radiation to generate electricity could offer more than double the efficiency of existing solar cell technology. The process, called "photon enhanced thermionic emission," or PETE, could reduce the costs of solar energy production enough for it to compete with oil as an energy source.

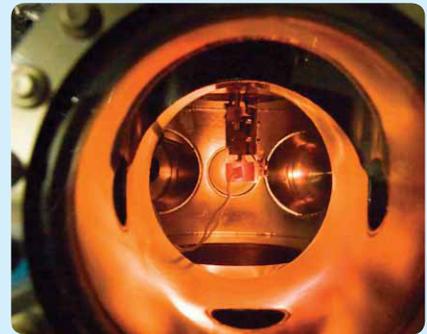
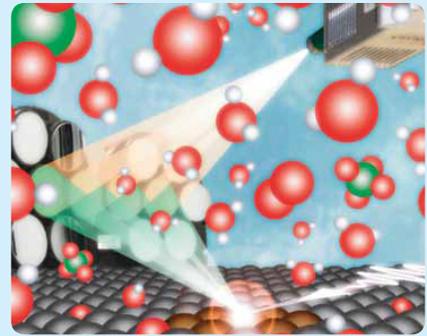
## Silent Killers

SSRL's X-rays are used to identify toxic elements in drinking water, soil, plants and microorganisms, contaminants that have the potential to kill millions. This work supports the development of new technologies for removing contaminants from the environment, directly impacting the health of Americans.

## Revolutionizing Electronics

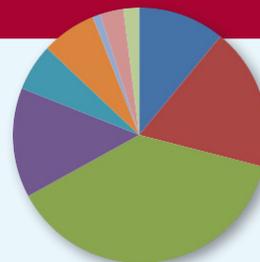
No longer content with materials found in nature or made through trial and error, scientists at SSRL are finding ways to design new materials, in atom by atom detail, that precisely fit society's needs. Applications include power lines that transmit electricity with 100 percent efficiency, new types of solar cells, more powerful electronics, catalysts that speed chemical reactions, and novel computing technologies.

*The Stanford Synchrotron Radiation Lightsource is an Office of Science User Facility operated for the Department of Energy by Stanford University. It is primarily supported by the DOE Offices of Basic Energy Sciences and Biological and Environmental Research, with additional support from the National Institutes of Health National Center for Research Resources, Biomedical Technology Program, and the National Institute of General Medical Sciences.*



## SSRL FACTS

- 181 Total SSRL Staff
- 1436 Scientists Who Conducted Experiments in 2010
- 9,500+ Refereed Publications Since 1974
- 4,870 Operating Hours in 2010
- 26 Number of Experimental Stations



Users by Field

- Physics (11%)
- Chemistry (18%)
- Biological and Life Sciences (38%)
- Materials Science (14%)
- Engineering (6%)
- Environmental Science (7%)



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