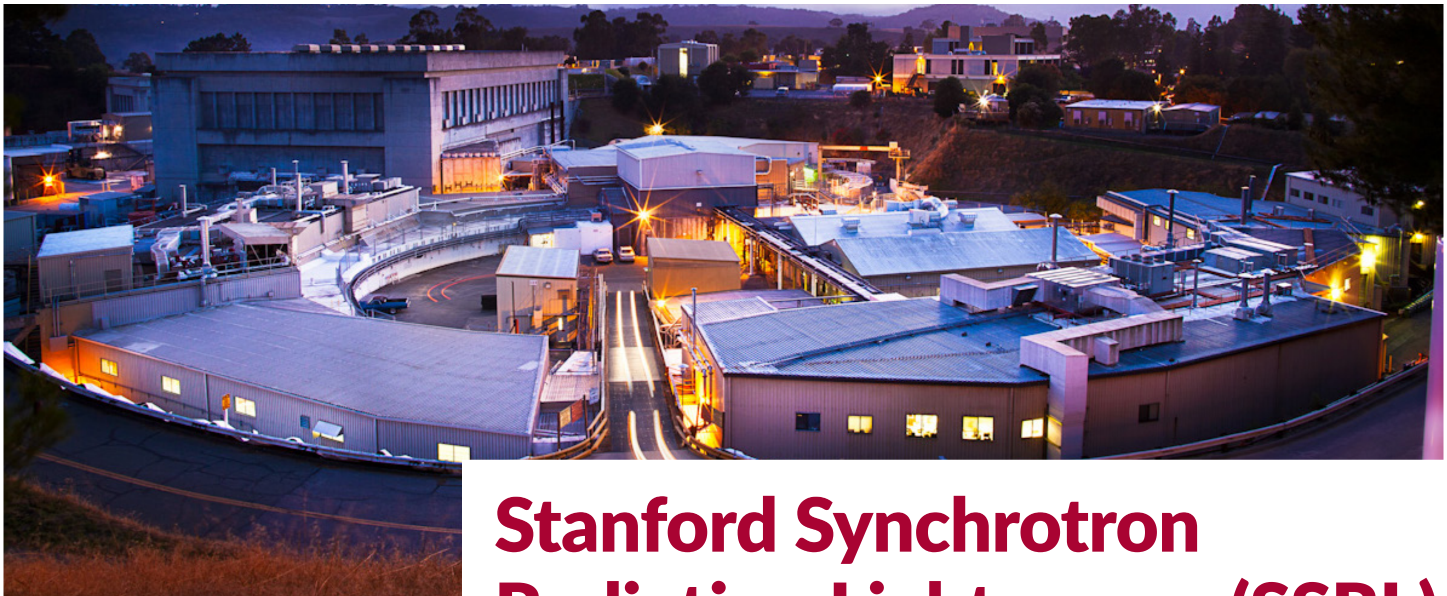

Stanford Synchrotron Radiation Lightsource (SSRL)

SSRL

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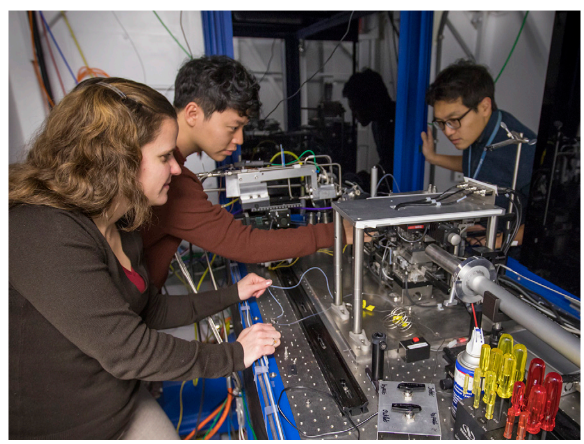
SSRL produces extremely bright X-ray light for probing our world at the atomic and molecular level. Scientists from all over the world use it each year for research that benefits many sectors of the American economy. Their work spurs advances in medicine, energy production, environmental cleanup, nanotechnology and new materials.

Facts

- 105 staff run the facility
- 17,000 publications since 1974
- 33 experimental stations

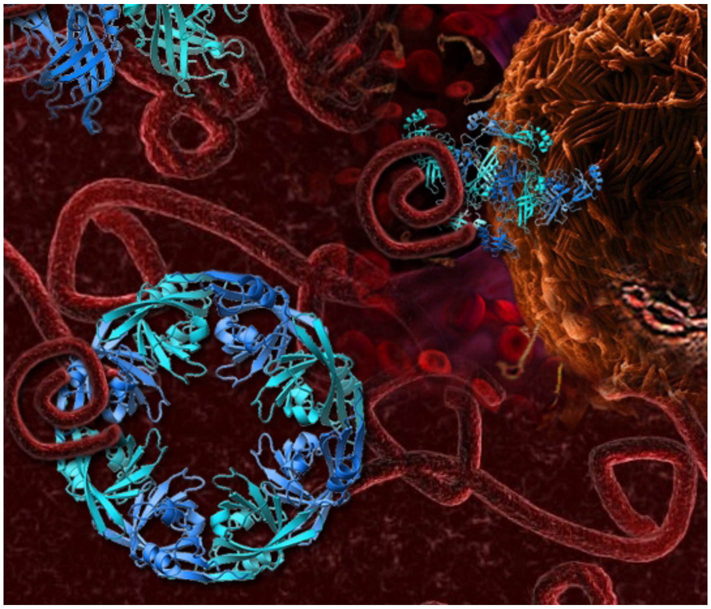
Tools for Discovery



Research at SSRL aids in the design of new drugs and next-generation batteries. It helps make catalysts more efficient, and reveals how to optimize the atom-by-atom structure of photovoltaic thin films that generate energy from sunlight. The goals are to make more effective medicines that have fewer side effects, improve the performance of alternative energy devices and develop greener processes for industry. In addition, fundamental studies of exotic materials at SSRL can pave the way for technologies of the future.

A Magnet for Research and Training

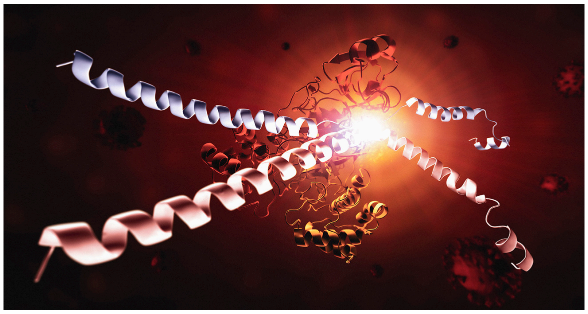
As one of the world's pioneering centers of X-ray science, SSRL is known for its outstanding support and training for scientists and engineers. Researchers from a wide variety of fields have published more than 17,000 scientific papers based on work at SSRL since it opened in 1974.



From left: An SSRL study revealed how a protein of the Ebola virus can arrange into three very different shapes, yielding new clues for how to fight the virus; an X-ray technique explores the active chemistry of a tiny fuel cell, at center, in a pressurized experimental chamber.

Saving Lives

Pharmaceutical companies use the SSRL beamlines to find potential drugs that fit snugly into targets in the cell. Research here contributed to the development of Vemurafenib, a treatment for late-stage or inoperable melanoma; Oseltamivir, a widely used antiviral drug marketed as Tamiflu; and a life-saving drug for tuberculosis. SSRL beamlines also identified shape changes in an Ebola virus protein and in the structure of the SARS-CoV-2 spike protein that could help combat those diseases.



An SSRL study determined how a SARS-CoV-2 virus protein cuts a vital immunity pathway in an infected host.

Building Better Batteries

Scientists around the world are racing to develop cheaper, sturdier, more efficient rechargeable batteries for electric cars, cell phones, laptops and other devices. With the SSRL X-ray beam they can test new battery materials and components in realistic operating conditions, watching split-second chemical changes occur as the battery charges and discharges. These studies are overturning old notions of how batteries work and pointing out new ways to improve them.

Improving Solar Cells

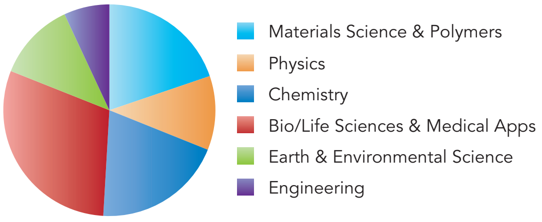
By packing molecules closer together, scientists have developed a semiconductor material that is among the speediest yet. This material—and the innovative process used to manufacture it—may significantly improve the efficiency and cost of organic solar cells used to turn the sun's rays into usable energy.

Spurring New Technology

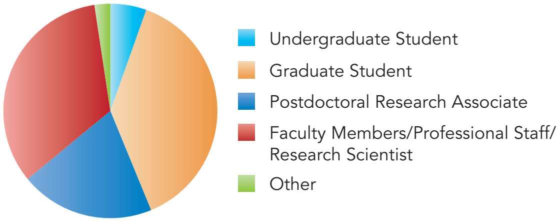
By partnering with industry, SSRL has enabled technical advancements that would otherwise not have been possible. This leads to job creation and gives advanced technologies a foothold in the commercial market.

Increasing Remote Work and Sustainability

Thanks to automated instruments and improved data collection, many scientists can now perform their SSRL experiments remotely – saving money on travel and housing and decreasing travel-related greenhouse gas emissions. This lowers SLAC's overall carbon footprint and makes research more sustainable.



Users by Science



Users by Career Status

SLAC's 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 Institute of General Medical Sciences.

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