SSRL produces extremely bright X-ray light for probing our world at the atomic and molecular level. Nearly 1,700 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 energy production, environmental cleanup, nanotechnology, new materials and medicine.

**Tools for Discovery**
Research at SSRL is improving the design of batteries, finding ways to make catalysts more efficient and optimizing the atom-by-atom structure of photovoltaic thin films that generate energy from sunlight. The goal is to improve the performance of alternative energy devices and develop greener processes for industry. At the same time, fundamental studies of topological insulators and other quantum materials are paving 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 11,000 scientific papers based on work at SSRL since it opened in 1974.

**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.
Saving Lives
Pharmaceutical companies and life sciences researchers use the SSRL beam lines 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, and Osteltamivir, a widely used antiviral drug marketed as Tamiflu. It has also improved our understanding of important signaling proteins that can lead to cancer and other diseases.

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.

SSRL Facts
- 1,675 scientists conducted experiments in 2013
- Over 11,000 refereed publications since 1974
- 5,160 operating hours in 2013
- 27 experimental stations