

BUILDING THE NEXT-GENERATION X-RAY LIGHT SOURCE

Advanced Photon Source Upgrade Project

Upon completion of the upgrade, the Advanced Photon Source (APS), a U.S. Department of Energy Office of Science User Facility at Argonne National Laboratory, will be a global leader among the next generation of storage-ring based X-ray light sources.

The APS Upgrade will allow researchers to see things at a scale never attained with storage-ring based X-rays. The extreme level of detail will open new frontiers and breakthroughs in basic science and help solve pressing problems across a wide range of scientific disciplines.

RESEARCH PRIORITIES

Future pivotal discoveries and scientific opportunities enabled by the APS Upgrade will be endless and may include:



Converting sunlight into energy and storing it using revolutionary systems



Developing cleaner, more efficient biofuels



Detailing mechanisms by which pollutants move through soil



Transforming our understanding of the structure of the Earth's core



Developing new drugs to treat infections resistant to today's antibiotics



Improving our understanding of how the brain processes and stores information using neurons

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DID YOU KNOW?

- Once complete, the upgraded APS will be the nation's brightest high-energy, storage-ring based X-ray source delivering X-rays that will be between **100 and 1,000 times brighter** than today's light source.
- Today's X-rays produced at the APS are **one billion times brighter** than the X-rays produced in a typical dentist office.
- Accelerated electrons move through the 1.1 kilometers X-ray storage ring at nearly the **speed of light**.
- Every year, more than **5,700 researchers** from almost every U.S. state, Washington, D.C., and countries around the world conduct experiments at the APS.
- The APS is a prolific source of scientific output contributing to more than **25,000 peer-reviewed journals** since operations began in 1996.
- **\$815 million** is being invested to upgrade the APS.