

# ADVANCED PHOTON SOURCE — LIGHTING THE WAY TO A BETTER TOMORROW

*Frontier science serving the national interest and  
positively impacting nearly every aspect of our lives*



## THE APS ENABLES RESEARCH IN NEARLY EVERY SCIENTIFIC DISCIPLINE

- Materials science
- Chemical science
- Environmental, geological, and planetary science
- Physics
- Polymer science
- Biological and life science
- Pharmaceutical research
- Nanoscale research

The U.S. Department of Energy Office of Science's (DOE-SC's) Advanced Photon Source (APS) gives scientists access to high-energy, high-brightness, highly-penetrating x-ray beams that are ideal for studying the arrangements of molecules and atoms, probing the interfaces where materials meet, determining the interdependent form and function of biological proteins, and watching chemical processes that happen on the nanoscale.

This remarkable scientific tool helps researchers illuminate answers to the challenges of our world, from developing new forms of energy to sustaining our nation's technological and economic competitiveness to pushing back against the ravages of disease. The DOE confidently invests in world-leading research centers such as the APS and the other SC user facilities because of the positive impacts from the science carried out on behalf of our nation and the world.

Thousands of researchers from universities, industries, and research labs in all 50 states, the District of Columbia, Puerto Rico, and foreign countries come to the APS. Many

of these institutions and companies invest millions of dollars to equip APS x-ray beamlines. The APS facility houses x-ray-producing technologies that comprise one of the most complex machines in the world, the result of innovative research and development carried out by scientists, engineers, and technicians from Argonne, other institutions, and industry.

### APS UPGRADE

A new effort, the APS Upgrade Project, will deliver an orders of magnitude increase in x-ray brightness and coherent flux, combining a state-of-the-art accelerator with advanced beamline, optics, and detector technologies.

The APS Upgrade will provide researchers with a next-generation tool to probe structure and function across length, time, and energy scales, extending the U.S. global leadership in hard x-ray science for decades to come.

### NOBEL PRIZE-WINNING RESEARCH

The recipients of the 2009 Nobel Prize in Chemistry published papers on their award-winning work based on data collected at DOE x-ray light sources: the APS, the National Synchrotron Light Source (Brookhaven National Laboratory), and the Advanced Light Source (Lawrence Berkeley National Laboratory). The 2012 Nobel Prize in Chemistry was awarded for discoveries based in large part on research at the APS.

### CONTACT

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