Argonne NATIONAL LABORATORY | Advanced Photon Source

eBERlight: EMPOWERING DISCOVERY IN BIOLOGICAL AND ENVIRONMENTAL RESEARCH

A new initiative at the world leading X-ray and analysis facility

Dive into the frontiers of biological and environmental research at the Advanced Photon Source, a global leader in X-ray science innovations.

THE ADVANCED PHOTON SOURCE

The U.S. Department of Energy (DOE) Office of Science's Advanced Photon Source (APS) at DOE's Argonne National Laboratory is one of the most technologically complex machines in the world. This premier national research facility provides ultra-bright, high-energy X-ray beams to more than 5,500 scientists from universities, industries, and research labs around the world to collect data in unprecedented detail and in amazingly short time frames.

The APS is used for nearly every scientific discipline, from materials science to biology, chemistry, environmental, geological, and planetary science, and fundamental physics. Discoveries at the APS have helped create stronger materials, build more efficient batteries and helped develop thermotolerant biocatalysts, vaccines and treatments for infectious diseases. The upgraded facility will remain at the forefront of X-ray science for decades to come.

eBERlight

Launched in October 2023, eBERlight is a new initiative from the APS that expands biological and environmental research at the facility. eBERlight acts as an integrated platform optimized to fulfill experimental needs of researchers conducting experiments within DOE's Biological and Environmental Research (BER) program mission. The program provides exclusive access to the world- leading X-ray science resources of the APS, along with comprehensive guidance and support for users dedicated to advancing research in BER science.

Prospective scientific endeavors at eBERlight:

- Biofuel and bioproduct
- Soil science
- Synthetic biology
- Catalysis
- Plant growth
- Plant-microbe interaction
- Atmospheric science
- Water dynamics
- Microorganisms

Scientists working with eBERlight will play a pivotal role in pioneering innovative scientific methodologies and collaborate with emerging multidisciplinary researchers in exploration of the latest insights concerning our world.

U.S. DEPARTMENT OF ENERGY
Argonne National Laboratory is a U.S. Department of Energy laboratory managed by UChicago Argonne, LLC.

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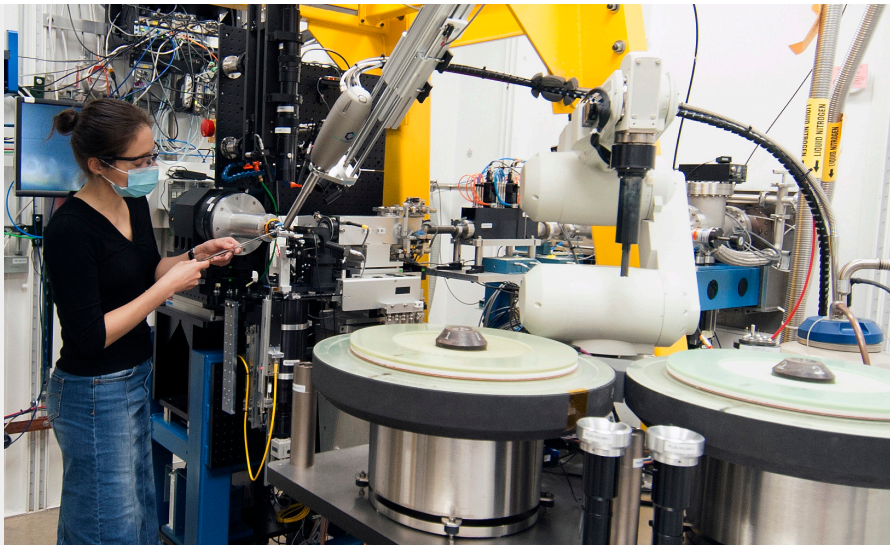
Working with eBERlight

Users may submit proposals to eBERlight either directly via the APS portal or indirectly though the FICUS call. Prior to proposal submission, it is recommended to engage with the staff by initiating contact for guidance and assistance.



Central Capabilities

- **Macromolecular crystallography**
  Investigation of biological molecules such as proteins and nucleic acids (RNA and DNA) at atomic resolution
- **X-ray microscopy**
  Nondestructive analysis of trace elements in diverse environments and materials
- **X-ray tomography**
  Nondestructive analysis of internal details of objects in three dimensions
- **X-ray absorption spectroscopy**
  Investigation of the element-specific local geometric and/or electronic structure of materials
- **Small angle scattering**
  Obtain direct structural information on systems with random arrangement of density inhomogeneities in a large scale

Additional Resources

Scientists working with eBERlight will also have access to additional Argonne resources, including the Argonne Leadership Computing Facility (ALCF), a DOE Office of Science user facility and home of the lab's supercomputers, and the Advanced Protein Characterization Facility (APCF), dedicated to crystallization and preparation of proteins for analysis. A fully equipped biogeochemical lab is available to provide support for on-site sample manipulations, including the manipulation of oxygen- sensitive environmental samples or the cultivation of plants onsite.

eBERlight actively collaborates with other DOE Office of Science user facilities, such as the Environmental Molecular Science Laboratory (EMSL) at Pacific Northwest National Laboratory (PNNL) and the Joint Genome Institute (JGI) at Lawrence Berkeley National Laboratory (LBNL) and participates in the Facilities Integrating Collaborations for User Science (FICUS) program.

The eBERlight program aims to connect the world-leading X-ray facility with more scientists studying Earth's climate and environment.

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