UPGRADING THE ADVANCED PHOTON SOURCE

A pair of new feature beamlines will benefit from the enhanced brightness and coherence of the new APS X-ray beam to deliver fascinating results

Argonne employees Jin Wang, Joe Strzalka and Raymond Ziegler stand next to the "Grand Tube" enclosure for the CSSI beamline. This tube spans 20 meters in length with a diameter of 3 meters.

The Advanced Photon Source (APS) Upgrade will not only improve the facility's X-ray beam, it will deliver new beamlines that will benefit from those improvements. Two of those beamlines sit next to each other, in sectors 8 and 9 of the APS, and they will use the increased brightness (up to 500 times) of the beam and its increased coherence. The **X-ray Photon Correlation Spectroscopy (XPCS)** beamlines at 8-ID-E and 8-ID-I will enable wide- and small-angle XPCS, respectively, for studies in a host of key areas of physics and materials science. XPCS is designed for hard and soft matter studies and will facilitate research into the structural dynamics of liquids, gels, glasses and quantum materials. Next door, the **Coherent Surface Scattering Imaging (CSSI)** beamline at 9-ID will investigate surface-interface phenomena, combining grazing incidence scattering and coherent imaging techniques. The CSSI beamline will enable studies into thin film and quantum dot growth and the structure of 3D nanoscale electronic circuits. Both beamlines are under construction and are expected to be operational in 2024.

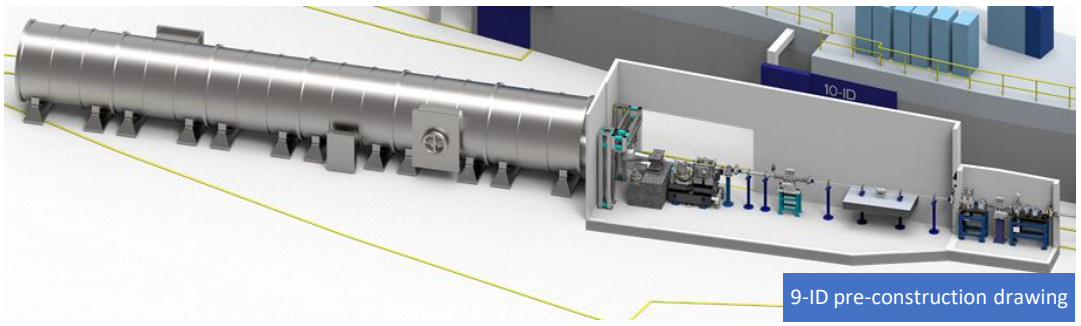
8-ID pre-construction drawing

XPCS Key Specifications

Photon beam energy	8-25 keV
X-ray spot size	8-ID-E: 0.3 to 3 µm 8-ID-I: 3-10 µm
Techniques	Wide-angle and small-angle X-ray photon correlation spectroscopy

CSSI Key Specifications

Photon beam energy	6-25 keV
X-ray spot size	0.6 x 0.35 µm to 0.75 x 0.42 µm
Working distance	2-20 m
Techniques	Coherent X-ray surface imaging, grazing incidence X-ray scattering



9-ID pre-construction drawing

Follow the APS Upgrade Project at aps.anl.gov/APS-Upgrade

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Advanced Photon Source
Bldg. 401
Argonne National Laboratory
9700 S. Cass Ave.
Argonne, IL, 60439

aps.anl.gov
aps.anl.gov/APS-Upgrade
apsinfo@aps.anl.gov

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