Special Issue

Advances in EUV/X-Ray Optics: Science and Applications

Message from the Guest Editors

Recent interest in extreme ultraviolet (EUV) and X-ray radiation within the electromagnetic spectrum has significantly increased. The latest generation of large photon sources, such as synchrotron radiation (SR) and X-ray free-electron lasers (XFELs), offers powerful EUV/X-ray light for contemporary scientific and technological applications.

To harness their full potential, it is crucial to transfer photons from the source to the experimental station without compromising their essential characteristics, particularly wavefront and coherence preservation. Recent developments in ultra-intense, highly brilliant SR and XFEL systems focus on achieving 1 nm spatial resolution imaging applications. Fields such as X-ray astronomy need high-resolution, large-surface-area mirrors.

Optical components, including reflective mirrors, diffraction gratings, zone plates, and multilayer mirrors, must be manufactured with nanometer to sub-nanometer figure and structural accuracy. This necessitates innovative approaches in optics development and metrological techniques to achieve enhanced radiation hardness and precise control over spectral amplitude and phase.

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