

Sub-10 nm X-ray Microscopy: Status and Pathways

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X-ray microscopy offers important and desirable visualization and characterization capabilities of great importance to broad range of scientific disciplines, including for example biology and emerging nanoscience and nanotechnology. Its short wavelength permits nanometer resolution imaging without the limitation of wavelength. Its high penetration power allows nondestructive imaging of internal structures of an object. It also has many contrast mechanisms that can be employed beyond simple structural imaging, such as chemical state imaging or elemental specific imaging.

Over the last decade, the resolution of x-ray microscopy has improved significantly. Thanks to mainly the advancement in developing high resolution x-ray focusing optics, x-ray imaging with a spatial resolution better than 15 nm and 20 nm has been demonstrated with soft and hard x-rays, respectively. Sub-10 nm resolution x-ray imaging is expected to be realized within the next few years. My talk will present the current status of the state-of-the-art x-ray imaging in terms of spatial resolution and discuss pathways toward achieving sub-10 nm x-ray imaging.