Beamline: HXN

Better Together: New 2D Multilayer Laue Lens Overcomes Alignment Challenge



A nanofabricated silicon template holds two independent MLLs with high-precision for easy alignment.



W. Xu, et al, *Opt. Express,* **28**(12), 17660 (2020).

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This work was performed at the National Synchrotron Light Source II (NSLS-II).

National Synchrotron Light Source II

Scientific Achievement

Scientists developed a monolithic 2D multi-layer Laue lens (MLL) to focus an x-ray down to approx. 10 nanometer, thus overcoming the alignment challenges associated with these optics. This development was recognized with the Microscopy Today Innovation Award 2022.

Significance and Impact

Ultrabright x-ray beams from modern synchrotron light sources offer powerful research opportunities; however, focusing such beams to delve into the range of nanometer resolutions requires highly precise optics, which until now have been hard to align. These new bonded MLL solve the alignment issue, allowing broader application of these optics in the x-ray microscopy community.

Research Details

- Grew two, independent 1D MLLs.
- Used microfabrication technology to develop a silicon template and accommodate two independent linear MLLs in a well-defined pre-aligned configuration.
- Demonstrated the effectiveness at the HXN beamline at NSLS-II.