

Focusing X-ray free-electron laser beams for imaging and creating extreme conditions in matter

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Modern X-ray free-electron lasers create new research opportunities, in particular regarding investigations on ultrashort time scales. For the most part, such measurements require a high spatial resolution as well. This can be achieved by means of magnified imaging or diffraction techniques. In both cases a focussing of the X-ray beam is necessary which is the aim of this fellowship. Refractive lenses of Beryllium (Be-CRLs) are promising optical components for the hard X-ray regime and have proven useful with various X-ray sources. In the framework of this project focussing X-ray optics is implemented, optimized and used at the "Matter in extreme conditions" experimental station at LCLS in Stanford. The quality of the optics will be tested in various experiments, such as time-resolved measurements of shock waves in aluminum and the preparation of warm dense matter.

Projektbeteiligte

Dr. Andreas Schropp

Technische Universität Dresden
Physik
Institut für Strukturphysik
Dresden

Prof. Dr. Jerome Hastings

SLAC National Accelerator Laboratory
LCLS - Linac Coheren Light Source
Menlo Park, CA
USA

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Full spatial characterization of a nanofocused x-ray free-electron laser beam by ptychographic imaging

