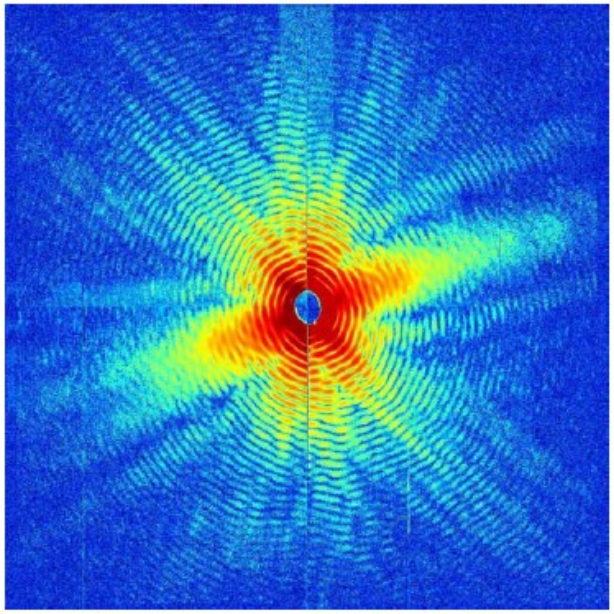
ELI-Miniworkshop on
Biological Imaging with Intense Ultra-Short X-Ray Pulses

Friday 13th April 2012, 9:30 a.m. to 3 p.m.
Ústav Teorie Informace a Automatizace, Pod vodárenskou věží 4, Praha 8

Georg Korn (ELI)	Sources of Coherent and Incoherent Short X-rays Pulses Planned within ELI
Janos Hajdu (BMC)	Imaging with Short Intense X-ray Pulses
Pavlina Rezacova (IOCB)	Current Challenges in Structural Biology, Structural Biology Team at IOCB
Tomas Ekeberg (BMC)	From Diffractive Imaging to Structure Reconstruction
Nicusor Timneanu (BMC)	Science at the extremes - from high energy density to structural biology
Jakob Andreasson (BMC)	Research-driven instrument development at the Laboratory of Molecular Biophysics
Jan Jakubek (UTEF)	X-ray Detection with the Timepix Detector
Bohdan Schneider (BIOCEV)	BIOCEV - A Prospective Partner of ELI Beamlines in Biomedical Sciences
Tomas Polivka (IPB)	ELI Experimental Station for Structural Dynamics of Biomolecules
Libor Juha (ELI)	Influencing and Probing Biostructures at ELI Beamlines



Theory predicts that with an ultra-short and very bright coherent X-ray pulse, a single diffraction pattern may be recorded from a large macromolecule, a virus, or a cell before the sample explodes and turns into a plasma. The over-sampled diffraction pattern permits phase retrieval and hence structure determination.

The interaction of an intense X-ray pulse with matter is profoundly different from that of an optical pulse. A necessary goal at ELI is to explore photon-material interactions in strong X-ray fields. The aim in structural biology is to step beyond conventional damage limits and develop the science and technology required to enable high resolution studies of single biological objects near the physical limits of imaging.

Eligible targets include nanocrystals, cells, cell organelles, single virus particles and isolated macromolecules. The challenges engage an interdisciplinary approach, drawing upon structural sciences, biology, optics and mathematics, atomic and plasma physics and detector development.

Diffraction pattern from a single mimivirus particle captured at the Linac Coherent Light Source with a single 60 fs long X-ray pulse at 2 keV photon energy (ELI-beamlines White Book).