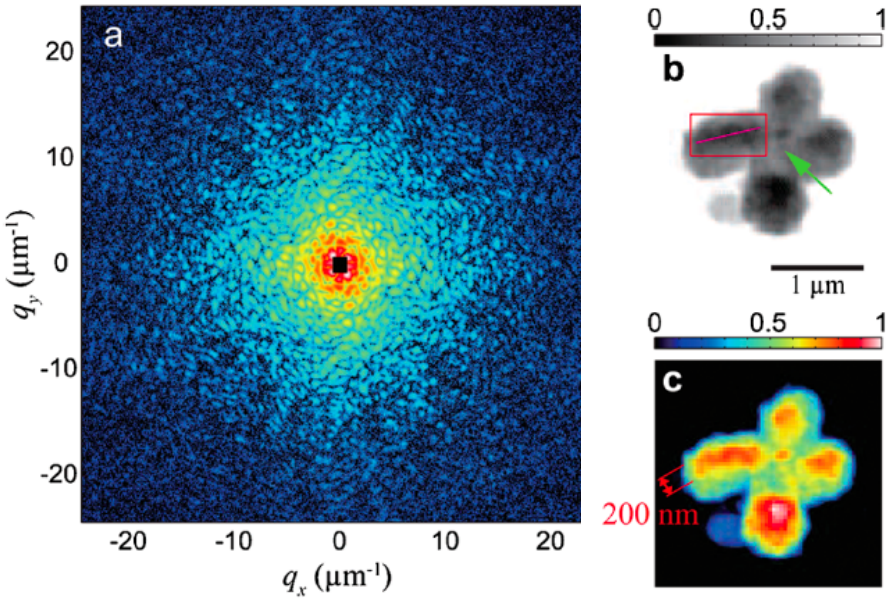
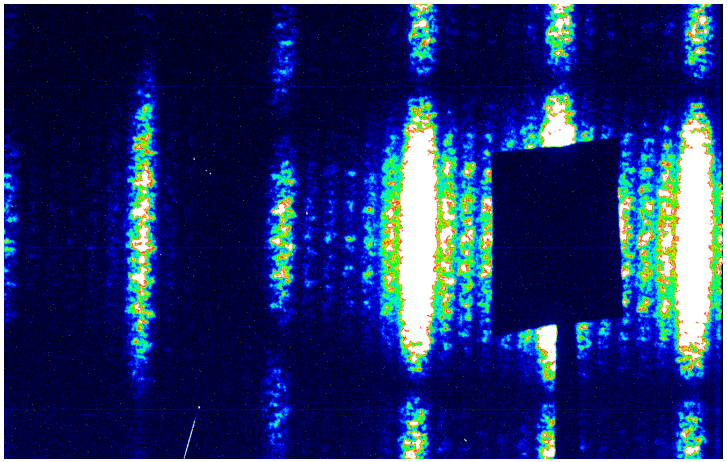
Coherent Diffraction Imaging (CDI)

CDI at NSLS-II

- Diffraction imaging of crystal shapes in 3D on nm scale
- Diffraction imaging of cryo-frozen cells and tissues
- Imaging of strain fields inside crystals
- Time evolution of shape/strain under working conditions
- Manipulation/deformation/indentation on the nm scale
- Ptychographic imaging for domains in materials
- Ptychographic imaging of biological samples using phase contrast, dark-field and phase encoding methods
- Applications in nanoscale semiconductor devices, strain engineering, catalysis and energy materials



CDI imaging of a human chromosome, Y. Nishino et al. PRL 102, 018101 (2009)



Collagen Phase-plate diffraction, Felisa. Berenguer and Richard Bean

CDI Beamline Capabilities

Canted IVU20 undulators (two branches) low-β

Long beamlines (200m) for maximum demagnification

Long hutches, stable floors, isolated from building

Monochromatic beam 2.5-10keV in branch A (in-line CDI)

Monochromatic beam 8-20keV in branch B (Bragg CDI)

Cryo sample manipulation in vacuum on branch A

KB optics and ultra precise goniometer on branch B

U.S. DEPARTMENT OF ENERGY

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