Commission Conferences

8th International Conference on Materials and Mechanisms of Superconductivity and High Temperature Superconductors
July 9-14, 2006
Dresden, GERMANY

10th International Conference on the Structure of Non-Crystalline Materials
September 18-22, 2006
Prague, CZECH REPUBLIC
Coherent X-ray diffraction imaging

Lead nanocrystals on silicon

Coherent diffraction on a single particle

Reconstruction of particle shape

Imaging of strain fields

M.A. Pfeifer, G.J. Williams, I.A. Vartanyants, R. Harder & I.K. Robinson

Nanotube foams

Chemical vapour deposited nanotube foam

Strong and flexible

Large porosity: ~87%
Large compressive strength: ~15MPa

The nanotubes buckle collectively

A. Cao, P.L. Dickrell, W.G. Sawyer, M.N. Ghasemi-Nejhad, P.M. Ajayan
Science 310, 1307 (2005)
Rotor–stator molecular crystals

Cubane (C8H8) - fullerene (C60 or C70) molecular crystal

The cubane fits into the octahedral void of the f.c.c. cell

The fullerene rotates in the molecular bearing of six cubanes

S. Pekker et al.
Solitons in uranium

Inelastic x-ray and neutron scattering on α-uranium

Intrinsically localized mode appears above 450K
- not coupled to structural change
- strongly nonlinear
- form randomly in the lattice → additional configurational entropy

Vortices and superfluidity in a Fermi gas

$^6$Li atoms cooled to 50nK in a magnetic trap

Control the strength of the interaction by the magnetic field

Crossover between BEC and BCS state
