



08th June 2012 - 13:15
FLASH HALL, Seminar Room (28c)

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**High resolution electron imaging and diffraction
of protein nanocrystals.
The prospects of real-space 3D
macromolecular nanocrystallography**

When protein crystals are sub-micron sized, X-ray radiation damage precludes conventional diffraction data collection. Electron diffraction might be an alternative for such small crystals, since single layer 2D nano-crystals (which have similar volumes) already have been tackled successfully for decades using electron diffraction. However, electron crystallography of 3D (rather than 2D) nano-crystals of proteins, requires several practical and fundamental problems to be surmounted.

Substantial progress can be reported:

- (i) A Medipix quantum area detector allowed collecting multiple electron diffraction frames in a rotation geometry of single protein nanocrystals to a resolution of about 2 Angstrom, which could be processed with standard X-ray data integration software.
- (ii) Single real space electron microscopy images collected on a Falcon direct electron detector allowed extracting phase information of these nanocrystals to a resolution of 2 Angstrom.