

Séminaire SOLEIL

X-ray imaging of single nano-crystals

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Invité par Alessandro COATI

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Grand Amphi SOLEIL

Séminaires

The last two decades have seen a fast development of sub-micrometric crystalline structures, in order to yield new properties through quantum confinement, to achieve further miniaturization or to enhance the energetic efficiency of nano-devices. This has been particularly important for semi-conductor nano-structures for photonic and electronic applications, as well as for nano-electro-mechanical systems.

In the same timeframe, experimental methods for structural determination at the nanoscale have also been developed, using mostly electron microscopy and X-ray scattering. In this presentation, we will focus on the use of X-ray nano-beams: thanks to efficient focusing optics, it is now possible to produce coherent and intense X-rays ($>10^5$ ph/s/nm² monochromatic) with small lateral sizes (<100 nm) on synchrotron beamlines.

These nano-beams can be used to perform different types of experiments : Coherent Diffraction Imaging (CDI) and Ptychography can be used to recover the shape and (in Bragg geometry) the deformation map of individual nano-structures. Using a white beam, micro-Laue diffraction can be used to recover the local structure and deformation of a crystal using single-shot images.

In this presentation we will discuss the advances of these different techniques, and show results obtained on semiconductor nano-structures for photonic and electronic applications.



Ce séminaire sera suivi d'une pause-café



Formalités d'entrée : accès libre dans l'amphi du Pavillon d'Accueil. Si la manifestation a lieu dans le Grand Amphi SOLEIL du Bâtiment Central, merci de vous munir d'une pièce d'identité (à échanger à l'accueil contre un badge d'accès).

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