

Coherent diffractive imaging of non-periodic self-assembled colloidal nanocrystals

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The presentation is aimed to discuss the application of coherent diffractive imaging to probe the assembly of colloidal nanocrystals in micrometric islands, either as isolated objects [1] and as extended regions into polymers [2].

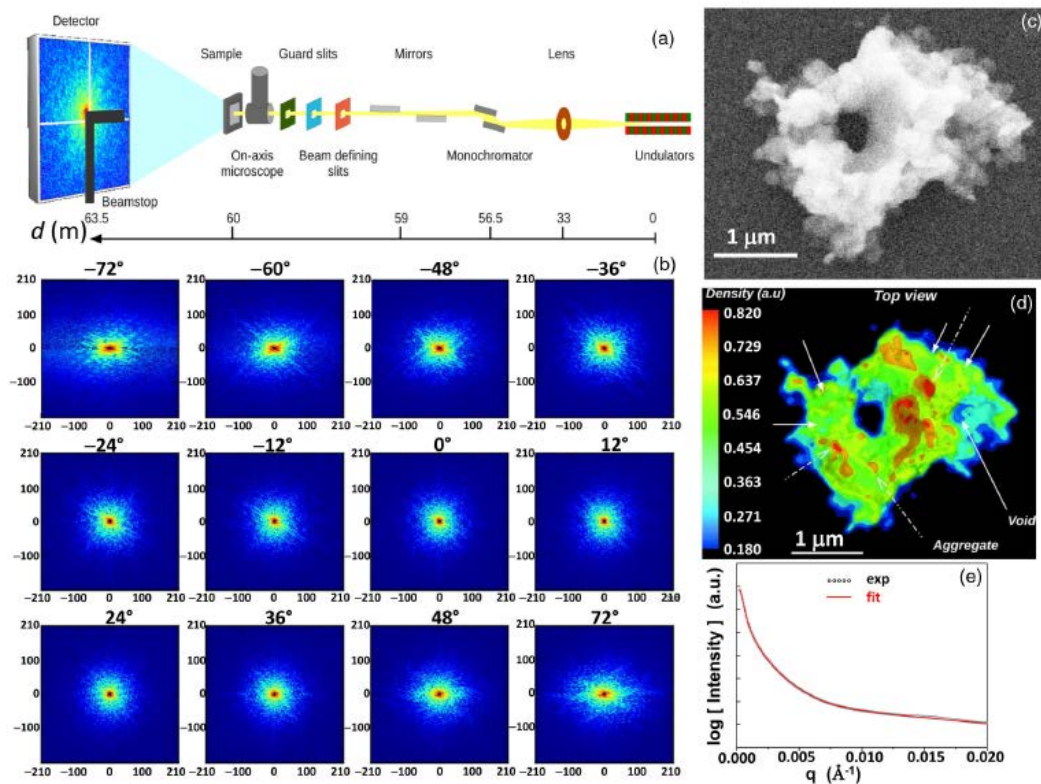


Figure 1. (a) Sketch of the experimental setup at the ID10 beam line of the ESRF reporting the distance d from the X-ray source of the different elements. (b) Example of some CDI diffraction patterns among the 73 frames taken for sample tilts between -72° and $+72^\circ$ with a step of 2° . (c) SEM image of the investigated Fe₂P cluster. (d) Reconstructed 3D image of the sample (resolution of 59 nm). Continuous arrows show several voids; dashed arrows point to the high-density aggregates. (e) Averaged SAXS profile (experimental, black circles) and computed profile (red line) [1,3].

References

- [1] - Three-dimensional coherent diffractive imaging on non-periodic specimens at the ESRF beamline ID10, Yuriy Chushkin, Federico Zontone, Enju Lima, Liberato De Caro, Pablo Guardia, Liberato Manna & C. Giannini, *J. SYNCH. RAD.* 21, 594-599 (2014).
- [2] - Ptychographic Imaging of Branched Colloidal Nanocrystals Embedded in Free-Standing Thick Polystyrene Films Liberato De Caro, Davide Altamura, Milena Arciniegas, Dritan Siliqi, Mee R. Kim, Teresa Sibillano, Liberato Manna and Cinzia Giannini. *SCIENTIFIC REPORTS* 6, 19397 (2016).
- [3] - Materials characterization by synchrotron X-ray microprobes and nanoprobe. Lorenzo Mino, Elisa Borfecchia, Jaime Alberto Segura-Ruiz, Cinzia Giannini, Gema Martinez-Criado, and Carlo Lamberti, *REVIEWS OF MODERN PHYSICS* 90, 025007 (2018).