

Coherent Diffraction Imaging of Biological Materials

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Coherent diffraction imaging (CDI) is a lensless imaging technique in which the diffraction pattern of a noncrystalline specimen or a nanocrystal was first measured and then directly phased to obtain a high-resolution image. The well-known phase problem was solved by combining the oversampling method with iterative algorithms. In this talk, I will first present the application of CDI to the imaging of mineral crystals inside intramuscular fish bone at the nanometer scale resolution. Mineral crystals in collagen fibrils at different stages of mineralization were identified and a dynamic model for the nucleation and growth of mineral crystals in a collagen matrix was proposed. I will then report our recent experimental results on the imaging of frozen-hydrated biological cells, which were obtained from ID10 at the ESRF.