

High-resolution biological cryo-ptychography

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Ptychography is a form of coherent imaging which offers wavelength-limited spatial resolution. In practice, the achievable resolution for imaging soft biological material is limited by the dose applied to the sample. In this presentation I will describe our efforts to combine cryogenic sample preservation with ptychography and x-ray fluorescence mapping to increase the dose tolerance and therefore the spatial resolution. I will present recent results from experiments on our model system, the alga *Chlamydomonas reinhardtii*, which has been mapped at around 20nm spatial resolution at 5keV. I show that the combination of ptychography and X-ray fluorescence reveals significantly more about the specimen than either method considered separately.