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CFEL, Building 99, seminar room I-III

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Phase retrieval in high dimensions

Ptychography enables one to build up macroscale images at wavelength resolution (i.e. potentially atomic) by combining the large field of view of a high precision scanning microscope system with the resolution enabled by diffraction measurements.

In ptychography, each recorded diffraction pattern contains short-spatial Fourier frequency information about features that are smaller than the x-ray (or electron) beam-size, enabling diffraction limited resolution.

Diffraction measurements from neighboring regions are related to each other by this illumination geometry.

The "relationship network" from diffraction measurements motivates spectral synchronization strategies aiming to organize local information in a global way to quickly turn high throughput "imaging by diffraction" techniques into the sharpest images ever produced.