SAT D: X-ray ptychography training course

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Ptychography is one of the coherent diffraction imaging (CDI) methods which are able to achieve high spatial resolution much higher than the illumination size. Using scanning microscopy approach with overlapping scan spots, ptychography bypasses the isolated object requirement for conventional CDI so that it is able to image extended samples. Ptychography has quickly gained momentum these years as a powerful tool to deliver high resolution images of samples in biology, material science, electronics, etc. As APS-U will provide more than 100-fold increase in coherent flux, we expect more and more existing and upgraded beamlines will utilize ptychography on their research. The goal of this training course is to introduce the basic principles of ptychography and experimental implementation, to summarize the evolution of the techniques and corresponding reconstruction algorithm development, to highlight the potential application in the life and materials sciences.

August 31, Session1

9:30 Welcome and General Overview

9:40 Junjing Deng

How and What to Do X-ray Ptychography

10:40 Yudong Yao

Coherence requirement of ptychography illumination and algorithms to deal with partial coherence in ptychography

11:20 Break and Free Disscussion

11:30 Yi Jiang

Ptychography: Algorithms and Challenges

September 1, Session2

9:30 Jeffrey Klug

Ptychographic tomography and laminography, and corresponding instruments at the APS

10: 20 Yi Jiang

Ptychography data acquisition and reconstruction workflow at the APS

11:00 Break and Free Disscussion

11:10 Ke Yue

GUI for ptycholib, ptychopy, and demo

12:00 Concluding remarks