

# APS Scientific Computation Seminar Series

Speaker: Yudong Yao  
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Title: Method Development of X-Ray Ptychography: Towards High-Resolution and High-Throughput Coherent Imaging

Date: Monday, July 26, 2021

Time: 1:00 p.m. (Central Time)

Location: <https://bluejeans.com/5625919115?src=calendarLink>

Hosts: Mathew Cherukara and Nicholas Schwarz

## Abstract

X-ray ptychography has become a widely used imaging technique to view internal structures of samples at nanoscale resolution. As a scanning variant of coherent diffraction imaging, ptychography doesn't put a limit on the imaging field-of-view. However, its potential application, such as large field-of-view imaging and three-dimensional imaging, is still limited due to the low throughput because of the high coherent flux requirement and the scanning mechanism. Advanced method development and algorithm improvement are therefore desired for accelerate both data acquisition and data processing speed while maintaining spatial resolution. In this talk, I will introduce the developed broadband ptychography and multi-beam ptychography methods which provide efficient ways to increase ptychography data acquisition speed. In addition, I will discuss the application of deep learning approach for accelerating the data processing speed for coherent diffraction imaging, including ptychography.

## Biography

Yudong Yao is an Assistant Physicist in X-ray Science Division, Argonne National Laboratory. She received her B.S. degree from Shandong University in 2012 and her Ph.D. degree in optics engineering from Chinese Academy of Sciences in 2017. Her research focuses on development and application of X-ray coherent imaging techniques and also has a strong background in optical imaging approaches.