

# APS Scientific Computation Seminar Series

Speaker: Ashish Tripathi  
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Argonne National Laboratory

Title: Ptycho-Tomography for Grazing Incidence Reflection Geometry Experiments

Date: Monday, October 11, 2021

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

Location: **Microsoft Teams meeting**  
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Hosts: Mathew Cherukara and Nicholas Schwarz

Abstract: Lensless imaging experiments at the APS are predominantly done in the small angle transmission or the Bragg geometry; these techniques combine principles of iterative phase retrieval and tomography to attempt imaging of arbitrarily large fields of view in three dimensions. Recently, Coherent Surface Scattering Imaging (CSSI) was proposed which aims to extend the repertoire of experimental arrangements to include the grazing incidence reflection geometry. We introduce the difficulties that arise with phase retrieval and tomography in more traditional lensless imaging experiments and then move on to discuss the various physical, computational, and numerical optimization algorithmic challenges that arise by attempting to perform phase retrieval and tomography in this new geometry and our progress at overcoming these challenges.