

# APS Scientific Computation Seminar Series

Speaker: Xiaogang Yang  
Postdoctoral Appointee, Imaging Group  
X-Ray Science Division (XSD)  
Argonne National Laboratory

Title: Deep Neural Networks for Synchrotron X-Ray Imaging

Date: Monday, January 16, 2017

Time: 1:00 p.m.

Location: 401/A1100

Hosts: Nicholas Schwarz and Brian Toby

## Abstract:

X-ray imaging scans at today's synchrotron light sources can yield thousands of image frames per second at high resolution. Typical data volumes from a single scan are on the order of tens of gigabytes, however for larger specimens this number can be up to three orders of magnitude larger. Moreover, data generation rates will significantly increase after the upgrade of the storage rings that are planned or under development at many synchrotron facilities worldwide. Current and expected data volumes and rates necessitate having reliable, efficient, and fully automated data processing pipelines. Traditional image processing models are powerless for data with complex patterns and noises. In most cases modern researchers solve these problems on large amounts of data manually. Deep neural networks can emulate the way humans model the data problem and process large datasets automatically. I will present my recent progress applying deep neural networks to calibrate tomographic rotation axis data, and to segment fluorescence and TXM images. Its future development will also be discussed.