WORKSHOP # 5 – Wednesday, April 22, 2026

Machine Learning Applications for Transmission Electron Microscopy

Organizers: Meng Li (CFN), Judy Yang (CFN)

As the volume and complexity of data generated by modern transmission electron microscopy (TEM) continue to outpace manual analysis, machine learning (ML) techniques have emerged as an essential tool for high-throughput analysis of such data. This workshop will explore how ML-driven workflows can be utilized to overcome challenges in data processing, such as denoising, segmentation, and spectral analysis. Participants will gain general overview of the ML techniques used for electron microscopes.

Start Time (ET)	Title	Speaker
12:00 – 2:00 pm	*Lunch Break (travel to/from SUSC to Berkner Hall)*	
2:00-2:10	Welcome	Dr. Meng Li
2:10	Self-supervised neural priors for computational imaging in electron microscopy	Prof. Colin Ophus
3:10	Evaluating Temporal Resolution Limitations by Exploiting Latest Developments in Detector Hardware and AI-based Denoising Algorithm in Application to Environmental TEM	Dr. Dmitri Zakharov
3:30	*Break*	
4:00	Core-electron spectral mixing and controlled deep projection	Dr. Xiaohui Qu
4:30	Denoising and segmentation ML models for HRTEM	Dr. Brian Lee
5:00	From Big Data to Big Materials: Autonomous Multimodal Microscopy for Materials and Physics Discovery	Prof. Sergei Kalinin
6:00	Adjourn	Dr. Meng Li