APS Workshop 2: Advancing Materials Research: Synergies in Large Scale Simulations and APS-U Imaging and Microscopy Techniques

Wednesday, May 7, Morning

8:30 – 9:00 Ross Harder and Jon Tischler (X-ray Science, Argonne National Laboratory)
Introduction and Opening Remarks

9:00 – 9:30 Anter El-Azab (School of Materials Engineering, Purdue University)
Machine Learning of Dislocation Microstructure from DAXM Data and a Theoretical Perspective from Mesoscale Theory of Crystal Defects

9:30 – 10:00 Felix Hofmann (Department of Engineering Science, University of Oxford)
Irradiation-induced Structure and Property Evolution in Metals: Combining Large-scale Atomistic Simulations and X-ray Observations

10:00 – 10:30 Break

10:30 – 11:00 Subramanian Sankaranarayanan (Center for Nanoscale Materials, Argonne National Laboratory)
Probing Defect Dynamics through Integrated Molecular Simulations, Imaging, and Machine Learning

11:00 – 11:30 Youping Chen (University of Florida)
Concurrent Atomistic-continuum Simulation of Materials and Heterostructures from Synthesis to Microstructure and Properties

11:30 – 12:00 Anthony Rollett (Department of Materials Science and Engineering, Carnegie Mellon University)
Synchrotron X-ray Microscopy Combined with Simulation and Machine Learning

12:00 – 1:30 Lunch Break

Wednesday, May 7, Afternoon

1:30 – 2:00 Henning Poulsen (The 3D Imaging Center, Technical University of Denmark)
Dark Field X-ray Microscopy and the Origin of Metal Plasticity

2:00 – 2:30 Leora Dresselhaus-Marais (Geballe Laboratory for Advanced Materials, Stanford University)
Subsurface Imaging of Multi-timescale Defect Dynamics

2:30 – 3:00 Stephan O. Hruszkewycz (Materials Science, Argonne National Laboratory)
Guiding High-energy Coherent Diffraction and HEDM Measurements with Mesoscale Crystal Plasticity Modeling

3:00 – 3:30 Break

3:30 – 4:00 Mathew J. Cherukara (X-ray Science, Argonne National Laboratory)
AI-enhanced X-ray Imaging: Bridging Length Scales to Visualize Materials Dynamics

4:00 – 4:30 Paul Evans (Materials Science and Engineering, University of Wisconsin-Madison)
Solid-phase Crystallization of Complex Oxides: Complementarity of X-ray Nanobeam Diffraction and Molecular Simulation

4:30 – 5:00 Workshop Organizers
Closing Discussion

5:00 Adjourn