

APS Workshop 5: Dark Field X-ray Microscopy for Mesoscale Phenomena in Ordered Materials at APS-U

Wednesday, May 4, Morning

9:15 – 9:20 Organizers Zahir Islam, Stephan Hruszkewycz, Zhan Zhang (Argonne National Laboratory), and Ashley Bucsek (University of Michigan)
Introduction and Welcome

Session 1 State of Dark Field X-ray Microscopy (Chair: Lahsen Assoufid)

9:20 – 9:30 Zhi Qiao (Argonne National Laboratory)
Overview of the Development of Large Field-of-view High-resolution Hard X-ray Microscope at Advanced Photon Source

9:30 – 10:00 Arndt Last (Karlsruhe Institute of Technology)
Optics for X-ray Microscopy from KIT/IMT

10:00 – 10:30 Can Yildirim (European Synchrotron Radiation Facility)
3D Mapping of Strain and Orientation of Embedded Crystalline Structures Using Dark Field X-ray Microscopy

10:30 – 10:45 Break

Session 2 Irreversible Phenomena/Pump-probe (Chair: Matthew Highland)

10:45 – 11:05 Michael Armstrong (Lawrence Livermore National Laboratory)
Dark Field X-ray Microscopy for Characterization of Materials Under Dynamic Compression

11:05 – 11:25 Leora Dresselhaus-Marais (Stanford University)
Time-resolved DFXM to Visualize 3D Dynamics in Dislocations

11:25 – 11:45 Haidan Wen (Argonne National Laboratory)
Time-resolved and In Situ Dark-field X-ray Imaging for Material Science

11:45 – 12:00 Xianbo Shi (Argonne National Laboratory)
Wrap-up and Discussion

12:00 Adjourn

Thursday, May 5, Morning

Session 3 Novel Image Contrasts (Chair: Sid Maddali)

9:15 – 9:40 Paul Fenter (Argonne National Laboratory)
Imaging Interfacial and Thin-film Topography without and with Coherent X-ray Illumination

9:40 – 10:05 Michael Sangid (Purdue University)
Examining Grain Substructure of Structural Polycrystalline Alloys Subjected to Fatigue Loading

10:05 – 10:30 Ishwor Poudyal (Argonne National Laboratory)
Opportunities of Dark-field X-ray Microscopy at Coherent Sources

10:30 – 10:45 Break

Session 4 Way Forward with Bulk Systems (Chair: Ashley Bucsek)

10:45 – 11:05 Richard Sandberg (Brigham Young University)
Measuring Strain and Dislocation Dynamics in Adjacent Crystalline Grains through Coherent X-ray Imaging

11:05 – 11:25 Darren Pagan (The Pennsylvania State University)
Future Considerations for Mapping Strain and Stress in 3D around Defects Using DFXM

11:25 – 11:45 Jayden Plumb (University of California, Santa Barbara)
Study of Defect Structures in NaMnO₂ Using Dark Field X-ray Microscopy

11:45 – 12:00 Peter Kenesei (Argonne National Laboratory)
Wrap-up and Discussion

12:00 Adjourn