USER SCIENCE HORIZONS

2016 APS/CNM USERS MEETING

COMPREHENSIVE PROGRAM

Monday, May 9

8:00–5:00 Exhibits
Bldg. 402, Gallery (lower level), outside E1100/1200 and Bldg. 402, Atrium

7:30–5:00 Registration
Bldg. 402, Atrium

12:00–1:30 Lunch
Tents outside of lower level Gallery

Opening Session—Morning
Bldg. 402, Lecture Hall

Session Chair: Jason Benedict (State University of New York, Buffalo)
APSUO Steering Committee Vice Chair

8:30–8:35 Jason Benedict, APSUO Vice Chair
Welcome and Launch of the 2016 Meeting

8:35–8:45 Al Sattelberger, Deputy Laboratory Director for Programs
Welcome from the Laboratory

8:45–9:10 Ben Brown, Senior Science and Technology Advisor, Office of Science, DOE
The DOE Perspective

9:10–9:15 Al Sattelberger, Deputy Laboratory Director for Programs
Introduction of Keynote Speaker

9:15–9:55 Keynote Speaker: Narayanan Kasthuri, Argonne National Laboratory
Towards Complete and Comprehensive Fine Structural Mapping of Brains

9:55–10:20 Break

10:20–10:35 Stephen Streiffer, APS Director
APS Update

10:35–10:50 Tijana Rajh, CNM Deputy Division Director
CNM Update

10:50–11:10 Dean Haeffner, APS Upgrade
APS Upgrade Update

11:10—11:15 Jason Benedict (APSUO) and Steve Smith (CNM UEC)
Introduction of the Speed Science Slam

11:15–12:00 S^3: Speed Science Slam

Yimin Wu (Nanoscience & Technology Division, Argonne National Laboratory)
Visualizing Redox Dynamics of a Single Ag/AgCl Heterogeneous Nanocatalyst at Atomic Resolution

Eran Greenberg (University of Chicago/CARS)
Powder XRD and ^{57}Fe Mössbauer Spectroscopy in High-pressure Studies

Daniel Duke (Energy Systems Division, Argonne National Laboratory)
X-ray Fluorescence Measurements of Pharmaceutical Sprays

Yuan Gao (Chemical Sciences & Engineering Division, Argonne National Laboratory)
X-ray Diffraction from Single Mesoscopic Particle Manipulated by 3-dimensional Optical Trapping

Kendra Letchworth-Weaver (Nanoscience & Technology Division, Argonne National Laboratory)
Theoretical Investigations of Atomic-scale Structure and Energetics at the Solid-liquid Interface

Yi Zhu (X-ray Science Division, Argonne National Laboratory)
Ultrafast THz-field-driven Dynamics in Ferroelectrics Revealed by Time-resolved Hard X-ray Microdiffraction

Kiran Sasikumar (Nanoscience & Technology Division, Argonne National Laboratory)
Investigation of Lattice Displacement Dynamics and Nanocatalytic Activity of Gold

Dongzhou Zhang (University of Hawaii/GSECARS)
High Pressure Research at the Partnership for eXtreme Xtallography (PX^2) Project

Ross Andrews (X-ray Science Division, Argonne National Laboratory)
In Operando *Applications of Combined USAXS/SA XS/WAXS Measurements at Pressure or Temperature*

12:00 Lunch

Parallel Facility Plenary Sessions—Afternoon

APS Session
Bldg. 402, Lecture Hall

Session Chair: Jason Benedict (State University of New York, Buffalo)
APSUO Steering Committee Vice Chair

1:15 - 1:55 Patrick La Riviere (University of Chicago)
Development of "Color" X-ray Histology Using Multiple Metal Stains and Multi-energy Synchrotron CT

1:55 - 2:15 2016 APSUO Rosalind Franklin Young Investigator Award
Ling Li (School of Engineering and Applied Sciences, Wyss Institute for Biologically Inspired Technology, Harvard University)
Biological and Bio-inspired Multifunctional Structural Materials

2:15 - 2:55 Connie Lu (University of Minnesota)
Harnessing Metal-metal Bonds for Small-molecule Activation

2:55 - 3:25 Break

3:25 - 4:05 Nicholas Kotov (University of Michigan)
Self-assembly of Nanoparticles: From Non-additivity to Chirality

4:05 - 4:25 Invited Student Talk: Jordan Cox (State University of New York, Buffalo)
Ligand Substitution and Guest Exchange in a Metal-Organic Framework Monitored by in situ Dynamic X-ray Diffraction Techniques

4:25 - 5:05 Keynote Speaker: Marius Schmidt (University of Wisconsin-Milwaukee)
TR-SFX

5:15 Buses leave APS and Guest House for the banquet at 5:15 sharp!

6:00 Banquet
The Public Landing located in the historic Galyord Building
200 West 8th Street, Lockport, IL 60441

Parallel Facility Plenary Sessions—Afternoon

CNM Session
Bldg. 402, Room A1100

Session Chair: **Steve Smith (South Dakota School of Mines & Technology)**
CNM Users Executive Committee Chair

1:30–2:15	Keynote Speaker: Julia Greer (California Institute of Technology) *Materials by Design: 3-dimensional Nano-architected Meta-materials*
2:15–2:45	Jacqueline Cole (University of Cambridge/Rutherford Appleton Laboratory) *Molecular Engineering of Nano-optomechanical Transducers*
2:45–3:15	James Rondinelli (Northwestern University) *Designing Functional Oxide-based Optical Materials from Quantum Mechanics to the Laboratory*
3:15–3:35	Break
3:35–3:45	Steve Smith, Chair (CNM Users Executive Committee) *Update from the CNM Users Executive Committee*
3:45–4:15	Tamar Segal-Peretz (Argonne National Laboratory) *Underneath the Surface of Block Copolymer Thin Films*
4:15–4:45	Alper Kinaci (Argonne National Laboratory) *Accelerating Nanomaterial Property Prediction Using Machine Learning*
4:45–5:00	Invited Student Talk: Peijun Guo (Northwestern University) *Ultrafast All-optical Modulation of the Full-visible Spectrum with Indium-Tin-Oxide Nanorod Arrays*
5:00	Adjourn
5:15	Buses leave APS and Guest House for the banquet at 5:15 sharp!
6:00	Banquet The Public Landing located in the historic Galyord Building 200 West 8th Street, Lockport, IL 60441

Tuesday, May 10

8:00–5:00 Exhibits
Bldg. 402, Gallery (lower level), outside E1100/1200 and Bldg. 402, Atrium

8:00–5:00 Registration
Bldg. 402, Atrium

12:00–2:00 Poster setup
(shuttle buses and vans provided throughout the lunch hour to provide transportation between APS, the Guest House, and TCS Bldg. 240)

12:00–1:30 Lunch
Tents outside lower level Gallery

12:00–1:30 APSUO Steering Committee/APS Partner User Council Meeting
Bldg. 401, Fifth Floor Gallery

3:00–5:00 CNM Users Executive Committee Meeting
Bldg. 401, Room B5100

5:30–8:00 Poster Session
TCS Building 240

Parallel Facility-specific Workshops*

APS/CNM – Workshop 2 (full day) – Bldg. 402, Room E1100/E1200
Challenges in Integrating Data Science, Computational Modeling, and Advanced Characterization (see page 21)

APS – Workshop 3 (full day) – APCF Auditorium, Building 446
Advances in in situ *and Serial Biological Crystallography (see page 25)*

CNM – Workshop 4 (full day) – Bldg. 401, Room A5000
Frontiers in Superconducting Electronics: From Quantum Computing to Photon Detectors (see page 30)

APS – Workshop 5 (full day) – Bldg. 402, Lecture Hall
Overview of APS-U Beamline Proposals (see page 33)

APS – Workshop 6 (morning) – Bldg. 401, Room A1100
Illuminating Current and Future Geochemistry and Geomicrobiology Research at APS (see page 39)

APS – Workshop 11 (afternoon) – Bldg. 402, Room A1100
In situ *Studies of Materials Transformations Using Coherent X-rays (see page 62)*

*Workshop 1 was withdrawn.

Wednesday, May 11

8:00–2:00 Exhibits
Bldg. 402 Gallery, outside E1100/1200 and Bldg. 402 Atrium

8:00–12:00 Registration
Bldg. 402, Atrium

12:00–1:30 Lunch
Tents outside lower level Gallery

Parallel Facility-specific Workshops

CNM –Workshop 7 (full day) – Bldg. 401, Room A1100
Revealing Hidden Structures and Properties: 3D Characterization of Nanoscale Materials (see page 43)

APS – Workshop 8 (full day) – Bldg. 401, Room A5000
Fundamentals and Emergent Applications of Ionic Soft Matters (see page 47)

APS – Workshop 9 (full day) – Bldg. 402, Room E1100/E1200
The Dynamic Compression Sector: Real-time Investigations of Dynamically Compressed Materials at Multiple Length Scales (see page 54)

CNM –Workshop 10 (full day) – APCF Auditorium, Building 446
2D Materials Beyond Graphene: Exploring the Heterostructures (see page 58)

APS – Workshop 11 (full day) – Bldg. 402, Lecture Hall
In situ *Studies of Materials Transformations Using Coherent X-rays (see page 62)*

Thursday, May 12

CNM Short Courses
Note: Fee of $40 in addition to meeting registration fee; pre-registration required.

8:30–12:00
1:30–5:00 Course A: Introduction to Transmission, Scanning Transmission, and Analytical Electron Microscopy
Bldg. 212, Room A157

8:30–12:00 Course B: Introduction to Confocal Raman Microscopy
Bldg. 440, Main Lobby

8:30–12:00 Course C: Using the Hard X-ray Nanoprobe
Bldg. 440, Main Lobby

1:30–5:00 Course D: Introduction to Atomic Layer Deposition and Applications
Bldg. 440, Main Lobby

8:30–5:00 Satellite Course: 2016 School on Liquid Surface X-ray Scattering: Data Analysis
Bldg. 401, Room A5000
Note: Fee of $65 for two-day course in addition to meeting registration fee; pre-registration required.

9:00–4:30 Satellite Course: SAXS Software Packages Irena and Nika Spring 2016 Course
Bldg. 401, Room E1100/1200
Note: Fee of $35 for two-day course in addition to meeting registration fee; pre-registration required.

Friday, May 13

8:30–2:15 Satellite Course: 2016 School on Liquid Surface X-ray Scattering: Data Analysis
Bldg. 401, Room A5000
Note: Fee of $65 for two-day course in addition to meeting registration fee; pre-registration required.

9:00–4:30 Satellite Course: SAXS Software Packages Irena and Nika Spring 2016 Course
Bldg. 401, Room E1100/1200
Note: Fee of $35 for two-day course in addition to meeting registration fee; pre-registration required.