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  S³: 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/SAXS/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  Course A: Introduction to Transmission, Scanning Transmission, and Analytical Electron Microscopy
            Bldg. 212, Room A157

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: SANS 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.