



2018 APS/CNM  
**USERS MEETING**

COMPREHENSIVE PROGRAM



## Monday, May 7

- 8:00 – 5:00 Exhibits  
*Building 402, Gallery (lower level), outside E1100/1200 and Building 402, Atrium*
- 7:30 – 5:00 Registration  
*Building 402, Atrium*
- 12:00 – 1:30 Lunch (in the Tent)

### Opening Session—Morning Building 402, Lecture Hall

**Session Chairs: Amy Clarke (Colorado School of Mines, Department of Metallurgical and Materials Engineering) and Zhili Xiao (Northern Illinois University, Department of Physics)**

- 8:30 – 8:35 Amy Clarke, Chair, APS Users Organization and Zhili Xiao, CNM Users Executive Committee  
*Welcome and Launch of the 2018 Meeting*
- 8:35 – 8:45 Paul K. Kearns, Argonne Laboratory Director  
*Welcome from the Laboratory*
- 8:45 – 9:10 Harriet Kung, Associate Director of Science (U.S. Department of Energy, Basic Energy Sciences)  
*The DOE Perspective*
- 9:10 – 9:25 Jodi Muckelbauer (Bristol-Myers Squibb) Member of the Board of Directors for the Society for Science at User Research Facilities (SSURF)  
*SSURF Update 2018*
- 9:25 – 9:30 Stephen Streiffer, APS Director  
*Introduction of Keynote Speaker*
- 9:30 – 10:10 Keynote Speaker: Harald Reichert, Director of Research in Physical Sciences (European Synchrotron Radiation Facility)  
*Science at the ESRF: Results and Future Challenges*
- 10:10 – 10:35 Break
- 10:35 – 10:50 Stephen Streiffer, APS Director  
*APS Update*
- 10:50 – 11:05 Supratik Guha, CNM Director  
*CNM Update*
- 11:05 – 11:20 Jim Kerby, APS Upgrade Project Manager  
*APS Upgrade Update*
- 11:20 – 11:25 Amy Clarke, Chair, APS Users Organization and Zhili Xiao, CNM Users Executive Committee  
*Introduction of the Speed Science Slam S<sup>3</sup>*

11:25 – 12:00 S<sup>3</sup>: Speed Science Slam

**APS:** Andre Al Haddad (Argonne National Laboratory)  
*Characterizing Photoinduced Excited States with ~10 ps Resolution Using Time Slicing X-ray Absorption Spectroscopy*

**CNM:** A. Jean-Luc Ayitou (Illinois Institute of Technology)  
*Triplet-triplet Annihilation-based Photon Upconversion Using All-organic Polycyclic Aromatic Donor and Acceptor Chromophores*

**APS:** Matt Frith (Argonne National Laboratory)  
*An In Situ Synchrotron X-ray Scattering Study of Microstructural Evolution in a Ni-based Alloy*

**APS:** Jonnathan Medina-Ramos (Argonne National Laboratory)  
*Understanding the Structural Dynamics of Bismuth-based Cathodes in Solutions of Alkyl imidazolium Ionic Liquids, under Conditions for Electrochemical CO<sub>2</sub> Reduction*

**CNM:** Anastasios Pateras (University of Wisconsin-Madison)  
*Dynamical Scattering Effects in Coherent X-ray Nanodiffraction*

**APS:** Niranjana Parab (Argonne National Laboratory)  
*Multi-scale Imaging in Metal Additive Manufacturing*

12:00 – 1:30 Lunch (in the tent)

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## Parallel Facility Plenary Sessions—Afternoon

### APS Session

#### Building 402, Lecture Hall

**Session Chair: R. Joseph Kline (National Institute of Standards and Technology)**  
**APSUO Steering Committee Vice Chair**

- 1:30 – 1:50 Glenn Decker (Advanced Photon Source)  
*The APS Upgrade Accelerator Design and Performance*
- 1:50 – 2:30 Rosalind Franklin Young Investigator Award: Joshua Riback (University of Chicago)  
*Characterizing Disordered Protein Ensembles Using Small-angle Scattering*
- 2:30 – 3:05 Stephan Hruszkewycz (Argonne National Laboratory)  
*New Opportunities for Materials Science with Coherent X-ray Diffraction Imaging*
- 3:05 – 3:25 Break
- 3:25 – 4:00 Eva Dyer (Georgia Tech College of Engineering and Emory School of Medicine)  
*Mapping the Brain with X-ray Microtomography*
- 4:00 – 4:05 Presentation of the Gopal K. Shenoy Excellence in Beamline Science Award:  
 Hua Zhou (Argonne National Laboratory)
- 4:05 – 4:25 Invited Student Talk: Ryan Poling-Skutvik (University of Houston)  
*Polymer-induced Structural Changes in Suspensions of Gold Nanorods*
- 4:25 – 5:00 S.-H. Dan Shim (Arizona State University)  
*Probing the Valence State of Fe in Mantle Mg-silicate Perovskite with Synchrotron X-ray*
- 5:00 Adjourn
- 6:00 Banquet  
*Elements at Water Street*  
 123 Water Street, 2nd Floor Hotel Indigo  
 Naperville, IL 60540  
 (Bus transportation departs 5:20 SHARP.)
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## Parallel Facility Plenary Sessions—Afternoon

### CNM Session

Building 402, Room A1100

**Session Chair:** James Rondinelli (Northwestern University) and Joshua Wood (MicroLink Devices, Inc.)  
**CNM Users Executive Committee Chair**

- 1:30 – 2:15 Dmitri Basov (Columbia University)  
*Quantum Materials: Insights from Infrared Nano-optics*
- 2:15 – 3:00 Manos Mavrikakis (University of Wisconsin Madison)  
*Active and Selective Designer Catalysts from First-principles*
- 3:00 – 3:20 Break
- 3:20 – 3:30 James Rondinelli (Northwestern University)  
*Update from the CNM Users Executive Committee*
- 3:30 – 4:00 Bozhi Tian (University of Chicago)  
*Inorganic Materials for Dynamic Interfaces*
- 4:00 – 4:30 Qing Hua Wang (Arizona State University)  
*Self-assembled van der Waals Heterostructures of 2D Materials and Organic Molecules*
- 4:30 – 4:45 Invited Student Talk: Alexandra Brumberg (Northwestern University)  
*Material Dimensionality Effects on Electron Transfer Rates between CsPbBr<sub>3</sub> and CdSe Nanoparticles*
- 4:45 Adjourn
- 6:00 Banquet  
*Elements at Water Street*  
123 Water Street, 2nd Floor Hotel Indigo  
Naperville, IL 60540  
(Bus transportation departs 5:20 SHARP.)
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## Tuesday, May 8

- 8:00 – 5:00 Exhibits  
*Building 402, Gallery (lower level), outside E1100/1200 and Building 402, Atrium*
- 8:00 – 5:00 Registration  
*Building 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 Building 240)*
- 12:00 – 1:30 Lunch (in the Tent)
- 12:00 – 1:30 APSUO Steering Committee/APS Partner User Council Meeting  
*Building 401, Fifth Floor Gallery*
- 5:30 – 8:00 Poster Session  
*TCS Building 240, Shuttle service available*
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### Parallel Facility-specific Workshops

- APS** Workshop 2 – Building 401, Room A1100  
*Workshop on Past, Present, and Future of Insertion Devices at the APS: A Tribute to Efim Gluskin, Emil Trakhtenberg, and Isaac Vasserman (see page 21)*
- CNM** Workshop 3 – Building 401, Room A5000  
*Next-generation Quantum Systems Based on Topological Phases and Integrated Quantum Photonics (see page 24)*
- APS** Workshop 4 – Building 402, Room E1100/1200  
*Frontiers of Materials Research with Single-crystal Total Scattering (see page 28)*
- APS/CNM** Workshop 5 – Building 446, Advanced Protein Characterization Facility Conference Room  
*In Situ Rheology, SAXS, and XPCS for the Study of Soft Matter (see page 34)*
- CNM** Workshop 6 – Building 440, Room A105/106  
*Tribology of 2D Materials: From Nanoscale to Macroscale (see page 39)*

## Wednesday, May 9

- 8:00 – 1:30 Exhibits  
*Building 402 Gallery, outside E1100/1200 and Building 402 Atrium*
- 8:00 – 1:30 Registration  
*Building 402, Atrium*
- 12:00 – 1:30 Lunch (in the Tent)
- 12:00 – 1:30 CNM Users Executive Committee Meeting  
*Building 401, Room B5100*
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### Parallel Facility-specific Workshops

- APS** Workshop 1 – Building 402, Room E1100/1200  
*Resolution@speed: Advanced X-ray Spectroscopies with Upgraded APS (APS\_U) (see page 19)*
- APS** Workshop 7 – Building 401, Room A1100  
*High-resolution 3D X-ray Imaging (see page 45)*
- APS/CNM** Workshop 8 – Building 401, Room A5000  
*Tipping X-ray – Comprehensive Nanoscale Characterization with Multimodal X-ray Imaging (see page 52)*
- CNM** Workshop 9 – Building 440, Room A105/106  
*Nanoscience for Quantum Science: Developing, Characterizing, and Harnessing Optically Active Defects (see page 58)*
- APS** Workshop 10 – Building 446, Advanced Protein Characterization Facility Conference Room  
*Applications of Synchrotron X-ray Techniques for Studying Metal Additive Manufacturing (see page 62)*



## Thursday, May 10

### CNM Short Course

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

9:00 – 12:00    Sector 26  
*Using the Hard X-ray Nanoprobe*

### Satellite Workshop

Pre-registration required.

8:30 – 5:00    Building 401, Room A1100  
*WKS: User Workshop for Micromanipulator Use in Diamond Anvil Cell  
Loading and Other Applications*

### Satellite Course — May 10–11, 2018

Note: Fee of \$35 in addition to meeting registration fee; pre-registration required.

9:00 – 4:30    Building 402, Room E1100/1200  
Daily            *SAXS Software Course Irena and Nika*

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