

Workshop #11

Solvation Structure, Electrical Double Layer, and Interphases—Solving the Unsolvable

*Huolin Xin (UC Irvine), Ashley Head (CFN), Lu Ma (NSLS-II), Ira Waluyo (NSLS-II),
Adrian Hunt (NSLS-II), Yonghua Du (NSLS-II), and Xiaojing Huang (NSLS-II)*

In the past two decades, the development of energy storage and conversion devices has been primarily focused on studying the active sites on the catalyst or the redox centers in the active electrode materials. However, the fundamental charge transfer process of electrochemical reactions happens at the interface between the electrode surface and the electrolytes. Now, the lack of understanding of the interphases, double layers, and the electrolyte solvation structure has become a major bottleneck for the continued development of energy conversion and storage devices. This has motivated the development of imaging, scattering, and spectroscopy technologies for the study of the atomistic organization in these disordered solid and liquid phases. The objective of this workshop is to provide a forum for the NSLS II-CFN User community to explore the research frontier of solid-electrode interface studies, and to identify potential synergistic NSLS II-CFN experiments, wherein the novel interrogation of liquid/interphases characteristics and the development of new imaging/scattering/spectroscopy technologies can lead to transformative advances and breakthroughs in the field.

Start Time (ET)	Title	Speaker (Affiliation)
12:55 – 1:00 p.m.	Opening Remarks by the Organizers	
1:00 – 1:40 p.m.	Keynote Talk: Insight into Electrolyte Structure and Interfacial Properties from Molecular Modeling	Oleg Borodin US Army
1:40 – 2:05 p.m.	Solvation Effects on Sub-nano Confined Lithium-Sulfur Reaction and Metals Deposition	Juchen Guo UC Riverside
2:05 – 2:30 p.m.	Understanding Electrochemical Processes under Confinement: Role of Interlayer Solvation and Cation Intercalation	Veronica Augustyn North Carolina State University
2:30 – 2:35 p.m.	VENDOR TALK #1	
2:35 – 3:00 p.m.	Solvation structure and interphases in all-solid-state batteries	Yan-Yan Hu Florida State University
3:00 – 3:15 p.m.	BREAK	
3:15 – 3:40 p.m.	Shedding synchrotron light on electrolyte and interphase for better batteries	Enyuan Hu Brookhaven National Laboratory
3:40 – 4:05 p.m.	Characterization of the structure and chemistry of the solid-electrolyte interface leads to high-performance solid-state batteries	Ruoqian Lin Jet Propulsion Laboratory
4:05 – 4:30 p.m.	Electrolyte Design Criteria for Extreme Temperature Batteries	Zheng Chen UC San Diego