Global Race for a Better Battery

Shirley Meng

Tuesday, February 25
3:00 p.m.
Bldg. 402 | APS Auditorium

Energy storage in the electrochemical form is attractive because of its high efficiency and fast response time. Besides the technological importance, electrochemical devices also provide a unique platform for fundamental and applied materials science & research, since ion movement is often accompanied by inherent complex phenomena related to phase changes, electronic structure changes and defect generation. Synchrotron X-ray characterization plays a critical role in understanding the ion transport, the dynamic structural changes and the corresponding degradations in high-energy rechargeable batteries.

In this talk, I will discuss new perspectives for energy storage materials, including new superionic conductors, new intercalation compounds and their interfacial engineering. With recent advances in photon and electron characterization tools and computational methods, we are able to explore ionic mobility, charge transfer and phase transformations in electrode and electrolyte materials in *operando* in materials beyond simple intercalation. Most recently we established ESRA, focused on energy storage beyond lithium ion. ESRA aims to enable transformative discoveries in materials chemistry, gain a fundamental understanding of electrochemical phenomena at the atomic scale, lay the scientific foundations for breakthroughs in energy storage technologies, and train the next-generation battery workforce to ensure U.S. scientific and economic leadership.

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Dr. Y. Shirley Meng is a Professor at the Pritzker School of Molecular Engineering at the University of Chicago, Chief Scientist of the Argonne Collaborative Center for Energy Storage Science, and director of Energy Storage Research Alliance, an innovation hub funded by the U.S. Department of Energy, Office of Science.

She is the principal investigator of the research group Laboratory for Energy Storage and Conversion, established at University of California San Diego. She founded the Sustainable Power and Energy Center. Dr. Meng received several prestigious awards, including ACS Research Excellence in Electrochemistry, ECS Battery Division Research Award, the C3E technology and innovation award, the Faraday Medal of Royal Chemistry Society, International Battery Association IBA Research Award, Blavatnik Awards for Young Scientists Finalist, C.W. Tobias Young Investigator Award of the Electrochemical Society and NSF CAREER Award. Dr. Meng is elected Fellow of Electrochemical Society, Fellow of Materials Research Society and Fellow of American Association for the Advancement of Science. She is the author and co-author of more than 320 peer-reviewed journal articles, two book chapters and twelve issued patents. Dr. Meng received her Ph.D. in Advance Materials for Micro & Nano Systems from the Singapore-MIT Alliance in 2005.

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