



Large Scale Energy Storage: From Nanomaterials to Large Systems

Wednesday October 26, 2011, Babbio 122, 11am

Dr. Jun Liu

Transformational Materials Science Initiative, Pacific Northwest National Laboratory (PNNL), Richland, WA

This talk aims to discuss important cross-cutting, fundamental materials science and materials chemistry challenges that are applicable to a range of technologies encountered in electrochemical storage. This talk will attempt to highlight the critical materials problems using specific examples and results from recent efforts to reduce the cost and improve the performance of electrochemical energy storage devices. Specifically, this talk discusses 1) the challenges for grid scale and transportation storage, 2) the characterization and understanding of the complex solution chemistry and redox reactions in concentrated, aggressive electrolyte solutions, 3) approaches to develop new battery designs and new chemistry combinations to reduce the cost, and 4) limitations and challenges of the electrode materials, nanoporous materials and ion selective membranes. In addition, the paper discusses the prospects of emergent technologies with ultralow costs on new energy storage materials and mechanisms.

Dr. Jun Liu is a Laboratory Fellow at the Pacific Northwest National Laboratory and Leader for the Transformational Materials Science Initiative. He is also a Fellow for the American Association for the Advancement of Science. In the past he has served as Pacific Northwest National Laboratory Fellow, senior research staff for Sandia National Laboratory and Lucent Bell Laboratory, Department Manager for the Synthesis and Nanomaterials Department, Sandia National Laboratory, Thrust Leader for Complex Functional Nanomaterials for the Center for Integrated Nanotechnologies, Sandia National Laboratories. His pioneering research in self-assembled, functional nanomaterials and solution phase growth of oriented nanostructures are widely recognized. He has received a R&D 100 Award and two Basic Energy Science Materials Science Awards for Materials Chemistry: Significant Implication for DOE-Related Technologies, and was named 2007 Distinguished Inventor of Battelle. He has over 250 publications and many invited review articles in leading technical journals.

**Co-sponsored by the Department of
Chemical Engineering & Materials Science**

