



UNIVERSITY OF CALIFORNIA, IRVINE

Department of Materials Science and Engineering

Solid State Batteries — from Interfaces to High Energy Density



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Abstract: Room temperature lithium ion conductors have been intensively revisited in an attempt to develop solid state batteries that can be deployed for high energy applications. In recent years, promising solid lithium ion conductors with competitive ionic conductivity to those of liquid electrolytes have been demonstrated. The integration of highly conductive solid electrolytes into the battery system is, however, still very challenging mainly due to the high impedance existing at different interfaces throughout the battery structure. In this talk, I will highlight our recent work on the understanding of interfaces between the solid electrolytes and anode & cathode, providing new insights into enabling future all solid-state batteries. I will also show that high energy and long cycle life can be achieved in solid state batteries via optimizing the interfacial thermodynamics.

Bio: Jihui Yang is currently the Vice Dean and Kyocera Chair Professor in the College of Engineering of the University of Washington (UW), Seattle, Washington. He was the Chair of UW's Materials Science and Engineering Department between 2017 and 2020. Prior to joining the UW in the Fall of 2011, he was a Technical Fellow and Lab Group Manager at GM Research and Development Center. Jihui's current research includes electrochemical energy storage, solid state energy conversion, electrocatalysis, and transport properties of two-dimensional materials. Jihui received his PhD degree in physics from the University of Michigan in 2000. He is the recipient of the Kent M. Terwilliger Prize for best doctoral thesis from the University of Michigan Physics Department in 2001, the John M. Campbell Award (outstanding contributions to pure or applied science) from GM R&D Center in 2007, and the US DOE Innovative and Novel Computational Impact on Theory and Experiment award in 2008. Jihui was elected a Fellow of the American Physical Society in 2012.