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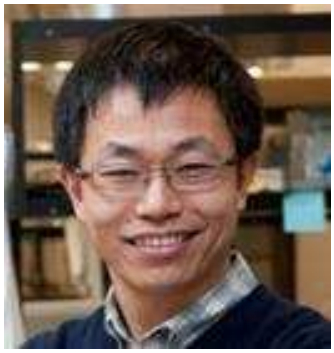
Wednesday, November 12, 2014

Somerset-Bridgewater Hotel, Somerset, New Jersey

(Formerly Crowne Plaza Hotel)



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Toward a distributed renewable electrochemical energy and mobility system

One of the grand challenges facing humanity today is the development of an alternative energy system that is safe, clean, and sustainable and where combustion of fossil fuels no longer dominates. A distributed renewable electrochemical energy and mobility system (DREEMS) could meet this challenge. At the foundation of this new energy system are a number of electrochemical devices including fuel cells, electrolyzers, and flow batteries. For all these devices electrocatalysis plays a critical role in controlling their performance and cost, and thus their commercial viability. In this presentation, I will focus on our recent work on hydroxide exchange membrane fuel cells which can work with non-precious metal catalysts and inexpensive membranes, and thus can be economically viable. More specifically I will show why hydrogen oxidation reactions are slower in base than in acid and how we have developed some of the highest performing non-precious metal hydrogen oxidation reaction catalysts.