



RENEWABLE AND SUSTAINABLE ENERGY INSTITUTE

# **BIG** energy seminar series

Addressing global energy challenges in scale and complexity.



## *Before Li-Ion Batteries, and Thereafter...*

*Kang Xu, ARL Fellow*

*Team Leader of Extreme Electrochemistry Team*

*John USA Army Research Lab*

**Date:** Wednesday, January 29<sup>th</sup> at 3:00pm

**Location:** ECCR 200

### **Abstract:**

October 20, 2019, Stockholm. Nobel committee announced that the Chemistry Prize that year will be awarded to Whittingham, Goodenough and Yoshino. This marks a long overdue recognition for this technology that have significantly reshaped our life since their initial commercialization in early 1990s.

Unlike many scientific discoveries, LIB was not born at a single “Eureka” moment. Battery (or any electrochemical device) is a system consisting of multiple components. For such a system to function, all components must be electrochemically synchronized. The lengthy history of LIB development witnessed such painful synchronization, which proceeded simultaneously with the development of intercalation science as well as its many individual components.

This talk aims to recount the history between the discovery of Li element to the commercialization of LIB in 1990s. As taught by Winston Churchill, “The farther back you can look, the farther forward you are likely to see”, such historical retrospective bring us inspiration and insight into the future, because being able to scrutinize the antique literature with contemporary hindsight offers us the advantageous angle to witness how accidental discoveries, intentional breakthroughs, and deceiving misconceptions interplayed to generate the unique chemistries and materials for such a sophisticated electrochemical device.

### **Bio:**

Kang Xu, Army Research Laboratory, has extensive expertise in electrolytes and interphasial chemistries. He is an authority in electrolyte materials and fundamental science of interphases; high voltage non-aqueous, aqueous and hybrid electrolytes; non-flammable electrolytes; solvation-interphase correlation; and the interphase-formation mechanism model. In addition, he holds 12 patents.

Xu's professional activities include being the co-founder and Steering Committee Member of Center of Research on Extreme Batteries; Advisory Board Member, ACS Applied Materials and Interfaces; Associate Editor, Energy and Environmental Materials; and Associate Editor, Electrochemistry.

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