



Department of  
Mechanical Engineering  
The University of Hong Kong



## **Battery Resilience under Extreme Conditions**

**Date:** 28 February, 2024 (Wednesday)  
**Time:** 2:00-3:30 p.m.  
**Venue:** Room 734/735, Haking Wong Building  
HKU

**Speaker:** Professor Chao-Yang Wang  
Electrochemical Engine Center (ECEC)  
The Pennsylvania State University  
University Park  
USA



### **Abstract:**

As transport electrification is shifting from luxury buyers and early adopters to mainstream customers, great attention must be paid to battery resilience under extreme conditions, like extreme cold winters or hot summers with surging air temperatures. In the cold, presently a battery requires pre-conditioning in order to be able to drive and charge; this is unacceptable for mainstream drivers. In hot summers with surging air temperatures, battery thermal stability and safety become great concern, calling for removal of volatile and flammable solvents from battery electrolytes that have very low boiling points. We will discuss what innovations are urgently needed to greatly improve battery resilience under these extreme and sometimes life-threatening conditions so as to continue transport decarbonization.

### **Biography:**

Dr. Chao-Yang Wang is William E. Diefenderfer Chair Professor of Mechanical Engineering and Professor of Chemical and Materials Science & Engineering at the Pennsylvania State University. He has 230+ journal publications and an H-index of 114. He holds over 140 patents and has published two books, “Battery Systems Engineering” by Wiley and “Modeling and Diagnostics of Polymer Electrolyte Fuel Cells” by Springer. Dr. Wang is known for his innovative research on batteries and fuel cells; particularly for pioneering a new battery paradigm with modulatory states and interfaces. The all-climate battery (ACB) he invented was adopted by 2022 Winter Olympics as well as commercialized by several carmakers. His latest invention on fast charging batteries was named as one of 10 biggest science stories in 2022 by the Guardian. He is a Fellow of U.S. National Academy of Inventors (NAI) and American Society of Mechanical Engineers (ASME) and a speaker of many public forums such as 2021 Tencent WE Summit alongside two Nobel Laureates, 2022 Distinguished Transport Lecture at Hong Kong University, and 2023 Hawkins Lecture at Purdue University. Dr. Wang’s expertise covers the transport, materials, manufacturing and modeling of batteries and fuel cells.

**ALL INTERESTED ARE WELCOME**

For further information, please contact Prof. Nicholas Fang at 3917 2639.