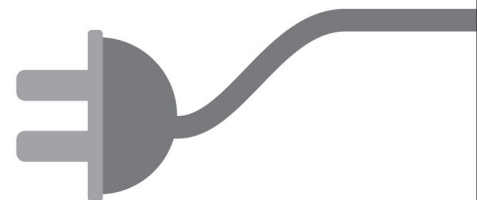


Fast Charging Batteries for Mass-Market Electric Vehicles



Abstract:

Range anxiety is a key reason that consumers are reluctant to embrace electric vehicles (EVs). To be truly competitive with gasoline vehicles, EVs should allow drivers to recharge quickly anywhere in any weather, like refueling gasoline cars. However, none of today's EVs allow fast charging due to the risk of lithium plating, the formation of metallic lithium that drastically reduces battery life and even results in safety hazards. In this talk, we present a new approach enabling 10-minute fast charging of energy-dense Li-ion batteries in any temperatures (even at -50°C) while still preserving remarkable cycle life. We further show that fast rechargeability is an economical answer to mass-market EVs, making possible a vehicle battery costing only \$3,500 while eliminating range anxiety. Finally, we shall discuss why any fast charging solutions for EVs must be evaluated under three metrics simultaneously: charge time (<10 min), specific energy acquired by fast charge (>180 Wh/kg), and cycle number (>1000) under the fast charge condition.



Speaker:



Professor Chao-Yang Wang
Electrochemical Engine Center (ECEC)
The Pennsylvania State University,
USA

Biography:

Dr. Chao-Yang Wang, Academician of National Academy of Inventors, is William E. Diefenderfer Chair Professor of Mechanical, Chemical, and Materials Science & Engineering at the Pennsylvania State University. He has 220+ journal publications, 34,000+ citations, an H-index of 101. 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. His work on all-temperature battery (ACB) was selected by 2022 Winter Olympic Games to power electric vehicles serving the Games, as well as adopted by several carmakers. His latest inventions on fast charging batteries (FCB) and thermally modulated battery (TMB) were highlighted by journals Nature and Science as well as covered by mainstream media such as USA Today, Popular Mechanics, BBC, The Guardian, AFP, Daily Mail, etc. Dr. Wang's expertise covers the transport, materials, manufacturing and modeling of batteries and fuel cells.

Moderator:



Professor Dennis Leung
Head, Department of
Mechanical Engineering, HKU

Webinar

Date & Time:

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The University of Hong Kong

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INSTITUTE OF TRANSPORT STUDIES
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Confirmation emails with ZOOM link will be sent to participants.

