



MECHANICAL & MATERIAL COLLOQUIUM

Carbon Nanotube Hybrid Materials for Advanced Energy Applications

by Wenzhi Li (FIU Physics)

Carbon nanotube (CNT) hybrid materials offer exceptional properties for energy storage and conversion, including high electrical conductivity, large surface area, and mechanical strength. This talk will explore the role of vertically aligned carbon nanotube hybrid materials, particularly metal oxide-coated CNTs, in enhancing lithium-ion battery (LIB) performance. Metal oxide coatings on vertically aligned CNTs improve electrochemical stability, increase the overall capacity, and extend the cycling life of LIBs by optimizing charge transport and interfacial interactions. We will also discuss the use of metal sulfide-filled CNTs in the hydrogen evolution reaction (HER), a critical process for sustainable hydrogen production. The inclusion of metal sulfides within CNTs enhances catalytic activity, charge transfer, and stability, making these materials promising candidates for efficient water splitting. By combining the unique properties of CNTs with metal oxides and metal sulfides, these materials provide significant advances in both energy storage and conversion. This colloquium will highlight the recent developments in CNT-based hybrid materials and their potential to drive innovations in clean energy technologies.

Dr. Wenzhi Li earned his PhD in Physics from the Chinese Academy of Sciences in Beijing in 1997. In 1998, he was awarded the KC-Wong Research Fellowship by the Royal Society of London, which enabled him to conduct research in the Department of Chemistry at Sussex University, UK. From 1999 to 2003, Dr. Li served as a Senior Research Scientist in the Physics Department at Boston College, Massachusetts. He joined the faculty at Florida International University (FIU) in 2003, where he is currently a Professor of Physics. Dr. Li's research interests focus on the synthesis mechanisms, electrochemical properties, and energy applications of nanomaterials. He has authored over 100 papers in peer-reviewed journals and has received



numerous accolades, including the FIU Excellence in Research Award, the Chemical Physics Letters Most Cited Paper Award, the ISI Citation Classic Award, and the National Science Foundation CAREER Award.

Place:
EC 1113

Time:
2:00-3:15PM

Feb. 18, 2025

<https://mme.fiu.edu/seminar-schedule>

For questions, comments and suggestions, contact Colloquium Organizers Dr. Benjamin Boesl (bboesl@fiu.edu) or Dr. Jiuhua Chen (chenj@fiu.edu)