

MATERIALS SCIENCE AND ENGINEERING (MS&E) SEMINAR SERIES

Friday November 1, 2019 at 3:00pm in room ESB 207

Design and Application of Advanced Materials in Electrochemical Energy Storage Systems

Zhongwei Chen

Professor & Canada Research Chair (Tier I)

Fellow of The Royal Society of Canada, Fellow of The Canadian Academy of Engineering

Department of Chemical Engineering, Department of Mechanical and Mechatronics Engineering, Waterloo Institute for Nanotechnology, Waterloo Centre for Electrochemical Energy System, University of Waterloo

E-mail: zhwchen@uwaterloo.ca

Abstract: Green, efficient energy storage and conversion systems are an important means of addressing global environmental and energy crisis. The current battery systems have been difficult to meet the increasing market demand due to their relatively low energy densities, therefore it is urgent to develop new energy storage technologies with high energy density and low cost. To this end, Professor Zhongwei Chen and his research group adhere to a bottom-up “material-electrode-battery-system” strategy to develop a variety of advanced energy storage technologies, including lithium-ion batteries, metal-air batteries, Lithium-sulfur batteries, fuel cells, for a wide range of energy storage applications. Through the rational material design and engineering, various high-performance electrodes with hierarchical micro- and nanostructures have been developed. Moreover, the electrode structures are controlled and optimized toward high recharge efficiency and energy density. Together, these innovate materials and electrode architectures practically allow industrial assembly and production of more efficient, affordable, and safer battery systems for clean and sustainable energy storage.



Dr. Zhongwei Chen is Canada Research Chair (CRC-Tier 1) Professor in Advanced Materials for Clean Energy at the University of Waterloo, Fellow of The Royal Society of Canada, Fellow of The Canadian Academy of Engineering, Director of Waterloo Center for Electrochemical Energy and Vice President of International Academy of Electrochemical Energy Science (IAOEES). His research interests are in the development of advanced energy materials and electrodes for fuel cells, metal-air batteries, and lithium-ion batteries. He has published 3 book, 9 book chapters and more than 260 peer reviewed journal articles with over 20,000 citations with a H-index of 73 (GoogleScholar). He is also listed as inventor over 30 US/international patents, with several licensed to companies internationally. His research activities are currently supported by a large and highly integrated team, comprising over 30 research associate/postdoctoral fellows and 30 graduate students. In addition, Dr. Chen has already trained more than 80 others through his research program, totaling over 100 highly qualified personnel in all. He was the recipient of the 2016 E.W.R Steacie Memorial Fellowship and elected as the member of the Royal Society of Canada’s College of New Scholars, Artists and Scientists in 2016, and was also elected as the fellow of the Canadian Academy of Engineering in 2017, the Rutherford memorial medal from The Royal Society of Canada in 2017, the fellow of the Royal Society of Canada 2019, which followed shortly upon several other prestigious honors, including the Ontario Early Researcher Award, an NSERC Discovery Supplement Award, the Distinguished Performance and Research. In 2018, Dr. Chen was ranked as the Global Highly Cited Researchers 2018 by Clarivate Analytics.

MS&E Seminar Series is sponsored by the Department of Chemical Engineering, Lane Department of Computer Science and Electrical Engineering, and Department of Mechanical & Aerospace Engineering.

DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

1306 Evansdale Drive | PO Box 6106
Morgantown, WV 26506-6106

☎ 304.293.3111 📠 304.293.6689