

MATERIALS SCIENCE AND ENGINEERING (MS&E) SEMINAR SERIES
Friday September 24, 2021 at 3:00 pm via Zoom

<https://wvu.zoom.us/j/98736690864?pwd=dGFWUkhRa3RCc3BKUzFpMDZyTjhTdz09>

Meeting ID: 987 3669 0864 Passcode: EVXjDr8v

**Interfacial Reactions in Electrochemical Energy Systems: *In-Situ* Studies Using
Synchrotron X-ray Techniques**

Zhenxing Feng, School of Chemical, Biological, and Environmental Engineering, Oregon State
University, Corvallis, Oregon, 97331, United States

For electrochemical systems such as batteries and fuel cells, the gas/solid and liquid/solid interfaces are critical parts where many important reactions take place. It is critical to understand the interfacial changes for the better design of efficient energy systems. In the past years we have used various *in-situ* and *operando* synchrotron-based X-ray techniques including scattering, spectroscopy and imaging to investigate the atomic and electronic structure, chemistry and compositions of various electrochemical interfaces in fuel cells, electrolyzers, lithium-, sodium- and magnesium-batteries. In my talk, I will mainly illustrate two representative examples. I will first discuss our recent works for aqueous sodium-ion batteries to achieve fast charging, better energy density and longer cycling life, and fundamental studies to reveal the mechanism that enables batteries' high performance. The second example will illustrate our efforts on using *in-situ* X-ray spectroscopy and scattering techniques to study electrocatalyst restructuring in highly oxidative electrochemical condition such as oxygen evolution reaction for water splitting. If time allows. I will also show unique lab-based spectroscopy and imaging capabilities for *in-situ* study of interfacial processes beyond electrochemistry.



Bio: Zhenxing Feng is an Associate Professor of Chemical Engineering in School of Chemical, Biological, and Environmental Engineering and a jointed faculty in Materials Science Program at Oregon State University. He obtained his Ph.D. in Materials Science and Engineering of Northwestern University, USA in 2011. Then he spent two years at Mechanical Engineering of MIT for postdoctoral trainings. After working in Joint Center for Energy Storage Research (JCESR) of Argonne National Lab for 3 years in advanced battery research, he moved to Oregon State University. He is interested in finding design principles of various materials for energy harvesting, conversion and storage applications.

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.

OFFICE OF MECHANICAL AND AEROSPACE ENGINEERING

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

☎ 304.293.3111 📠 304.293.6689

mae.statler.wvu.edu

EEO/Affirmative Action employer — Minority/Female/Disability/Veteran