

# Aiiiso Yufeng Li Family Department of Chemical and Nano Engineering

## Department Seminar

Wednesday, April 1, 2026

11:00am – 12:00pm PT

SME 248



**Dr. Chengcheng Fang, PhD**

*“Toward Manufacturable  
Batteries: From Materials  
Engineering to Cell Architecture”*

Associate Professor

Department of Chemical Engineering and Materials  
Science

Michigan State University

**Abstract:** I will introduce our efforts toward manufacturable batteries by integrating materials engineering, electrochemical interface design, and scalable cell components. First, I will present a multifield-assisted rapid synthesis strategy that enables minute-scale production of defect-controlled oxide materials (such as Wadsley-Roth phase anodes and single-crystal layered oxide cathodes), allowing precise control of defect chemistry while significantly reducing processing time and energy consumption. Next, I will describe electrolyte and interphase design strategies that enable high-energy lithium batteries through simultaneously controlled lithium deposition and intercalation, enabling pressure-free operation of lithium metal while maintaining fast-charging/low-temperature capability and compatibility with existing battery manufacturing infrastructure. Finally, I will present scalable battery components, including ultralight composite current collectors and thermally stable lignin-based separators. Together, these efforts demonstrate a pathway for connecting materials innovation with manufacturable cell architectures, helping move advanced battery technologies from laboratory discovery toward practical and scalable deployment.

**Bio:** Dr. Chengcheng Fang is an Assistant Professor in the Department of Chemical Engineering and Materials Science at Michigan State University. She received her Ph.D. in Materials Science and Engineering from the University of California, San Diego, an M.Phil. in Innovative Technologies Leadership from the Hong Kong University of Science and Technology, and a B.S. in Materials Science and Engineering from Zhejiang University. Dr. Fang’s research focuses on advancing next-generation battery technologies by bridging fundamental materials science with practical deployment. Her work spans multiscale quantitative characterization for failure diagnostics, the design of advanced battery materials, and the development of manufacturing processes that enable scalable battery technologies. Her group addresses critical challenges in fast charging, extreme-temperature operation, energy-efficient manufacturing, and the integration of emerging materials into commercial battery production. Her research has been widely supported by federal agencies and industry partners. Dr. Fang was named to the MIT Technology Review Innovators Under 35 global list and received the MSU Corporate Connector Award in recognition of her extensive collaborations with industrial partners.

**Seminar Host:** Zheng Chen