

DISTINGUISHED SEMINAR SERIES

DECODING MULTIPHASE TRANSPORT PROCESSES: FROM ADDITIVE MANUFACTURING TO THERMAL MANAGEMENT

THURSDAY, APRIL 24TH
10:00AM-11:30AM, POTR 234



YING SUN

BIO: Dr. Ying Sun is the Herman Schneider Professor in Mechanical Engineering and the Director of Research and Strategic Initiatives in the College of Engineering and Applied Science at the University of Cincinnati. She served as Head of the Department of Mechanical & Materials Engineering at UC and Program Director of the Thermal Transport Processes Program at the National Science Foundation. Prior to joining UC, Dr. Sun was the Hess Family Endowed Chair Professor in Mechanical Engineering at Drexel University. Her research interests span multiphase flows and heat/mass transfer, complex fluids and interfacial phenomena, machine learning and data-driven methods, and multi-scale modeling. Dr. Sun is an elected Fellow of APS and ASME and a recipient of the NSF CAREER Award, AFOSR Summer Faculty Fellowship, CNRS Visiting Professorship, and Drexel College of Engineering Research Achievement Award. She serves as an Associate Editor for the Journal of Heat and Mass Transfer and has been a visiting professor at Princeton University, Ecole Polytechnique, and Tsinghua University.

ABSTRACT: The Complex Fluids and Multiphase Transport Laboratory focuses on advancing fundamental thermal-fluid, interfacial, and data sciences, and applying them to enable sustainable manufacturing, effective thermal management, and efficient energy conversion and storage systems. In this talk, I will highlight our combined use of multiscale modeling, experimental techniques, and data-driven approaches to understand transport processes in multiphase systems with fluid flow, heat and mass transfer, phase change, electrochemistry, and pattern formation. Examples of spatiotemporally resolved microscopy and acoustic sensing techniques to probe interfacial instabilities, as well as generalizable unsupervised learning for boiling and condensation will be discussed, aiming to discover new physical insights and enable efficient thermal management solutions and sustainable manufacturing processes.