



**Wednesday, June 28, 2023, 11 am – 12 pm**  
**Klug Memorial Room, Boelter Hall 8500**

**Additive Manufacturing and Scalable  
Nanomanufacturing of Advanced Energy  
and Electronic Systems using Nanoscale  
Building Blocks**

**Yanliang Zhang**

Associate Professor  
Engineering  
University of Notre Dame

**ABSTRACT:** Nanoscale materials are attractive building blocks for a broad range of emerging technologies due to their unique and often superior properties. However, transforming nanoscale materials into macroscale devices and systems while translating their unique properties from nanoscale to macroscale remains a major challenge due to many scientific and technological obstacles. In this talk, I will present our research on developing versatile and synergistic additive manufacturing and scalable nanomanufacturing methods to manufacture and transform a broad range of emerging nanoscale materials into advanced energy and electronic systems in a highly scalable and intelligent manner. I will present our recent research progress on several closely related topics. First, I will present our research on scalable nanomanufacturing to create nanoscale building blocks and printable inks with desired physical property, colloidal stability and printability. Second, I will present our work on developing novel additive, hybrid and autonomous manufacturing methods to fabricate multifunctional and flexible/wearable devices for energy conversion, sensing and health monitoring. Finally, I will introduce innovative photonic synthesis and sintering methods that enable high-throughput and ultrafast processing of printed semiconducting and metallic nanoparticles on delicate and temperature sensitive materials to produce wearable devices and biomedical devices.

**BIO:** Yanliang Zhang is an Associate Professor of Engineering at University of Notre Dame. He received his Ph.D. in Mechanical Engineering from Rensselaer Polytechnic Institute in 2011, and his M.S. and B.S. from Southeast University in 2008 and 2005. His research focuses on additive manufacturing, scalable nanomanufacturing, autonomous and hybrid manufacturing, advanced materials and devices for energy conversion, sensing, and health monitoring. He has received honors including NSF Career Award, Young Investigator Award from International Thermoelectric Society, IBM Fellowship award, and multiple best paper awards at international conferences. He has published papers on top journals including *Nature*, *Nature Materials*, *Energy and Environmental Science*, *Chemical Society Review*, *Advanced Materials*, etc