Abstract: Inkjet is an emerging technology that enables more economic and scalable manufacturing than other additive techniques. This talk will preview a novel nozzle technology that has been developed to overcome the limitations of material choices. Material interface evolution during the material joining process is identified to be critical for the problem of “inferior material properties” and for a fundamental understanding of how materials are combined. A novel metric has been developed to quantify the geometry of the material interface. With the help of this metric, the physics underlying the interface evolution of a single droplet has been examined. A powerful numerical solver based on the Lattice-Boltzmann method has been developed to study more complicated interface evolution. With this foundation, research plans are developed to simulate real-world manufacturing process in order to build the “process-structure-property” relationship for next generation of Computer-Aided Design systems and address the four fundamental challenges mentioned above.

Bio: Wenchao Zhou is currently a postdoc working with Drs. Sudarsanam Suresh Babu and Chad Duty at the University of Tennessee and Oak Ridge National Lab on advanced manufacturing technologies. He is also the Chief Research Engineer of Alpzhi Inc., a Georgia Tech startup company, where he is leading the development and commercialization of a disruptive 3-D printing-based micro-lens fabrication technology under an NSF sponsored Small Business Innovation Research (SBIR) grant. He recently completed his Ph.D. Degree in Mechanical Engineering from Georgia Tech and his Bachelor’s and Master’s degrees in Mechanical Engineering from Huazhong University of Science and Technology and Xi’an Jiaotong University, respectively.