Carbon Nanotube Forests: Growth, Morphology, and Controllable Properties

Dr. Matthew R. Maschmann
Assistant Professor
Department of Mechanical and Aerospace Engineering
University of Missouri
Columbia, MO

Abstract:

Individual carbon nanotubes (CNTs) exhibit remarkable thermal, electrical, and mechanical properties that exceed those of conventional engineering materials. When synthesized in relatively dense and vertically oriented CNT “forests,” these advantageous properties diminish, often by orders of magnitude. This talk will examine the potential of CNT forests as an engineering material and explore tuning mechanically-coupled properties by controlling a forest’s structural morphology. A mesoscale modeling technique will be introduced as a means to analyze spatio-temporal CNT forest growth kinetics and predict ensemble forest properties. Emerging applications and fabrication techniques within the MU Advanced Nanostructures Laboratory will also be discussed.

Bio:

Matt Maschmann is an Assistant Professor in the Mechanical & Aerospace Engineering Department at the University of Missouri (MU). He earned his B.S. and M.S. degrees from MU before earning a Ph.D. in Mechanical Engineering at Purdue University in 2006. After graduating from Purdue he worked as a senior thermal test engineer at Intel Corporation in Chandler, Arizona for three years before working as a research engineer at the Materials & Manufacturing Directorate at the Air Force Research Lab at Wright-Patterson Air Force Base. Matt joined the MAE faculty at MU in the Fall of 2013. His research interests include manufacturing, mechanics, and energy transport at the nanoscale. He was awarded the Ralph A. Powe Award from the Oak Ridge Associated Universities in 2014 and was a recipient of the Air Force Office of Scientific Research Summer Faculty Fellowship in 2015. At Missouri, Matt directs the Advanced Nanostructures Laboratory and teaches undergraduate and graduate courses related to nanoscale energy transport and heat transfer.

This seminar is co-sponsored by the Academy of Mechanical and Aerospace Engineers

Refreshments will be served at 3:15 p.m.