



Scalable Thermal Energy Engineering Technologies

Wednesday, October 10

Mechanical Engineering Building, Room 128

3:30 pm - 4:30 pm

Host: Dr. Geoff Wehmeyer

Shannon Yee, PhD

Assistant Professor of Mechanical Engineering

Georgia Institute of Technology

Abstract:

Dr. Shannon Yee directs the Scalable Thermal Energy Engineering Lab (STEEL) at the Georgia Institute of Technology. The lab focuses on direct thermal energy conversion and thermal transport technologies, translating fundamental science into application. The thermal conversion technologies that STEEL currently focuses on are: (i) polymer-based thermoelectrics, (ii) thermo-electrochemical converters, specifically sodium ion heat engines and redox flow coolers, (iii) mass manufacturable thermoelectric technologies, and (iv) betavoltaic energy converters. The thermal transport technologies that STEEL currently focuses on include optothermal and electrothermal techniques primarily used for in-plane and through-plane polymer thermal conductivity measurements. Dr. Yee also co-directs the Heat Lab, a user facility training graduate students in a suite of thermal property measurement techniques and providing thermal expertise to solve pressing thermal problems facing industry. This overview seminar will provide a high-level introduction to the research topics, discoveries, and technologies coming out of the STEEL and the Heat Lab under Dr. Yee's guidance. Discussion will cover numerous topics based on audience interest. The underlying motivation across these topics stems from global electrification, global cooling, and electrifying transportation. The most popular topics cover: (a) air-stable metal-coordinated n-type polymer thermoelectrics, a best in-class n-type polymer thermoelectrics, (b) thermal transport in amorphous polymers, empirical observations of propagons and diffusons, and (c) thermoelectric and thermo-electrochemical converters, opportunities for improved generator and cooler efficiency.

Biography:

Dr. Shannon Yee is an Assistant Professor of Mechanical Engineering at the Georgia Institute of Technology. He received his Ph.D. from the University of California, Berkeley, and joined Georgia Tech in January of 2014. In 2010, he joined the US Dept. of Energy's Advanced Research Projects Agency for Energy (ARPA-E) during its inaugural year as the first ARPA-E Fellow. Dr. Yee was selected for an AFOSR Young Investigator Award in 2015, and is the recipient of the 2017 ASME Pi-Tau-Sigma Gold Medal award for outstanding contributions to Mechanical Engineering since graduation. He currently holds a visiting scientist position at Lawrence Livermore National Laboratory.