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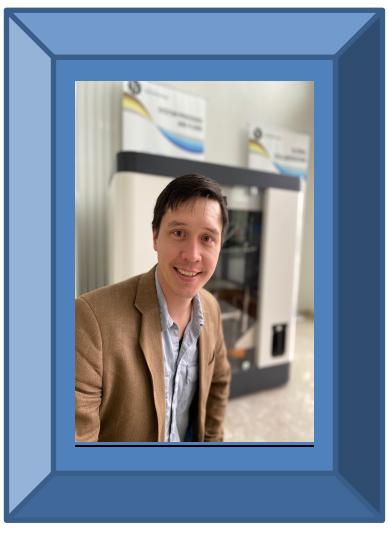

Scalable Thermal Engineering: new thermal energy conversion technologies

Dr. Shannon Yee

Associate Professor at the G.W.W. School of Mechanical Engineering at the Georgia Institute of Technology

Date: Friday, March 17th, 2:00-3:00 PM
Location: SEEC Building, Sievers S228 or Zoom https://cuboulder.zoom.us/j/97004369138

Abstract:

The Scalable Thermal Energy Engineering Laboratory (STEEL) develops thermal energy conversion technologies and thermal transport technologies to address some of the most pressing energy, sustainability, and climate related challenges. The energy transition and climate mitigation strategies both require better utilization of thermal energy, namely in how we heat and cool. Central to heating and cooling are heat pumps and refrigeration technologies, and, with the Kigali amendment to the Montreal protocol, there now exists a need to invent new thermodynamic cycles and processes that have zero-global warming potential (zero-GWP) impact unlike our conventional refrigerant vapor compression technologies. In this talk, Prof. Shannon Yee will discuss how refrigeration, air-conditioning, and heat pumping can now be accomplished through electrochemical thermodynamic cycles, highlighting experimental demonstrations of this new technology. Just as electric vehicles are displacing a mainstay mechanical engineering technology of internal combustion vehicles, electrochemical heat pumps and refrigerators could someday displace another mainstay mechanical engineering technology, air-conditioners and refrigerators. If time allows, Prof. Yee will also talk about the fundamental building blocks of thermal technologies enabled by thermal switches. With new material functionality enables new methods for which we can (up-) convert and manage heat, thereby allowing for the recovery of waste heat and providing better thermal reliability across technology domains. Such efforts bring together chemists, material scientists, and engineers to realize the fundamental components that enable us to unlock new technologies. https://yeelab.gatech.edu/research/

Bio:

Dr. Shannon Yee is an Associate Professor at the G.W.W. School of Mechanical Engineering at the Georgia Institute of Technology. Dr. Yee joined Georgia Tech in 2014 directly from his PhD at the University of California Berkeley. In the midst of his studies, 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 completed his MS in Nuclear Engineering in 2008 and his BS in Mechanical Engineering in 2007, both from The Ohio State University. In 2008, he was awarded a prestigious Hertz Fellowship. In 2015, Dr. Yee was selected for an AFOSR Young Investigator Award to develop polymer thermoelectrics. Dr. Yee is the recipient of the 2017 ASME Pi-Tau-Sigma Gold Medal award for "outstanding contributions to the field of Mechanical Engineering in the first decade of one's career." In 2019, Shannon was selected for an ONR Young Investigator Award to develop polymer thermal switches. Most recently, Dr. Yee is directing the Generation II Reinvent the Toilet (G2RT) program supported by the Bill & Melinda Gates Foundation and was recognized as one of Bill Gate's Heroes in the Field in 2021.

Link to campus map for SEEC Building

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