



MSE Faculty Seminar:

Achieving Enhanced Thermoelectric Performance in Multi-phase Materials

Professor Alex Yan Qingyu

Abstract

Thermoelectric (TE) materials are capable of direct solid state conversion of heat to electricity without moving parts or gas emissions, and show a great potential for increasing energy utilization efficiency and reducing greenhouse gas emissions. Controlling the charge carrier concentration, lattice defects and electronic band structures are very important to enhance the thermoelectric properties of materials. This can be achieved in multi-phased material system. We will show some examples for the enhancing and optimizing the performance of PbX (X= S, Se, Te) based thermoelectric materials by incorporation with other phases. We will also discuss some work on control the crystal orientation of polycrystalline SnSe₂ samples to improve its charge transport behavior and optimize thermoelectric properties. Lastly, we will discuss on study on a new TE material, Sb₂Si₂Te₆ with small amount of Si₂Te₃ secondary phase.

Biography

Qingyu Yan is currently a professor in School of Materials Science and Engineering in Nanyang Technological University. He obtained his BS in Materials Science and Engineering, Nanjing University. He finished his PhD from Materials Science and Engineering Department of State University of New York at Stony Brook. After that, He joined the Materials Science and Engineering Department of Rensselaer Polytechnic Institute as a postdoctoral research associate. He joined School of Materials Science and Engineering of Nanyang Technological University as an assistant professor in early 2008 and became a Professor in 2018.

Wednesday, 27 September 2023 || Time: 2:00 pm – 3:00 pm ||

MSE Meeting Room 1 (N4.1-01-28)

Please register [here](#).

Hosted by: Associate Professor Xue Can