Thermoelectricity enabling the direct conversion between heat and electricity is a sustainable green energy technique for power generation or refrigeration. Enhancing thermoelectric efficiency, evaluated by the figure-of-merit ZT, is a compelling need for achieving wide applications. Compared with bulk analogs, nanostructures provide alternative potentials to tune thermoelectric properties. This Ph.D project employed microwave-assisted solvothermal method to fabricate Bi2Te3-based nanomaterials. Electronic microscopy, infrared spectroscopy, and MATLAB modellings were applied to understand the measured properties. Specifically, atomically-thin Bi2Se3 nanosheets and Te/Bi2Te3 hierarchical nanostructures were synthesized. Owing to the rationally designed nanostructures, and the modified band structures, ZT was enhanced.

Moreover, ternary n-type Bi2Te3-xSex and p-type BixSb2-xTe3 nanoplates were synthesized. Because of the enhanced phonon scattering and band structure engineering, ZT values of the ternary phases were enhanced as well.

Min Hong is a Ph.D candidate under the supervision of Prof. Jin Zou and Dr. Zhi-Gang Chen. His research focuses on developing nanostructured thermoelectric materials, and understanding parameters that determine the thermoelectric properties. His research leads to high-impact publications in Adv. Electron. Mater., Nanoscale, Nano Energy, and ACS Nano.

When
Friday 6 May 2016, 12:00 – 1:00 pm

Where
50-N201
Hawken Engineering Building, St Lucia

School of Mechanical and Mining Engineering

All interested persons are invited to attend. The seminar is free of charge – no RSVP is required.

Enquiries – Contact Kristin Greer (3346 9124)