

MAR16-2015-030145

Abstract for an Invited Paper  
for the MAR16 Meeting of  
the American Physical Society

**Thermal and Electronic Transport in Inorganic and Organic Thermoelectric Materials**

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In this talk, we will first talk about first-principles calculations of phonon and electron transport in inorganic thermoelectric materials. We will start with rocksalt PbTe and PbSe, and move on to wurtzite ZnO. We will emphasize the strategies to reduce the lattice thermal conductivity. Then we apply first-principles calculations to organic thermoelectric materials. The thermoelectric properties of doped polypyrrole (PPy) will be discussed. In addition, we will cover the chain confinement effects observed in amorphous polymer thin films using molecular dynamics simulations, which highlights the fundamental difference in heat conduction between crystalline polymers and amorphous polymers