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**Thermoelectric Energy Conversion with Organic  
Semiconductors**

Organic semiconductors provide the ability to directly manufacture thin film electronics including transistors, light emitting diodes, and solar cells. There has been recent interest in using organic materials as thermoelectrics for conversion of waste heat to electricity and also temperature control. We will discuss our efforts to develop methods to control the thermoelectric properties of semiconducting polymers. In this work, we have used emerging soft X-ray scattering methods and high resolution transmission electron microscopy to reveal structural order in semiconducting polymers to connect nanostructure with macroscopic properties. Using model systems, we have uncovered how the process of electrically doping semiconducting polymers influences their ultimate electrical properties. We will discuss the current state of performance of organic thermoelectrics and prospects for the future.

**Biosketch**

Professor Michael Chabynec is Chair of the Materials Department at the University of California Santa Barbara. He received his Ph.D. in chemistry from Stanford University and was an NIH postdoctoral fellow at Harvard University. He was a Member of Research Staff at (Xerox) PARC prior to joining UCSB in 2008. His research group studies fundamental properties of organic semiconducting materials and thin film inorganic semiconductors with a focus on materials useful for energy conversion. He has authored more than 180 papers across a range of topics and is inventor on more than 40 patents.