

Michigan State University
Science at the Edge
Engineering Seminar

April 14th, 2017

11:30 a.m., Room 1400 Biomedical and Physical Sciences Building
Refreshments served at 11:15 a.m.

Michael Chabynec
Materials Department
University of California Santa Barbara

Energy Conversion with Organic Semiconductors

Abstract

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.

Bio

Professor Michael Chabynec is Associate 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 150 papers across a range of topics and is inventor on more than 40 patents. He is currently an editor of *Journal of Materials Chemistry A*.

For further information please contact Prof. Richard Lunt, Department of Chemical Engineering and Materials Science at
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Persons with disabilities have the right to request and receive reasonable accommodation. Please call the Department of Chemical Engineering and Materials Science at 355-5135 at least one day prior to the seminar; requests received after this date will be met when possible.