

# Joint MRSEC & Materials Chemistry Seminar

## Professor Michael Chabynyc

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### “Organic Electronics: Making Devices with Molecules and Polymers”

Organic semiconductors provide the opportunity for low-cost fabrication of flexible thin film electronics including displays, wearable electronics, and solar cells. Over the last few years, there has been significant progress in improving the performance of organic light emitting diodes, solar cells, and thin film transistors. This success is due to advances in the molecular design of organic semiconductors and in processing methods that control structural order across length scales. Connecting charge transport with structural order requires a combination of methods including X-ray spectroscopy and scattering and high resolution transmission electron microscopy. For example, long-range correlations of conjugated backbones in high carrier mobility polymers observed by TEM and soft X-ray scattering provide a clear connection between morphology and charge transport. We have also investigated the structure of unique domain boundaries in semiconducting polymers driven by epitaxial arrangements caused by the backbone design. Examples of how these structural features affect the performance of devices such as solar cells and transistors will be discussed.

Monday  
November 9

3:30 pm  
Room 1315  
Chemistry



DEPARTMENT OF  
**Chemistry**  
UNIVERSITY OF WISCONSIN-MADISON