



Department of Chemistry and Biochemistry
Physical Chemistry Seminar Series

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Monday, January 14, 2019 ~ 2:00 pm 331 Klamath Hall

Charge transport in conjugated polymers: a multi-scale microstructural problem

Organic semiconductors are an interesting materials family for number of technologies including solar cells, LEDs, transistors and sensors. The fundamental premise of organic semiconductors is that synthetic chemists can generate materials with properties “on demand”. Unfortunately, even if this became a reality, we would not know what to order! Indeed, while organic semiconductors have been around for a while, the preeminent role of the microstructure in governing their properties has often been overlooked.

In this seminar, I will emphasize the role played by structure at different length-scales and how charge transport is a complex multi-scale phenomenon. We use charge-modulated IR spectroscopy to measure the delocalization of charges in crystallites. Correlating carrier mobility to charge delocalization highlights the importance of mesoscale film properties, such as the connectivity of aggregates by tie-chains. This multi-scale approach to understanding charge transport highlights the need to develop appropriate characterization techniques in order to gain a fundamental understanding of the structure-property relationships in this important class of materials.

Refreshments served at 1:45 pm 331 Klamath Hall

Hosted by Cathy Wong