

CORE-CM SEMINAR

Michigan State University

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By Indirections Find Directions Out – Charge Motion in Molecular Assemblies

The molecular state of matter occasionally forms crystals. But the solid state of many molecules is disordered, perhaps even to the extent of becoming a glass. More generally, large organics have trouble accommodating themselves to the periodicity that is required to be crystalline. If the solid material based on molecular identities is to act as a producer of electronic charge and/or a transporter of electronic charge, its interactions with its neighbors are critical. This issue is aggravated when there are several different molecules in the material. This has been explored extensively by physical chemists over the last five decades, in all of its manifestations. In this talk, we will discuss organic materials such as phthalocyanines with large groups on the periphery, fullerenes with alkane or alkene attachments, linear chain molecules and organometallics. All of these form non-crystalline solids, and many of them are used in applications that require transport of charge or ions through the material. We will examine ways in which we can simplify the complexity of the non-crystalline material, and finally come up with an index to describe the nature of the material and its probability of conducting charge. Applications to organic photovoltaics will be stressed.

Thursday, March 3, 2016
12:00 NOON
Room 1400 – Biomedical & Physical Sciences
Professor Ben Levine - Host