

# Physical Chemistry Seminar

Tuesday,  
October 27, 2015

11:00 am

Room 1315  
Chemistry Building

## ***Probing Directional Interactions in Crystalline Organic Semiconductor Nanowires***



Professor Michael D. Barnes

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Host: Randy Goldsmith

One of the fundamental design paradigms in organic photovoltaic (OPV) device engineering holds that charge separation requires diffusion of excitons to an interface. This basic concept has driven an enormous materials science engineering effort focused on construction (for example, by directed self-assembly, or nanoparticle superlattice formation) of n- and p-type domains whose dimensions are commensurate with a nominal exciton diffusion length of  $\approx 10 - 50$  nm. Recently, our group's research has focused on experimental manifestations of strongly directional charge-transfer (CT) interactions in crystalline nanowire assemblies of organic semiconductors, and whether such interactions can be exploited to drive charge-separation along specific crystallographic directions in the crystal without the requirement of a heterojunction interface. In this talk, I will describe some of our experimental approaches to probing directional inter-chromophore coupling in organic nanowire assemblies via optical and conducting probe AFM techniques, and illustrate the prospect for a new OPV design paradigm based on single-crystal donor domains.

Refreshments will be available prior to the seminar at 10:45 a.m. outside room 1315

Graduate Students can meet with the speaker at 1:00 pm in Room 8305F