



THE CHINESE UNIVERSITY OF HONG KONG
Department of Physics
SEMINAR

Visualising Electron and Hole Dynamics in Organic Heterostructures

by

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Date: November 13, 2019 (Wednesday)

Time: 11:15 a.m. - 12:15 p.m.

Place: Rm. G25, Science Centre North Block, CUHK

ALL INTERESTED ARE WELCOME

Abstract

Elucidation of electronic state dynamics in novel nanoscale materials and structures is crucial for understanding their photophysical properties and applications. For instance, understanding how photogenerated electron-hole pairs (excitons) separate into free carriers in organic heterostructures is needed for the development of organic solar cells (OSCs). New material designs have greatly improved OSC efficiencies over the past several years, recently reaching over 16%. However, the fundamental processes underlying such unprecedented performance remain unclear. In this talk, I will present experimental results that shed light on two fundamental questions in OSC research: 1) how can charges overcome their Coulomb interaction without losing energy at the heterojunction, and 2) how can charges avoid losing their energies to spin-triplet exciton states which lie within the bandgap. Based on these results I will discuss strategies to further improve OSC performance. Furthermore, the possibility of applying similar optical methods to study photophysical properties of other nanoscale materials will be discussed.