CHEMISTRY & BIOCHEMISTRY COLLOQUIUM:

Charged Polaritons in Organic Semiconductors

Chris Giebink
Associate Professor, Department of Electrical Engineering
Penn State University

Date:
11/12/2021

Time:
1:30 PM-2:50 PM

Link:
Please contact snsgradstaff@ucmerced.edu for the Zoom information.

About the Speaker:

Chris Giebink is an Associate Professor of Electrical Engineering at Penn State University. He received his Ph.D. in Electrical Engineering from Princeton University and holds undergraduate degrees in both Physics and Engineering Science from Trinity University (TX). His research focuses broadly on optoelectronic and photonic devices based on organic materials, with applications in solar energy conversion, solid-state lighting, lasers, and nonlinear optics. He holds 11 patents and is a senior member of the IEEE, OSA, SPIE, and National Academy of Inventors as well as a recipient of the DARPA YFA, AFOSR YIP, and NSF CAREER awards.

Abstract:

The strong light-matter coupling regime is reached when the matter component of a system (e.g. a molecular excitation) exchanges energy with a photon mode (e.g. in a microcavity) faster than their individual rates of decay and dephasing. The resulting eigenstates are hybrid light/matter quasi-particles termed polaritons, and they are responsible for a variety of spectacular phenomena such as Bose-Einstein condensation and room temperature superfluidity. Polariton modes in organic semiconductor microcavities traditionally derive from singlet exciton states that possess no net charge or spin. This talk will explore the properties and prospects of charged polariton states that originate from coupling to cationic molecular transitions in a heavily p-doped organic semiconductor. In addition to new electric and magnetic properties associated with their net charge and spin, charged polaritons are shown to be a useful platform for exploring cavity-modified photoinduced electron transfer and the mechanisms that underlie it.

For more information, contact : Christine Isborn
cisborn@ucmerced.edu