CHEMISTRY & BIOCHEMISTRY
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DATE	TIME	LOCATION
04/18/2025	01:30pm	COB1 110

CHEMISTRY & BIOCHEMISTRY SEMINAR SERIES:
Short- and Long-Range Excitonic Couplings in Low-Dimensional Molecular Systems

Abstract:

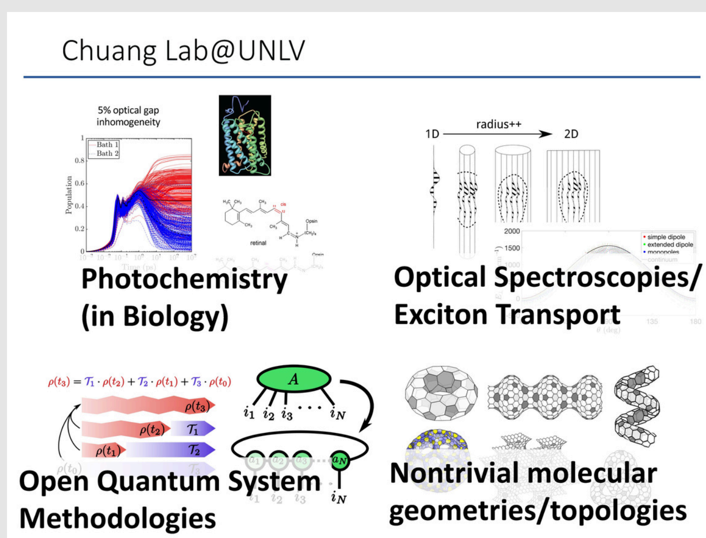
The excitonic properties of molecular systems, spectroscopy and dynamics/transport included, depend critically on the morphology and microscopy packing conditions of the constituent molecules. The tunability of self-assembled molecular systems in terms of their modular nature and sensitivity of thermodynamic conditions is a blessing and a curse at the same time: On the one hand, the vast parametric space allows exotic photophysical properties that find applications from light-harvesting to medical imaging. On the other hand, due to the shallow thermodynamic landscape of self-assembling systems generic guiding principles for parameter-to-structure and structure-to-function relationships are difficult to come by. Here we provide a paradigm-shifting perspective to studying these systems by establishing function dependence and independence between macroscopic observables and microscopic details. This is achieved by correlating short- and long-range excitonic couplings to observables that reflect photophysics of the corresponding wavelengths. Recent results on the spectroscopic response to certain short- and long-wavelength lattice imperfections will also be discussed.

Chern Chuang

Assistant Professor
Department of Chemistry and Biochemistry
University of Nevada, Las Vegas

About the Speaker:

Dr. Chuang received his bachelor and master degrees from the National Taiwan University. He then moved to the US for his PhD degree at the Massachusetts Institute of Technology and to Canada for postdoctoral research at the University of Toronto, before joining the University of Nevada, Las Vegas in 2023 to start his independent research group. His research interests include open quantum system dynamics, microscopy and spectroscopy of excitonic materials, as well as nontrivial geometry and topology in molecular structures.



For more info, contact: Liang Shi, lshi4@ucmerced.edu