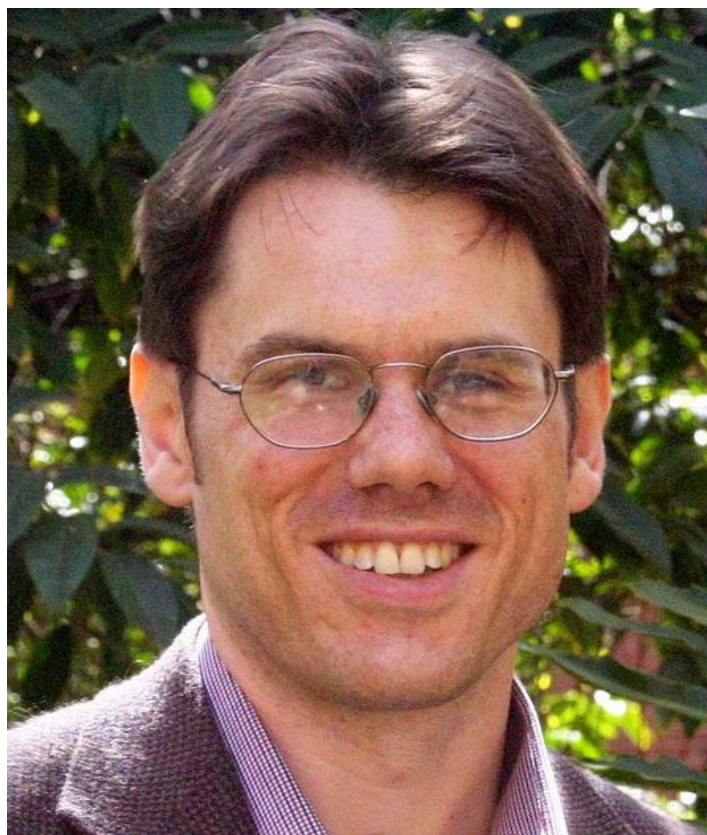


PHYSICAL CHEMISTRY SEMINAR



Prof. Art Bragg

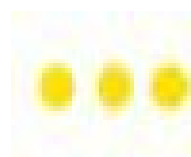
Department of Chemistry
 Johns Hopkins University

Monday, May 1, 2023

4:00 PM | YH 4222

Mani L. Bhaumik Collaboratory -
 Dongwon Yoo Seminar & Conference Hall

Structure-tuned Exciton Dynamics in Peptide and Electrolyte-scaffolded Molecular Assemblies



Abstract: Electrostatic interactions and hydrogen bonding present means for driving supramolecular assembly of organic chromophores in aqueous environments and controlling the microstructures of resultant assemblies for light-harvesting applications. We present our recent studies of the microstructure-dependence of exciton migration and electron transfer in two classes of supramolecular assemblies: 1) complexes of conjugated polyelectrolytes with electrolytic small-molecule electron acceptors; 2) assemblies of peptide-functionalized perylene diimide. For the former, we have determined that acceptor:donor stoichiometry and compatible head-group separations in donors and acceptors can be used to control the dominant exciton coupling of a polythiophene donor, with significant impacts on potential for long-range charge separation and recombination. For the later, we demonstrate control of energy transfer by using peptide interactions to control exchange interactions of neighboring sites and thereby tune the exciton diffusion constant along molecular stacks. We discuss potential uses of peptide-driven assembly to control inter-chromophore interactions.