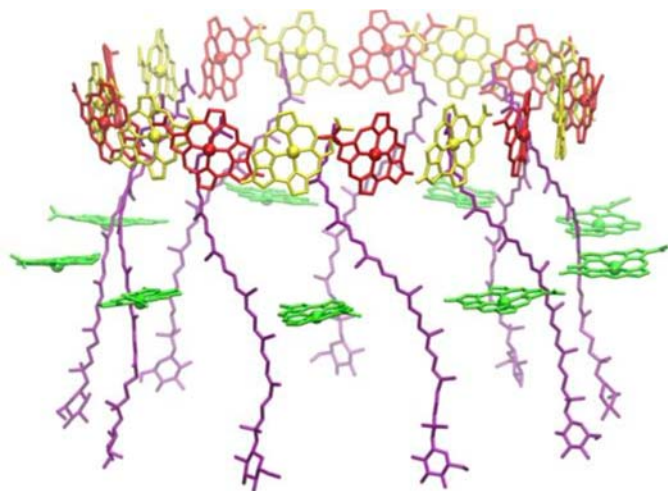


# PHYSICAL SEMINAR

**Title: “Delocalized Excitons in Light Harvesting Complexes: What are design principles for efficient and robust energy collection?”**



**Guest Speaker:**  
**Professor Seogjoo J. Jang**  
Queens College  
Department of  
Chemistry and Biochemistry

**Monday, November 11**  
**4:00 PM**  
**473 Hutchison Hall**  
**Department of Chemistry**

**Abstract:** Natural organisms such as photosynthetic bacteria, algae, and plants employ complex molecular machinery to convert solar energy into biochemical fuel. An important common feature shared by most of these photosynthetic organisms is that they capture photons in the form of excitons typically delocalized over a few to tens of pigment molecules embedded in protein environments of light harvesting complexes (LHCs). Delocalized excitons created in such LHCs remain well protected despite being swayed by environmental fluctuations, and are delivered successfully to their destinations over hundred nanometer scale distances in about hundred picosecond time scales. Despite decades of research, key design principles enabling their superb light harvesting capability are not yet clearly understood at present. I will provide a brief overview of recent findings on three major LHCs, Fenna-Matthews-Olson complex of green sulfur bacteria, light harvesting 2 (LH2) complex of purple bacteria, and phycobiliproteins of cryptophyte algae, and assesses their implications in the context of achieving excellent light harvesting functionality. Then, I will explain our ongoing efforts to model the spectroscopy and the exciton dynamics of LH2 complexes. These results provide new insights into how natural systems control negative effects of disorder through interplay of structural factors, hydrogen bonding, and quantum mechanical delocalization. .

Host: Professor Ignacio Franco - email: [Ignacio.franco@rochester.edu](mailto:Ignacio.franco@rochester.edu)