

## **Spectral signatures of coherent dynamics in organic materials**

Lately, organic molecular aggregates have attracted considerable attention as possible functional components in photovoltaic devices. A pertinent question is how electronic excitation energy moves through these inherently soft and disordered materials. Several studies suggested that quantum coherence plays a crucial role in excitation mobility, as it enhances the transfer efficiency by minimizing losses. This talk will address the signatures of coherent dynamics in nonlinear spectral measurements. Most recent reports of coherence relied on beating transients appearing in two-dimensional electronic spectroscopy. However, for this experimental technique the interpretation of measurements is far from trivial. Through a combined theoretical and experimental approach, we demonstrate for a simple molecular dimer how two-dimensional spectral transients of electronic coherence overlap with those of nuclear degrees of freedom, and how specific information on electronic coherence can still be extracted. Furthermore, we suggest ultra-fast fluorescence spectroscopy as a powerful complementary technique that allows for studying electronic coherence free from nuclear signals.