Coherent Quantum Dynamics in Atomically Thin Semiconductors: excitons, trions and valley pseudospins

The near band-edge optical response of atomically thin transitional metal dichalcogenides (TMDs) is dominated by tightly-bound excitons and charged excitons (i.e. trions). A fundamental property of these quasiparticles (excitons and trions) is dephasing time, which reflects irreversible quantum dissipation arising from system (excitons and trions) and bath (vacuum and other quasiparticles) interactions. Using a powerful coherent spectroscopy method known as the two-dimensional Fourier transform spectroscopy, we investigate the ultrafast coherent dynamics of excitons, trions, and valley pseudo-spins in these monolayer semiconductors. These experiments shine new light on the relevant time scales over which these quasiparticles and pseudospins can be coherently manipulated.

Tuesday, February 14, 2017
4:00 pm
Room 334 JFB