



Special seminar

Wednesday, February 26, 2025

4:00 pm

WSI, Seminar room S 101

Exclusively in person

“Excitonic landscape in layered semiconductors”

The optical properties of low-dimensional semiconductor nanostructures are often governed by excitons – quasi-particles formed by a photo-generated electron and hole bound together by Coulomb attraction. Here I will explore the excitonic landscape in 2D semiconductors, and van der Waals heterostructures, where excitonic effect are strongly enhanced. One prominent example is the 2D Ruddlesden–Popper metal-halide perovskites (2DP), where the soft, polar, and low-symmetry lattice creates a unique environment for electron-hole interactions. I will also demonstrate that the van der Waals nature of 2DP allows for easy integration with other 2D materials, particularly transition metal dichalcogenides. Finally, I will discuss the excitonic properties in homo-bilayer transition metal dichalcogenides where the interaction between two dipolar excitons with opposite dipole moments can lead to the formation of a new type of interlayer exciton, namely a quadrupolar exciton.

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