

Future PhD activities – MAP-Fis

Currently, work is being done in the study of excitons in multilayer materials with the Bethe-Salpeter equation. The optical properties of these excitons will be studied, namely their optical conductivity and absorption, together with their tunability via external bias potentials.

Following from this, we will study excitons in twisted bilayer systems and the effects of the twist angle in the optical properties of the excitonic systems.

Afterwards, we will study valley coherent states and their optical creation and manipulation, alongside the coupling of the spin and valley degrees of freedom, as these are highly relevant for quantum computing. The Stark effect and ionization rate of vdW heterostructures, highly relevant in the creation of valley coherent states, will also be computed.

In the final year, a stay abroad at University of Aalborg, Denmark to work directly with professor Thomas G. Pedersen is planned.

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