



IMPRS UFAST Call for PhD applications 2020/2021



Coherent and non-coherent dynamics of excited states in 2D materials

G. Bester

Title of PhD Project	Coherent and non-coherent dynamics of excited states in 2D materials
Type	Theory
Supervisor(s)	Prof. Gabriel Bester Dr. Abderrezak Torche
Affiliation(s):	UHH
Number of positions:	1
Abstract:	<p>The aim of the project is to study the dynamics of photo excited states in 2D materials. Of special interest will be the investigation of 2D transition metals dichalcogenides as these materials show strong light mater interaction together with a locked spin-valley dynamic as well as black phosphorus which has interesting anisotropic properties. The project consists in the further development of a suitable theoretical ab-initio framework to address the questions of coherent and incoherent dynamics, the role of phonons, and the spin and valley lifetimes. The work will be based on our newly developed ab-initio approach to (static) optical excitations in 2D systems [1] and be combined with our codes able to calculate efficiently electron-phonon coupling for large nanostructures.</p> <p>Reference:</p> <p>[1] Torche, A., & Bester, G. (2019). First-principles many-body theory for charged and neutral excitations: Trion fine structure splitting in transition metal dichalcogenides. <i>Physical Review B</i>, 100, 201403.</p>
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