Max-Planck-Institut für
Struktur und Dynamik der Materie
Max Planck Institute for the Structure and Dynamics of Matter

IMPRS UFAST Call for PhD applications 2022/2023

GB1- Non-equilibrium dynamics in metallic and semiconducting nanoparticles

Title of PhD Project	**Non-equilibrium dynamics in metallic and semiconducting nanoparticles**
Type	Theory
Supervisor(s)	Prof. Gabriel Bester
Affiliation(s):	UHH
Number of positions:	1
Abstract:	Semiconducting and metallic nanostructures can be excited by femtosecond laser pulses, and due to the relatively strong coupling between the optical excitation (exciton) and the lattice vibrations, the system is not only electronically, but also vibrationally excited. These lattice vibrations (coherent phonons) can be detected experimentally from X-ray spectroscopy. The work will involve density functional theory (DFT) calculations of realistic nanostructures, coupled to a screened configuration interaction approach for the excitonic properties. While the work is based on existing methodologies, a code development aspect could be included if desired, with the goal to couple the results to a real time evolution at the level of empirical models. A comparison to experiments performed on-site is intended.
Contact person for scientific questions about the project:	Gabriel Bester: gabriel.bester@uni-hamburg.de