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 2023/2024

NH1- Studying photocatalytic pathways in molecular and solid-state systems with ultrafast lasers

Title of PhD Project	**Studying photocatalytic pathways in molecular and solid-state systems with ultrafast lasers**
Type	Experimental
Supervisor(s)	Prof. Nils Huse
Affiliation(s):	UHH
Number of positions:	1
Abstract:	Chemical reactions and phase transitions in matter can be initiated ultrashort electromagnetic pulses. We study these crucial processes in nanocrystalline solids and molecules with femtosecond X-ray, optical and infrared/THz spectroscopy to unravel (competing) quantum pathways on the natural timescale on which matter transforms. We use state-of-the-art techniques and partner with international groups to study catalytic systems with emphasis on fundamental research and method development. The project will make use of X-ray and optical lasers for probing small molecular systems and nanoparticles. Ultrafast in-house laser labs require basic understanding of optics and lasers as well as quantum mechanics and/or quantum chemistry. Measurement campaigns (beamtimes) at large-scale user facilities such as X-ray lasers in Hamburg, Switzerland, Korea and California will also be part of the project which is international and interdisciplinary in character.
Contact person for scientific questions about the project:	Prof. Nils Huse: nils.huse@uni-hamburg.de