

# 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



**NH1- Ultrafast spectroscopy of molecular and nanoscopic systems in non-equilibrium states**

<b>Title of PhD Project</b>	<b>Ultrafast spectroscopy of molecular and nanoscopic systems in non-equilibrium states</b>
<b>Type</b>	Experimental
<b>Supervisor(s)</b>	Prof. Nils Huse
<b>Affiliation(s):</b>	UHH
<b>Number of positions:</b>	1
<b>Abstract:</b>	<p>Chemical reactions and phase transitions in matter can be initiated ultrashort electromagnetic pulses. We study such processes nanocrystalline solids and molecules with femtosecond X-ray, UV, visible and infrared spectroscopy to unravel (competing) quantum pathways on the natural timescale on which matter transforms.</p> <p>We use state-of-the-art techniques and partner with leading international groups to study catalytic systems with emphasis on fundamental research and method development.</p> <p>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.</p>
<b>Contact person for scientific questions about the project:</b>	Nils Huse, <a href="mailto:nils.huse@uni-hamburg.de">nils.huse@uni-hamburg.de</a>

