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

IMPRS ULTRAFAST IMAGING & STRUCTURAL DYNAMICS

IMPRS UFAST Call for PhD applications 2021/2022

Transport signatures and cavity control of non-Hermitian topology
M.Sentef-2

Title of PhD Project	**Transport signatures and cavity control of non-Hermitian topology**
Type	Theory
Supervisor(s)	Dr. Michael Sentef, Prof. Dante Kennes
Affiliation(s):	Max Planck Institute for the Structure and Dynamics of Matter RWTH Aachen University
Number of positions:	2
Abstract:	Non-Hermitian systems can host topological states without Hermitian analogs, since the complex-valued spectra can host two different types of energy gaps (point and line gaps). This has consequences for instance for the anomalous localization of an extensive number of eigenstates at boundaries, the non-Hermitian skin effect. In this project, the PhD candidates will investigate whether and how non-Hermitian topology impacts the linear and non-linear transport behavior, and how the corresponding topological invariants could thus be measured experimentally. In a second step, the PhD candidates will investigate the question how a non-Hermitian Hamiltonian can be engineered by coupling a material to a cavity with gain and loss and whether the effects are robust to adding interactions.
Contact person for scientific questions about the project:	Micheal Sentef: michael.sentef@mpsd.mpg.de Dante Kennes: dante.kennes@rwth-aachen.de