



e-conversion



Seminarankündigung

**Dienstag, 3. November 2020
13:00 Uhr**

ONLINE via ZOOM

“Exciton diffusion in 2D materials and hybrid perovskites”

Transport of optical excitations in semiconducting solids plays a central role from both fundamental and technological perspectives. In systems with strong Coulomb interaction the propagation of optically injected carriers is dominated by excitons instead of free electrons or holes. This can affect both the overall energy landscape and the interactions with vibrational modes, with a strong impact on the mobility of the excitations.

Here, I will present recent studies of exciton diffusion in semiconducting van der Waals monolayers and hybrid two-dimensional materials, directly monitored via time-resolved optical microscopy. I will discuss linear and non-linear phenomena arising from efficient interactions as well as illustrate intriguing temperature-dependent dynamics revealing distinct regimes of exciton propagation. Particular focus will be placed on the impact of efficient coupling to vibrational modes and the influence of disorder from local fluctuations of the dielectric environment. Finally, I will discuss the interplay between free carriers and excitons at room temperature conditions and the limits of semi-classical description for exciton transport, with an outlook towards future directions.

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