SFB1242

SFB 1242 Nichtgleichgewichtsdynamik kondensierter Materie in der Zeitdomäne

UNIVERSITÄT DUISBURG ESSEN

Open-Minded

**20.04.2021 / 10 Uhr c.t.**

# Carrier capture dynamics in monolayers of transition metal dichalcogenides


## Jun.-Prof. Dr. Doris Reiter

Universität Münster



Monolayers of transition metal dichalcogenides (TMDCs) are two-dimensional semiconductors with strong electron-electron and electron-phonon interaction. Due to their unique properties, they have attracted much attention in recent years. While they are true two-dimensional electronic systems, they can also host zero-dimensional potentials, which can be formed via strain deformation or in so-called nanobubbles. The question arises, how the carrier dynamics reacts when the carriers impinge on such a potential.

Theoretical approaches to describe the carrier dynamics can become rather involved due to dimensionality and inhomogeneity. Quantum kinetic calculations show that the carrier capture process happens locally and that non-trivial spatiotemporal dynamics are induced by the capture. The locality of the capture process is crucial, because the 2D dimensionality opens up possibilities to exploit spatial selection rules.

This talk will focus on the carrier capture dynamics in a TMDC monolayer with an embedded potential. Considering a wave packet impinging on the potential, we show that different dynamics can build up depending on the excitation conditions. The dynamics can also be controlled by using several wave packets. Furthermore, we look at the excitonic dynamics and discuss the influence of phonons on the capture process giving insight into the physics of these fascinating materials.


Für diese Zeit steht eine Kinderbetreuung nach vorheriger Anmeldung zur Verfügung.


Contact: Prof. Dr. Björn Sothmann, Faculty of Physics
Phone: +49 (203) 37-91578 / Mail: bjoerns@thp.uni-due.de