SFB1242

SFB 1242 Nichtgleichgewichtsdynamik kondensierter Materie in der Zeitdomäne

UNIVERSITÄT DUISBURG ESSEN

Open-Minded

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Generating atomistic quantum emitters in 2D materials

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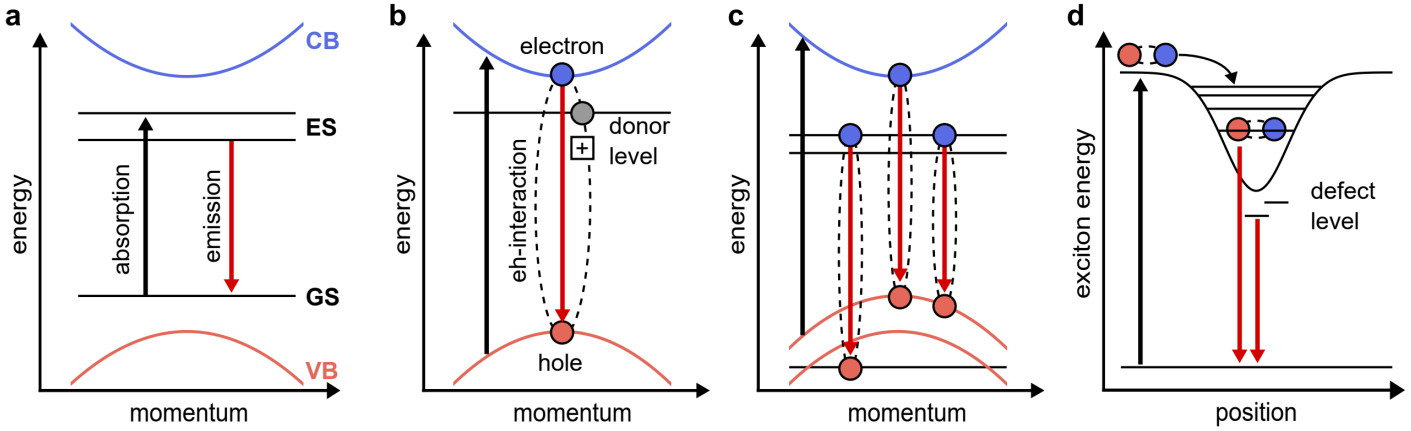
We highlight recent advances in the controlled creation of single-photon emitters in van der Waals materials and in the understanding of their atomistic origin (Figure and [1]). A particular emphasis will be put on the optical properties of quantum emitters in MoS2 as produced by the help of a focused beam of helium-ions.



Classification of quantum emitters in 2D materials. **a** Color centers derived from deep in-gap states with ground state (GS) and multiple excited states (ES). The color center is directly addressable in absorption or emission. **b** Shallow donors or acceptors states localize excitons into bound complexes by mutual electron-hole interactions. **c** Defect-localized excitons can hybridize both to deep in-gap states and to shallow extended band states. **d** Local strains or moiré potentials trap excitons. Point defects may facilitate radiative recombination and single-photon emission. Adapted from [1].

[1] Creation and Microscopic Origins of Single-Photon Emitters in Transition Metal Dichalcogenides and Hexagonal Boron Nitride, A. Carbone, D.-P. Bendixen-Fernex de Mongex, A.V. Krasheninnikov, M. Wubs, A. Huck, T.W. Hansen, A.W. Holleitner, N. Stenger, and C. Kastl, Appl. Rev. Mat. **12** (3) (2025).

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

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