

Physikalisches Kolloquium

Prof. Aleksandra Radenovic

Laboratory of Nanoscale Biology, EPFL Lausanne

Nanoscopy of 2D materials

In this talk, I will detail our strategy on how to translate nanoscopy techniques into the field of materials science. We have developed and applied different modalities of nanoscopy techniques that provide unique insights about the type and density of defects together with the spectral characterization at locations determined with nanometre-scale precision. We focus on defects hosted in two classes of 2D materials: hexagonal boron nitride (h-BN) and transition metal dichalcogenides (TMDs), such as MoS₂, WS₂, MoSe₂, WSe₂, and MoTe₂. Defects hosted in 2D materials such as h-BN and TMDs are particularly interesting due to their single photon emission. SP emitters are stable concerning transfer onto other substrates, opening the possibility of integrating them into more complex nanophotonic devices and paving the way for future semiconductor quantum information processing technologies.

Transmission electron microscopy and scanning probe microscopy can provide atomic resolution. However, both techniques require strict sample preparation protocols and are not optimal for fast in-situ operation or applications requiring the characterization of large areas. In contrast, Nanoscopy can operate in-situ under ambient conditions and is compatible with the probing of defect chemistry and dynamics in different pH environments and under different solvents. We also demonstrated high-content characterization of 2D materials using silicon nitride waveguides as imaging platforms that allow integration of more complex nanophotonic circuits.

Montag, 08.04.2019, 16:15 Uhr

Ort: Hörsaal 5