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# Seminar über Quanten-, Atom- und Neutronenphysik (QUANTUM)

Nov. 25, 2021 at 2 p.m.  
None

Dr. Sarah Skoff  
Technische Universität Wien

## **Quantum optics with solid-state quantum emitters and waveguides**

Since quantum technology is becoming advanced, new ways are sought to make miniature systems for quantum networks and sensing. Solid-state quantum emitters have therefore moved into focus as they lend themselves for integration into nanophotonic platforms and come in a variety of forms and with a variety of different level structures. Here, I want to present two different kinds of solid-state platforms, single molecules in solids and quantum emitters in 2D materials. I will present measurements on coupling these quantum emitters to waveguides, in particular optical nanofibers. These are waveguides that are naturally integrated with optical fibers and enhance the light-matter interaction by their strong transverse confinement of the guided light field. I will also show how the light-matter interaction can be further increased by employing fiber-based cavities. These cavities have been shown to work equally well at room temperature and cryogenic temperatures, where the latter is still most often a requirement for solid-state system due to the phonons from the host material. However due to the 2D nature of the host material, quantum emitters in 2D hexagonal Boron nitride may provide a platform for quantum technology that could also operate at room temperature and I will give an overview of recent measurements with these emitters and give an outlook of our endeavour to bring solid-state quantum optics to a room temperature environment.

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