



# PADERBORN PHOTONICS LECTURE

WEDNESDAY, FEBRUARY 15TH, 2023

## PROF. DR. CHRISTIAN SCHNEIDER

UPB | LECTURE HALL A.3 | 16:00 H

**Coupling Excitons in atomically thin crystals  
with widely tunable open cavities:**

**A versatile platform for quantum- and topological photonics**

Monolayer transition metal dichalcogenides (TMDC) have emerged as a new and interesting platform for studies of tightly bound exciton in ultimately thin materials. Their giant dipole coupling to optical fields makes them very appealing for implementing novel photonic devices, and for fundamental, as well as quantum photonic investigations in the framework of cavity quantum electrodynamics [1].

I will discuss implementations of open optical cavities, which are ideally suited for the study of exciton-polaritons using TMDC monolayers, for implementing widely tunable photonic lattices [2] of nontrivial topology, and finally for deterministic coupling of single quantum emitters enabling the implementation of high-performance single photon sources [3].



Prof. Dr. Christian Schneider (Foto: Daniel Schmidt)

#### References

- [1] C. Schneider et al. Nature Comm. 9, 2695 (2018).
- [2] L. Lackner et al. Nature comm. 12, 4933 (2021).
- [3] H. Shan, V. Mitryakhin et al. Under Prep. (2022).