UNIVERSITÄT PADERBORN
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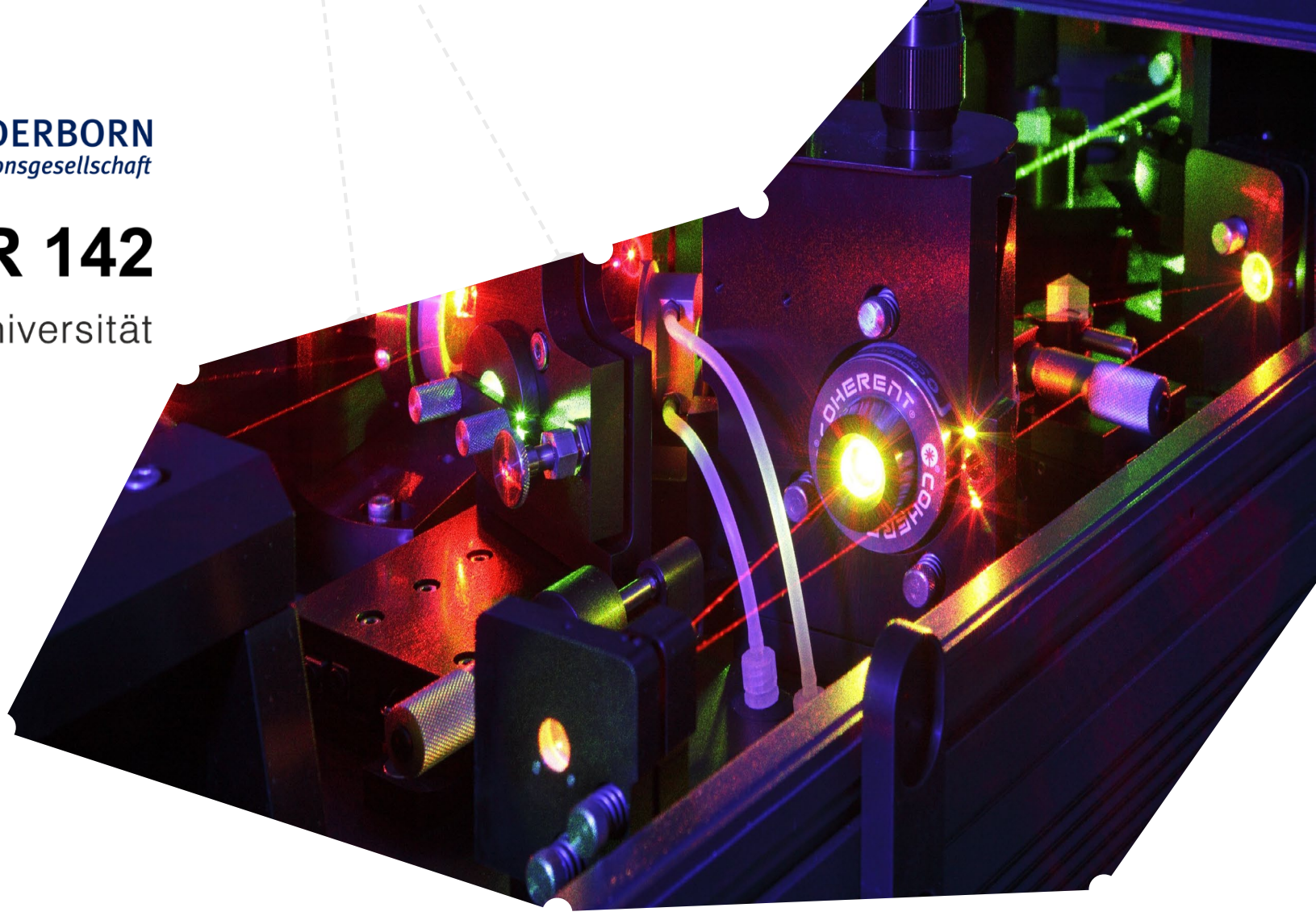

PADERBORN PHOTONICS LECTURE

WEDNESDAY, MAY 31ST 2023 | 16:00 H

PROF. DR. BRIAN GERADOT

LECTURE HALL A.2

Moiré Quantum Materials

The unique physical properties of two-dimensional materials, combined with the ability to stack unlimited combinations of atomic layers with arbitrary crystal angle, has unlocked a new paradigm in designer quantum materials. For example, when two different monolayers are brought into contact to form a heterobilayer, the electronic interaction between the two layers results in a spatially periodic potential-energy landscape: the moiré superlattice. The moiré superlattice can create flat bands and quench the kinetic energy of electrons, giving rise to strongly correlated electron systems. Further, single particle wave packets can be trapped in the moiré potential pockets with three-fold symmetry to form ‘quantum dots’ which can emit single photons. Here I will introduce and discuss the physics of moiré superlattices made by stacking two layers of transition metal dichalcogenide semiconductors together with a slight twist, with a focus on strongly correlated electronic systems and quantum dots.

Prof. Dr. Brian Geradot,
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