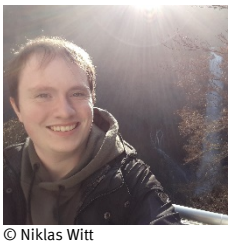
WWU MÜNSTER

**Aktuelle Fragen der Nanophysik**

**Montag, 31.05.2021 um 15:15 Uhr**
**Online Seminar**

# Doping fingerprints of spin and lattice fluctuations in moiré superlattice systems


© Niklas Witt


## Niklas Witt
**Universität Bremen**
**Institut für Theoretische Physik (ITP)**



Twisted van der Waals materials open up novel avenues to control electronic correlation and topological effects. These systems contain the unprecedented possibility to precisely tune strong correlations, topology, magnetism, nematicity, and superconductivity with an external non-invasive electrostatic doping. By doing so, rich phase diagrams can be explored and the nature of the different states and how they interplay with each other could be unveiled. The nature of the superconducting order presents a recurring overarching open question in this context.

In this talk, we quantitatively asses the case of spin-fluctuation-mediated pairing for Γ-valley twisted transition metal dichalcogenide homobilayers. We construct a low-energy honeycomb model on which basis we self-consistently and dynamically determine a doping dependent phase diagram for the superconducting transition temperature $T_c$. A superconducting dome emerges with a maximal $T_c$ of 0.1 - 1 K depending on twist-angle. We qualitatively compare our results with conventional phonon-mediated superconductivity and discern clear fingerprints which are detectable by doping- and twist-dependent measurements of the superconducting transition temperature.