SEMINAR ANNOUNCEMENT

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Electronic transport in twisted van der Waals 2D materials

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Abstract

The discovery of monolayer gaphene in 2004 using mechanical exfoliation led to the era of 2D materials. Subsequent nanotechnological developments making use of the weak van der Waals interaction, particularly the so-called tear-and-twist technique, eventually led to the recently emerging field of twistronics, where different types of superlattices are formed by stacking atomic layers of 2D materials on top of each other, whether twisted or untwisted, homogeneous or heterogeneous. In this talk, recent transport experiments and simulations for graphene systems are briefly reviewed, including various combinations of graphene (Gr) and hexagonal boron nitride (hBN): Gr/hBN [1], hBN/Gr/hBN [2], Gr/Gr [3], and Gr/hBN/hBN. At the end of the talk, recent work on twisted MoS2 systems based solely on our theoretical calculations will also be shown, pointing the experimentalists to possible new challenges.

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[1] R. Kraft et al., Phys. Rev. Lett. 125, 217701 (2020).
[2] L. Wang et al., Nano Lett. 19, 2371 (2019).
[3] A. Mreńca-Kolasińska et al., 2D Mater. 9, 025013 (2022).

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