Poster-1-15

Moiré magnetism in CrBr3 multilayers emerging from differential strain

Fengrui Yao,[1,2] Dario Rossi,[1,2] Ivo Gabrovski,[1,2] Volodymyr Multian,[1,2] Marco Gibertini,[3] Ignacio Gutiérrez-Lezama,[1,2] Louk Rademaker,[1,2] and Alberto F. Morpurgo[1,2]

[1] *Department of Quantum Matter Physics, University of Geneva, 24 Quai Ernest Ansermet, CH-1211 Geneva, Switzerland*

[2] *Department of Applied Physics, University of Geneva, 24 Quai Ernest Ansermet, CH-1211 Geneva, Switzerland*

[3] *Dipartimento di Scienze Fisiche, Informatiche e Matematiche, University of Modena and Reggio Emilia, IT-41125, Modena, Italy*

Interfaces between twisted 2D materials host a wealth of physical phenomena originating from the long-scale periodicity associated with the resulting moiré structure. Besides twisting, an alternative route to create structures with comparably long -or even longer- periodicities is inducing a differential strain gradient between adjacent layers in a van der Waals (vdW) material. Despite recent theoretical efforts analyzing its benefits, this route has not yet been implemented experimentally. Here we report evidence for the simultaneous presence of ferromagnetic and antiferromagnetic regions in CrBr3 -a hallmark of moiré magnetism- from the observation of an unexpected, low-temperature magnetoconductance in CrBr3 tunnel barriers with ferromagnetic Fe3GeTe2 and graphene electrodes. We attribute the phenomenon to the presence of a strain gradient in the CrBr3 multilayer, which locally modifies the stacking and the interlayer exchange between adjacent CrBr3 layers, resulting in spatially modulated spin textures. Our conclusions indicate that inducing differential strain in vdW multilayers is a viable strategy to create moiré-like superlattices, which may offer in-situ continuous tunability in the future.