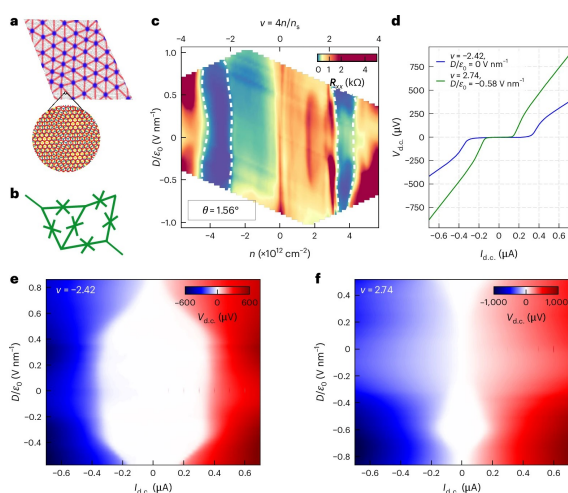


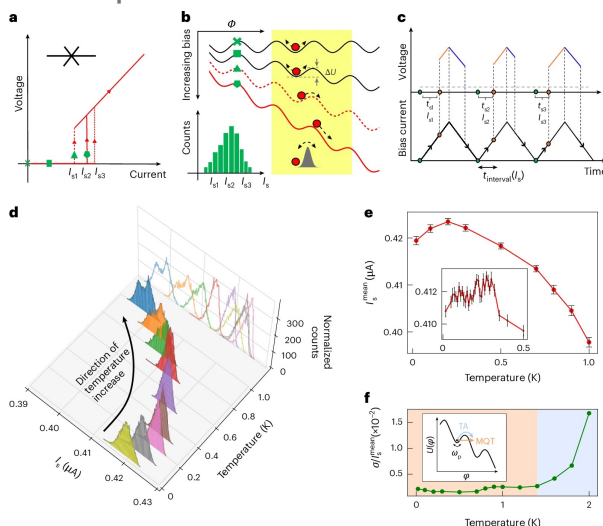
Magic-angle twisted trilayer graphene (MATTG): Inhomogeneous twisted superconductor shows magnetic order

Ms Ayshi Mukherjee
(DCMPMS, TIFR Mumbai)

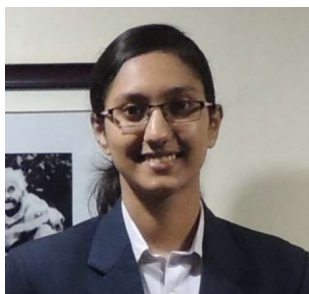
Twisted graphene systems form an exciting platform to study the effects of strong electronic correlations arising due to flat bands. Members of the twisted graphene family exhibit unconventional superconductivity, the origin of which largely remains elusive. In our experiments, we observe evidence of MATTG being an inhomogeneous superconductor creating weak links that behave like an array of Josephson junctions. We gather large statistics on the switching from the superconducting to the normal state - the switching distributions. These distributions are studied with the variation of temperature and in-plane magnetic field providing evidence of a competing magnetic order in the ground state. We observe additional evidence for magnetic order in hysteresis and magnetoresistance with in-plane magnetic field, in normal regions doped slightly away from the superconducting pockets. Also, our DC I-V characteristics, on analysis, reveal a broadened BKT transition as we extract the superfluid stiffness in MATTG superconductor.



Superconductivity in MATTG.



Switching statistics with temperature suggests inhomogeneities and competing order.



Ayshi Mukherjee is currently pursuing her PhD research in the Nanoelectronics lab, which is led by Prof. Mandar Deshmukh at DCMPMS, TIFR Mumbai. Before joining TIFR in 2020, she earned her bachelor's degree in physics from St. Xavier's College in Kolkata. In the Nanoelectronics lab, she primarily focuses on studying superconductors in twisted graphene systems and aims to understand how such exotic phases emerge in these materials.

In addition to her research, she also participates in science outreach activities at TIFR, with a keen interest in gender advocacy in STEM. She has been tutoring various courses at Vigyaan Vidhushi.

July 4 at
4 pm

Lecture Theatre AG66, TIFR
YouTube Live: tinyurl.com/AsetAyshi

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