

Novel physics in twisted systems.

Geliang Yu ¹

¹ Nanjing University, Nanjing, China

*email: yugeliang@163.com

Abstract

Twisted systems, starting with twisted bilayer graphene, have emerged as one of the most fascinating platforms in condensed matter physics with a wide range of potential applications. These systems exhibit an array of novel properties including correlated insulating states, magnetism, and superconductivity. By manipulating the twist angle between the layers, the electronic properties of the system can be precisely tuned. Beyond twisted bilayer graphene, such as graphene/hBN superlattice, twisted monolayer-bilayer graphene, twisted double bilayer graphene and alternating twisted graphene have also demonstrated many unique correlated phase diagrams and band topology. These systems provide a distinctive platform for investigating correlation phenomena and have potential applications in fields such as electronics and quantum computing. Continued research into twisted graphene systems is anticipated to yield many exciting discoveries and advancements.

[1] Strongly coupled magneto-exciton condensates in large-angle twisted double bilayer graphene, Nature Communications 15 (1), 5065, 2024

[2] Ferroelectricity in twisted double bilayer graphene, 2D Materials 11 (2), 025015, 2024.