**Emergent quantum phenomena in twisted MoTe2**

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Two-dimensional moiré systems provide an exceptional platform for exploring novel quantum phenomena driven by the interplay of strong electronic correlations and nontrivial band topology. A notable example is the recent observation of fractional Chern insulators at zero magnetic field (i.e. fractional quantum anomalous Hall effects) in moiré Chern bands. It opens new avenues for further exploring a variety of many-body quantum phases at zero magnetic field within a lattice system. In this talk, I will present our recent experimental results in twisted bilayer MoTe2. We revealed the subtle competition between fractional Chern insulators, superconductivity, reentrant quantum anomalous Hall solids, and other interaction-driven quantum states in twisted MoTe2. Our findings expand the understanding of emergent quantum phenomena in moiré Chern bands.