

Mott transition and superconductivity in twisted WSe₂

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Semiconductor moiré materials provide a highly tunable platform for the study of correlation physics. In this talk, I will discuss the emergence of superconductivity near Mott transition and the nature of Mott insulating states in moiré WSe₂ bilayers in the regime of intermediate interaction strength. We observe an abrupt quantum phase transition between two distinct Mott insulating states as a function of perpendicular displacement field at half-band filling. The transition is understood as being driven by field-tuned electron spin rotational symmetry. At low displacement field, a strongly correlated metal, exhibiting a large local moment response, emerges from a non-magnetic Mott insulator, which eventually develops superconductivity at low temperature.