

Molecular Quantum Materials: A Workbench for Novel Electronic States

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Organic charge transfer salts and radical cation salts have been in the focus of worldwide research efforts for decades due to their low-dimensional metallic and even superconducting properties. More recently, organic conductors, such as the BEDT-TTF compounds, are recognized as versatile molecular quantum materials, which exhibit numerous interesting and unprecedented properties. The focus of interest shifted towards novel electronic properties that are related to their anisotropic electronic structure, strong electron-electron correlations, frustration and disorder.

Here we will focus on one particular compound, κ -(BEDT-TTF)₂Cu₂(CN)₃, and report on our recent investigations of several fundamental problems: electronic Mott transition, quantum spin liquid state, spinon contributions, Fermi-liquid state, valence bond solid, just to name a few.

