

Interplay of electronic orders in kagome metals

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The family of Kagome metals AV_3Sb_5 with $A = K, Rb, Cs$ has attracted a lot of attention recently for the wealth of exotic phases its members exhibit. In particular, all three members enter a charge-density-wave phase at ~ 100 K and below a critical temperature of ~ 2 K, they become superconducting. While experimental results agree on an in-plane 2×2 reconstruction due to the charge density wave, the out-of-plane wave vector and exact nature of the ordered phase, specifically whether it breaks additional point-group or time-reversal symmetries in the form of loop-currents, has yet to be determined unambiguously. In addition, very little is known about the superconducting state. With multiple conflicting experiments and no clear microscopic understanding, a phenomenological description in the form of a Ginzburg-Landau analysis offers valuable insights. Studying charge-density waves and their interplay, and given recent transport experiments in the normal state, we arrive at a picture in this material class of correlated orders at a tipping point. Finally, the interplay of charge-density-wave order and superconductivity naturally leads to pair-density waves, a phenomenon recently uncovered in experiments.