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Local Quantum Criticality of an Iron-Pnictide Tetrahedron[1] TZE TZEN ONG, PIERS COLEMAN, Center for Materials Theory, Department of Physics & Astronomy, Rutgers University
— Motivated by the close correlation between transition temperature (T_c) and the tetrahedral bond angle of the As-Fe-As layer observed in the iron-based superconductors, we study the interplay between spin and orbital physics of an isolated iron-arsenide tetrahedron embedded in a metallic environment. Whereas the spin Kondo effect is suppressed to low temperatures by Hund's coupling, the orbital degrees of freedom are expected to quantum mechanically quench at high temperatures, giving rise to an overscreened, non-Fermi liquid ground-state. Translated into a dense environment, this critical state may play an important role in the superconductivity of these materials.

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