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Strongly correlated superconductivity arising in a pseudo-gap metal

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We solve a simple two-orbital Hubbard model with an antiferromagnetic on-site exchange in the limit of infinite coordination lattices by means of dynamical mean field theory (DMFT). The model has a phase diagram that is surprisingly similar to cuprates, including pseudo-gap and Fermi-liquid normal phases, and a superconducting one. With the help of the numerical renormalization group solution of the two-orbital Anderson impurity model onto which the lattice model is mapped by DMFT, we uncover the mechanism that allows a pseudo-gap phase to develop a large superconducting gap. We find that the Fermi liquid phase, the pseudo-gap phase and the superconducting one are all legitimate outcomes of an unstable phase that exists only at high temperature, above T_c as well as above the pseudo-gap and the Fermi liquid coherence temperatures, which is accessible by DMFT as a metastable phase only because one can prevent any symmetry breaking.