Pseudogap in hole-doped and, especially, electron-doped high-temperature superconductors

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One of the most puzzling aspects of high-temperature superconductors is the pseudogap phenomenon. It will be shown that a variety of theoretical approaches applied to the t-t'-t"-U Hubbard model give a consistent view of the pseudogap observed in ARPES on an energy scale of tens of meV. The same model explains both hole and electron-doped superconductors as long as there is a small dependence on doping of the interaction strength U. It turns out that electron-doped supercondutors near optimal doping are somewhat less strongly coupled, allowing more detailed solutions. In particular, using the Two-Particle Self-Consistent approach, one can demonstrate the consistency between ARPES and neutron results and make predictions for future experiments on electron-doped cuprates. One of these predictions has already been verified, more of these will be discussed.