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Examination of the Role of Electronic Correlations in the Pnictides[1]

THOMAS DEVEREAUX, SLAC National Accelerator Laboratory and Stanford Univ.

In the new and rapidly developing field of Fe-pnictide superconductivity, the question of what constitutes the basic ingredients for high transition temperatures remains largely unanswered. Parallels have been drawn to the cuprate high-temperature superconductors, which contain partially filled d-electron bands whose spins in the parent phase are aligned antiferromagnetically like the pnictides, and high-temperature superconductivity emerges when magnetism can be suppressed. Common to many ideas is that superconductivity itself may be emergent from the two competing phases, driven by an underlying quantum critical point. A key question that needs to be addressed to understand this framework is whether or not the Fe pnictides are strongly correlated like the cuprates. In this talk I will review some experimental indications that address this issue, with a particular focus on photoemission and x-ray based spectroscopic investigations. Comparison of the data with a variety of calculated spectroscopies indicate that the electronic correlations are not as strong as the cuprates, but also reveal aspects where correlations might be of central importance.

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