

Multiband structure and interband pairing in pnictides: two crucial ingredients to understand the experiments

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The occurrence of superconductivity in pnictides renewed in the last year the interest in the physics of multiband superconductors. However, what makes the case of pnictides very peculiar is the fact, suggested by many authors since the very beginning, that pairing has mainly an interband character, as due to exchange of spin fluctuations between hole and electron pockets. These two characteristics make the theoretical description of pnictides much more involved than what is usually believed. In this talk I will review some of our recent results based on a four-band model, where pairing is described within the Eliashberg theory. I will show that this approach allows us to reconcile several spectroscopic and thermodynamic properties of hole-doped 122 pnictides, showing also the intrinsic limitation of simpler two-band models.