scattering on finite angular momentum pairing. T_c is given approximately by

$$T_c \approx \omega_c \exp(-(1 + |\lambda_s|)/|\lambda_d|), \tag{44}$$

where λ_s is the coupling constant which appears in the normal self-energy and λ_d, the coupling constant which appears in the pairing self-energy. From the measurements summarized above and Eq.(42), $\lambda_d/\lambda_s \approx 1/2$. Using the deduced value of λ_s and ω_c from the ARPES measurements, one estimates a value of $T_c \approx 100K$.

Although T_c is expected to reduce in the underdoped region due to the competing phase and in the overdoped region due to the change in the spectra to an incoherent spectra below a cross-over scale, no quantitative calculations for these effects exist.

E. The case of the Fe-Pnictides

The newly discovered superconductivity in the Fe-pnictides is also quite unlikely to be induced through interaction with lattice vibrations. A recent review is Ref.(89). The highest T_c in this class of compounds so far is about $50K$ in $RFeAs(O_{1-x}F_x) : (R = Ce, Pr, Sm, Nd,$ etc). The "parent compound" at $x = 0$ is metallic but antiferromagnetic. The lack of significant observable feature in the specific heat at the high superconducting transition temperatures raises doubt as to whether bulk superconductivity in this structure of the Fe-Pnictides has indeed been found. There is also some evidence that this structure may have a two-phase co-existence as a function of doping. A closely related new structure of Fe-Pnictides called 122 appears to form good single crystals. Thermodynamic data indicates bulk superconductivity. The phase diagram of this class of materials appears similar for both hole doping and electron doping. The superconducting region is organized around a quantum critical point, see Fig.(15) where an AFM/structural transition temperature $\rightarrow 0$ with change in doping. The mystery of the Cuprates: the nature of the ordered phase on one side of the critical point is absent. Moreover, the anisotropy in resistivity of these compound is less than an order of magnitude - they are properly considered three-dimensional. The fermi-surface has five sheets, most prominently a pair of electron-pockets centered at the zone-center and a pair of electron pockets at the zone-faces. At this point, the symmetry of superconductivity is not unambiguously known. ARPES experiments indicate that there is a gap everywhere on the Fermi-surface. This may well be an extended s-wave form of