Hund's induced Fermi-liquid instabilities and enhanced quasiparticle interactions

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Hund's coupling is shown to generally favor, in a doped half-filled Mott insulator, an increase in the compressibility culminating in a Fermi-liquid instability towards phase separation. The largest effect is found about the frontier between an ordinary and an orbitally-decoupled ("Hund's") metal. The increased compressibility implies an enhancement of quasiparticle scattering, thus favoring other possible symmetry breakings. This physics is shown to happen in simulations of the 122 Fe-based superconductors, possibly implying the relevance of this mechanism in the enhancement of the the critical temperature for superconductivity.

L. de,Äô Medici, ArXiv:1609.01303