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Confronting LDA+DMFT results with experiments in the iron pnictide families

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The normal state electronic structure of the pnictides is an important challenge to electronic structure theory. Optical conductivity experiments are indicative of electronic electron correlations (with mass renormalizations of the order of three). Neutron scattering experiments have features characteristic of both itinerant and localized electrons. High energy spectroscopies indicate the absence of satellite peaks. In this talk, we will show how LDA+DMFT allows us to reconcile these apparently inconsistent facts, and trace them to the unique chemical ingredients of these compounds: the iron Hunds rule coupling and the hybridization with very broad arsenide bands. Quantitative results for the different iron pnictide families will be presented and the factors that govern the strength of the correlations in this family of compounds will be discussed.