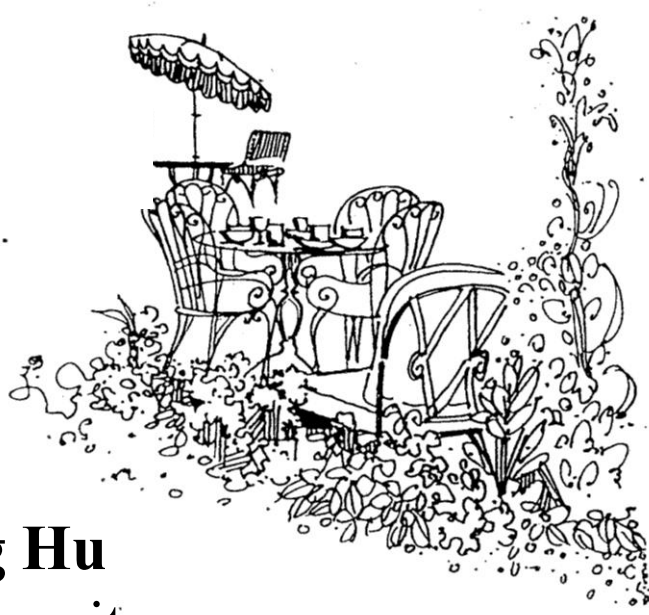
Chez Pierre

Presents ...

Monday, October 22, 2012
12:00pm
MIT Room 4-331



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"S_4 Symmetric Microscopic Model for Iron Based Superconductors"

How are cuprates and iron-based high temperature superconductors correlated? What is the common mechanism behind two different families of iron-based superconductors, iron-pnicitides and iron-chalcogenides? These two questions are two major challenges in the today's field of high temperature superconductors.

In this talk, we will show when the lattice symmetry, the S_4 symmetry, of the building block, the tri-layer structure of FeAs or FeSe, is properly considered, the low energy physics of iron-based superconductors is governed by a two-orbital Hamiltonian near half filling that can be divided two weakly coupled one-orbital model. We will discuss the microscopic origin and some unique properties of the model, including magnetism and pairing symmetry. The model provides a unified understanding of iron pnictides and iron chalcogenides, and suggests that cuprates and iron-based superconductors share an identical high-Tc superconducting mechanism.

We believe that the model establishes a new foundation for exploring novel properties of iron based superconductors.

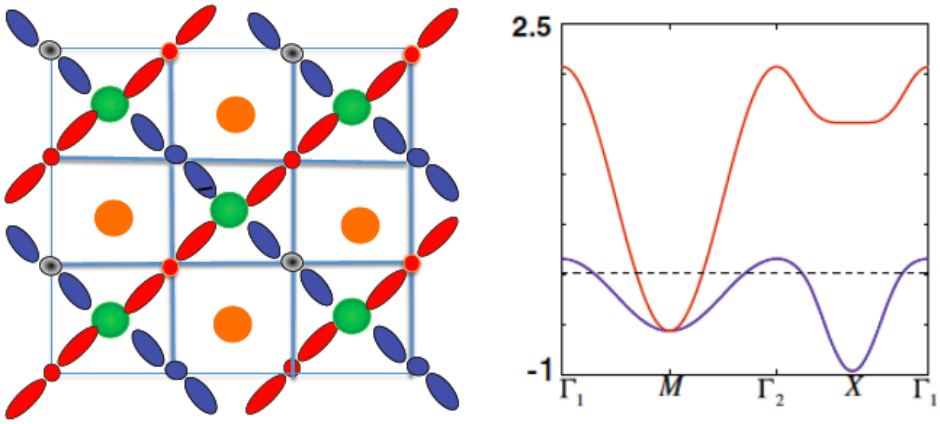

Figure 1 A sketch of kinematics governed by s_4 symmetry and the band dispersion.

References:

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N.N. Hao, Y.P. Wang and J.P. Hu, Arxiv: 1207.6798 (2012)

J.P. Hu, and NingNing Hao, unpublished

J.P. Hu, Arxiv: 1208.6201 (2012)