MAR11-2010-001207

Abstract for an Invited Paper for the MAR11 Meeting of the American Physical Society

The nature of electronic nematic states in iron-pnictides JIANGPING HU, Purdue University

We show that the electronic nematic states in iron-pnictides is driven by frustrated spin fluctuations. A three dimensional effective spin model is constructed to explain the nematicity. This model explains the relation between the structural and magnetic transitions, and the spin excitations measured in recent neutron scattering experiments. Moreover, the model naturally predicts the separation between the two transitions are controlled by the c-axis magnetic exchange coupling , and the existence of an non-collinear magnetic state before spin-glass state upon replacing irons by nonmagnetic impurities. The experimental evidence supporting the predictions and the relation to orbital ordering and superconductivity will also be addressed.