Jozef Stefan Institute, Department of Theoretical Physics

Solid State Group Seminars

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Spin liquids, collinear- and spiral-order phases in the anisotropic triangular lattice

We study the competition between magnetic and spin-liquid phases in the Hubbard model on the anisotropic triangular lattice, which is described by two hopping parameters in different spatial directions, and is relevant for layered organic charge-transfer salts and for the inorganic compounds Cs2CuBr4 and Cs2CuCl4 [1,2]. By using variational wave functions which include both Jastrow and backflow terms, we provide solid evidence that two spin-liquid phases are stabilized in the strongly correlated regime, while states with spiral magnetic order and a non trivial pitch vector are found close to the isotropic point. Two different kinds of collinear orders are found in a wide region of the phase diagram close, respectively, to the limits of square lattice and decoupled one-dimensional chains. We also introduce another family of organic charge-transfer salts where a fully anisotropic triangular-lattice description produces importantly different results, including a significant lowering of the critical U of the spin-liquid phase.[3]

[1] Tocchio, Feldner, Becca, Valenti, Gros, PRB 87, 035143 (2013).
[2] Tocchio, Gros, Valenti, Becca, PRB 89, 235107 (2014).
[3] Jacko, Tocchio, Jeschke, Valenti, PRB 88, 155139 (2013).

Monday, March 30, 2:30pm

Čajna soba F1, Jozef Stefan Institute