



Department of
Theoretical Physics

THE QUANTUM SPACETIME SEMINAR SERIES

Melting of three-sublattice order: How does a KT phase pinch off?

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On lattices with triangular symmetry, competition between different antiferromagnetic interactions results in a macroscopic degeneracy of low energy configurations for easy-axis magnets. Small perturbations or quantum fluctuations then seed a three-sublattice ordered state which breaks lattice and spin symmetries. The question in the title has to do with the temperature-driven transition from this long-range ordered state to a high-temperature paramagnet: In addition to a direct first order transition, which is certainly possible, two other scenarios are possible on general (symmetry) grounds: a two-step melting process, with an intermediate Kosterlitz-Thouless (KT) phase, or a sequence of two second-order transitions. After introducing this physics, I will try and outline a couple of questions (and some partial answers) about the multicritical point(s?) at which the intermediate KT phase pinches-off to give way to either a first-order transition line or two second-order transition lines.