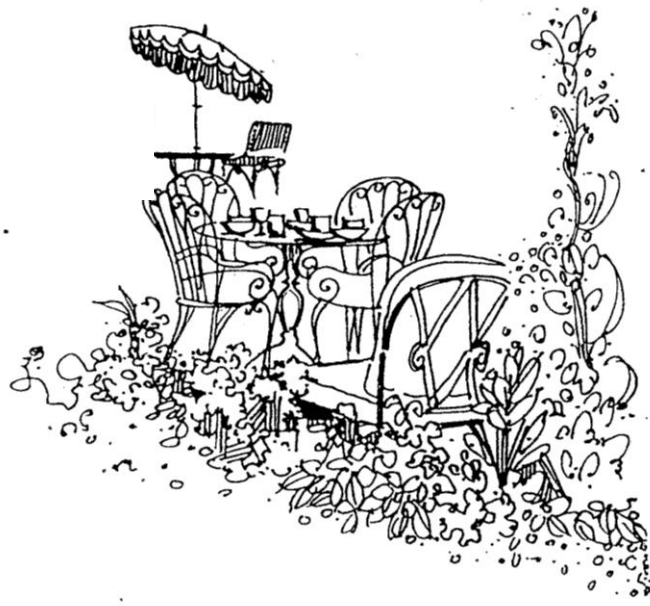
Chez Pierre

Presents ...

Monday, October 4, 2010
12:00pm
MIT Room 4-331



Anders W. Sandvik
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"Deconfined spinons at the Neel-VBS transition in two dimensions"

Adding certain multi-spin interactions of strength Q to the standard 2D Heisenberg model with exchange J (the J-Q model) leads to the destruction of Neel order and a transition into a valence-bond-solid (VBS) state [1]. Large-scale quantum Monte Carlo (QMC) simulations of this system reveals scaling behavior at the Neel-VBS transition consistent with a continuous quantum critical point, in agreement with the theory of "deconfined" quantum criticality [2]. There are, however, significant scaling corrections, possibly logarithmic [3], that had not been anticipated. These corrections may actually be a fingerprint of deconfined spinons [4]. I will discuss the latest QMC evidence for a continuous ground state transition as well as signatures of spinon deconfinement in thermodynamic properties.

[1] A. W. Sandvik, Phys. Rev. Lett. 98, 227202 (2007).
[2] T. Senthil et al., Science 303, 1490 (2004).
[3] A. W. Sandvik, Phys. Rev. Lett. 104 177201 (2010).
[4] A. W. Sandvik, V. N. Kotov, and O. P. Sushkov (in progress).