

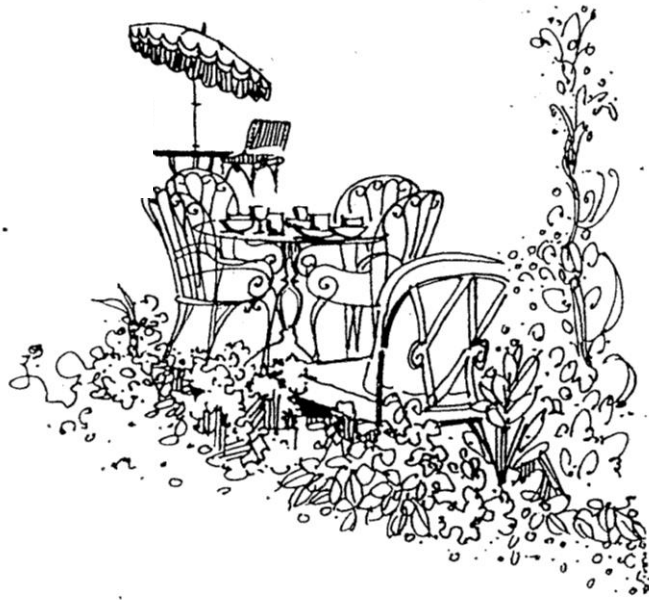
Chez Pierre

Presents ...

Monday, November 21, 2011

12:00pm

MIT Room 4-331



Roger Melko

University of Waterloo, Canada

“Spin liquid and Deconfined Criticality in a Kagome Lattice Bose-Hubbard Model ”

We present large-scale quantum Monte Carlo simulations on a sign-problem free Bose-Hubbard model on the kagome lattice.

This model supports a quantum Z_2 spin liquid phase with fractional excitations and topological order, which can be characterized definitively through calculation of the topological entanglement entropy. I will outline how the entanglement entropy can be measured in general using a direct implementation of the familiar "replica trick", which allows for the study of entanglement scaling in a variety of other models amenable to study by QMC. Finally, I will examine the kagome model's superfluid/spin-liquid transition.

This is an example of an exotic deconfined quantum critical point called XY^* , mediated by the fractional charges -- a fact that is demonstrated in several universal quantities that we measure.