Massachusetts Institute of Technology
Department of Physics

Condensed Matter Theory Seminar

"Study of Non-Abelian Quasiholes Using Matrix Product States"

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Abstract: Quasiholes in certain fractional quantum Hall states are strong candidates for the experimental realization of non-Abelian anyons. They are assumed to be localized excitations, and to display non-Abelian statistics when sufficiently separated, but these properties have not been explicitly demonstrated except for the Moore-Read state. In this work, we apply the newly developed matrix product state technique to examine these exotic excitations. For the Moore-Read and the $\mathbb{Z}_3$ Read-Rezayi states, we estimate the quasihole radii, and determine the correlation lengths associated with the exponential convergence of the braiding statistics. We provide the first microscopic verification for the Fibonacci nature of the Read-Rezayi quasiholes. We also present evidence for the gapless behavior of the non-unitary Gaffnian wave function.

12:00noon
Friday, April 25, 2014
Duboc Seminar Room (4-331)

Host: Liang Fu/Tim Hsieh