Massachusetts Institute of Technology
Department of Physics

Condensed Matter Theory Seminar

"Quantum computation using many-body localization"

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Abstract: We explore a new approach to quantum information processing using disordered, strongly interacting systems in the many-body localized (MBL) phase. Our approach utilizes unique features of MBL phases such as the lack of thermalization and the slow growth of entanglement. Specifically, using a particular spin-1 Hamiltonian, we describe an approach that allows us to encode and decode quantum information, and to perform a universal set of quantum operations. We also discuss an extension to generic MBL systems, discuss the fundamental ingredients and limits of our protocol and outline possible approaches for its experimental realization.

12:00noon
Tuesday, October 21, 2014
***Low Seminar Room (6C-333)**

Host: Tim Hsieh