Massachusetts Institute of Technology
Department of Physics

Condensed Matter Theory Seminar

" Local criticality, diffusion and chaos in generalized Sachdev-Ye-Kitaev models"

Yingfei Gu, Stanford University

Abstract: The Sachdev-Ye-Kitaev (SYK) model is a (0+1)-dimensional model describing fermions with random interactions. This model has various interesting properties such as approximate local criticality (power law correlation in time), zero temperature entropy, and quantum chaos. In this talk, I will discuss a higher dimensional generalization of the SYK model, which is a lattice model with N Majorana fermions at each site and random interactions between them. Our model can be defined on arbitrary lattices in arbitrary spatial dimensions. In the large N limit, the higher dimensional model preserves many properties of the SYK model such as local criticality in two-point functions, zero temperature entropy and chaos measured by the out-of-time-ordered correlation functions. In addition, we obtain new properties unique to higher dimensions such as diffusive energy transport and a "butterfly velocity" describing the propagation of chaos in space.

The talk is based on arxiv: 1609.07832

12:00pm
Tuesday, November 22, 2016
Duboc Room (4-331)

Host: Liang Fu