Title:
Relaxation due to stochastic spreading in a closed ring

Speaker:

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Abstract:

The "glassy" version of "random walk in disordered lattice" features a percolation-related crossover to variable-range-hopping, or to sub-diffusion in one-dimension. The more general problem of "random walk in random environment", where transitions rates are allowed to be asymmetric, has been explored by Sinai, Derrida, and followers. It turns out that for any small amount of disorder an unbiased spreading in one-dimension becomes sub-diffusive, while for bias that exceeds a finite threshold there is a "sliding transition", leading to a non-zero drift velocity. In the present study [1] we explore the implications of the percolation and sliding transitions for the relaxation modes of a topologically closed circuit. A complementary question regarding the "delocalization" of eigenstates of non-hermitian Hamiltonians has been addressed by Hatano, Nelson, and followers. But we show that for a conservative random-walk dynamics the implied spectral properties are dramatically different.

[1] Daniel Hurowitz and Doron Cohen, http://www.nature.com/articles/srep22735

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