LABORATORY FOR ELEMENTARY-PARTICLE PHYSICS (LEPP)

Theory Seminar

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The SYK model at very low energies

We explore the Sachdev-Ye-Kitaev model at large N and very low energies. A study of quadratic fluctuations around the conformal saddle reveals a replica off-diagonal mode that can acquire a negative mass-squared at exponentially low temperatures. However, at such low temperatures, the physics of the model is not conformal, but is rather described by a strongly fluctuating Schwarzian degree of freedom. The correlation functions in the Schwarzian theory are softer and we find that there is no spin-glass transition. We have also performed exact diagonalization study of the low lying spectrum of the SYK model with large system sizes up to N=42. There is no hint of a spin-glass phase in the spectral data. We also find that the distribution of the ground state energy is Gaussian, not Tracy-Widom.

Wednesday, May 30, 2018

2:00pm

401 Physical Sciences Building