

Mathematical Physics Seminar

Jacobus Verbaarschot

SUNY Stony Brook

Spectral and Thermodynamic Properties of the Sachdev-Ye-Kitaev Model

The two-body random ensemble has a long history in nuclear physics starting from work by Bohigas, Flores, French and collaborators. Contrary to the invariant random matrix ensembles, this model embodies the two-body nature of the nuclear reactions and provides us with a more realistic description of nuclear spectra. More recently this model was introduced to condensed matter physics by Sachdev, Ye and Kitaev (SYK). In one version of this model the fermions are Majorana particles, and because this model may be the simplest possible model with a gravity dual, it has attracted quite some attention in the field of string theory. The bulk of this talk is the discussion of the spectral and thermodynamical properties of this version of the SYK Hamiltonian. The entropy and the specific heat are related to the spectral density and we show that the spectral correlations are given by the invariant random matrix ensembles of the universality class that is determined by the total number of particles mod 8. We also connect the level density of the SYK model to the Bethe formula for the nuclear level density.

Thursday, 01.12.2016, 16:00 Uhr
D5-153