

# Séminaire de physique statistique

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Lundi 14/10/2019, 14:00-15:00

Orme des Merisiers Salle Claude Itzykson, Bât. 774

Sachdev-Ye-Kitaev Model

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Introduced in 2015, the SYK model has become a paradigm of many body quantum chaos. It displays a plethora of phenomena characteristic for strongly interacting non-integrable many body systems, including exponential instabilities, non-Fermi liquid behavior, chaotic spectral correlations and many body wave functions, and manifestations of Fock space fractality and localization. The system is a promising prototype system for the modeling of strongly correlated (strange metal) phases of matter, and considered as a holographic one dimensional boundary theory of a two-dimensional bulk. At the same time, it is simple enough to be amenable to sensitive numerical diagnostics and analytic approaches. It is perhaps the only many body chaotic quantum system where parameter free comparison between analytic theories and numerical data is possible, and in this regard has become somewhat of the harmonic oscillator of the field. In this talk I will review the physics of the SYK model and its surprisingly rich internal symmetries which make analytic progress possible. I will discuss both, the physics at short times governed by strong chaotic instabilities, and that at long times, or small energies, where the intricate fine structures of its many body eigenenergies and -functions are resolved.

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