Séminaire de physique statistique

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Lundi 06/05/2019, 14h00-15h00

Orme des Merisiers Salle Claude Itzykson, Bât. 774

Minimal models for chaotic quantum dynamics in spatially extended many-body systems

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I will give an overview of recent work on minimal models for quantum chaos in spatially extended many-body quantum systems, describing simple, solvable models.

The detailed study of generic quantum systems – ones without exact or approximate conservation laws – goes back at least as far as investigations of highly-excited states in nuclei in the 1950s. It saw revivals in the 1980s with work on systems such as quantum billiards, that have only a few degrees of freedom, and also in the context of mesoscopic conductors. It is attracting renewed current interest with a focus on many-body systems that are spatially extended. Part of the motivation for this comes from experiments on cold atom systems, and part comes from development on the theoretical understanding of eigenstates of many-body systems.

The study of dynamics in spatially many-body systems introduces new questions that do not arise in finite systems such as quantum billiards, or in extended single-particle systems, such as mesoscopic conductors. The questions concern the dynamics of quantum information and the approach to equilibrium. I will discuss how these can be answered in the context of minimal models.