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Seminaires du LPTM , Universite de Cergy Pontoise

Jeudi 6 Mai 2021, 14 :00
LPTM, Distanciel TEAMS
Domaines : math-ph

Titre : *Spectral statistics in the thermodynamic limit of extended many-body quantum systems*

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Résumé : *Defining the chaotic properties of quantum systems is a notoriously difficult problem, because of the fundamental fact that in quantum mechanics trajectories are not well-defined. A historically very productive direction has been the investigation of spectral properties of quantum Hamiltonian in a statistical way : it emerges that chaos is associated with strong repulsion between energy levels. When one tries to apply this recipe to many-body systems, it is clear that a hierarchy of energy/time scales can emerge due to the interplay of farther components of the system which are less and less correlated. Recently, the use of quantum circuits composed by random gates has allowed explicit calculations clarifying to what extent chaos emerges for spatially extended systems. In this talk, I will review some recent advances in the field with an emphasis on the strong success of a "Wick rotation" which exchanges space and time. Thanks to this formulation, we have been able to connect spectral properties to a spectrum of Lyapunov exponents, which emerge from the infinite product of random operators in the space direction.*
