SEMPARIS – Séminaires en région parisienne

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Forum de Physique Statistique @ ENS

Mercredi 1 Octobre 2025, 11 :00
LPENS, L378
Domaines : cond-mat.stat-mech

Titre : *Anomalous slow relaxation of local observables in diffusive quantum systems*

Orateur : **Ewan Mcculloch (LPENS)**

Résumé : *Chaotic quantum systems at finite energy density are expected to act as their own heat baths, rapidly dephasing local quantum superpositions. We argue that in fact this dephasing is subexponential for chaotic dynamics with conservation laws in one spatial dimension : all local correlation functions decay as stretched exponentials or slower. The stretched exponential bound is saturated for operators that are orthogonal to all hydrodynamic modes. This anomalous decay is a quantum coherent effect, which lies beyond standard fluctuating hydrodynamics ; it vanishes in the presence of extrinsic dephasing. Our arguments are general, subject principally to the assumption that there exist zero-entropy charge sectors (such as the particle vacuum) with no nontrivial dynamics : slow relaxation is due to the persistence of regions resembling these inert vacua, which we term "voids". In systems with energy conservation, this assumption is automatically satisfied because of the third law of thermodynamics.*
