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Balades Quantiques de le LPENS

Mercredi 19 Novembre 2025, 11 :00
LPENS, L378
Domaines : cond-mat.stat-mech

Titre : *Probing symmetry breaking : from the quantum Mpemba effect to black hole evaporation*

Orateur : **Filiberto Ares (SISSA)**

Résumé : *In this seminar, I will introduce the entanglement asymmetry, a quantum information based observable that measures how much a symmetry is broken in a part of an extended quantum system. I will then discuss two applications of it. First, I consider a spin chain in which a symmetry explicitly broken by the initial state is dynamically restored by the time evolution after a quantum quench. Unexpectedly, the more the symmetry is initially broken, the faster is restored, a quantum version of the counterintuitive and yet mysterious Mpemba effect. As a second application, I will use the entanglement asymmetry to monitor the broken symmetries of a black hole during its evaporation. I will show that, if the black hole initially breaks an arbitrary U(1) symmetry, the emitted radiation is in a symmetric state until the halfway point of the evaporation, the Page time, at which undergoes a sharp transition to a state that breaks the symmetry.*