ΚΟΙΝΟ ΣΕΜΙΝΑΡΙΟ ΚΕΝΤΡΟΥ ΚΒΑΝΤΙΚΗΣ ΠΟΛΥΠΛΟΚΟΤΗΤΑΣ ΚΑΙ ΝΑΝΟΤΕΧΝΟΛΟΓΙΑΣ & ΚΕΝΤΡΟΥ ΘΕΩΡΗΤΙΚΗΣ ΦΥΣΙΚΗΣ ΚΡΗΤΗΣ /

JOINT CCQCN -CCTP SEMINAR

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14:00-15:00

2nd Floor Seminar Room

Non-equilibrium steady states in many-body quantum systems

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Abstract

Let an infinite, homogeneous, many-body quantum system be unitarily evolved for a long time from a state where two halves are independently thermalized. A non-equilibrium steady state emerges if there are nonzero steady currents in the central region, and their presence is a signature of ballistic transport. I will describe recent results for such non-equilibrium steady states, in any dimensionality. I will explain how, using the Lieb-Robinson bound, there are, under certain conditions, bounds on the average current and on the noise. These suggest definitions for nonlinear sound velocities in non-integrable models, and for generalized sound velocities, encoding generalized Gibbs thermalization, in integrable models. Depending on time, I will then describe results for the exact steady state, the energy current and its fluctuations in various models (one- and higher-dimensional CFT, free-particle models), involving various techniques including aspect of the AdS/CFT duality. I will discuss the bounds within these various models, and I will explain how large-time fluctuations are described by independent Poisson processes. This is based in part on works done in collaboration with Denis Bernard and Marianne Hoogeveen, and with Joe Bhaseen, Andrew Lucas and Koenraad Schalm.