

Title:

Testing nonequilibrium currents with the stochastic area

Speaker:

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Abstract:

Determining whether a system is in an equilibrium or nonequilibrium state from simulations or experiments is a fundamental problem in statistical physics. In this talk I will discuss how this problem is normally approached by measuring the probability current in space and how it can be made more precise by defining statistical tests involving projections of the current. I will illustrate this point by considering a specific linear projection of the current for diffusion systems, related to the stochastic area, first studied by Paul Lévy in the 1940s for Brownian motion. This area is a good observable for testing the nonequilibrium or nonreversible nature of diffusions as it is a scalar and its statistics can be studied in a precise way using large deviation theory.