ICTS Statistical Physics Journal Club Seminar

Title : Detecting nonequilibrium dynamics via extreme value statistics

Speaker : Francesco Mori (LPTMS France)

Date : Thursday, 10th June 2021

Time : 03:00 pm (IST)

Abstract : Determining whether or not a stationary system is at equilibrium is of fundamental importance in several applications. In this talk, I will present a novel noninvasive method to detect nonequilibrium dynamics in a stationary time series. This technique is based on extreme value theory and does not require detailed knowledge of the system dynamics. Our method relies on the distribution P(t_m|T) of the time t_m at which the process reaches its maximal value in the time interval [0,T]. We show that, if the underlying process is at equilibrium, then P(t_m|T) is symmetric around t_m=T/2, i.e., P(t_m|T) =P(T−t_m|T). Thus, if P(t_m|T) is not symmetric the process is necessarily out-of-equilibrium. We illustrate this principle by exact solutions in a number of equilibrium and nonequilibrium stationary processes. Moreover, for a large class of equilibrium stationary processes that correspond to diffusion in a confining potential, we show that the scaled symmetric distribution P(t_m|T) has a universal form for large T. This talk is based on the recent preprint https://arxiv.org/pdf/2104.07346.pdf, a joint work with Satya Majumdar and Gregory Schehr.

Venue : Please click on the below link to join the seminar

https://zoom.us/j/96056959713?pwd=RWRwSmoxSXhtN3dUZVZQcVE3aHVUQT09
Meeting ID: 960 5695 9713
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