ICTS PhD Seminar

Title : Out of time ordered effective dynamics of a Brownian particle

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Date : Thursday, May 14, 2020

Time : 04:00 PM

Venue : Online seminar (Please use this link to join the seminar - https://guest.lifesize.com/672942. Google chrome is preferred)

Abstract : In this talk I will present the out of time ordered (OTO) dynamics of a Brownian particle interacting with a large environment. To illustrate the features of this dynamics, I will describe a toy model where the environment is a thermal bath comprising of two sets of harmonic oscillators coupled nonlinearly to the particle. Beginning with a Schwinger-Keldysh effective action of the particle, I will demonstrate its duality with a non-linear Langevin dynamics. This Langevin dynamics or the equivalent Schwinger-Keldysh effective theory is, however, inadequate for determining the OTO correlators of the particle. I will show that this limitation can be overcome by extending the effective theory to a path integral formalism defined on a contour with multiple time-folds. This extended effective dynamics has to satisfy some constraints due to microscopic reversibility and thermality of the environment. I will show that, from the perspective of the Langevin dynamics, these constraints lead to a generalised fluctuation-dissipation relation between a non-Gaussianity in the noise distribution and a thermal jitter in the particle's damping coefficient.