ICTS | INTERNATIONAL CENTRE for THEORETICAL SCIENCES

TATA INSTITUTE OF FUNDAMENTAL RESEARCH

ICTS Statistical Physics Journal Club Seminar

Title : Inferring entropy production from short time series data

Speaker : Supriya Krishnamurthy (Stockholm University, Sweden)

Date : Thursday, 14th January 2020

Time : 03:00 pm (IST)

Abstract : The rate of entropy production provides a useful quantitative measure of how far a system is from equilibrium and estimating it directly from time-series data from experiments is desirable. Several approaches have been considered for stationary dynamics, some of which are based on a variational characterization of the entropy production rate. These usually however only give bounds on the value of the entropy production rate. We have shown earlier [1] that the variational scheme based on the finite-time thermodynamical uncertainty relation [2] can be modified (by considering very short time series) and by this means give the exact value of the entropy production rate, and not just a bound, under steady-state conditions.

In more recent work[3] we demonstrate that the same approach can give the value of the entropy production rate even for arbitrary non-equilibrium non-stationary dynamics. On the basis of this result, we develop an efficient algorithm that estimates the entropy production rate continuously in time by using machine learning techniques, and validate our numerical estimates using analytically tractable Langevin models.

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

https://zoom.us/j/96174583667?pwd=ckVqSm1nOXVYZGo4RDJ4SlloblkxZz09
Meeting ID: 961 7458 3667
Passcode: 776957