ICTS Seminar

Title : Additivity and mass fluctuations in conserved-mass transport processes

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Date : Thursday, August 3, 2017

Time : 11:30 AM

Venue : Amal Raychaudhuri Meeting Room, ICTS Campus, Bangalore

Abstract : Understanding fluctuations is fundamental to the formulation of statistical mechanics. Unlike in equilibrium, where fluctuations are obtained from the Boltzmann distribution, there is no unified principle to characterize fluctuations in nonequilibrium. In this talk, we shall discuss a statistical mechanics framework to characterize steady-state mass fluctuations in conserved-mass transport processes. We demonstrate that mass distributions in a broad class of nonequilibrium mass-transport processes can be obtained from an additivity property, the tenet of equilibrium thermodynamics. In particular, our results answer a long-standing question why gamma-like distributions arise in many of the mass transport processes, irrespective of different dynamical rules.

References

1. Sayani Chatterjee, Punyabrata Pradhan, and P. K. Mohanty, Phys. Rev. Lett. 112, 030601 (2014)
2. Sayani Chatterjee, Punyabrata Pradhan, and P. K. Mohanty, Phys. Rev. E 91, 062136 (2015)