

ICTS Statistical Physics Journal Club Seminar

Title : Survival probability and record statistics for random walks

Speaker : Bertrand Lacroix-A-Chez-Toine (Weizmann Institute, Rehovot, Israel)

Date : Thursday, 8th April 2021

Time : 03:00 pm (IST)

Abstract : In this talk, I will first review some results on record statistics for independent random variables and random walks [1]. In particular, these statistics are universal for a large class of random walks. It stems from the universality of the survival probability of random walks, known as Sparre-Andersen formula [2]. I will then introduce a new model of random walks where the sign of consecutive steps are correlated [3]. In particular, in some range of parameters this random walk maps onto a model of active particles, the run-and-tumble particle (RTP). We show that for this walk too, the survival probability is universal. As an application we compute the record statistics for this model of random walk, which displays the same universality [3]. In particular, we obtain original results in the scaling regime corresponding to the RTP that are quite different from the case of the usual random walk. This work is done in collaboration with F. Mori from Paris-Saclay University.

Ref:

[1] C. Godreche, S. N. Majumdar, G. Schehr, Record statistics of a strongly correlated time series: random walks and Levy flights, *J. Phys. A* 50(33), 333001 (2017).

[2] E. Sparre Andersen, On the fluctuations of sums of random variables II, *Math. Scand.*, 195-223 (1955).

[3] B. Lacroix-A-Chez-Toine, F. Mori, Universal survival probability for a correlated random walk and applications to records, *J. Phys. A* 9, 101 (2020).

Venue : Please click on the link to join the meeting

<https://zoom.us/j/93601997336?pwd=WkZpcm54a2lUbjVUTlk2UFJYU3ZDQT09>

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