
THE WEIZMANN INSTITUTE OF SCIENCE
FACULTY OF MATHEMATICS AND COMPUTER SCIENCE
Geometric Functional Analysis and Probability Seminar

Room 155 ,Ziskind Building
on Thursday, Dec 02, 2021at 13:30

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High moments of partition function for 2D polymers in the weak disorder regime (joint with Ofer Zeitouni)

Abstract:

We consider the model of directed polymers in dimension $1+2$, where we take the temperature of the model to infinity with the volume, in such a way that the partition function stays bounded in L^2 . It is well known that the diffusively rescaled log-partition function converges to a Gaussian log-correlated field. One natural question is to understand the behavior of the maximum of this rescaled field, which is related to the problem of understanding the probability distribution of the favorite point of the polymer trajectory. One major issue is that the field itself (before taking the limit) is not Gaussian, and one has to quantify how close it is to a Gaussian field. A direction towards this is to compute moments of the rescaled logarithm field, which amounts to taking large moments (going to infinity with the volume) of the (non-log) partition function. I will explain how we are able to show that the moments coincide with Gaussian moments up to some threshold, and discuss the background and open questions.