PROBABILITY

Ori Gurel-Gurevich (Hebrew University)

Exceptional rays in invariant processes on trees

Consider a process on the edges of the d-regular tree which is non-constant, ergodic, and invariant under all automorphisms of the tree. We show that such a process necessarily admits an exceptional ray for which the asymptotic average of the process along the ray is bigger than the expectation of the process. We will discuss history and related results. Based on joint works with Itai Benjamini and Nitzan Hen.

Yeor Hafouta (University of Florida)

Local limit theorems for non-stationary sequences

The local central limit theorem (LCLT) has origins in the De Moivre-Laplace theorem and it goes back to De Moivre's paper from 1733. In this talk we will discuss the LCLT for non-autonomous subshifts of finite type taken with Gibbs measures and present the exact obstructions for the local asymptotic law to be Lebesgue. These obstructions are richer than the ones in the stationary case. If time permits we will discuss several applications and relations with other areas of mathematics. The talk is based on joint work with Dmitry Dolgopyat.

Daniel Sharon (Technion)

Cluster-cluster model

The cluster-cluster model was defined by Meakin in 1984. Consider a stochastic process on the graph $\mathbb{Z}^d$. Each $x \in \mathbb{Z}^d$ starts with a cluster of size 1 with probability $p \in (0, 1]$ independently. Each cluster C performs a continuous time SRW with rate $|C|^{-\alpha}$. If it attempts to move to a vertex occupied by another cluster, it does not move, and instead the two clusters connect via a new edge. In this talk we will present results about explosion, non-explosion, and cluster growth rates, as a function of the dimension d, percolation density p, and diffusion rate parameter α. Joint work with Noam Berger (TUM), Eviatar B. Procaccia (Technion), and Dominik Schmid (Augsburg University).

Zhenhao Cai (Weizmann)

Progress towards the scaling limit of loop soup percolation in three dimensions

In the last decade, loop soup percolation stands out as one of the few lattice percolation models where significant progress has been made in intermediate dimensions. This largely stems from the profound link between loop soups and Gaussian free fields, characterized by a Ray-Knight-type theorem. This talk will present our recent result that the clusters of loop soups on $\mathbb{R}^3$ and the metric graph of $\mathbb{Z}^3$ have different fractal dimensions. This result corrects a key prediction in Wendelin Werners blueprint for the scaling limit of this model. This is joint work with Jian Ding (Peking University).