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97º EDAÍ   18 de agosto de 2023

Auditório do bloco G, Campus do Gragoatá, UFF

Matinê: 14h30 – 15h30

Conversando sobre percolação e processos de crescimento em ambientes aleatórios: Renormalização e transição de fase

Maria Eulália Vares (IM-UFRJ)

Neste colóquio iremos discutir alguns aspectos de modelos estocásticos de percolação, especialmente percolação orientada, bem como o clássico processo de contato de Harris, ambos em situações de ambientes aleatórios. Para o processo de contato estaremos considerando uma situação de ambiente aleatório dinâmico. Renormalização multi-escala é um ingrediente comum na análise dos exemplos que iremos considerar.

Referências:

H. Kesten, V. Sidoravicius, M.E. Vares. Oriented percolation in a random environment. Electron. J. Probab. 27: 1-49 (2022). DOI: 10.1214/22-EJP791

M. Hilário, D. Ungaretti, D. Valesin, M.E. Vares. Results on the contact process with dynamic edges or under renewals. Electron. J. Probab. 27: 1-31 (2022). DOI: 10.1214/22-EJP811

Palestra 1: 15h40 – 16h40

Groups of homeomorphisms of Cantor sets in the line

Dominique Malicet (LAMA, Université Paris Est Marne la Vallée)

Let K be a Cantor set included in the real line. We look at group actions on K by homeomorphisms which locally preserve or invert the orientation of the line (that is, the homeomorphisms are locally monotonic). These actions are similar with group actions in dimension 1, but may be more complex. A natural class of examples is given by the groups of diffeomorphisms of a Cantor set: in the case of the triadic Cantor we obtain an action of the Thompson group V, which contains every finite group. Another interesting class of examples are the finitely generated groups of transformations of $[0, 1]$ with a finite number of discontinuities, which give rise to such actions by blowing up the discontinuity points by a semiconjugacy. In a recent work with Emmanuel Militon (University Côte d'Azur), we studied these group actions, and proved they satisfy a Tits alternative in the Margulis sense: either the group has a non abelian free subgroup, or it preserves some probability measure on K. A large part of the proof consists in the study of random dynamical systems/random walks generated by elements of the group.

Café: 16h40 – 17h10

Palestra 2: 17h10 – 18h10

Mass Transference Principle for general shapes

Michal Rams, (IMPAN)

The Mass Transference Principle is the name usually given to a theorem by Beresnevitch and Velani. This theorem is very surprising, on several counts. For one, the first reaction is that this result should not be true. After one understands that it is indeed true, one gets an opposite impression: that the assumptions should be much weaker than they are! Alas, the counterexamples say this is not true...

So, what is this theorem about. The statement is as follows: assume that you have an infinite collection of euclidean balls B_i in $\mathbb{R}^d$, such that their lim sup set $B = \limsup B_i$ has full Lebesgue measure in the unit cube $[0, 1]^d$. Then for any $a > 1$ we have

$$\dim_H \limsup B_i^a \geq \frac{d}{a},$$

where $B(x, r)^a := B(x, r^a)$. That is, we do not need to know anything about a family of balls, except that it is large and dense, to get a lower bound for the family of smaller balls with the same centers. Obviously, this result has many applications, in particular in the metric number theory. In the talk I will present a rather spectacular generalization: instead of smaller balls one can simply take arbitrary open sets, each subset of the corresponding B_i, and obtain a lower bound for their limsup set. This is a joint result with Henna Koivusalo.

Confraternização: Botequim Canto Do Peixe, 18h30 – ∞

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