

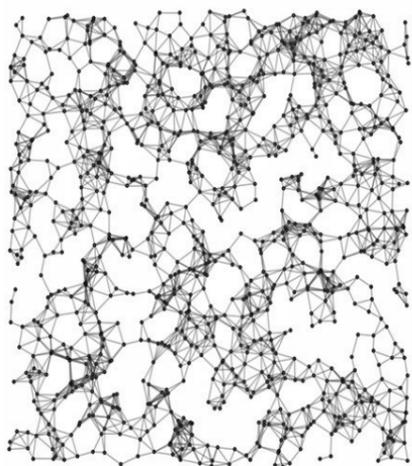


# Colóquio Interinstitucional

## Modelos Estocásticos e Aplicações

Quarta-feira, 26 de novembro de 2014

### Programa



14:00 - 15:20 – **Augusto Q. Teixeira (IMPA)**

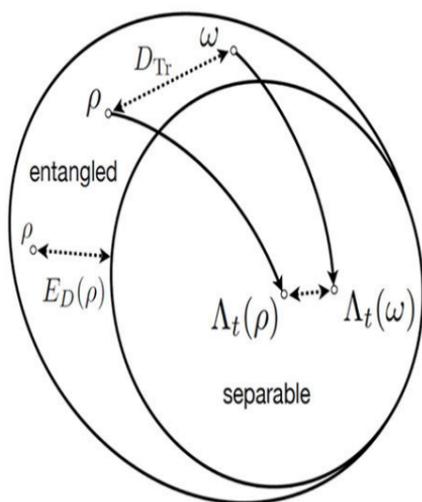
#### *Percolation and local isoperimetric inequalities*

In this talk we will discuss some relations between percolation on a given graph  $G$  and its geometry. There are several interesting questions relating various properties of  $G$ , such as growth or dimension, and the process of percolation on  $G$ . In particular one could look for conditions under which the critical percolation threshold  $p_c(G)$  is non-trivial, that is:  $p_c(G)$  is strictly between zero and one. In a very important paper on this subject, Benjamini and Schramm asked whether it is true that for every graph satisfying  $\dim(G) > 1$ , one has  $p_c(G) < 1$ . We will explain this question in detail, explaining what they meant by the dimension of a graph and we will present a result that has recently been obtained in this direction.

15:40 - 17:00 – **Fernando de Melo (CBPF)**

#### *Open-system dynamics of entanglement*

One of the greatest challenges in the fields of quantum information processing and quantum technologies is the detailed coherent control over each and all of the constituents of quantum systems with an ever increasing number of particles. Within this endeavor, the harnessing of many-body entanglement against the detrimental effects of the environment is a major and pressing issue. Besides being an important concept from a fundamental standpoint, entanglement has been recognized as a crucial resource for quantum speed-ups or performance enhancements over classical methods. Understanding and controlling many-body entanglement in open systems may have strong implications in quantum computing, quantum simulations of many-body systems, quantum cryptography, quantum metrology, our understanding of the quantum-to-classical transition, and other important questions of quantum foundations.



In this seminar entanglement will be taken as a dynamic quantity on its own, that evolves due to the unavoidable interaction of the entangled system with its surroundings. I will introduce the main aspects of entanglement dynamics in open quantum systems, portraying its richness and complexity. After setting the stage, I will present two different approaches to deal with entanglement dynamics: First, for bipartite systems I'll present a deterministic dynamical equation for entanglement. Second, in order to cope with many-body systems, I'll resort to a statistical description of typical entanglement dynamics. The latter relies solely on geometrical aspects of the space of states.

17:00 – Discussão e lanche

### Local

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### Contatos

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Realização:



Apoio:

