COLÓQUIO INTER – INSTITUCIONAL
CBPF – IMPA – LNCC – UFRJ

MODELOS ESTOCÁSTICOS E APLICAÇÕES

Quarta-feira - 30 de abril de 2008, IMPA

Programa:

13.30h – 15.00h

Palestrante: **Pierre Nolin** (ENS-Paris)

Titulo: **"Near-critical percolation and the geometry of diffusion fronts"**

Resumo: We discuss a model of inhomogeneous medium known as "Gradient Percolation", which is an inhomogeneous percolation process where the density of occupied sites depends on the location in space. This model was first introduced by the physicists Gouyet, Rosso and Sapoval in 1985 to show numerical evidence that diffusion fronts are fractal. The macroscopic interface - separating occupied sites and vacant sites - that appears remains localized in regions where the density of occupied sites is close to the percolation threshold p_c, and its behavior can be described using properties of near-critical standard percolation.

This allows to study a simple two-dimensional model where a large number of particles that start at a given site diffuse independently. As the particles evolve, a concentration gradient appears and we observe a macroscopic interface. We exhibit in particular a regime where this (properly rescaled) interface is fractal with dimension 7/4: this model thus provides a natural setting where *fractal geometry* spontaneously arises, as predicted by physicists.

15.00h – 15.30h café

15.30h – 17.00h

Palestrante: **Wendelin Werner**, Medalha Fields 2006 (ENS-Paris)

Titulo: **"Are random frontiers always symmetric?"**

Resumo: We will make comments on the following problem: Suppose that a two-dimensional domain is created at random from many infinitesimal local inputs, and that one only observes its outer boundary. Can one detect on which side the domain is by looking at a portion of this boundary?
The talk is partly based on joint work with Pierre Nolin.

17.00h – 18.30h – Discussão e conversa informal, coquetel.

Local: Auditório Ricardo Mañé, IMPA