SEMINÁRIO DE PROBABILIDADE - IM-UFRJ

Data: 2 de outubro de 2017 (2a-feira)
Hora: 15:30h
Local: Sala B106b -Bloco B do CT Instituto de Matemática - Ilha do Fundão

Palestrante: Hubert Lacoin (IMPA)

Título: Layering transitions for the Solid-on-Solid model

Resumo: Solid-on-Solid (SOS) is a simplified surface model which has been introduced to understand the behavior of Ising interfaces in $\mathbb{Z}^d$ at low temperature. The simplification is obtained by considering that the interface is a graph of a function ϕ, $\mathbb{Z}^{d-1} \to \mathbb{Z}$. In the present talk, we study the behavior of SOS surfaces in $\mathbb{Z}^2$ constrained to remain positive, and interacting with a potential when touching zero, corresponding to the energy functional:

$$V(\phi) = \beta \sum_{x \sim y} |\phi(x) - \phi(y)| - \sum_{x} \left(h_{\{\phi(x)=0\}} - \infty_{\{\phi(x)=0\}} \right).$$

We show that if β is small enough, the system undergoes a transition from a localized phase, where there is a positive fraction of contact with the wall to a delicalized one for

$$h_w(\beta) = \log\left(\frac{e^{4\beta}}{e^{4\beta}-1}\right).$$

In addition, by studying the free energy, we prove that the system undergoes countably many layering transitions, where the typical height of the interface jumps between consecutive integer values.