SEMINÁRIO DE EQUAÇÕES DIFERENCIAIS

Solving the KPZ Equation

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Resumo: The KPZ equation introduced by M. Kardar, G. Parisi and Y. Zhang has been successful in describing properties of rough interfaces. This equation is also related to Burgers' equation of turbulence and to directed polymers in random media. The KPZ equation describes the evolution of the profile of the interface, $h(x, t)$, at position x and time t:

$$\begin{cases} \partial_t h(t,x) = \triangle h(t,x) + (\partial_x h(t,x))^2 + W(t,x) \\ h(0,x) = f(x) \end{cases}$$

where $W(t, x)$ is a space-time white noise. In this talk we introduces a new notion of solution for the KPZ equation, in particular, our approach encompasses the Cole-Hopf solution. This new theory provides a pathwise notion of solution as well as a structured approximation theory. The developments are based on regularization arguments from the theory of distributions.