MSRI/Evans Talk

Monday, March 7, 2011
4:10PM; 60 Evans Hall
University of California, Berkeley

"Nonlinear diffusion and free boundaries. From porous media to fractional diffusion"

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In the talk we will make a presentation of the theory of Nonlinear Diffusion centered on one of the popular models, the porous medium equation and its close relative, the fast diffusion equation. The existence of free boundaries is one of the most peculiar properties of the former equation. In the final section, we will present recent work that combines degenerate nonlinear diffusion with nonlocal operators of fractional Laplacian type. Apart from the unexpected existence of free boundaries, the model admits mass preserving self-similar solutions that are found by solving an elliptic fractional-Laplacian obstacle problem. We use entropy methods to show that the asymptotic behaviour is described after renormalization by these selfimilar solutions.

Refreshments at a nearby establishment immediately following the talk!
Graduate students and Postdoctoral Fellows are particularly welcome.
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