

The theory of fractional heat and porous medium equations

Juan Luis Vázquez

Dpto de Matemáticas, Univ Autónoma de Madrid

We will report on recent research in the area of elliptic and parabolic equations of diffusion type where the Laplace operator is replaced by a fractional Laplacian operator, or other similar nonlocal operators.

The lecture will describe recent progress made by the author and collaborators on the topic of nonlinear fractional heat equations, in particular when the nonlinearities are of porous medium and fast diffusion type. We prove existence and uniqueness of solutions, regularity, positivity, Harnack estimates and symmetrization. Special attention is given to the construction of fractional Barenblatt solutions. We also study KPP phenomena

Collaborators

M. Bonforte, A. de Pablo, F. Quirós, A. Rodríguez, D. Stan, F del Teso, B. Volzone.