



Seminari Informal de Matemàtiques de Barcelona

Speaker: Damia Torres Latorre.

University: Universitat de Barcelona.

Date: Wednesday, October 20th, 2021.

Schedule: 12:00, *virtual coffee break*; 12:20, talk.

Place: Zoom (the link will be posted on our website).

Language: English.

Title: Supercritical diffusion: memes, stonks and more

Abstract: In this talk, I will explain the foundations of the theory of elliptic nonlocal PDE, focusing on the fractional Laplacian, $(-\Delta)^s$ as a model example, and then some recent results on the supercritical fractional obstacle problem.

The first part will start with the relation of fractional operators to jump-diffusion (Lévy) processes and some physical applications. Then, I will give an overview of the basic properties of solutions and compare them to harmonic functions, and also comment on the Caffarelli-Silvestre extension.

In the second part, I will give an idea of how stock prices can be modelled with a nonlocal parabolic obstacle problem, compare the scaling properties of the problem depending on the value of s and present the main points of a recent work with X. Ros-Oton where we study the regularity of the solutions in the supercritical case.

About us: *SIMBa* is a youth mathematics seminar organized by graduate students in the Barcelona area. It is aimed towards graduate and last course undergraduate students. Our goals are divulging the knowledge from different branches of mathematics for those interested and promote networking between the attendants.

This seminar is backed by the Faculty of Mathematics and Computer Science at Universitat de Barcelona, Faculty of Mathematics and Statistics at Universitat Politècnica de Catalunya, the Department of Mathematics from Univesitat Autònoma de Barcelona, CRM, IMUB and BGSMath.

For more information, visit at www.ub.edu/simba/en/.

If you have any doubt or comment do not hesitate to contact us by sending an email to seminari.simba@gmail.com.