Introduction to Viscosity Solutions of Hamilton-Jacobi Equations and Asymptotic Analysis

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5:00 - 6:00 PM, Thursdays (CST)
April 22, 29 and May 6, 2021
Hosted Via Zoom
(Members of NYU Shanghai Community can join from Room 613 at Pudong Campus)

Abstract:
In this minicourse, we will introduce the notion of viscosity solutions of Hamilton-Jacobi equations and some applications to asymptotic analysis. A brief exploration of the method of characteristic curves and the convex space-homogeneous Hamiltonian case will provide an intuitive understanding the solutions. However, some shortcomings will motivate the introduction of the notion of viscosity solutions. This new framework exhibits suitable properties of consistency, stability, existence and uniqueness, which we will prove. The final leg of the minicourse will deal with certain applications of Hamilton-Jacobi equations to the asymptotic analysis of propagating phenomena, ideally concluding with the sketch of the proof of results obtained during Álvaro’s PhD that involves many of the methods previously introduced, while dealing with certain special complications.

Biography:
Prior to joining NYU Shanghai as a Postdoctoral Fellow in 2019, Álvaro studied mathematics and completed his Ph.D. at the École Normale Supérieure de Lyon, France, and was a postdoctoral researcher in the Université de Montpellier. His main research interests lie in the analysis of mathematical models stemming from Biology, with a focus on integro-differential equations, PDE, asymptotic analysis, Hamilton-Jacobi equations, and SDE.