

Title: Asymptotic models for free boundary Darcy flows

Abstract: In the first lecture I will provide rigorous asymptotic models for the free boundary Darcy problem under the assumption of weak nonlinear interaction, in a regime in which the steepness parameter of the interface is considered to be very small. The second lecture will be devoted to prove some rigorous result of well-posedness in critical spaces for the asymptotic model. Basic knowledge of Fourier analysis and functional analysis is the only prerequisite for understanding the lectures. Joint work with R. Granero-Belinchón.