Talk 18: Carlo Bellingeri (Université de Lorraine)

Title: A Law of Large Numbers for Kinetic Diffusions

Abstract. Interacting particle systems are now a well-studied area with numerous applications, including the modeling of biological systems, financial markets, and more. In this talk, I will focus on a system of kinetic stochastic differential equations, where each particle is additively perturbed by a Brownian motion. While in the deterministic setting no hypothesis is needed beyond the convergence of the empirical measure, the stochastic framework typically requires either strong exchangeability of the initial particle configuration or certain technical moment assumptions. Based on joint work with Fabio Coppini (Utrecht University), I will show how one can recover the deterministic framework and establish a classical law of large numbers for kinetic diffusions. The main tools include anisotropic Besov spaces, a "simple" SPDE satisfied by the empirical measure, and the Garsia-Rodemich-Rumsey lemma.