

Institute for Applied Mathematics, Bonn University

Oberseminar Stochastik

Thursday, 5 December 2024, 16:30

Lipschitz-Saal (LWK 1.016)

Pedro Cardoso

Bonn University

Linear and nonlinear fractional PDEs from interacting particle systems

In this talk, we describe the strategy for the derivation of the hydrodynamic limit for a family of long-range interacting particle systems of exclusion type with symmetric rates. The corresponding hydrodynamic equation is

$$\partial_t \rho = [-(-\Delta)^{\gamma/2}] \rho^m$$

for some fixed $m \in \mathbb{N}$, where ρ is the density of particles in the system. For $m = 1$, this is the fractional heat equation. For $m \geq 2$, this is the fractional porous medium equation, obtained by choosing a rate that depends on the number of particles next to the initial and final position of a jump.