Bernoullis Tafelrunde

Graduate Student Seminar

Thursday, 19 February, 12:15-13:00
Seminarraum 05.002, Spiegelgasse 5

Alessia Nota

University of Helsinki

"Trails in a kinetic land"

Abstract

The problem of deriving macroscopic evolution equations from the microscopic laws of motion governed by Newton's laws of classical mechanics is one of the most important keystones in mathematical physics. In this talk we consider a simple microscopic model, namely a gas of non-interacting particles in a fixed random configuration of scatterers. This dynamical system is usually referred to as the Lorentz gas. Even though this model is quite simple, it is still paradigmatic. It represents a rare source of exact results in kinetic theory, providing a concrete example where microscopic reversibility can be reconciled with macroscopic irreversibility. We will focus on some examples where the rigorous validation of linear kinetic equations (in a suitable kinetic limit) and of hydrodynamics equations (under suitable diffusive limits) can be provided.