

Vincent Ardourel (Louvain), *Infinite limit, Brownian motion and stochasticity*

Brownian motion is the random motion of a particle in a fluid because of its collisions with the molecules of the fluid. Its dynamic is generally described by a stochastic equation, viz. the Langevin equation, which represents the effects of collisions. Yet each collision in the fluid is supposed to be deterministic since the molecules of the fluid can be represented by hard spheres. An important question for the foundations of statistical mechanics is whether the stochastic motion of the particle can be derived from a deterministic system of hard spheres. In this talk, I investigate this question from a recent mathematical derivation of the Brownian motion from a hard sphere gas (Bodineau, Gallagher and Saint-Raymond 2016). Its main interest is that Brownian motion is derived as the **limit** of a deterministic system. This talk aims at clarifying and discussing the role of the **infinite limit** in the appearance of Brownian motion.