UAB Universitat Autònoma de Barcelona
UNIVERSITAT DE BARCELONA
UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH

Barcelona Analysis Seminar **2025–2026**

Date: Thursday April 9, 2026
Time: 15:00 CET
Room: UB iA (Universitat de Barcelona)

Fisher information for the Boltzmann equation

Cyril Imbert
École normale supérieure, Université PSL, CNRS

The Boltzmann equation plays a central role in statistical mechanics. It describes the dynamics of a gas made of many interacting particles. Since its derivation by J. C. Maxwell in 1967, it has been extensively studied by the mathematical community, starting with articles by T. Carleman in the years 1930. Its "resolution" is still open: like for the Navier-Stokes equations in fluid mechanics, it is not known yet whether smooth initial data can give rise to solutions blowing up after existing for some time or if on the contrary they will exist forever. Various types of interactions between particles can be considered, leading to various distinct regimes to study the dynamical system. Assuming that velocities of particles are equally statistically distributed at each point of the set occupied by the gas, it is possible to "solve the problem" for all physically relevant interaction laws. Joint work with L. Silvestre and C. Villani.