

COLÓQUIO DE MATEMÁTICA

Quarta-feira, 3 de maio de 2023 às 16h00

About several issues concerning the Vlasov equation: Quasilinear approximation, Balescu Lenhard approximation and Landau Damping

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Ciências
ULisboa | Matemática

Convívio antes do Colóquio na sala dos docentes do C6,
com café, chá e bolos (15h45 até às 16h00)

Abstract:
In this talk we will discuss the evolution of a density of electrons under a mean-field approximation. It is simple enough to lead to some basic mathematical problems which received over the recent years complete or partial answers. For instance:

1. Short and long time existence of solutions,
2. Derivation of the solution of N interacting particles as N tends to infinity. On the other hand it is rich enough to lead to the formulation of qualitative issues appearing in real physical problem like the stability of plasma in Tokomak or laser confined plasma. In particular

Following an ongoing project, I intend to elaborate on this last point. I will start with the quasilinear approximation: a non linear diffusion equation which shares some similarity (and difference in the range of applications) with the Balescu Lenard or the Fokker Planck equations which will be considered as connection between the Penrose unstable solutions, the Penrose stable (O. Penrose. Phys. Fluids, 3:258-265, 1960) and at the end of the day the Mouhot Villani version of Landau Damping.