

## UNIVERSITÀ DI PARMA

## DIPARTIMENTO DI SCIENZE MATEMATICHE, FISICHE E INFORMATICHE http://smfi.unipr.it

## SEMINARIO di Fisica Matematica

Relatore: Prof. Niclas Bernhoff, Karlstad University – Sweden
Luogo: Sala delle Riunioni, Plesso di Matematica
Quando: martedì 15 ottobre 2019, ore 15.

## **Titolo:** Half-space problems in the kinetic theory of gases

Tutti gli interessati sono invitati a partecipare.

Organizzatore: Prof.ssa Marzia Bisi

**Abstract:** Half-space problems for the Boltzmann equation (BE) are of great importance in the study of the asymptotic behavior of the solutions of boundary value problems of the BE for small Knudsen numbers. They provide the boundary conditions for the fluid-dynamic-type equations and Knudsen-layer corrections to the solution of the fluid-dynamic-type equations in a neighborhood of the boundary.

Together with A.V. Bobylev, we began to consider such half-space problems for a general discrete velocity model for single species in an abstract setting, and obtained results for the number of conditions needed on the in-data for the problem to be well-posed. Later those results were extended. In fact, it appeared that the abstract formulation allowed the obtained results to be generalized to multi-component mixtures, polyatomic molecules (modelled by that each molecule has an internal energy to ), quantum BE for bosons, fermions, and anyons, excitations near a Bose-Einstein condensate, etc..

In this talk, we will, in addition to the results mentioned above, address a more generally formulated half-space problem, covering those discrete cases, but also (at least in some cases) the continuous BE for hard sphere models. The latter part is based on discussions with F. Golse.