

Recent advances in kinetic equations and applications

Report of Contributions

Contribution ID: 1

Type: **not specified**

Force acting on a heated/cooled particle in a rarefied flow with heat transfer

Friday, 24 November 2017 15:40 (30 minutes)

Presenter: TAGUCHI, Satoshi (University of Kyoto, Japan)

Contribution ID: 2

Type: **not specified**

Stiff-response-induced instability of chemotactic bacteria

Friday, 24 November 2017 11:15 (30 minutes)

Presenter: YASUDA, Shugo (University of hyogo, Japan)

Contribution ID: 3

Type: **not specified**

A kinetic model for the phase transition of the van der Waals fluid

Friday, 24 November 2017 09:50 (30 minutes)

Presenter: TAKATA, Shigeru (University of Kyoto, Japan)

Contribution ID: 5

Type: **not specified**

Quaternions in collective dynamics

Friday, 24 November 2017 13:45 (30 minutes)

Presenter: TRESCASES, Ariane

Contribution ID: 6

Type: **not specified**

Moments estimates for the discrete coagulation-fragmentation equations with diffusion

Friday, 24 November 2017 14:15 (30 minutes)

Coagulation-fragmentation equations can be used to study a wide range of phenomena, ranging from blood coagulation and polymer formation to planet formation. The (discrete) model consists in an infinite system of reaction-diffusion equations, each equation describing the evolution of the concentration of clusters of a given size/mass. While the spatially homogeneous case has been studied extensively, there are fewer mathematical results available when spatial inhomogeneity is taken into account.

In this talk I will explain how the so called “duality lemma” can be used in this context, to get estimates on the moments of the solution, leading to regularity results. This is joint work with L. Desvillettes and K. Fellner. I will also show how these estimates can be used to study the gelation issue, and prove that strong enough fragmentation can ensure mass conservation even for superlinear coagulation coefficients.

Presenter: BREDEN, Maxime

Contribution ID: 7

Type: **not specified**

Improving coherence in simulations of rarefied flows in the upper atmosphere

Friday, 24 November 2017 10:20 (30 minutes)

Presenter: DESVILLETES, Laurent (Université Paris Diderot)

Contribution ID: 8

Type: **not specified**

Linear Boltzmann Equation and Fractional Diffusion

Friday, 24 November 2017 16:10 (30 minutes)

Presenter: GOLSE, François

Contribution ID: 9

Type: **not specified**

Regularisation properties of the Boltzmann equation without cut-off

Friday, 24 November 2017 11:45 (30 minutes)

In this talk, we will study the regularisation properties of the Boltzmann equation without cut-off (in the hard potentials case) at the linearised level. The proof uses the hypoellipticity features of the equation and is reminiscent of what has already been done for the Fokker-Planck equation. We will then see that this type of property is a key point to develop a Cauchy theory for the nonlinear equation in Sobolev spaces with polynomial weights. This is a joint work with Frédéric Hérau and Daniela Tonon.

Presenter: TRISTANI, Isabelle

Contribution ID: 10

Type: **not specified**

Instantaneous filling of the vacuum for Boltzmann gases in bounded domains

Friday, 24 November 2017 14:45 (30 minutes)

Let us think of a room divided into two compartments thanks to a sealed wall. One of the two compartments is empty and the other filled with a gas. What does happen when one removes the wall ? The mathematical answer to this question is that the gas will immediately spread into every single nook of the entire room.

In this talk I will present how to prove this behaviour in convex bounded domains from the Boltzmann equation. More precisely, I will give an overview of the analytic and geometric methods leading to the existence of a uniform exponential lower bound for solutions to the Boltzmann equation.

Presenter: BRIANT, Marc

Contribution ID: 13

Type: **not specified**

Opening

Presenter: Mr TOMA, Shigemitsu (Embassy of Japan in France)