

*The Legacy of Carlo Cercignani: from Kinetic Theory to Turbulence Modeling*

May 24-28, 2021

PROGRAM

Monday 24 May

- 9:30-10:30 Opening (Giulio Magli, Giuseppe Saccomandi, Paolo Biscari, Mara Cercignani)
- 10:30-11:15 **Aldo Frezzotti** (invited)  
“ Kinetic theory approach to non-equilibrium two-phase flows”
- 11:15-12:00 **Tommaso Ruggeri** (invited)  
“ Kinetic theory and extended thermodynamics of polyatomic gas incorporating molecular rotation and vibration”
- 12:00-12:30 **Marzia Bisi**  
“ A general internal states framework for kinetic modelling of polyatomic gases”
- 12:30-14:00 Lunch time
- 14:00-14:45 **Vittorio Romano** (invited)  
“ Mathematical issues in charge transport in graphene”
- 14:45-15:30 **Luca Biferale** (invited)  
“ Data-driven and equation informed tools to model and reconstruct turbulent flows”
- 15:30-15:45 Break
- 15:45-16:30 **Massimo Germano** (invited)  
“ Taking the heritage: recent developments in the anisotropic eddy viscosity”
- 16:30-17:00 **Marcello Righi**  
“ A gas-kinetic scheme for turbulent flow”

Tuesday 25 May

- 9:30-10:15 **Kazuo Aoki** (invited)  
“ Model Boltzmann equations for a polyatomic gas and applications”
- 10:15-11:00 **Francois Golse** (invited)  
“ Half-space problems for the Boltzmann equation with phase transition at the boundary”
- 11:00-11:15 Break
- 11:15-11:45 **Silvia Lorenzani**  
“ Variational solutions of the linearized Boltzmann equation for hard-sphere molecules and Cercignani-Lampis boundary conditions”
- 11:45-12:15 **Niclas Bernhoff**  
“ Half-space problems for multi-component mixtures”
- 12:15-12:45 **Andrea Tosin**  
“ Non-conservative viral load-based kinetic description of epidemic spread on networks”
- 12:45-14:15 Lunch time
- 14:15-15:00 **Dimitris Valougeorgis** (invited)  
“ Oscillatory rarefied gas flows in long capillaries”
- 15:00-15:45 **Stefan Stefanov** (invited)  
“ Kinetic theory and Direct Simulation Monte Carlo Method- basic relations”
- 15:45-16:00 Break
- 16:00-16:30 **Avshalom Manela**  
“ Propagation of two-dimensional localized vibroacoustic disturbances in a rarefied gas”
- 16:30-17:00 **Giorgos Tatsios**  
“ Half-range moment method for rarefied gas flows driven by harmonically oscillating boundaries”
- 17:00-17:30 **Giovanni Nastasi**  
“ Charge transport in graphene nanoribbons”

Wednesday 26 May

- 9:30-10:15 **Giancarlo Benettin** (invited)  
“ The Fermi-Pasta-Ulam problem and its underlying integrable dynamics”
- 10:15-11:00 **Paolo Biscari** (invited)  
“ Scale-free evolution in random and periodic systems”
- 11:00-11:15 Break
- 11:15-11:45 **Marco Lenci**  
“ Random walk in a one-dimensional Lévy random medium”
- 11:45-12:15 **Nicolas Vauchelet**  
“ Computing accurate approximations of kinetic systems at diffusive regime”
- 12:15-13:15 *Seminario di cultura matematica*: **Giuseppe Toscani**  
“Meccanica statistica e fenomeni sociali” (in Italian).  
LINK: <http://tiny.cc/fdsCM2021>
- 13:15 15:00 Lunch time
- 15:00-15:45 **Felix Sharipov** (invited)  
“ Cercignani-Lampis scattering kernel and its applications to rarefied gas flows”
- 15:45-16:15 **Irina Graur**  
“ Simulation of the gas mixture behaviors using hard sphere and ab initio potentials”
- 16:15-16:45 **Tatiana Salnikova**  
“ Evolution of mutually gravitating particles system with possible collisions”
- 16:45-17:00 Break
- 17:00-17:30 **Marlies Pirner**  
“ BGK models for gas mixtures, polyatomic molecules and gases with chemical reactions: Modeling and theory”

Thursday 27 May

- 9:30-10:15 **Mario Pulvirenti** (invited)  
“ On the size of backward clusters in a low-density regime for hard-sphere systems”
- 10:15-11:00 **Alexander Bobylev** (invited)  
“ On self-similar solutions of the Boltzmann equation”
- 11:00-11:15 Break
- 11:15-11:45 **Francesco Mainardi**  
“ The key role of the functions of the Mittag-Leffler type in eternal solutions of the Boltzmann equation”
- 11:45-12:15 **Maria Groppi**  
“ Consistent BGK models for gas mixtures and applications”
- 12:15-12:45 **Sandra Warnecke**  
“ Numerical schemes for a multi-species BGK model with velocity-dependent collision frequency”
- 12:45-14:45 Lunch time
- 14:45-15:30 **Andrea Carati and Luigi Galgani** (invited)  
“ The Einstein classical program in the Cercignani's sense of the 'shortcut'. A review of some results”
- 15:30-16:00 **Fabrizio Gangemi**  
“ The Cercignani conjecture about a classical zero-point energy. Preliminary results”
- 16:00-16:30 **Matteo Zuin**  
“ Loss of magnetic confinement above a critical density in a microscopic model of magnetized plasma”
- 16:30-17:15 **Irene Gamba** (invited)  
“ The Boltzmann equation modeling mixtures and polyatomic gases”

Friday 28 May

- 9:30-10:15 **Giuseppe Toscani** (invited)  
“ Human behavior and lognormal distribution. A kinetic description”
- 10:15-11:00 **Laurent Desvillettes** (invited)  
“ Some new ideas about Cercignani's conjecture”
- 11:00-11:15 Photo gallery by Giovanni Frosali
- 11:15-11:45 **Mattia Zanella**  
“ Kinetic models for epidemic dynamics”
- 11:45-12:15 **Giacomo Dimarco**  
“ Wealth distribution under the spread of infectious diseases”
- 12:15-12:45 **Nadia Loy**  
“ Nonlocal kinetic models for cell-cell adhesion”
- 12:45-14:00 Lunch time
- 14:00-14:45 **Sauro Succi** (invited)  
“ Kinetic theory of soft flowing matter”
- 14:45-15:15 **Antonella Abba'**  
“Tensorial turbulent viscosity model for LES: properties and applications”
- 15:15-15:45 In memory of Carlo Cercignani by Luigi Galgani
- 15:45-16:00 Closing (Organizing Committee and Scientific Committee)