

Los Angeles, California **Computational Kinetic Transport** and Hybrid Methods

March 30 – April 3, 2009

ORGANIZING COMMITTEE: Pierre Degond (Université de Toulouse III (Paul Sabatier)), Bjorn Engquist (University of Texas at Austin), Frank Graziani (Lawrence Livermore National Laboratory), Shi Jin (University of Wisconsin-Madison), Caroline Lasser (Freie Universität Berlin), Anna-Karin Tornberg (Royal Institute of Technology (KTH), NADA)

Scientific Overview

This workshop will focus on computational modeling of various kinetic transport problems, in particular Boltzmann kinetic or transport equations with applications in astrophysics, planetary atmospheres, medical imaging, semiconductor-devices, and plasmas. The numerical methods to be discussed include direct simulation Monte-Carlo methods, particle methods, moment closure techniques, deterministic finite difference, finite element, and spectral methods. Hybridization of computational schemes linking multi-scale and multi-physics will also be addressed. Examples are microscopic to mesoscopic linking of quantum systems to semiclassical models for semiconductor device simulations, coupled kinetic and fluid models for hypersonic vehicles, and coupling of Monte Carlo and deterministic numerical methods.

Confirmed Speakers

Anton Arnold (Technische Universität Wien), Victor Batista (Yale), Russ Caflisch (UCLA), Eric Cances (École Nationale des Ponts-et-Chaussées), José A. Carrillo (Autonomous University of Barcelona), Andrew Christlieb (Michigan State), Bill Dorland (University of Maryland), Bjorn Enquist (University of Texas), Frank Graziani (Lawrence Livermore National Laboratory), Shi Jin (Wisconsin), Edward Larsen (Michigan), Jian-Guo Liu (University of Maryland), Robert Lowrie (Los Alamos National Laboratory), Luc Mieussens (Université Paul Sabatier Toulouse 3), Jim Morel (Texas A&M), Kyle Novak (Air Force Institute of Technology), Christian Ratsch (UCLA, IPAM), Giovanni Russo (Università di Catania), Chi-Wang Shu (Brown University), Henning Struchtrup (University of Victoria), Eitan Tadmor (University of Maryland), Manuel Torrilhon (ETH Zürich), Marie-Helene Vignal (Université de Toulouse III (Paul Sabatier)), Haobin Wang (New Mexico State University)

Long Program Schedule

This workshop is part of the Long Program "Quantum and Kinetic Transport: Analysis, Computations, and New Applications"

- Tutorials, March 10 13, 2009
- Workshop 1: Computational Kinetic Transport and Hybrid Methods, March 30 April 3, 2009
- Workshop 2: The Boltzmann Equation: DiPerna-Lions Plus 20 Years, April 15 17, 2009
- Workshop 3: Flows and Networks in Complex Media, April 27 May 1, 2009
- Workshop 4: Asymptotic Methods for Dissipative Particle Systems, May 18 22, 2009
- Culminating Workshop at Lake Arrowhead Conference Center, June 7 12, 2009

Participation

Additional information about this workshop including links to register and to apply for funding, can be found on the webpage listed below. Encouraging the careers of women and minority mathematicians and scientists is an important component of IPAM's mission, and we welcome their applications.

www.ipam.ucla.edu/programs/ktws1

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