

Curriculum Vitae

Luc MIEUSSENS

Professor

Bordeaux Institut National Polytechnique

Date of birth: 30th June 1972. Nationality: french

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Professional Appointments

- 2017–: Scientific Director of the high performance computer facilities MCIA
(with a HPC cluster of 11.000 cores)
University of Bordeaux, France
 - 2017–: Full Professor “classe exceptionnelle” in applied mathematics
Bordeaux Institut National Polytechnique, France
 - 2014–: Deputy director of the Institute of Mathematics of Bordeaux
 - 2014–: Scientific advisor at the French Atomic Energy Agency
 - 2012–2017 : Full Professor “1ère classe” in applied mathematics
Bordeaux Institut National Polytechnique, France
 - 2008–2012 : Full Professor in applied mathematics
Bordeaux Institut National Polytechnique, France
 - 2000–2008 : Assistant Professor
Université Paul Sabatier Toulouse 3, France
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Education

- 2007: Habilitation à diriger des recherches (Université Paul Sabatier Toulouse 3).
Title: *Contributions to the numerical simulation in Kinetic Theory: implicit schemes, coupling of models, asymptotic models..*
Advisor: P. Degond.
- 1999: Ph. D. in Applied Mathematics - Université Bordeaux 1.
Title: *Méthodes numériques pour l'équation de Boltzmann-BGK de la théorie cinétique des gaz.*
Advisor: Prof. P. Charrier.
- 1995: DEA - Applied Mathematics and Scientific Computing,
University of Bordeaux, France

Research interests

- Developpement of numerical methods for kinetic equations:
 - fast implicit schemes (rarefied gases)
 - uniformly stable methods for fluid limits (linear transport, radiative transfer, gaz dynamics)
 - numerical methods for coupling kinetic and fluid models
- Developpement of parallel codes for numerical simulation of rarefied gases
- Derivation of simplified kinetic models of the Boltzmann equation
- Application to atmospheric re-entry flows
- Mathematical and numerical modelling for air-sea interaction (rain, sea spray)

Selected publications

- K. Aoki, C. Baranger, M. Hattori, S. Kosuge, G. Martal, J. Mathiaud, L. Mieussens. *Slip Boundary Conditions for the Compressible Navier-Stokes Equations*, Journal of Statistical Physics, 169(4), 744-781 (2017)
- J. Mathiaud, L. Mieussens. *A Fokker-Planck Model of the Boltzmann Equation with Correct Prandtl Number for Polyatomic Gases*. Journal of Statistical Physics, 168(5), 1031-1055 (2017)
- S. Peluchon, G. Gallice, L. Mieussens. *A robust implicit-explicit acoustic-transport splitting scheme for two-phase flows*, Journal of Computational Physics, 339(15), 328-355 (2017)
- F. Veron, L. Mieussens. *A kinetic model for particle-surface interaction applied to rain falling on water waves*. Journal of Fluid Mechanics, 796, 767-787 (2016)
- G. Dechristé, L. Mieussens, *A Cartesian Cut Cell Method for Rarefied Flow Simulations around Moving Obstacles*, Journal of Computational Physics, 314, 465-488 (2016)
- S. Brull, L. Mieussens. *Local discrete velocity grids for deterministic rarefied flow simulations*. J. Comput. Phys., 266(1), 22-46 (2014)
- C. Baranger, J. Claudel, N. Hérouard, L. Mieussens. *Locally refined discrete velocity grids for stationary rarefied flow simulations*. J. Comput. Phys., 257(15), 572-593 (2014)

Teaching

- all my teaching activities are in the Engineering School ENSEIRB-MATMECA
- course on Numerical Methods for PDEs (finite differences, finite volumes)
- course on basic numerical methods (interpolation, quadratures, integration of differential equations, linear systems)
- course “an introduction to Transport of Particles: models, numerical methods, and applications” in which I present rarefied gas dynamics, radiative transfer, and spray transport in fluids (Master level degree)

Ph. D. and post-docs students

- Current Ph. D. students:
 - 2018–: M. Schouler, (co-advised with Dr. Y. Prévèrault, ONERA)
Thesis: Modelling flows in hypersonic rarefied regimes: applications to satellites in very low orbite and to atmospheric reentry problems.
 - 2016–: G. Jeanmasson, (co-advised with Dr. I. Mary, ONERA)
Thesis: Local time stepping explicit methods for the simulation of unsteady turbulent flows.
- Former Ph. D students (including last known position):
 - 2014–2017: S. Peluchon (co-advised with G. Gallice (CEA))
Researcher, French atomic energy agency (CEA)
Thesis: Numerical modelling of the liquid ablation
 - 2011–2014: G. Dechristé
Engineer, Cdiscount
Thesis: Numerical methods for the numerical simulation of rarefied gas flows around moving obstacles
 - 2011–2014: N. Hérouard
Engineer, CS
Thesis: Optimization, analysis, and comparison of deterministic numerical methods for rarefied gas dynamics
 - 2005–2009: M. Bennoune (co-advised with M. Lemou)
Mathematics teacher (Canada)
Thesis: Numerical approximations of some kinetic equations that preserve their fluid asymptotics
 - 2001–2004: J.-P. Bourgade (co-advised with P. Degond)
Mathematics teacher (university of Toulouse)
Thesis: Diffusion models obtained from kinetic equations: modelling, mathematical analysis, and simulation
- Former post-docs:
 - 2015–2017: Jordane Mathé, co-advised with C. Baranger and J. Mathiaud (CEA-CESTA)
project: "Models and methods for a deterministic chemically reacting rarefied flows solver"
 - 2015–2017: Giorgio Martalò, co-advised with C. Baranger, J. Mathiaud (CEA-CESTA) and P. Congedo (INRIA)
project: "Slip and jump boundary conditions for the compressible Navier-Stokes equations: derivation and sensitivity analysis"
 - 2014–2015: Mathieu Coquerelle, co-advised with P. Lubin, S. Glockner (I2M, Bx INP), and F. Véron (university of Delaware, USA)
project: "Impact of rain on ocean waves"
 - 2012–2013: Louis Forestier-Costes
project: "Local discrete velocity grids for rarefied flow simulations"
 - 2012–2013: Florent Pruvost
project: "Parallelization and optimization of a deterministic simulation code for rarefied gas flows"

International outreach

- Invitations in international conferences (since 2013)
 - The 12th AIMS Conference on Dynamical Systems, minisymposium Models and numerical methods in kinetic theory, *Numerical boundary conditions for the simulation of rarefied flows along solid boundaries*, July 5 – July 9, 2018 Taipei, Taiwan
 - The 12th AIMS Conference on Dynamical Systems, minisymposium Collisions, mean field, and organized motion, *A BGK model for polyatomic gas flows at high temperature*, July 5 – July 9, 2018 Taipei, Taiwan
 - SIAM Conference on Analysis of Partial Differential Equations, minisymposium Multi-species Kinetic and Fluid Models and Applications, *A BGK model for polyatomic gas flows at high temperature*, December 9–12, 2017 Baltimore (Maryland, USA)
 - European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS), *Local velocity grids for deterministic simulations of rarefied flows*, June 5-10, 2016 (Crete Island, Greece)
 - 2nd European Conference on Non-equilibrium Gas Flows: *Numerical Simulation of the Crookes Radiometer*, December 9-11, 2015, Eindhoven University of Technology (Eindhoven, Netherlands)
 - Workshop “Kinetic and Related Equations”, 2015, Casa Matemática Oaxaca (Mexico)
 - SIAM conference on Computational Science & Engineering, 2015, Salt Lake City (Utah, USA)
 - 29th International Symposium on Rarefied Gas Dynamics: *A survey of deterministic solvers for rarefied flows*, July 13-18, 2014, Xi'an, (China)
 - SIAM Conference on Analysis of Partial Differential Equations: *The unified gas kinetic scheme of K. Xu applied to linear transport in diffusion regimes*, December 7-10, 2013, Orlando (Florida, USA)
 - Workshop “Issues in Solving the Boltzmann Equation for Aerospace Applications”: *How to avoid very large discrete velocity grids in deterministic simulation of rarefied gas flows?* June 3-7, 2013, ICERM, Providence RI. (USA)
- Invitations in foreign universities
 - university of Delaware at Newark (USA), invited by Fabrice Véron, in 2018, 2017, 2016, (one week) and 2014 (two weeks)
 - university Aachen (Germany), invited by Manuel Torrilhon in 2015 (3 days)
 - Newton Institute for Mathematical Sciences, Cambridge (UK), 2010 (three weeks)
 - university of Maryland at College-Park (USA), invited by Jian-Guo Liu, 2005 and 2008 (two weeks)
 - university of Wisconsin at Madison (USA), invited by Shi Jin, 2004 (two weeks)
 - university of Kyoto (Japan), invited by Kazuo Aoki, 2002, 2003, and 2006 (two weeks)

Research grant support

Currently funded grants

- Title: Modelling flows in hypersonic rarefied regimes: applications to satellites in very low orbite and to atmospheric reentry problems
PI: L. Mieussens (co-PI: Dr. Y. Préverault)
Period: 2018–2021
Sponsor: DGA
Amount: 80.000 Euro
Details: collaborative project in which we want to correctly describe the flight of a satellite in very low orbite. We will use existing fine scale solvers (like the SPARTA code), and develop reduced order models for fast simulations.
- Title: Local time stepping explicit methods for the simulation of unsteady turbulent flows
PI: L. Mieussens (co-PI: Dr. I. Mary)
Period: 2016–2019
Sponsor: DGA
Amount: 80.000 Euro
Details: we want to develop numerical solvers for unsteady flows in which the time step can be space dependent, and locally adapted to small or larger cells. The resulting solvers should be very well suited to large scale simulations on high performance computers with thousand of processors.

Completed projects

- Title: Construction and analysis of slip and jump boundary conditions for Navier-Stokes equations of compressible gas dynamics applied to flows in the transitional regime
PI: L. Mieussens
Period: 2015–2017
Sponsor: CPU Labex
Amount: 188.000 Euro
Details: This project was a collaborative proposal in which we studied the derivation of slip and jump boundary conditions for the Navier-Stokes equations, by using an asymptotic analysis of the Boltzmann equation. These boundary conditions have been compared to more standard ones.
- Title: Models and numerical methods for rarefied flow simulations with chemical reactions
PI: L. Mieussens and L. Desvillettes
Period: 2012–2014
Sponsor: CEA
Amount: 45.000 Euro
Details: This project was concerned with the developpement of a simplified BGK model of the Boltzmann equation for chemically reacting gases. This model was implemented in the simulation code of the CEA.
- Title: Improvement of a deterministic code for rarefied flow simulations
PI: L. Mieussens
Period: 2010–2014
Sponsor: CEA
Amount: 100.000 Euro
Details: during this project, the deterministic code of the CEA for rarefied flow simulations (applied to atmospheric reentry) was greatly improved: models for polyatomic gases, optimization of the numerical methods

Complete list of publications

Submitted

1. E. Jun, M. Gorji, L. Mieussens. *A Comparative Study Between Cubic and Ellipsoidal Fokker-Planck Kinetic Models*, (2018)
2. C. Baranger, G. Marois, J. Mathé, J. Mathiaud, L. Mieussens. *A BGK model for high temperature rarefied gas flows*, (2018)
3. C. Baranger, N. Hérouard, J. Mathiaud, L. Mieussens. *Numerical boundary conditions in Finite Volume and Discontinuous Galerkin schemes for the simulation of rarefied flows along solid boundaries*, (2017)

International Journals

1. K. Aoki, C. Baranger, M. Hattori, S. Kosuge, G. Martalò, J. Mathiaud, L. Mieussens. *Slip Boundary Conditions for the Compressible NavierStokes Equations*, J. Stat. Phys., 169(4), 744-781 (2017)
2. J. Mathiaud, L. Mieussens. *A Fokker-Planck Model of the Boltzmann Equation with Correct Prandtl Number for Polyatomic Gases*. J. Stat. Phys., 168(5), 1031-1055 (2017)
3. S. Peluchon, G. Gallice, L. Mieussens. *A robust implicit-explicit acoustic-transport splitting scheme for two-phase flows*, J. Comput. Phys., 339(15), 328-355 (2017)
4. S. Brull, P. Charrier, L. Mieussens. *Nanoscale roughness effect on Maxwell-like boundary conditions for the Boltzmann equation*, Phys. Fluids 28, 082004 (2016)
5. F. Veron, L. Mieussens. *A kinetic model for particle-surface interaction applied to rain falling on water waves*. Journal of Fluid Mechanics, 796, 767-787 (2016)
6. G. Dechristé, L. Mieussens. *A cartesian cut cell method for rarefied flow simulations around moving obstacles*. J. Comput. Phys., 314, 465-488 (2016)
7. J. Mathiaud, L. Mieussens. *A Fokker-Planck model of the Boltzmann equation with correct Prandtl number*. J. Stat. Phys., 162(2), 397-414 (2016)
8. G. Dimarco, L. Mieussens, V. Rispoli. *An asymptotic preserving automatic domain decomposition method for the Vlasov-Poisson-BGK system with applications to plasmas*. J. Comput. Phys., 274(1), 122-139 (2014)
9. S. Brull, P. Charrier, L. Mieussens. *Gas-surface interaction and boundary conditions for the Boltzmann equation*. Kinetic and Related Models 7(2), 219-251, (2014)
10. S. Brull, L. Mieussens. *Local discrete velocity grids for deterministic rarefied flow simulations*. J. Comput. Phys., 266(1), 22-46 (2014)
11. C. Baranger, J. Claudel, N. Hérouard, L. Mieussens. *Locally refined discrete velocity grids for stationary rarefied flow simulations*. J. Comput. Phys., 257(15), 572-593 (2014)
12. L. Mieussens. *On the Asymptotic Preserving property of the Unified Gas Kinetic Scheme for the diffusion limit of linear kinetic models*. J. Comput. Phys., 253(15), 138-156 (2013)
13. J.-G. Liu, L. Mieussens. *Analysis of an asymptotic preserving scheme for linear kinetic equations in the diffusion limit*. SIAM J. Numer. Anal. 48(4), 1474-1491 (2010)
14. P. Degond, G. Dimarco, L. Mieussens. *A multiscale kinetic-fluid solver with dynamic localization of kinetic effects*. J. Comput. Phys. 229(13), 4907-4933 (2010)

15. M. Bennoune, M. Lemou, L. Mieussens. *An asymptotic preserving scheme for the Kac model of the Boltzmann equation in the diffusion limit*. Cont. Mech. Thermodyn. 21(5), 401-421 (2009)
16. K. Aoki, P. Degond, L. Mieussens. *Numerical simulations of rarefied gases in curved channels: thermal creep, circulating flow, and pumping effect*. Commun. Comput. Phys. 6(5), 919-954 (2009)
17. M. Lemou et L. Mieussens. *A new asymptotic preserving scheme based on micro-macro formulation for linear kinetic equations in the diffusion limit*. SIAM J. Sci. Comput. 31(1), 334-368 (2008)
18. M. Bennoune, M. Lemou, L. Mieussens. *Uniformly stable numerical schemes for the Boltzmann equation preserving compressible Navier-Stokes asymptotics*. J. Comput. Phys. 227(8) 3781-3803 (2008)
19. K. Aoki, P. Degond, L. Mieussens, S. Takata, et H. Yoshida. *A diffusion model for rarefied flows in curved channels*. SIAM MMS 6(4), 1281-1316 (2008)
20. P. Degond, G. Dimarco, L. Mieussens. *A moving interface method for dynamic kinetic-fluid coupling*. J. Comput. Phys. 227(10), 1176-1208 (2007)
21. P. Degond, J.-G. Liu, L. Mieussens. *Macroscopic fluid models with localized kinetic upscaling effects*. SIAM MMS 5(3), 940-979 (2006)
22. M. Lemou, L. Mieussens. *Implicit schemes for the Fokker-Planck-Landau equation*. SIAM J. Sci. Comp. 27(3), 809-830 (2005)
23. P. Degond, S. Jin et L. Mieussens. *A smooth coupling transition model between kinetic and hydrodynamic equations* J. Comput. Phys. 209, 665-694 (2005)
24. L. Mieussens, H. Struchtrup. *Numerical comparison of BGK-models with proper Prandtl number*. Phys. Fluids 16(8), 2797-2813 (2004)
25. J.-P. Bourgade, A. Mellet, L. Mieussens. *Numerical comparison between two Spherical Harmonics Expansion models and a kinetic equation*, Mathematical and Computer Modelling, 40(7/8), 777-795 (2004)
26. P. Charrier, B. Dubroca, L. Mieussens, R. Turpault. *Discrete-velocity models for numerical simulations in transitional regime for rarefied flows and radiative transfer*. IMA Volumes in Mathematics and its Applications. Volume 135: Transport in Transition Regimes, 85-103 (2003)
27. B. Dubroca, L. Mieussens. *A conservative and entropic discrete-velocity model for rarefied polyatomic gases*, ESAIM-Proceedings Vol. 10 - CEMRACS 1999, 127-139 (2001)
28. L. Mieussens. *Convergence of a discrete-velocity model for the Boltzmann-BGK equation*, Computers Math. Applic. 41(1-2), 83-96 (2001)
29. L. Mieussens. *Discrete velocity models and numerical schemes for the Boltzmann-BGK equation in plane and axisymmetric geometries*, J. Comput. Phys. 162, 429-466 (2000)
30. L. Mieussens. *Discrete Velocity Model and Implicit Scheme for the BGK Equation of Rarefied Gas Dynamics*, Math. Models and Meth. Appl. Sci. 8(10), 1121-1149 (2000)

Proceedings

1. S. Brull, L. Forestier-Costes, L. Mieussens, *Two dimensional local adaptive discrete velocity grids for rarefied flow simulations* , Proceedings of the 30th International symposium on rarefied gas dynamics,AIP Conf. Proc. 1786, 180002 (2016).
2. G. Dechristé, L. Mieussens, *A cut cell method for the 3D simulation of Crookes radiometer*, Proceedings of the 29th International symposium on rarefied gas dynamics,AIP Conf. Proc. 1628, 988 (2014).

3. S. Brull and L. Mieussens, *A numerical adaptative method for solving kinetic equations based on local velocity grids*, Proceedings of the 29th International symposium on rarefied gas dynamics, AIP Conf. Proc. 1628, 962 (2014).
4. L. Mieussens, *A survey of deterministic solvers for rarefied flows*, Proceedings of the 29th International symposium on rarefied gas dynamics, AIP Conf. Proc. 1628, 943 (2014),
5. C. Baranger, J. Claudel, N. Hérouard, and L. Mieussens *Locally refined discrete velocity grids for deterministic rarefied flow simulations*. 28th International symposium on rarefied gas dynamics 2012, AIP Conf. Proc. 1501, pp. 389-396.
6. G. Dechristé, L. Mieussens. *A moving mesh approach for the numerical simulation of gas micro flows*. 28th International symposium on rarefied gas dynamics 2012, AIP Conf. Proc. 1501, pp. 366-372.
7. G. Dechristé, L. Mieussens. *Numerical simulation of micro flows with moving obstacles*. Actes du 1st European Conference on Gas Micro Flows (GasMems 2012), 2012 J. Phys.: Conf. Ser. 362 012030.
8. C. J. T. Laneryd, K. Aoki, P. Degond, L. Mieussens. *Thermal creep of a slightly rarefied gas through a channel with curved boundary*. In M. S. Ivanov and A. K. Rebrov, editors, *Rarefied Gas Dynamics*, pages 1111-1116. Siberian Branch of the Russian Academy of Sciences, Novosibirsk, 2007.
9. K. Aoki, P. Degond, L. Mieussens, M. Nishioka, S. Takata. *Numerical simulation of a Knudsen pump using the effect of curvature of the channel*. In M. S. Ivanov and A. K. Rebrov, editors, *Rarefied Gas Dynamics*, pages 1079-1084. Siberian Branch of the Russian Academy of Sciences, Novosibirsk, 2007.
10. M. Lemou, L. Mieussens. *Time implicit schemes and fast approximations of the Fokker-Planck-Landau equation*. Proceedings of the 6th MAFPD (Kyoto, septembre 2004), Bulletin of the Institute of Mathematics, Academia Sinica (New Series), Volume 2, N. 2, pp. 533-567, 2007.
11. L. Mieussens, H. Struchtrup. *Numerical solutions for the BGK-model with velocity-dependent collision frequency*. Symposium on Rarefied Gasdynamics 23, AIP Conference Proceedings 663, 320-327 (2003)
12. P. Charrier, B. Dubroca, L. Mieussens. *A Numerical Method for Rarefied Flow Computation using a Discrete Velocity BGK model*, in *Rarefied Gas Dynamics (Volume 1)*. R. Brun, R. Campargue, R. Gatignol, and J.C. Lengrand, eds., Cépaduès éditions, 1999

Conferences

1. The 12th AIMS Conference on Dynamical Systems, minisymposium “Differential Equations and Applications, Special Session Models and numerical methods in kinetic theory”, July 5 – July 9, 2018 Taipei, Taiwan, (invited talk)
2. The 12th AIMS Conference on Dynamical Systems, minisymposium “Differential Equations and Applications, Kinetic and related equations: collisions, mean field, and organized motion”, July 5 – July 9, 2018 Taipei, Taiwan, (invited talk)
3. SIAM Conference on Analysis of Partial Differential Equations, minisymposium Multi-species Kinetic and Fluid Models and Applications, *A BGK model for polyatomic gas flows at high temperature*, December 9–12, 2017 Baltimore (Maryland, USA), (invited talk)
4. 30th International Symposium on Rarefied Gas Dynamics, *Local velocity grids for deterministic simulations of rarefied flows* July 10-15, 2016 (University of Victoria, Canada)
5. European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS), *Local velocity grids for deterministic simulations of rarefied flows*, June 5-10, 2016 (Crete Island, Greece), (invited talk)

6. Sminaire de Mcanique des Fluides Numriques CEA-GAMNI: *Numerical Simulation of the Crookes Radiometer*, January 25-26, 2016, (invited talk)
7. 2nd European Conference on Non-equilibrium Gas Flows: *Numerical Simulation of the Crookes Radiometer*, December 9-11, 2015, Eindhoven University of Technology (Eindhoven, Netherlands), (invited talk)
8. Workshop “Kinetic and Related Equations”, 2015, Casa Matemtica Oaxaca (Mexique) (invited talk)
9. SIAM conference on Computational Science & Engineering, 2015, Salt Lake City (Utah, USA) (invited talk)
10. 29th International Symposium on Rarefied Gas Dynamics: *A survey of deterministic solvers for rarefied flows*, July 13-18, 2014, Xi'an, (Chine) (invited talk)
11. SIAM Conference on Analysis of Partial Differential Equations: *The unified gas kinetic scheme of K. Xu applied to linear transport in diffusion regimes*, December 7-10, 2013, Orlando (Florida, USA), (invited talk)
12. Workshop “Issues in Solving the Boltzmann Equation for Aerospace Applications”: *How to avoid very large discrete velocity grids in deterministic simulation of rarefied gas flows?* June 3-7, 2013, Providence RI. (USA), (invited talk)
13. Workshop “Kinetic Theory and Related Fields: Theoretical and Numerical Approaches”: *Changing the paradigm of the discrete-ordinate method for rarefied gas dynamics: how to define locally refined velocity grids and local discrete velocity methods*, 24th-28th September 2012, Kyoto (Japan), (invited talk)
14. ICIAM 2011, Vancouver, Canada, 18-22 juillet 2011 : *Asymptotic Preserving Schemes for Kinetic Equations for Hydrodynamic and Diffusion Regimes*, Minisymposium “Gas-kinetic Theory based Numerical Algorithms for Computational Fluid Dynamics” (invited talk)
15. ICIAM 2011, Vancouver, Canada, 18-22 juillet 2011 : *Fast Deterministic Rarefied Flow Simulation using non Cartesian Velocity Grids*, Minisymposium “Advanced Numerical Methods for Kinetic Simulations and Their Applications” (invited talk)
16. GASMEMS 3rd Summer School and Workshop, Bertinoro, Italie, 6-11 juin 2011 : *Numerical Simulation of Gas Microflows* (invited talk)
17. Workshop “Numerical Methods for stiff problems in Hamiltonian systems and kinetic equations”, Saint-Malo 26-28 janvier 2011 : *AP space discretizations of kinetic equations* (invited talk)
18. Workshop on “Topics in Kinetic Theory”, Universit de Victoria, Canada, 29 juin-3 juillet 2009 : *Analysis of an asymptotic preserving scheme for linear kinetic equations in the diffusion limit* (invited talk)
19. 3rd International Conference on Approximation Methods and numerical Modeling in Environment and Natural Resources (MAMERN 2009), Universit de Pau, 8-11 juin 2009 *Numerical simulations and asymptotic model for a Knudsen compressor*. (invited talk)
20. Workshop on Microfluid Flows & Kinetic Equations, universit Lyon 1, 26-28 mai 2009, *Numerical simulations of rarefied gases in curved channels: thermal creep, circulating flow, and pumping effect*. (invited talk)
21. Quantum and Kinetic Transport: Analysis, Computations, and New Applications Workshop I: Computational Kinetic Transport and Hybrid Methods, Institute for Pure and Applied Mathematics, University of California at Los Angeles, USA, 30 mars-3 avril 2009 : *On the use of the micro-macro decomposition to design multiscale numerical schemes for kinetic equations* (invited talk)
22. Workshop on Moment Methods in Kinetic Gas Theory, ETH Zrich, 6-8 novembre 2008 : *Asymptotic preserving schemes for kinetic equations*. (invited talk)
23. Nano-Brixen 2007 (Modeling and computational methods in fluid dynamics and material science: towards the challenge of the nanoscales), 19-22 dcembre 2007, Bressanone, Italie : *Numerical simulations of rarefied gases in curved channels: thermal creep, circulating flow, and pumping effect*. (invited talk)

24. The Second International Conference for Mesoscopic Methods in Engineering and Science, Hong Kong Polytechnic University, Hong Kong, 2005 : *A smooth transition model between kinetic and hydrodynamic equations*. (invited talk)
25. International workshop on kinetic theory and fluid dynamics in complex systems, Department of Aeronautics and Astronautics, Graduate School of Engineering, Kyoto University, Japon (31 Octobre 2003) : *Implicit schemes for the Fokker-Planck-Landau equation of plasma physics* (invited talk)
26. Oberwolfach meeting (Asymptotic and Numerical Methods for Kinetic Equations), Allemagne, 2001 : *Discrete-velocity models of BGK-like equations and numerical methods for fast computing rarefied flows*. (invited talk)
27. Workshop Numerical Methods for Hyperbolic and Kinetic Equations, Universit de Ferrare, Italie, 1999 : *Numerical methods for the Boltzmann-BGK equation in plane and axisymmetric geometries*. (invited talk)
28. Institute of Theoretical and Applied Mechanics, Novosibirsk, Russie, 1999 : *Discrete-velocity methods for computing rarefied gas flows*. (invited talk)
29. Congrès national d'analyse numérique (CANum 1999). Bonascre, Ax-les-Thermes, France, 1999 : *Modèle à vitesses discrètes pour l'équation BGK et simulation de gaz raréfiés*.
30. Joint TMR Conference on Kinetic and Hyperbolic Problems. S. Margherita Ligure, Italie, 1999 : *Convergence of a Discrete Velocity Model for the BGK Equation*.
31. Sixteenth International Conference in Numerical Methods for Fluid Dynamics (16th ICNMF), Arcachon, France, 1998 : *An Implicit Discrete Velocity Scheme for the BGK Equation of Rarefied Gas Dynamics*.
32. First European Symposium on Applied Kinetic Theory (1st ESAKT), Toulouse, France, 1998 : *An Implicit Discrete Velocity Scheme for the BGK Equation of Rarefied Gas Dynamics*.