

CURRICULUM VITAE

FRANCESCO SALVARANI

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Current position:

Since 2005: *Tenured University Researcher*, University of Pavia (Italy).

Previous academic position:

2002-2005: *University Researcher*, University of Pavia (Italy)

Qualifications:

2014: Full professorship scientific habilitation (Italy).

2017: Professorship qualification (Sections 25 and 26, France).

Education:

2001: Double PhD in Mathematics, École Normale Supérieure de Cachan (France) and University of Genoa (Italy). Title: *Linear and nonlinear problems in kinetic and transport theory*.

1997: Master in Physics, University of Pavia (Italy).

Keywords: Kinetic and transport theory, complex fluids, plasmas, evolutionary domains, multi-agent phenomena, mean-field games.

Publications: 47 articles (among them, 38 are published or accepted in international peer-reviewed journals) and 5 preprints

Editorial activity: PDE models for multi-agent phenomena. INdAM Springer series, Pierre Cardaliaguet, Alessio Porretta, Francesco Salvarani editors, Springer Verlag, in preparation

Programming skills: C, CUDA, FreeFem++, Matlab, Scilab.

Spoken languages: Italian (mother tongue), English (fluent), French (fluent), Spanish (fluent).

Published articles on international peer-reviewed journals.

- [1] Harsha Hutridurga, Francesco Salvarani. Maxwell-Stefan diffusion asymptotic for gas mixtures in non-isothermal setting. In print on *Nonlinear Analysis*
- [2] Harsha Hutridurga, Francesco Salvarani. On the Maxwell-Stefan diffusion limit for a mixture of monatomic gases. *Math. Meth. in Appl. Sci.*, **40**, 3 (2017) 803–813
- [3] Luigi Barletti, Francesco Salvarani. On a nonlinear parabolic problem arising in the quantum diffusive description of a degenerate fermion gas. *SIAM J. Appl. Math.* **76**, 3 (2016) 867–886
- [4] Laurent Boudin, Francesco Salvarani. Opinion dynamics: kinetic modelling with mass media, application to the Scottish independence referendum. *Phys. A* **444**, 22 (2016) 448–457
- [5] Laurent Boudin, Bérénice Grec, Francesco Salvarani. The Maxwell-Stefan diffusion limit for a kinetic model of mixtures. *Acta Appl Math.* **136**, 1 (2015) 79–90
- [6] Florian De Vuyst, Francesco Salvarani. Numerical simulations of degenerate transport problems. *Kinet. Relat. Models* **7**, 3 (2014) 463–476
- [7] Pierre Gabriel, Francesco Salvarani. Exponential relaxation to self-similarity for the superquadratic fragmentation equation. *Appl. Math. Lett.* **27** (2014) 74–78.
- [8] Étienne Bernard, Francesco Salvarani. Optimal estimate of the spectral gap for the degenerate Goldstein-Taylor model. *J. Stat. Phys.* **153**, 2 (2013) 363–375
- [9] Étienne Bernard, Francesco Salvarani. On the exponential decay to equilibrium of the degenerate linear Boltzmann equation. *J. Funct. Anal.* **265**, 9 (2013) 1934–1954
- [10] Étienne Bernard, Francesco Salvarani. On the convergence to equilibrium for degenerate transport problems. *Arch. Rational. Mech. Anal.*, **208**, 3 (2013) 977–984
- [11] Francesco Salvarani. On the linear Boltzmann equation in evolutionary domains with absorbing boundary. *J. Phys. A* **46**, (2013) 355501
- [12] Julien Mathiaud, Francesco Salvarani. A numerical strategy for radiative transfer problems with highly oscillating opacities. *Appl. Math. Comput.* **221**, (2013) 249–256
- [13] Laurent Boudin, Bérénice Grec, Milana Pavić, Francesco Salvarani. Diffusion asymptotics of a kinetic model for gaseous mixtures. *Kinet. Relat. Models*, **6**, 1 (2013) 137–157
- [14] Florian De Vuyst, Francesco Salvarani. GPU-accelerated numerical simulations of the Knudsen gas on time-dependent domains. *J. Comput. Phys.*, **184**, 3 (2013) 532–536
- [15] Laurent Boudin, Aurore Mercier, Francesco Salvarani. Conciliatory and contradictory dynamics in opinion formation. *Phys. A* **391**, 22 (2012) 5672–5684
- [16] Laurent Boudin, Bérénice Grec, Francesco Salvarani. A mathematical and numerical analysis of the Maxwell-Stefan diffusion equations. *Discrete Contin. Dyn. Syst. B* **17**, 5 (2012) 1427–1440
- [17] Mustapha Mokhtar-Kharroubi, Francesco Salvarani. Convergence rates to equilibrium for neutron chain fissions. *Acta Appl. Math.* **113**, 2 (2011) 145–165
- [18] Cristina Montomoli, Michele Nichelatti, Francesco Salvarani. Recovering incidence from repeated measures of prevalence: the case of urinary tract infections. *J. Clin. Monit. Comput.* **24**, 4 (2010) 269–277
- [19] Laurent Boudin, Roberto Monaco, Francesco Salvarani. A kinetic model for multidimensional opinion formation. *Phys. Rev. E* **81**, 036109 (2010)
- [20] Étienne Bernard, François Golse, Francesco Salvarani. Homogenization of transport problems and semigroups. *Math. Meth. in Appl. Sci.* **33**, 10 (2010) 1228–1234

- [21] Francesco Salvarani. Asymptotic behaviour for logarithmic diffusion. *J. Math. Phys.* **50**, 113518 (2009)
- [22] Laurent Boudin, Francesco Salvarani. The quasi-invariant limit for a kinetic model of sociological collective behavior. *Kinet. Relat. Models* **2**, 3 (2009) 433–449
- [23] Laurent Boudin, Francesco Salvarani. A kinetic approach to the study of opinion formation. *M2AN Math. Model. Numer. Anal.* **43**, 3 (2009) 507–522
- [24] Francesco Salvarani, Giuseppe Toscani. The diffusive limit of Carleman-type models in the range of very fast diffusion equations. *J. Evol. Eq.* **9**, 1 (2009) 67–80
- [25] Emmanuel Frénod, Francesco Salvarani, Eric Sonnendrücker. Long time simulation of a beam in a periodic focusing channel via a two-scale PIC-method. *Math. Models Methods Appl. Sci.* **19**, 2 (2009) 175–197
- [26] Laurent Desvillettes, Francesco Salvarani. Asymptotic behavior of degenerate linear transport equations. *Bull. Sci. Mat.* **133**, 8 (2009) 848–858
- [27] José Antonio Carrillo, Jesús Rosado, Francesco Salvarani. 1D Nonlinear Fokker-Planck equations for Fermions and Bosons. *Appl. Math. Lett.* **21**, 2 (2008) 148–154
- [28] François Golse, Francesco Salvarani. Nonlinear diffusion for Carleman-like models: the initial-boundary value problem. *Nonlinearity* **20**, 4 (2007) 927–942
- [29] Luigi Barletti, Aldo Belleni Morante, Roberto Monaco, Francesco Salvarani. A kinetic approach to dust coagulation. *Ricerche di Matematica* **LIV**, 1 (2005) 271–291
- [30] Francesco Salvarani, Juan Luis Vázquez. The diffusive limit for Carleman-type kinetic models. *Nonlinearity* **18**, 3 (2005) 1223–1248
- [31] Laurent Desvillettes, Roberto Monaco, Francesco Salvarani. A kinetic model allowing to obtain the energy law of polytropic gases in the presence of chemical reactions. *Eur. J. Mech. B/Fluids* **24**, 2 (2005) 219–236
- [32] Francesco Salvarani, Giuseppe Toscani. Large-time asymptotics for nonlinear diffusions: the initial-boundary value problem. *J. Math. Phys.* **46**, 023502 (2005)
- [33] Aldo Belleni Morante, Roberto Monaco, Riccardo Riganti, Francesco Salvarani. A numerical approach for inverse problems in photon transport inside an interstellar cloud. *Appl. Math. Comput.* **154**, 1 (2004) 115–126
- [34] Laurent Desvillettes, Francesco Salvarani. Characterization of collision kernels. *M2AN Math. Model. Numer. Anal.* **37**, 2 (2003) 345–355
- [35] Eric Carlen, Francesco Salvarani. On the optimal choice of coefficients in a truncated Wild sum and approximate solutions for the Kac equation. *J. Stat. Phys.* **109**, 1/2 (2002) 261–277
- [36] Riccardo Riganti, Francesco Salvarani. A singularly perturbed problem of photon transport in a time-dependent region. *Math. Meth. in Appl. Sci.* **25**, 9 (2002) 749–769
- [37] Aldo Belleni Morante, Roberto Monaco, Francesco Salvarani. Approximated solutions of photon transport in a time dependent region. *Trans. Theory Stat. Phys.* **30**, 4-6 (2001) 421–438
- [38] Francesco Salvarani. Diffusion limits for the initial-boundary value problem of the Goldstein-Taylor model. *Rend. Sem. Mat. Univ. Polit. Torino* **57**, 3 (1999) 209–220

Chapters of book.

- [39] Laurent Boudin, Francesco Salvarani. Modelling opinion formation by means of kinetic equations. *Mathematical Modeling of collective behavior in socio-economic and life sciences*, G. Naldi, L. Pareschi, et G. Toscani editors, Birkhäuser, Boston 2010 pag. 245–270
- [40] Laurent Desvillettes, Roberto Monaco, Francesco Salvarani. A kinetic model for chemically reacting gases. *Modeling and numerics of kinetic dissipative systems: cooling, clustering, and pattern formation*, L. Pareschi, G. Russo et G. Toscani editors, Nova Science, New York 2006 pag. 127–142

Peer-reviewed conference proceedings.

- [41] Laurent Boudin, Francesco Salvarani. Compactness of linearized kinetic operators. From Particle Systems to Partial Differential Equations III, Volume 162 of the series Springer Proceedings in Mathematics & Statistics, 2016, 73–97
- [42] Florian De Vuyst, Valeria Ricci, Francesco Salvarani. Nonlocal second order vehicular traffic flow models and Lagrange-remap finite volumes. *Finite Volumes for Complex Applications VI Problems & Perspectives*, Springer Proceedings in Mathematics, 2011, Volume 4, Part 1, 781–789
- [43] François Golse, Francesco Salvarani. Radiative transfer equations and Rosseland approximation in gray matter. *Proceedings WASCOM 2007 14th Conference on Waves and Stability in Continuous Media*, N. Manganaro et al. editors, World Scientific, Singapore 2008 pag. 321–326
- [44] Francesco Salvarani, Juan Luis Vázquez. From kinetic systems to diffusion equations. *Proceedings WASCOM 2003 12th Conference on Waves and Stability in Continuous Media*, R. Monaco et al. editors, World Scientific, Singapore 2004 pag. 52–59
- [45] Aldo Belloni Morante, Roberto Monaco, Riccardo Riganti, Francesco Salvarani. Inverse problems in photon transport. Part I: determination of physical and geometrical features of an interstellar cloud. *Proceedings WASCOM 2003 12th Conference on Waves and Stability in Continuous Media*, R. Monaco et al. editors, World Scientific, Singapore 2004, pag. 475–481
- [46] Riccardo Riganti, Francesco Salvarani. On a photon transport problem in a time dependent region. *Proceedings WASCOM 2001 11th Conference on Waves and Stability in Continuous Media*, R. Monaco et al. editors, World Scientific, Singapore 2002 pag. 438–446
- [47] Aldo Belloni Morante, Roberto Monaco, Francesco Salvarani. Numerical simulation of a photon transport problem in a time dependent domain. *Proceedings WASCOM 99 10th Conference on Waves and Stability in Continuous Media*, V. Ciancio et al. editors, World Scientific, Singapore 2001 pag. 314–324

Submitted papers and preprints.

- [48] François Golse, Francesco Salvarani. The Rosseland limit for radiative transfer in gray matter.
- [49] Nadir Farhi, Habib Haj-Salem, Megan M. Khoshyaran, Jean-Patrick Lebacque, Francesco Salvarani, Bernard Schnetzler, Florian De Vuyst. The logit lane assignment model: first results.
- [50] Francesco Salvarani, Gabriel Turinici. Optimal individual strategies for influenza vaccines with imperfect efficacy and limited persistence.
- [51] Francesco Salvarani, Daniela Tonon. Kinetic description of strategic binary games.
- [52] Harsha Hutridurga, Francesco Salvarani. Existence and uniqueness analysis of a non-isothermal cross-diffusion system of Maxwell-Stefan type.