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Personal Data

Name Pietro Caputo
Address Dip. Matematica, Università di Roma Tre
Largo San Murialdo 1, 00146 Roma - Italy
E-mail caputo@mat.uniroma3.it

Date and
place of birth January 14, 1972
Milano, Italy
Nationality Italian

Education

1991–1996 Physics studies at the University of Rome, “La Sapienza”
Laurea degree in Physics. Thesis on
“Relaxation to equilibrium of disordered systems”
directed by Prof. Fabio Martinelli

1997–1999 PhD studies at the Technical University, Berlin (Germany)
within the DFG–Graduiertenkolleg Stochastic Processes
and Probabilistic Analysis. PhD Thesis on
“Harmonic crystals: statistical mechanics and large deviations”,
directed by Prof. J.-D. Deuschel.

Academic positions

Jan. – July 2000 Postdoctoral fellowship at Technion,
Israel institute of technology, Haifa, Israel.

Sept. 2000 – Dec. 2003 Research fellowship at the Roma Tre University, Rome, Italy.

Jan. 2004 – present Tenure position (Ricercatore)
at the Roma Tre University, Rome, Italy.

Aug. 2005 – Dec. 2005 Visiting Assistant Professor
at the Georgia Institute of Technology, Atlanta, GA – USA.

Aug. 2008 – June 2009 Visiting Associate Professor
at the University of California, Los Angeles (UCLA), CA – USA.

Languages

Italian, French, English, German

Research Interests

Probability Theory, Statistical physics. Main topics include:

Spin systems: Gibbs measures, large deviations.

Interface models: Equilibrium fluctuations and stochastic dynamics.

Random media: Homogenization, random walks in random environment, random matrices.

Mixing time for Markov chain Monte Carlo algorithms.

Teaching Experience

1997–1999	Undergraduate lower division teaching at the TU–Berlin
2000–present	Undergraduate courses at Università Roma Tre: <ul style="list-style-type: none">- Probability Theory- Introduction to Stochastic Simulation Graduate courses at Università Roma Tre: <ul style="list-style-type: none">- Brownian motion and stochastic differential equations.
2005	Undergraduate Probability and Statistics at the Georgia Institute of Technology.
2008-09	Graduate and undergraduate Probability classes at UCLA.

Conferences

(conferences with an invited talk are marked with a (*))

May 1996	Statistical mechanics of interfaces, Cortona, Italy.
October 1996	Statistical mechanics workshop, Prague, Czech Republic
September 1997	Stochastic modeling of physical systems, Cambridge, UK
October 1997	Workshop on large deviations, Bielefeld, Germany (*)
September 1998	Macroscopic stochastic fluctuations, Vulcano, Italy
April 1999	Eurandom Workshop on stochastic models, Eindhoven, Holland
August 1999	III escola brasileira de probabilidade, Rio de Janeiro, Brasil
June 2000	Probability Theory, Phase Transitions and Computational Complexity, Cortona, Italy
Sept. 2000	Dynamical Systems: classical, quantum, stochastic, Teulada, Italy.
Oct. 2001	Hydrodynamic Limits. Institut Henri Poincaré, Paris, France
July 2002	Stochastic Analysis on Large Interacting Systems, Tokyo, Japan (*)
Sept. 2002	Dynamical Systems: classical, quantum, stochastic Otranto, Italy (*)
Jan. 2003	Inhomogeneous Random Systems, Cergy–Pontoise, Paris, France (*)
Aug. 2004	Large scale structures, Oberwolfach, Germany (*)
Sept. 2004	Dynamical Systems: classical, quantum, stochastic Acireale, Italy
Jan. 2005	Probability, Algorithms and Statistical Physics, MSRI Berkeley, CA, USA (*)
June 2006	Stochastic processes in mathematical physics, Firenze, Italy
July 2006	Asymptotic Geometric Analysis and Applications, IHP Paris, France (*)
July 2006	Stochastic Processes and Applications, SPA 2006, Paris, France (*)
March 2007	Phase Transitions in Random Structures and Algorithms,

June 2007	GaTech-DIMACS Workshop, Atlanta GA, USA Percolation, random fields and evolution of stochastic interacting systems, Bologna, Italy (*)
Sept. 2007	Large scale stochastic interacting systems, Oberwolfach, Germany (*)
Nov. 2007	Particle systems, nonlinear diffusions, and equilibration. Hausdorff Institute, Bonn, Germany (*)
Dec 2008	Southern California Probability Symposium, UCLA, Los Angeles, USA (*)
July 2009	Stochastic Processes and Applications, SPA 2009, Berlin, Germany (*)

Other professional activities

Referee reviewer for several probability journals including: Probability theory and related fields, Annals of probability, Annals of applied probability, Journal of theoretical probability, Stochastic processes and applications, Journal of statistical physics.

Published papers

1. **PC**, J.D. Deuschel, *Large deviations and variational principle for harmonic crystals*, Commun. Math. Phys. **209**, 595-632, 2000
2. **PC**, Y. Velenik, *A note on wetting transition for gradient fields*, Stoch. Proc. Appl. **87**, 107-113, 2000
3. **PC**, J.D. Deuschel, *Critical large deviations in harmonic crystals with long range interactions*, Ann. Probab. **29**, 242-287, 2001
4. **PC**, F. Martinelli, *Asymmetric diffusion and the energy gap above the 111 ground state of the quantum XXZ models*, Commun. Math. Phys. **226**, 323-375, 2002
5. **PC**, D. Ioffe, *Finite volume approximations of the effective diffusion matrix: The case of independent bond disorder*, Ann. Inst. Henri Poincaré (Probab. & Stat.) **39**, No. 3, 505-525, 2003
6. **PC**, F. Martinelli, *Relaxation time of anisotropic simple exclusion processes and quantum Heisenberg models*, Ann. Appl. Probab. **13**, No. 2, 691-721, 2003
7. **PC**, *Uniform Poincaré inequalities for unbounded conservative spin systems: The non-interacting case*, Stoch. Proc. Appl. **106**, No. 2, 223-244, 2003
8. **PC**, *Spectral gap inequalities in product spaces with conservation laws*, in: T. Funaki and H. Osada (eds.) Adv. Studies in Pure Math. Japan 2004
9. **PC**, *Energy gap estimates in XXZ ferromagnets and stochastic particle systems*, Markov Processes and Related Fields **11**, 189-210, 2005
10. A.S. Boudou, **PC**, P. Dai Pra, G. Posta, *Spectral gap inequalities for interacting particle systems via a Bochner type inequality*, Journal of Funct. Analysis **232**, 222-258, 2006

11. **PC**, F. Martinelli, *Phase ordering after a deep quench: The stochastic Ising and hard-core gas models on a tree*, Probability Theory and Related Fields **136**, 37-80, 2006
12. N. Cancrini, **PC**, F. Martinelli, *Relaxation time for L -reversal processes and other chromosome shuffles*, Annals of Applied Probab. **16**, 1506-1527, 2006
13. **PC**, G. Posta, *Entropy dissipation estimates in a zero-range dynamics*, Probability Theory and Related Fields, **139**, 65-87, 2007
14. N. Bhatnagar, **PC**, P. Tetali, E. Vigoda, *Analysis of Top-Swap Shuffling for Genome Rearrangements*, Annals of Applied Probability, **17**, 1424-1445, 2007
15. **PC**, A. Faggionato, *Isoperimetric inequalities and mixing time for a random walk on a random point process*, Annals of Applied Probability, **17**, 1707-1744,, 2007
16. **PC**, F. Martinelli and F.L. Toninelli, *On the approach to equilibrium for a polymer with adsorption and repulsion*, Electronic Journal of Probability **13**, 213-258, 2008
17. **PC**, *On the spectral gap of the Kac walk and other binary collision processes*, ALEA - Latin American Journal of Probability and Mathematical Statistics **6**, 2008.
18. **PC**, P. Dai Pra, G. Posta, *Convex entropy decay via the Bochner–Bakry–Emery approach*, Ann. Inst. Henri Poincaré (Probab. & Stat.) **45**, 734-753, 2009.
19. **PC**, A. Faggionato, *Diffusivity in one-dimensional generalized Mott variable-range hopping models*, Annals of Applied Probability **10**, 1459-1494, 2009.
20. **PC**, A. Faggionato, A. Gaudilliere, *Recurrence and transience for long-range reversible random walks on a random point process*. Electronic Journal of Probability **14**, 2580-2616, 2009.
21. **PC**, T.M. Liggett and T. Richthammer, *Proof of Aldous' spectral gap conjecture*, Journal of the American Mathematical Society (to appear)

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For more information:

<http://www.mat.uniroma3.it/users/caputo/>