

## Curriculum Vitae

Pietro Caputo

nato a Milano il 14 gennaio 1972

**Laurea.** 1991-1996: Corso di laurea in Fisica presso l'Università di Roma "La Sapienza", con piano di studi di indirizzo fisico-matematico.

**Dottorato.** 1996-2000 : Ph.D. in "Analisi probabilistica e processi stocastici", presso la Technische Universität di Berlino.

### Posizioni accademiche.

Gennaio 2000 - Luglio 2000: Postdoctoral fellowship presso il Technion (Israel institute of technology) di Haifa, Israele.

Ottobre 2000 – Dicembre 2003: Assegno di ricerca presso il Dipartimento di Matematica dell'università di Roma Tre.

Gennaio 2004 – Gennaio 2011: Ricercatore universitario presso il Dipartimento di Matematica dell'università di Roma Tre, nel settore MAT/06 (Probabilità e Statistica). Ricercatore confermato da gennaio 2007.

Agosto 2005 – Gennaio 2006: Visiting Assistant Professor presso il Georgia Institute of Technology (Georgia Tech) di Atlanta, GA – USA.

Luglio 2008 – Luglio 2009: Visiting Associate Professor presso la University of California, Los Angeles (UCLA), CA – USA.

Febbraio 2011 – Agosto 2016. Professore Associato presso il Dipartimento di Matematica dell'università di Roma Tre, nel settore MAT/06 (Probabilità e Statistica).

Settembre 2016: Professore Ordinario presso il Dipartimento di Matematica dell'università di Roma Tre, nel settore MAT/06 (Probabilità e Statistica).

Agosto 2022 – Dicembre 2022: Miller visiting professor, UC Berkeley, CA – USA.

**Lingue straniere.** Inglese, Francese, Tedesco.

**Principali interessi di ricerca.** Campo di ricerca: Teoria delle Probabilità. Temi di particolare interesse includono:

- Teoria delle Grandi Deviazioni e applicazioni.
- Diffusione in mezzi aleatori e teoria dell'omogenizzazione.
- Matrici aleatorie, grafi aleatori e applicazioni.
- Dinamica stocastica per sistemi di particelle interagenti.
- Convergenza all'equilibrio per algoritmi di tipo Monte Carlo
- Misure di Gibbs, transizioni di fase, disuguaglianze funzionali.

**Attività didattica.**

- 1996-1999: Seminari di dottorato su sistemi di particelle interagenti e grandi deviazioni presso il DFG Graduirten Kolleg, TU-Berlino.
- 1999: Corso di introduzione alla matematica presso la Technische Universität di Berlino. Corso propedeutico bimestrale indirizzato alle matricole delle facoltà scientifiche.
- 2000: Corso di dottorato in collaborazione con il prof. Dimitri Ioffe su teoria della omogenizzazione e processi di diffusione in mezzi aleatori presso il Technion di Haifa.
- 2005: Probability and statistics, corso di tipo undergraduate presso Georgia Tech, Atlanta, GA – USA
- 2005: Corso di dottorato su convergenza all'equilibrio per dinamiche stocastiche e applicazioni presso Georgia Tech, Atlanta, GA – USA
- 2008-2009: Probability theory, serie di corsi di tipo undergraduate presso UCLA, Los Angeles, CA – USA
- 2009: Stochastic processes, corso di dottorato presso UCLA, Los Angeles, CA – USA
- 2015: Large deviations in sparse random graphs, corso di dottorato presso IMPA, Rio de Janeiro, Brasil
- 2017: Local convergence of graphs and applications, corso di dottorato presso Eulerandom YEP school, Eindhoven, Netherlands.
- 2022-23-24: Markov chains, corso di master presso AIMS, Ghana.
- 2022: Entropy and Markov chain mixing, corso di dottorato presso UC Santa Barbara e UC Berkeley, USA.
- 2001–oggi: Docente presso Roma Tre. I corsi tenuti includono:
  - Probabilità e statistica
  - Probabilità al calcolatore
  - Metodi matematici e statistici per architettura
  - Equazioni differenziali e calcolo in più variabili
  - Processi stocastici, calcolo stocastico e applicazioni
  - Catene di Markov: convergenza all'equilibrio

**Tesi di laurea e dottorato.**

- 2004-2023: Relatore di 25 tesi di laurea magistrale presso il Dipartimento di Matematica e Fisica di Roma Tre.
- 2011-2014: Relatore della tesi dottorato di Simone Franchini “Large Deviations for Generalized Polya Urns” presso il Dipartimento di Matematica e Fisica di Roma Tre.
- 2012-2015: Relatore della tesi dottorato di Daniele Piras “Spectrum of non Hermitian random Markov matrices with heavy tailed weights” presso il Dipartimento di Matematica e Fisica di Roma Tre.
- 2016-2019: Relatore della tesi dottorato di Matteo Quattropiani “Cover and mixing time of sparse directed configuration models” presso il Dipartimento di Matematica e Fisica di Roma Tre.
- 2020-2023 : Relatore della tesi dottorato di Daniel Parisi “Entropy factorizations and Markov chain mixing” presso il Dipartimento di Matematica e Fisica di Roma Tre.
- 2023- : Relatore della tesi dottorato di Mario Morellini “Nonlinear evolutions for spin systems” presso il Dipartimento di Matematica e Fisica di Roma Tre.

### **Partecipazioni a Convegni**

- 1) Maggio 1996: Statistical mechanics of interfaces; Cortona, Italy.
- 2) Ottobre 1996: Statistical mechanics workshop; Prague, Czech Republic
- 3) Settembre 1997: Stochastic modeling of physical systems; Cambridge, UK
- 4) Ottobre 1997: Workshop on large deviations; Bielefeld, Germany
- 5) Settembre 1998: Macroscopic stochastic fluctuations; Vulcano, Italy
- 6) Aprile 1999: Eurandom Workshop on stochastic models; Eindhoven, Holland
- 7) Agosto 1999: III escola brasileira de probabilidade; Rio de Janeiro, Brasil
- 8) Giugno 2000: Probability Theory, Phase Transitions and Computational Complexity; Cortona, Italy
- 9) Settembre 2000: Dynamical Systems: classical, quantum, stochastic; Teulada, Italy.
- 10) Ottobre 2001: Hydrodynamic Limits; Institut Henri Poincaré, Paris, France
- 11) Luglio 2002: Stochastic Analysis on Large Interacting Systems; Tokyo, Japan
- 12) Settembre 2002: Dynamical Systems: classical, quantum, stochastic; Otranto, Italy
- 13) Gennaio 2003: Inhomogeneous Random Systems; Cergy–Pontoise, Paris, France
- 14) Agosto 2004: Large scale structures; Oberwolfach, Germany
- 15) Settembre 2004: Dynamical Systems: classical, quantum, stochastic; Acireale, Italy
- 16) Gennaio 2005: Algorithms, statistical physics and probability; MSRI Berkeley, CA, USA
- 17) Giugno 2006: Stochastic processes in mathematical physics; Villa la Pietra, Firenze.
- 18) Luglio 2006: Asymptotic Geometric Analysis and Applications, IHP Paris, Francia
- 19) Luglio 2006: Stochastic Processes and Applications SPA 2006, Paris, Francia
- 20) Marzo 2007: Phase Transitions in Random Structures and Algorithms, GaTech-DIMACS Workshop, Atlanta GA, USA
- 21) Giugno 2007: Percolation, random fields and evolution of stochastic interacting systems, Bologna
- 22) Settembre 2007: Large scale stochastic interacting systems, Oberwolfach, Germania

- 23) Novembre 2007: Particle systems, nonlinear diffusions, and equilibration, Hausdorff Institute, Bonn, Germany
- 24) Dicembre 2008: Southern California Probability Symposium, UCLA, Los Angeles, USA
- 25) Luglio 2009: Stochastic Processes and Applications, SPA 2009, Berlin, Germany
- 26) Aprile 2010: Hypathie 2010. Marseille, France
- 27) Maggio 2010: CIRM conference on random matrices. Marseille, France
- 28) Gennaio 2011: Functional inequalities and discrete spaces. Paris, France
- 29) Giugno 2011: La Pietra Probability week. Firenze, Italia
- 30) Ottobre 2011: FOCS 2011. Palm Springs, CA - USA
- 31) Marzo 2012: PDE and Probability at ICOR 2012. Havana, Cuba
- 32) Giugno 2012: Phenomena in high dimensions in geometric analysis, random matrices, and computational geometry, Roscoff, France
- 33) Agosto 2012: Interacting particle systems, Firenze
- 34) Sett. 2013: Real Analysis in computer science. Simons Institute, Berkeley CA, USA
- 35) Marzo 2014: Talking across fields. Conference in honor of P. Diaconis. Toulouse, France
- 36) Settembre 2014: Statistical Mechanics, Many-Body Quantum Physics and PDEs, La Spezia, Italy
- 37) Dicembre 2014: When Dominique Bakry is sixty, Toulouse, France
- 38) Gennaio 2015: Random Matrices and Their Applications Workshop, Hong Kong
- 39) Marzo 2015: Kolmogorov meets Turing I, La Sapienza, Roma
- 40) Agosto 2015: Mostly Markov Mixing, PhD school and workshop, Technion, Haifa - Israel.
- 41) Gennaio 2016: Inhomogeneous Random Systems, Institut Henri Poincaré , Paris.
- 42) Febbraio 2016: Approximate Counting, Markov chains and Phase Transitions, Simons Institute, Berkeley, CA - USA.
- 43) Maggio 2016: Kolmogorov meets Turing III, Luiss, Roma
- 44) Giugno 2016: School and Workshop on Random Interacting Systems, Bath, UK
- 45) Luglio 2016: Summer school on Universality, Scaling Limits and Effective Theories, Roma La Sapienza, Italy
- 46) Sett. 2016: Interactions between PDE and functional inequalities, Mittag-Leffler Institute, Stockholm, Sweden
- 47) Nov. 2016: Large scale structures, Oberwolfach, Germany
- 48) Dic. 2016: XIV Latin American Congress of Probability and Mathematical Statistics (CLAPEM). Universidad de San Jose, Costa Rica
- 49) Aprile 2017: PDEs and Probability, C.I.R.M. Marseille, France
- 50) Maggio 2017: One-day workshop on Large scale random structures, Roma Tre, Roma.
- 51) 5-9 Giugno 2017: Statistical Mechanics, random planar geometry, and interacting random walks. Lyon, France.
- 52) 23-28 Luglio 2017: SPA conference, Moscow, Russia. Random Graphs and Random Matrices session organizer.
- 53) 1-10 Ago. 2017: Escola Brasileira de Probabilidade, IMPA Rio de Janeiro, Brasil.
- 54) 4-8 Sett. 2017: Eurandom PhD school YEP, Eindhoven, The Netherlands.

- 55) 1 Dic. 2017: Kolmogorov meets Turing IV, Roma Tre (organizzatore).
- 56) Gen. 28-Feb. 3 2018: Strongly correlated systems, Oberwolfach, Germany.
- 57) Apr 17, 2018: Random graphs workshop at King's College, London, UK.
- 58) Maggio 4, 2018: Mark Kac seminar, Utrecht, NL.
- 59) Maggio 14-17, 2018: Markov mixing and algorithms, Georgia Tech, Atlanta, USA.
- 60) Settembre, 2018: Large scale random structures, Oberwolfach, Germany.
- 61) Marzo 6-9, 2019: Interacting particle systems conference in honour of Tom Liggett, UCLA, Los Angeles, CA - USA.
- 62) Luglio 11, 2019: Large scale random structures, PRIN meeting, Milano Bicocca.
- 63) Settembre, 2019: Large Scale Stochastic Dynamics, Oberwolfach, Germany.
- 64) Jan. 2020: Random matrices and graphs, CIRM meeting, Marseille, France.
- 65) Sept. 2020: Random polymers and networks, Porquerolles, France.
- 66) June 3, 2021: Random walks on random directed networks, plenary talk at the Networks 2021 Conference, Amsterdam (online).
- 67) Jan 24-Feb 8, 2022: Entropy decay in Markov chains, AIMS Ghana.
- 68) August 8-12, 2022. Summer school: Entropy and Markov chains, UC Santa Barbara, CA - USA.
- 69) Sep 11-17, 2022: Large scale random structures, Oberwolfach meeting (organizer), Germany
- 70) October 5, 2022: Random walks on random directed networks, Neyman Seminar, UC Berkeley, CA - USA.
- 71) Jan 30-Feb 15, 2023: Entropy and Markov chains, AIMS Ghana.
- 72) April 4-6, 2023: speaker al British Mathematical Colloquium, Bath, UK.
- 73) June 2023: Probability Encounters Toulouse, FR.
- 74) February 2024: Probability, AIMS Ghana.

### **Seminari su invito**

2000–oggi: oltre 120 seminari scientifici presentati presso università e istituti di ricerca in Italia e all'estero.

### **Altre attività professionali**

*Associate editor* per

- Journal of Functional Analysis (2020–oggi)
- Probability Theory and Related Fields (2021–oggi)
- Annales Mathématiques Blaise Pascal (2013–oggi)
- ALEA, Latin American Probability Journal (2018–oggi)
- Annales de l'Institut Henri Poincaré Probab. Stat. (2012–2020)

*Referee* per diverse riviste internazionali, tra cui:

- Duke Math. Journal

- Probability theory and related fields
- Annals of probability
- Annals of applied probability
- Annales de l'Institut Henri Poincaré Probab. Stat.
- Communications in mathematical physics
- Electronic Journal of Probability

## Finanziamenti alla ricerca

- 2002-2004 Cofin-PRIN (unità locale Roma Tre, coordinatore: F. Martinelli): *Sistemi dinamici, classici, quantistici e stocastici*
- 2004-2006 Cofin-PRIN (unità locale Roma Tre, coordinatore: F. Martinelli): *Campi aleatori, evoluzioni stocastiche ed applicazioni a modelli di sistemi interagenti*
- 2006-2008 Cofin-PRIN (unità locale Roma Tre, coordinatore: F. Martinelli): *Grandi deviazioni, sistemi di particelle interagenti e loro applicazioni*
- Febbraio 2008: finanziamento 1 mese prof. visitatore presso Université P. Sabatier, Toulouse, France
- 2008-2009 NSF Grant DMS-0301795 presso UCLA, Los Angeles, CA - USA (Coordinatore: Thomas M. Liggett)
- 2009-2012 Team member of ERC Advanced Grant PTRELSS ADG-228032 (Principal Investigator: Fabio Martinelli) presso Roma Tre: *Phase transitions in random evolutions of large scale structures*
- Gennaio 2011: finanziamento 1 mese prof. visitatore presso Université Marne la Vallée, Paris, France
- Sett. 2013: research visitor presso Simons institute Berkeley, CA - USA
- Aprile 2015: research visitor presso IMPA, Rio de Janeiro - Brasil
- Febbraio-Aprile 2016: research visitor presso Simons institute Berkeley, CA - USA
- 2017-2020 PRIN (unità locale Roma Tre, coordinatore: F. Martinelli): *Large scale random structures.*
- Gennaio 2020: finanziamento 1 mese prof. visitatore presso Université Dauphine, Paris, France
- 2022: Miller visiting professor at UC Berkeley, USA.
- Ottobre 2023: finanziamento 1 mese prof. visitatore presso Université Dauphine, Paris, France

## Articoli pubblicati

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*, Annals of Probability **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. H. Poincaré Probab. Stat. **39**, No. 3, 505–525, 2003
6. **PC**, F. Martinelli, *Relaxation time of anisotropic simple exclusion processes and quantum Heisenberg models*, Annals of Applied Probability **13**, No. 2, 691–721, 2003
7. **PC**, *Uniform Poincaré inequalities for unbounded conservative spin systems: The non-interacting case*, Stochastic Processes and Applications **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. **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
11. N. Cancrini, **PC**, F. Martinelli, *Relaxation time for  $L$ -reversal processes and other chromosome shuffles*, Annals of Applied Probability **16**, 1506-1527, 2006
12. A.S. Boudou, **PC**, P. Dai Pra, G. Posta, *Spectral gap inequalities for interacting particle systems via a Bochner type inequality*, Journal of Functional Analysis **232**, 222-258, 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, 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 Math. Stat. **4**, 205–222, 2008
18. **PC**, Paolo Dai Pra, Gustavo Posta, *Convex entropy decay via the Bochner–Bakry–Emery approach*, Ann. Inst. H. 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. C. Bordenave, **PC**, D. Chafai, *Spectrum of large random reversible Markov chains: two examples*, ALEA – Latin American Journal of Probability and Math. Stat. **6**, 2010
22. **PC**, T.M. Liggett and T. Richthammer, *Proof of Aldous’ spectral gap conjecture*, Journal of the American Mathematical Society **23**, 831-851, 2010.
23. **PC**, F. Martinelli, F.L. Toninelli, *Convergence to equilibrium of biased plane partitions*, Random Structures & Algorithms **39**, 83D114, 2011
24. C. Bordenave, **PC**, D. Chafai, *Spectrum of large random reversible Markov chains: Heavy-tailed weights on the complete graph*, Annals of Probability **39**, 1544-1590, 2011
25. **PC**, F. Martinelli, F. Simenhaus, and F.L. Toninelli, *“Zero” temperature stochastic 3D Ising model and dimer covering fluctuations: a first step towards interface mean curvature motion*, Communications in Pure and Applied Math. **64** , 778-831, 2011
26. C. Bordenave, **PC**, D. Chafai, *Circular law theorem for random Markov matrices*, Probability Theory and Related Fields **152**, 751-779, 2012
27. **PC**, H. Lacoin, F. Martinelli, F. Simenhaus, F.L. Toninelli, *Polymer dynamics in the depinned phase: metastability with logarithmic barriers*, Probability Theory and Related Fields **153**, 587D641, 2012
28. C. Bordenave, **PC**, D. Chafai, *Spectrum of non-Hermitian heavy tailed random matrices*, Communications in Mathematical Physics **307**, 513-560, 2011
29. **PC**, F. Martinelli, and F.L. Toninelli, *Mixing times of monotone surfaces and SOS interfaces: a mean curvature approach*, Communications in Mathematical Physics **311**, 157-189, 2012
30. **PC**, A. Faggionato and T. Prescott, *Invariance principle for Mott variable range hopping and other walks on point processes*, Ann. Inst. Henri Poincaré Probab. & Stat. **49**, no. 3, 654-697, 2013
31. **PC**, F. Martinelli, and F.L. Toninelli, *Sharp mixing times for sampling random surfaces*, Proceedings of IEEE FOCS 2011.
32. **PC**, E. Lubetzky, F. Martinelli, A. Sly, and F.L. Toninelli, *The shape of the  $(2 + 1)D$  SOS surface above a wall*. C. R. Math. Acad. Sci. Paris **350**, no. 13-14, 703-706, 2012
33. **PC**, E. Lubetzky, F. Martinelli, A. Sly, and F.L. Toninelli, *Dynamics of  $2+1$  dimensional SOS surfaces above a wall: slow mixing induced by entropic repulsion*, Annals of Probability **42**, no. 4, 1516-1589, 2014



34. **PC**, Fabio Martinelli, Alistair Sinclair, Alexandre Stauffer, *Random Lattice Triangulations: Structure and Algorithms* (conference version), Proceedings of the 45th Annual ACM Symposium on Theory of Computing STOC 2013.
35. Charles Bordenave, **PC** and Djalil Chafai, *Spectrum of Markov generators on sparse random graphs*, Communications in Pure and Applied Math. **67**, 621-669, 2014
36. Charles Bordenave, **PC**, *Large deviation principle for Wigner matrices without gaussian tails*, Annals of Probability **42**, no. 6, 2454-2496, 2014
37. **PC**, E. Lubetzky, F. Martinelli, A. Sly, and F.L. Toninelli, *Scaling limit and cube-root fluctuations in SOS surfaces above a wall*, Journal of the European Mathematical Society (JEMS) **18**, 931-995, 2016
38. **PC**, Fabio Martinelli, Alistair Sinclair, Alexandre Stauffer, *Random Lattice Triangulations: Structure and Algorithms*, Annals of Applied Probability **25**, 1650-1685, 2015
39. Charles Bordenave, **PC**, *Large deviations of empirical neighborhood distribution in sparse random graphs*, Probability Theory and Related Fields **163**, 149-222, 2015
40. **PC**, Georg Menz, Prasad Tetali, *Approximate tensorization of entropy at high temperature*, Ann. Fac. Sci. Toulouse **24**, no. 4, 691-716, 2015, special issue in honor of P. Diaconis.
41. **PC**, F. Martinelli, and F.L. Toninelli, *Multi-level pinning problems for random walks and self-avoiding lattice paths*, Electronic journal of probability **20**, 29 pp, 2015
42. **PC**, F. Martinelli, and F.L. Toninelli, *On the probability of staying above a wall for the (2+1)-dimensional SOS model at low temperature*, Probability Theory and Related Fields **163**, 803-331, 2015
43. **PC**, J. Sohier, *Convergence to equilibrium for a directed (1 + d)-dimensional polymer*. Ann. Fac. Sci. Toulouse **26**, 289-318, 2017
44. **PC**, Fabio Martinelli, Alistair Sinclair, Alexandre Stauffer, *Dynamics of Lattice Triangulations on Thin Rectangles*, Electronic journal of probability **21**, 22 pp, 2016
45. Charles Bordenave, **PC**, and Djalil Chafai, Daniele Piras, *Spectrum of large random Markov chains: Heavy-tailed weights on the oriented complete graph*. Random Matrices Theory and Applications **6**, no. 2, 1750006, 33 pp, 2017.
46. Charles Bordenave, **PC**, Justin Salez, *Random walk on sparse random digraphs*, Probability Theory and Related Fields **170**, 933-960, 2018.
47. **PC**, Alistair Sinclair, *Entropy production in nonlinear recombination models*. Bernoulli **24**, 3246-3282, 2018.
48. **PC**, F. Martinelli, and F.L. Toninelli, *Entropic repulsion in  $|\nabla\phi|^p$  surfaces: a large deviation bound for all  $p \geq 1$* , Boll. Unione Mat. Ital. **10**, no. 3, 2017.

49. Charles Bordenave, **PC**, Djalil Chafai, Konstantin Tikhomirov, *On the spectral radius of a random matrix: an upper bound without fourth moment*, Annals of Probability **46**, no. 4, 2268-2286, 2018
50. Antonio Blanca, **PC**, Alistair Sinclair, Eric Vigoda, *Spatial mixing and non-local Markov chains*, (conference version), Proceedings *SODA* 2017.
51. Charles Bordenave, **PC**, Justin Salez, *Cutoff at the “entropic time” for sparse Markov chains*. Probability Theory and Related Fields **173**, 2019
52. Antonio Blanca, **PC**, Alistair Sinclair, Eric Vigoda, *Spatial mixing and non-local Markov chains*, Random Structures and Algorithms **55**, 2019.
53. **PC**, Dima Ioffe, Vitali Wachtel, *Confinement of Brownian Polymers under Geometric Area Tilts*. Electronic Journal of Probability **24**, 2019
54. **PC**, Dima Ioffe, Vitali Wachtel, *Tightness and line ensembles for brownian polymers under geometric area tilts*. In: Statistical Mechanics of Classical and Disordered Systems. Springer 2019 (eds: Gayrard, Arguin, Kistler, Kourkova)
55. **PC**, Cyril Labbé, Hubert Lacoin, *Mixing time of the adjacent walk on the simplex*. Annals of Probability **48**, 2020
56. **PC**, Matteo Quattropiani, *Stationary distribution and cover time of sparse directed configuration models*. Probability Theory and Related Fields **178**, 2020
57. **PC**, Matteo Quattropiani, *Mixing time of PageRank surfers on sparse random digraphs*. Random Structures and Algorithms **59**, 376-406, 2021.
58. David Aldous, **PC**, Rick Durrett, Alexander E. Holroyd, Paul Jung, Amber L. Puha, *The Life and Mathematical Legacy of Thomas M. Liggett*. Notices of the AMS **68**, 2021.
59. Antonio Blanca, **PC**, Daniel Parisi, Alistair Sinclair, Eric Vigoda, *Entropy decay in the Swendsen-Wang dynamics*. Annals of Applied Probability **32**, 2022. (conference version: STOC 2021).
60. **PC**, Matteo Quattropiani, *Mixing time trichotomy in regenerating dynamic digraphs*. Stochastic Processes and Applications **137**, 2021.
61. **PC**, Cyril Labbé, Hubert Lacoin, *Spectral gap and cutoff phenomenon for the Gibbs sampler of  $\nabla\varphi$  interfaces with convex potential*. Annales de l’Institut Henri Poincaré Probab. Stat. **58**, 2022.
62. **PC**, Daniel Parisi, *Block factorization of the relative entropy via spatial mixing*. Communications in Mathematical Physics **388**, 2021.
63. Alexandre Bristiel, **PC**, *Entropy inequalities for random walks and permutations*. Annales de l’Institut Henri Poincaré **60**, 2024.

64. Xing Shi Cai, **PC**, Guillem Perarnau, Matteo Quattropiani, *Rankings in directed configuration models with heavy tailed in-degrees*. *Annals of applied probability* **33**, 2023.
65. Antonio Blanca, **PC**, Zongchen Chen, Daniel Parisi, Daniel Stefankovic, Eric Vigoda, *On Mixing of Markov Chains: Coupling, Spectral Independence, and Entropy Factorization*. *Electronic Journal of Probability* **27**, 1-42, 2022. (conference version: SODA 2022)
66. **PC**, Matteo Quattropiani, Federico Sau, *Cutoff for the Averaging process on the hypercube and complete bipartite graphs*. *Electronic Journal of Probability* **28**, 1-31, 2023.

### Preprints

67. **PC**, Daniel Parisi, *Nonlinear recombinations and generalized random transpositions*. arXiv:2207.04775
68. **PC**, Alistair Sinclair, *Nonlinear dynamics for the Ising model*. arXiv:2305.18788
69. **PC**, Shirshendu Ganguly, *Uniqueness, mixing, and optimal tails for Brownian line ensembles with geometric area tilt*. arXiv:2305.18280
70. Mriganka Basu Roy Chowdhury, **PC**, Shirshendu Ganguly, *Characterizing Gibbs states for area-tilted Brownian lines*. arXiv:2310.06817
71. **PC**, Cyril Labbe', Hubert Lacoïn, *Cutoff phenomenon in nonlinear recombinations*. arXiv:2402.11396
72. **PC**, Florentin Münch, Justin Salez, *Entropy and curvature: beyond the Peres-Tetali conjecture*. arXiv:2401.17148

*Ultimo aggiornamento: marzo 2024. Per ulteriori informazioni:*  
<http://www.mat.uniroma3.it/users/caputo/>

**Pietro Caputo**