Francesco Caravenna
Curriculum Vitæ

PERSONAL DETAILS

- Born on March 15, 1979, in Treviglio (BG), Italy.
- *Office:* Department of Mathematics and Applications, University of Milano-Bicocca
  Temporarily: DB1 building, Piazza del Calendario, 20126 Milano, Italy
- *E-mail:* `francesco.caravenna@unimib.it`
- *Home page:* `https://fcaraven.github.io/`
- *Language skills:* Italian (mother tongue), English, French

EDUCATION

- (2002 – 2005) *Ph.D. in Mathematics*, University of Milano-Bicocca (I) and University of Paris 7 (F). Advisors: Giambattista Giacomin, Alberto Gandolfi.
- (1998 – 2002) *'Diploma di Licenza' in Physics* cum laude, Scuola Normale Superiore of Pisa (I). Advisor: Sergio Caracciolo.
- (1998 – 2002) *Master's Degree in Physics* cum laude, University of Pisa (I). Advisor: Sergio Caracciolo.

ACADEMIC POSITIONS

- (Oct 2016 – present) *Full Professor*, University of Milano-Bicocca (I).
- (Nov 2010 – Sep 2016) *Associate Professor*, University of Milano-Bicocca (I).
- (Oct 2006 – Oct 2010) *Assistant Professor* ("Ricercatore", tenured), University of Padova (I).
- (Oct 2005 – Sep 2006) *Postdoc* in the group of Erwin Bolthausen, University of Zürich (CH).

HONORS

- Invited speaker, *International Congress of Mathematicians (ICM) 2026*, Philadelphia (USA) [joint section lecture with Rongfeng Sun and Nikos Zygouras]
- Plenary speaker, *45th Conference on Stochastic Processes and their Applications (SPA) 2026*, Cornell University, Ithaca (USA)
- Best Paper Award (Silver), *International Congress of Chinese Mathematicians (ICCM) 2025* [shared with Rongfeng Sun and Nikos Zygouras]
- Plenary speaker, *4th Italian Meeting on Probability and Mathematical Statistics*, Rome 2024
- Corresponding Member of *Istituto Lombardo Accademia di Scienze e Lettere* (Lombard Institute Academy of Sciences and Letters) since 2023
- Winner of the "Guido Fubini Prize 2011"

EDITORIAL SERVICES

- Associate editor of *Annales de l'Institut Henri Poincaré* (2018 –)

- Associate editor of *Annals of Applied Probability* (2019 – 2024)

ORGANIZATION

- (4–22 May 2026) Research program (seminars, workshop, mini-courses) on "Statistical Mechanics and Singular SPDEs", Institute for Mathematical Sciences (IMS), National University of Singapore (NUS) [co-organized with Rongfeng Sun and Nikos Zygouras]
- (10 Sep 2025) One day on *Stochastic Analysis and Singular Equations*, workshop *The Mathematics of Subjective Probability*, Milano-Bicocca (I) [co-organized with Gianmario Tessitore]
- (23–26 July 2024) Special Session B21 *"Recent Trends in Stochastic Analysis"*, AMS-UMI International Joint Meeting 2024, Palermo (I) [co-organized with Mykhaylo Shkolnikov]
- (11–15 Sep 2023) C.I.M.E. Summer School *"Statistical Mechanics and Stochastic PDEs"*, Cetraro (I) [co-organized with Rongfeng Sun and Nikos Zygouras]
- (24-28 Jul 2023) Contributed Session *"Statistical Mechanics and Stochastic PDEs"*, SPA 2023 Conference, Lisbon (P) [speakers Quentin Berger, Clément Cosco, Stefan Junk]
- (9–13 Sep 2019) Workshop *"Self-interacting random walks, Polymers and Folding"*, CIRM, Marseille (F) [co-organized with Quentin Berger and Julien Poisat]
- (10–11 Jul 2019) Third Workshop on *"Large Scale Random Structures"*, Milano-Bicocca (I)
- (2–6 Feb 2015) Winter School *"Recent Breakthroughs in Singular Stochastic PDEs"*, Milano-Bicocca (I) [co-organized with Federica Masiero and Gianmario Tessitore].
- *"XVIII Workshop on Quantitative Finance"* (Milano-Bicocca, January 25–27, 2017) and *"XII Workshop on Quantitative Finance"* (Padova, January 27–28, 2011).

GRANTS

- Associated Investigator of the National Research Project *'Large Scale Random Structure'* (PRIN 2015) [PI: Fabio Martinelli]
- Principal Investigator of the grant *'Probabilistic models for the statistical mechanics of polymers, interacting particle systems and applications'* of the University of Padova (2008)
- Member of National Research Projects (PRIN 2004, 2006, 2009)

PH.D. STUDENTS

- (2025 – present) Maël Laoufi, University Paris Dauphine-PSL (F) and University of Milano-Bicocca, Pavia and Cattolica del Sacro Cuore (joint PhD with Indam); joint supervision with Clément Cosco and Julien Poisat.
- (2023 – present) Anna Donadini, Universities of Milano-Bicocca, Pavia and Cattolica del Sacro Cuore (joint PhD with Indam).
- (2019 – 2023) Francesca Cottini, Universities of Milano-Bicocca and Pavia (joint PhD with Indam). Thesis *"Central limit theorems for polynomial chaos and fluctuations for 2d directed polymers"* defended on 5 May 2023.
- (2016 – 2019) Giulia Comi, Universities of Pavia and Milano-Bicocca (joint PhD with Indam). Thesis *"Two fractional stochastic problems: semi-linear heat equation and singular Volterra equation"* defended on 13 December 2019.

- (2012 – 2015) Niccolò Torri, University Claude Bernarde Lyon 1 (F) and University of Milano-Bicocca (I); joint supervision with Fabio Lucio Toninelli. Thesis *"Localization and universality phenomena for random polymers"* defended on 18 September 2015.
- (2011 – 2014) Jacopo Corbetta, University of Milano-Bicocca (I). Thesis *"General smile asymptotics and a multiscaling stochastic volatility model"* defended on 4 March 2015.

RESEARCH INTERESTS

My research activity is focused on *probability theory and its applications*, including:

- Statistical Mechanics (disordered systems, random polymers)
- Stochastic Equations (singular PDEs, scaling limits)
- Random Walks (asymptotic properties, renewal theory)

PUBLICATIONS

Lecture Notes and Surveys

- F. Caravenna, R. Sun, N. Zygouras, *From disordered systems to the Critical 2D Stochastic Heat Flow*, Proceedings of the 2026 International Congress of Mathematicians
- F. Caravenna, R. Sun, N. Zygouras, *The Critical 2d Stochastic Heat Flow and Related Models*, in: "Statistical Mechanics and Stochastic PDEs", Springer C.I.M.E. Foundation Subseries
- F. Caravenna, R. Sun, N. Zygouras, *Scaling limits of disordered systems and disorder relevance*, Proceedings of the XVIII International Congress of Mathematical Physics, 2016 (volume cancelled)
- F. Caravenna, F. den Hollander, N. Pétrélis, *Lectures on Random Polymers*, in: Probability and Statistical Physics in Two and more Dimensions, Clay Mathematics Proceedings 15 (2012), 319–393

Journal papers

(39) F. Caravenna, F. Cottini, M. Rossi. *Quasi-critical fluctuations for 2d directed polymers*, Ann. Appl. Probab. 35 (2025), 2604–2643.

(38) L. Broux, F. Caravenna, L. Zambotti. *Hairer's multilevel Schauder estimates without Regularity Structures*, Trans. Amer. Math. Soc. 377 (2024), 981–7035.

(37) F. Caravenna, R. Sun, N. Zygouras. *The critical 2d Stochastic Heat Flow is not a Gaussian Multiplicative Chaos*, Ann. Probab. 51 (2023), 2265-2300.

(36) F. Caravenna, R. Sun, N. Zygouras, *The Critical 2d Stochastic Heat Flow*, Inventiones Math. 233 (2023), 325-460.

(35) F. Caravenna, F. Cottini, *Gaussian Limits for Subcritical Chaos*, Electron. J. Probab. 27 (2022), article no. 81, 1-35.

(34) F. Caravenna, L. Zambotti, *Hairer's Reconstruction Theorem without Regularity Structures*, EMS Surv. Math. Sci. 7 (2020), 207-251.

(33) F. Caravenna, F. den Hollander, Phase transitions for spatially extended pinning, Probab. Theory Related Fields 181 (2021), 329-375.

(32) F. Caravenna, R. Sun, N. Zygouras, *The two-dimensional KPZ equation in the entire subcritical regime*, Ann. Probab. 48 (2020), 1086-1127.

(31) F. Caravenna, R. Sun, N. Zygouras, *On the moments of the (2+1)-dimensional directed polymer and stochastic heat equation in the critical window*, Commun. Math. Phys. 372 (2019), 385-440.

(30) F. Caravenna, R. Sun, N. Zygouras, *The Dickman subordinator, renewal theorems, and disordered systems*, Electron. J. Probab. 24 (2019), paper no. 101, 40 pp.

(29) F. Caravenna, *On the maximum of conditioned random walks and tightness for pinning models*, Electron. Commun. Probab. 23 (2018), paper n. 69, 13 pp.

(28) F. Caravenna, R. Doney, *Local large deviations and the strong renewal theorem*, Electron. J. Probab. 24 (2019), paper no. 72, 1-48.

(27) F. Caravenna, A. Garavaglia, R. van der Hofstad, *Diameter in ultra-small scale-free random graphs*, Random Structures Algorithms 54 (2019), 444-498.

(26) F. Caravenna, J. Corbetta, *The asymptotic smile of a multiscaling stochastic volatility model*, Stochastic Process. Appl. 128 (2018), 1034-1071.

(25) F. Caravenna, R. Sun, N. Zygouras, *Universality in marginally relevant disordered systems*, Ann. Appl. Probab. 27 (2017), 3050-3112.

(24) F. Caravenna, J. Corbetta, *General smile asymptotics with bounded maturity*, SIAM J. Financial Math. 7 (2016), 720-759.

(23) F. Caravenna, F. L. Toninelli, N. Torri, *Universality for the pinning model in the weak coupling regime*, Ann. Probab. 45 (2017), 2154-2209.

(22) F. Caravenna, F. den Hollander, N. Pétrélis, J. Poisat, *Annealed scaling for a charged polymer*, Math. Phys. Anal. Geom. (2016), 19:2.

(21) F. Caravenna, R. Sun, N. Zygouras, *The continuum disordered pinning model*, Probab. Theory Related Fields 164 (2016), 17-59.

(20) F. Caravenna, R. Sun, N. Zygouras, *Polynomial chaos and scaling limits of disordered systems*, J. Eur. Math. Soc. 19 (2017), 1-65.

(19) F. Caravenna, F. den Hollander, *A general smoothing inequality for disordered polymers*, Electron. Commun. Probab. 18 (2013), no. 76, 1-15.

(18) F. Caravenna, L. Chaumont, *An invariance principle for random walk bridges conditioned to stay positive*, Electron. J. Probab. 18 (2013), no. 60, 1-32.

(17) Q. Berger, F. Caravenna, J. Poisat, R. Sun, N. Zygouras, *The critical curve of the random pinning and copolymer models at weak coupling*, Commun. Math. Phys. 326 (2014), 507-530.

(16) F. Caravenna, P. Carmona, N. Pétrélis, *The discrete-time parabolic Anderson model with heavy-tailed potential*, Ann. Inst. H. Poincaré 48 (2012), 1049-1080.

(15) A. Andreoli, F. Caravenna, P. Dai Pra, G. Posta, *Scaling and multiscaling in financial series: a simple model*, Adv. in Appl. Probab. 44 (2012), 1018-1051.

(14) M. Borecki, F. Caravenna, *Localization for (1+1)-dimensional pinning models with $(\nabla + \Delta)$ interaction*, Electron. Commun. Probab. 15 (2010), 534-548.

(13) F. Caravenna, G. Giacomin, *The weak coupling limit of disordered copolymer models*, Ann. Probab. 38 (2010), 2322-2378.

(12) F. Caravenna, N. Pétrélis, *Depinning of a polymer in a multi-interface medium*, Electron. J. Probab. 14 (2009), 2038-2067.

(11) F. Caravenna, N. Pétrélis, *A polymer in a multi-interface medium*, Ann. Appl. Probab. 19 (2009), 1803-1839.

(10) F. Caravenna, G. Giacomin, M. Gubinelli, *Large scale behavior of semiflexible heteropolymers*, Ann. Inst. H. Poincaré Probab. Statist. 46 (2010), 97-118.

(9) F. Caravenna, J.-D. Deuschel, *Scaling limits of (1+1)-dimensional pinning models with Laplacian interaction*, Ann. Probab. 37 (2009), 903-945.

(8) E. Bolthausen, F. Caravenna, B. de Tilière, *The quenched critical point of a diluted disordered polymer model*, Stochastic Process. Appl. 119 (2009), 1479-1504.

(7) F. Caravenna, J.-D. Deuschel, *Pinning and wetting transition for (1+1)-dimensional fields with Laplacian interaction*, Ann. Probab. 36 (2008), 2388-2433.

(6) F. Caravenna, L. Chaumont, *Invariance principles for random walks conditioned to stay positive*, Ann. Inst. H. Poincaré Probab. Statist. 44 (2008), 170-190.

(5) F. Caravenna, G. Giacomin, L. Zambotti, *Sharp asymptotic behavior for wetting models in (1+1)-dimension*, Electron. J. Probab. 11 (2006), 345-362.

(4) F. Caravenna, G. Giacomin, L. Zambotti, *A renewal theory approach to periodic copolymers with adsorption*, Ann. Appl. Probab. 17 (2007), 1362-1398.

(3) F. Caravenna, G. Giacomin, M. Gubinelli, *A numerical approach to copolymers at selective interfaces*, J. Stat. Phys. 122 (2006), 799-832.

(2) F. Caravenna, G. Giacomin, *On constrained annealed bounds for pinning and wetting models*, Electron. Commun. Probab. 10 (2005), 179-189.

(1) F. Caravenna, *A local limit theorem for random walks conditioned to stay positive*, Probab. Theory Related Fields 133 (2005), 508-530.

Popular science

- Q. Berger and F. Caravenna, *Simpson's paradox and anticovid vaccination data*, popular science article (2021) in Italian (Intenazionale.it) and in French (The Conversation).

Proceedings

- F. Caravenna, G. Giacomin, F. L. Toninelli, *Copolymers at selective interfaces: settled issues and open problems*, in: Probability in complex physical systems. In honour of Erwin Bolthausen and Jürgen Gärtner. Edited by J.-D. Deuschel, B. Gentz, W. König, M. von Renesse, M. Scheutzow, U. Schmock. Springer Proceedings in Mathematics 11 (2012), 289-312.

- A. Andreoli, F. Caravenna, P. Dai Pra, G. Posta, *A model for multiscaling and clustering of volatility in financial indexes*, Proceedings of the 19th International Symposium on Mathematical Theory of Networks and Systems - MTNS, vol.5, no.9, 2010/7.

- F. Caravenna, *Modelli di polimeri e passeggiate aleatorie*, Boll. Unione Mat. Ital. Serie IX, vol. I (2008), 559-571.

- F. Caravenna, G. Giacomin, L. Zambotti, *Infinite volume limits of polymer chains with periodic charges*, Markov Process. Related Fields 13 (2007), 697-730.

Textbook

- Q. Berger, F. Caravenna, P. Dai Pra. *Probabilità. Un'introduzione attraverso esempi, modelli e applicazioni.* Seconda Edizione. Springer-Verlag Italia, Milano (2021).

RESEARCH VISITS

- One/two weeks stay at *Peking University / BICMR* (13-24 May 2024), *National University of Singapore* (8-19 May 2023, 18-29 Mar 2019, 27 Mar - 7 Apr 2017, 4-15 Apr 2016, 4-15 May 2015, 27 Jan - 8 Feb 2014, 14-25 May 2012), *Durham University* (25-29 Sep 2023), *Univeristé Lyon 1* (13-16 May 2019), *University of Luxembourg* (13-17 Jun 2016), *University of Warwick* (16-21 Jun 2014), *University of Nantes* (18-22 Oct 2010), *Technical University of Berlin* (3-14 Nov 2008), *ENS Lyon* (16-20 Jun 2008), *University of Paris 7* (17-21 Jul 2006, 19-23 May 2008), *University of Zürich* (28 Apr - 2 May 2008), *Technical University of Eindhoven / Eurandom* (10-14 Jul 2006, 22-26 Oct 2007).

- Five months at the *Mathematical Institute* of the *University of Leiden* (NL) as a visiting professor in the framework of the ERC Advanced Grant VARIS, at the invitation of Frank den Hollander (17 March - 11 May 2012; 1 May - 30 June 2013; 1-30 March 2014)

- Two months at the *Laboratoire de Probabilités et Modèles Aléatoires*, *Universities of Paris 6 and Paris 7* (F), at the invitation of Giambattista Giacomin and Lorenzo Zambotti (5 October - 13 December 2009) .

- One month at the *Institute of Mathematics* of the *Technical University of Berlin* (D) at the invitation of Jean-Dominique Deuschel (8 January - 2 February 2007) .

SEMINARS

Invited Talks

- (3 Feb 2026) *The 2D Stochastic Heat Equation and related critical models*, Colloquium du Ceremade, Université Paris Dauphine-PSL (F).

- (13 Jan 2026) *The 2D Stochastic Heat Equation in the strong disorder limit*, Workshop "Renormalization from Quantum Field Theory to Statistical Mechanics and Complex Systems", Collegio Ghislieri, Pavia (I).

- (11 Dec 2025) *On (ir)reducible Central Limit Theorems*, Workshop "20 Years of the Fourth Moment Theorem", University of Luxembourg (L).

- (30 Oct 2025) *The Critical 2D Stochastic Heat Flow in the strong disorder limit*, BIRS Workshop "Emerging Synergies between Stochastic Analysis and Statistical Mechanics", Banff (CDN).

- (4 Sep 2025) *2D directed polymers and Stochastic Heat Flow*, Workshop "Large Scale Stochastic Dynamics", Mathematisches Forschungsinstitut Oberwolfach (D).

- (24 Jun 2025) *Noise sensitivity for the 2D Stochastic Heat Equation and directed polymers*, *"Workshop on Irregular Stochastic Analysis"*, INdAM Meeting, Cortona (I).

- (4 Apr 2025) *Noise Sensitivity and Critical 2D Directed Polymers*, Mark Kac Seminar, Utrecht (NL).

- (6 Mar 2025) *The 2D Stochastic Heat Equation and related critical models*, Colloquium du LPSM (Laboratoire de Probabilités, Statistique et Modélisation), Paris (F).

- (11 Feb 2025) *Noise sensitivity for the 2D Stochastic Heat Equation*, Workshop on "Stochastic Equations and Stochastic Dynamics", SwissMap Research Station, Les Diablerets (CH).

- (14 Jun 2024) *The 2d Stochastic Heat Equation and related critical models*, Plenary talk at the 4th Italian Meeting on Probability and Mathematical Statistics, Rome (I).

- (23 Jan 2024) *Singolarità e Regolarità Aleatorie*, Colloquium di Matematica, Fisica e Informatica, University of Parma (I).

- (23 Jan 2024) *Singolarità e Regolarità Aleatorie*, Colloquium di Matematica, Fisica e Informatica, University of Parma (I).
- (11 Jan 2024) *Enhanced Schauder estimates for families of distributions*, Workshop "Common trends and challenges in QFT and stochastic PDEs", University of Pavia (I).
- (23 Dec 2023) *The critical 2d Stochastic Heat Flow*, Workshop "Critical phenomena in statistical physics, continuum theories and SPDEs ", University of Warwick (UK).
- (23 Oct 2023) *The critical 2d Stochastic Heat Flow*, 21st Symposium "Stochastic Analysis on Large Scale Interacting Systems", RIMS, Kyoto University (JP).
- (1 Jun 2023) *Renewal Theory, Disordered Systems, and Stochastic PDEs*, Workshop "Polymers and self-avoiding walks", University of Nantes (F).
- (28 Mar 2023) *The critical 2d Stochastic Heat Flow*, UK Easter Probability Meeting, University of Manchester (UK).
- (26 Jan 2023) *Singolarità e Regolarità Aleatorie*, "I Seminari del Centenario", Cento anni di UMI 1922-2022, University of Milano-Bicocca.
- (9 Jan 2023) *On the 2d Stochastic Heat Equation and delta Bose gas*, Workshop "Mathematical Quantum Matter", University of Milano (I).
- (23 Sep 2022) *Renewal Theory, Disordered Systems, and Stochastic PDEs*, Workshop "A journey through complex systems" in honor of Paolo Dai Pra 60th birthday, L'Aquila (I).
- (12 Sep 2022) *The critical 2d Stochastic Heat Flow*, Workshop "Large Scale Stochastic Dynamics", Mathematisches Forschungsinstitut Oberwolfach (D).
- (26 Jul 2022) *Renewal Theory, Disordered Systems, and Stochastic PDEs*, Workshop "Lévy Processes and Random Walks" in celebration of Ron Doney's 80th birthday, Manchester (UK) [online talk].
- (28 Jun 2022) *The critical 2d Stochastic Heat Flow*, SPA 2022 Conference, Invited session "Stochastic Partial Differential Equations", Wuhan (CN) [online talk].
- (2 May 2022) *The critical 2d Stochastic Heat Flow is not a Gaussian Multiplicative Chaos*, Workshop "Random Walk, Reinforcement and Localization", CIRM, Marseille (F).
- (8 Sep 2021) *Gaussian Limits for Subcritical Chaos*, workshop "Directed Polymers and Folding", CIRM, Marseille (F).
- (7 Jun 2021) *Central Limit Theorems in Disordered Systems and Stochastic PDEs*, UMI-PRISMA Seminar [online talk].
- (21 Jan 2021) *Hairer's Reconstruction Theorem without Regularity Structures*, One World Probability Seminar [online talk].
- (11 Sep 2020) *The two-dimensional directed polymer and the Dickman subordinator*, workshop "Random Polymers and Networks", IGESA center, Porquerolles island (F).
- (12 Nov 2019) *On the two-dimensional KPZ equation*, Conference of the Euro-Maghreb International Research Network in Mathematics and Applications, Madrid (E).
- (30 Oct 2019) *On the 2d KPZ Equation*, Half day in Stochastic Analysis and applications, University of Padova (I).
- (24 Oct 2019) *On the 2d KPZ and Stochastic Heat Equation*, Workshop on "Singular SPDEs and Related Topics", Hausdorff Research Institute for Mathematics, Bonn (D).
- (27 Sep 2019) *On the 2d KPZ and Stochastic Heat Equation*, Meeting of the AAP Editorial Board, University of Nice (F).

- (20 Jun 2019) *On the 2d KPZ and Stochastic Heat Equation*, Second Italian Meeting on Probability and Mathematical Statistics, Vietri sul Mare (I).

- (3 July 2018) *Moment asymptotics for 2d directed polymer and stochastic heat equation in the critical window*, Two days workshop on "Large scale random structures", University of Padova (I).

- (3 Apr 2018) *Moment asymptotics for 2d directed polymer and stochastic heat equation in the critical window*, Workshop "Polymer, Folding and Phase Transition", CIRM, Marseille (F).

- (23 Jan 2018) *Pinning model, universality and rough paths*, Conference "Universality and scaling limits of interacting random systems", Inhomogeneous Random Systems 2018, Institut H. Poincaré, Paris (F).

- (27 Jul 2017) *Local large deviations and the strong renewal theorem*, SPA 2017 Conference, "Random Walks" Invited Session, Moscow (RU).

- (5 Jun 2017) *Marginally relevant polymer models in the critical window*, Conference "Statistical Mechanics, random planar geometry and interacting random walks", University of Lyon 1 (F).

- (8 May 2017) *Marginally relevant polymer models in the critical window*, Workshop on "Large scale random structures", University of Roma Tre (I).

- (12 Dec 2016) *Universality in marginally relevant disordered systems*, Workshop "Guided Tour: Random Media" for the 60th birthday of Frank den Hollander, Eurandom, Eindhoven (NL).

- (14 Jun 2016) *Scaling and universality in Probability*, Mathematics Colloquium of the University of Luxembourg (L).

- (10 Sep 2015) *A multilinear extension of the central limit theorem and the universality phenomenon for disordered systems*, XX Congress of the Italian Mathematical Union, Siena (I).

- (31 Aug 2015) *Universality in marginally relevant disordered systems*, Meeting on "Scaling Limits in Models of Statistical Mechanics", Oberwolfach Center of Mathematical Research (D).

- (5 May 2015) *Polynomial chaos and scaling limits of disordered systems*, Workshop on Stochastic Processes in Random Media, Institute for Mathematical Sciences, National University of Singapore.

- (28 Jul 2014) *The continuum disordered pinning model*, SPA 2014 Conference, "Random Polymers" Invited Session, Buenos Aires (AR).

- (6 Jun 2014) *Polynomial chaos and scaling limits of disordered systems*, Statistical Mechanics Conference, University of Nantes (F).

- (27 Apr 2014) *Polynomial chaos and scaling limits of disordered systems*, Mini-Workshop at NYU Abu Dhabi (UAE).

- (13 Mar 2014) *Scaling and universality in Probability*, General Colloquium, Institute of Mathematics, University of Leiden (NL).

- (12 Sep 2013) *Scaling limits and universality for random pinning models*, 15th Italian Meeting on Hyperbolic Equations, University of Milano-Bicocca (I).

- (9 Aug 2013) *Scaling limits and universality for random pinning models*, Workshop "Universality and Scaling Limits in Probability and Statistical Mechanics", Hokkaido University, Sapporo (JP).

- (21 Mar 2013) *Scaling limits and universality for random pinning models*, Workshop "Analysis and Stochastics in Complex Physical Systems", University of Leipzig (D).

- (15 Feb 2011) *The weak coupling limit of disordered copolymer models*, Workshop on Interacting Processes in Random Environments, Fields Instutute, Toronto (CDN).
- (16 Oct 2010) *The weak coupling limit of disordered copolymer models*, Workshop "Probabilistic Methods in Statistical Physics" on the occasion of Erwin Bolthausen's 65th birthday, Technische Universität Berlin (D).
- (7 Jun 2010) *Scaling and multiscaling in financial indexes: a simple model*, Workshop "Statistical Mechanics and Random Media", University of Nantes (F).
- (11 Jun 2008) *Pinning and wetting transition for (1+1)–dimensional fields with Laplacian interaction*, Workshop on Gradient Models and Elasticity, University of Warwick (UK).
- (6 Mar 2008) *The quenched critical point of a diluted disordered polymer model*, GREFI-MEFI 2008 Workshop, CIRM, Marseille (F).
- (26 Sep 2007) *Polymer models and random walks*, XVIII Congress of the Italian Mathematical Union, Bari (I).
- (22 Jun 2007) *On the phase diagram of random copolymers at selective interfaces*, Workshop "Random Polymer Models", Eurandom, Eindhoven (NL).
- (21 Feb 2007) *Pinning and wetting models with Laplacian interaction in (1+1)–dimension*, Workshop "Polymer Models and Related Topics", Laboratoire J.A. Dieudonné, University of Nice 'Sophia Antipolis' (F).
- (4 Sep 2006) *Pinning models with Laplacian interactions in (1+1)–dimension*, Meeting on "Spatial Random Processes and Statistical Mechanics", Oberwolfach Center of Mathematical Research (D).
- (6 Jun 2006) *A renewal theory approach to weakly inhomogeneous polymer models*, Workshop "Hydrodynamic Limits and Particle Systems", *Ennio De Giorgi* Center of Mathematical Research in Pisa (I).

Talks at Universities

- (23 Sep 2025) *General Noise Sensitivity, 2D Directed Polymers and Stochastic Heat Flow*, University of Groningen (NL) [online talk]
- (28 Jan 2025) *General Noise Sensitivity and Critical 2D Directed Polymers*, University of Grenoble (F).
- (21 Nov 2024) *The 2D Stochastic Heat Equation and related critical models*, SISSA, Trieste (I).
- (12 Jun 2023) *The critical 2d Stochastic Heat Flow*, University of Oxford (UK).
- (1 Mar 2023) *The critical 2d Stochastic Heat Flow*, University of Zurich (CH).
- (19 Mag 2022) *The critical 2d Stochastic Heat Flow*, GSSI, L'Aquila (I).
- (25 Ott 2021) *Hairer's Reconstruction Theorem without Regularity Structures*, organized by TU Delft (NL) [online talk]
- (15 Dec 2020) *On the two-dimensional KPZ and Stochastic Heat Equation*, Vienna Probability Seminar (A) [online talk]
- (11 Nov 2020) *On the two-dimensional KPZ and Stochastic Heat Equation*, organized by University College Dublin (IE) [online talk]
- (11 Jun 2020) *Hairer's Reconstruction Theorem without Regularity Structures*, organized by TU Berlin (D) [online talk]
- (27 Jan 2020) *On the two-dimensional KPZ and Stochastic Heat Equation*, Sapienza Università di Roma (I).

- (27 Sep 2018) *Local large deviations and the strong renewal theorem*, DEC-Statistics Seminar, Bocconi University, Milan (I).
- (6 Mar 2018) *Moment asymptotics for 2d directed polymer and stochastic heat equation in the critical window*, Stochastic Analysis Seminar, Imperial College, London (UK).
- (9 Feb 2018) *Pinning model, universality and rough paths*, Rhein-Main Kolloquium Stochastik, Technische Universität Darmstadt (D).
- (23 May 2017) *Marginally relevant polymer models in the critical window*, University of Grenoble (F).
- (15 Jun 2016) *Universality in marginally relevant disordered systems*, University of Luxembourg (L).
- (2 Jun 2016) *Universality in marginally relevant disordered systems*, University of Paris Diderot (F).
- (19 Nov 2015) *Multi-linear central limit theorems and scaling limits of disordered systems*, Vienna Seminar in Mathematical Finance and Probability (A).
- (19 Mar 2015) *Polynomial chaos and scaling limits of disordered systems*, Probability Seminar, ENS Lyon (F).
- (11 Oct 2013) *Polynomial chaos and scaling limits of disordered systems*, University of Padova (I).
- (12 Jul 2013) *Scaling limits and universality for random pinning models*, Rhein-Main Kolloquium Stochastik, University of Mainz (D).
- (13 Jun 2013) *Scaling limits and universality for random pinning models*, Most Informal Probability Seminar, University of Leiden (NL).
- (10 Jun 2013) *Scaling limits and universality for random pinning models*, University of Angers (F).
- (27 Jul 2012) *Scaling and multiscaling in financial series: a simple model*, Department of Statistics and Quantitative Methods, University of Milano-Bicocca (I).
- (10 Jul 2012) *A random copolymer near a selective interface*, University of Roma Sapienza (I).
- (3 Apr 2012) *Bootstrap percolation on Galton Watson trees*, Most Informal Probability Seminar, University of Leiden (NL).
- (12 Mar 2012) *Scaling and multiscaling in financial series: a simple model*, University of Modena and Reggio Emilia (I).
- (23 Sep 2011) *Scaling and multiscaling in financial indexes: a simple model*, University of Rome Tor Vergata (I).
- (16 Dec 2010) *A polymer in a multi-interface medium*, Oberseminar Stochastics, University of Bonn (D).
- (2 Nov 2010) *Scaling and multiscaling in financial indexes: a simple model*, University of Milano-Bicocca (I).
- (10 Jun 2010) *The weak coupling limit of disordered copolymer models*, University of Warwick (UK).
- (20 May 2010) *Scaling and multiscaling in financial indexes: a simple model*, University of Padova (I).
- (1 Feb 2010) *Scaling and multiscaling in financial indexes: a simple model*, University of Pavia (I).
- (8 Dec 2009) *A polymer in a multi-interface medium*, Séminaire de Probabilités, Laboratoire de Probabilités et Modèles Aléatoires, Universities of Paris 6 and Paris 7 (F).
- (5 Nov 2009) *Large scale behavior of semiflexible heteropolymers*, University of Nantes (F).

- (21 Jul 2009) *A polymer in a multi-interface medium*, University of Roma 3 (I).
- (12 Nov 2008) *A polymer in a multi-interface medium*, Berliner Kolloquium Wahrscheinlich-keitstheorie (IRTG Seminar), Humboldt University in Berlin (D).
- (19 Jun 2008) *Pinning and wetting transition for (1+1)–dimensional fields with Laplacian interaction*, Séminaire de Probabilités, ENS Lyon (F).
- (30 Apr 2008) *Pinning and wetting transition for (1+1)–dimensional fields with Laplacian interaction*, Seminar on Stochastic Processes, University of Zürich (CH).
- (23 Oct 2007) *The quenched critical point of a diluted disordered polymer model*, Random Spatial Structures Seminar, Eurandom, Eindhoven (NL).
- (17 Jul 2007) *The quenched critical point of a diluted disordered polymer model*, St. Flour Summer School of Probability (F).
- (24 Jan 2007) *Free energy lower bounds for random copolymers at selective interfaces*, Technical University of Berlin (D).
- (13 Jul 2006) *Pinning models with Laplacian interactions in (1+1)–dimension*, Random Spatial Structures Seminar, Eurandom, Eindhoven (NL).
- (17 Mar 2006) *A renewal theory approach to periodically inhomogeneous polymer models*, Seminaire de Probabilités et Statistique, Centre de Mathématiques et Informatique, University of Provence, Marseille (F).
- (21 Dec 2005) *A local limit theorem and an invariance principle for random walks conditioned to stay positive*, Seminar on Stochastic Processes, ETH Zürich (CH).
- (16 Dec 2005) *A renewal theory approach to periodically inhomogeneous polymer models*, Berlin-Leipzig Seminar, Technical University of Berlin (D).
- (19 Jul 2005) *A renewal theory approach to periodically inhomogeneous polymer models*, St. Flour Summer School of Probability (F).
- (27 May 2005) *Random copolymers at selective interfaces*, University of Milano-Bicocca (I).
- (2 Jun 2004) *A local limit theorem for random walks conditioned to stay positive*, Rencontres de Probabilités, University of Rouen (F).

Didactic Talks

- (20 Mar 2025) *Predictions, Gambling, and Popular Myths*, Collegio Ghislieri, Pavia (I).
- (17 Jun 2022) *Mathematics and chance: probability theory*, lecture for an audience of high school students, Summer School "An Introduction to College Mathematics", University of Milano-Bicocca (I).
- (4 Sep 2019) *Mathematics and chance*, talk for an audience of high school students, Summer School "La Matematica Oggi", San Pellegrino Terme, BG (I).
- (12 Mar 2015) *Mathematics in the university*, talk for an audience of high school students, Open Day "Privavera in Bicocca 2015".
- (14 Mar 2013) *Research in mathematics*, talk for an audience of high school students, Open Day "Privavera in Bicocca 2013".
- (5 Nov 2008) *The Banach-Tarski Paradox*, Technische Universität Berlin (D).
- (29 June 2006) *What is. . . the Banach-Tarski Paradox?*, Zürich Graduate Colloquium (CH).

Research courses in schools and workshops

- (15 Oct - 22 Nov 2024) *The critical 2d Stochastic Heat Flow and related models* [3 x (2 x 1h) online], in collaboration with Rongfeng Sun and Nikos Zygouras, "Intensive Lecture Series", Seoul National University (KR).
- (14-20 May 2024) *The critical 2d Stochastic Heat Flow* [3 x 2h], in collaboration with Rongfeng Sun and Nikos Zygouras, "Spring School on Critical Singular SPDEs", Beijing International Center for Mathematical Research (BICMR), Peking University (CN).
- (11-15 Sep 2023) *The critical 2d Stochastic Heat Flow* [3 x 1.5h], in collaboration with Rongfeng Sun and Nikos Zygouras, C.I.M.E. Summer School "Statistical Mechanics and Stochastic PDEs", Cetraro (CS), Italy.
- (19-22 Mar 2021) *Gaussian Limits for 2d Directed Polymers, KPZ and SHE* [3 x (2 x 1.5h) online], in collaboration with Rongfeng Sun and Nikos Zygouras, Berlin-Oxford IRTG
- (10-11 Dec 2018) *On the two-dimensional KPZ and Stochastic Heat Equation via directed polymers* [2 x 1.5h], Conference "State of research: statistical mechanics" of the French Mathematical Society, Institut Henri Poincaré, Paris (F).
- (2 Jun 2016) *Polynomial chaos and scaling limits of disordered systems* [3h], Working group on "Statistical mechanics and particle systems", University of Paris Diderot (F).
- (7 - 11 Mar 2016) *Polynomial chaos and scaling limits of disordered systems* [3 x 1.5h], Workshop YEP XIII, Eurandom, TU Eindhoven (NL).
- (28 Sep - 2 Oct 2015) *Polynomial chaos and scaling limits of disordered systems* [5 x 1.5h], Berlin-Potsdam Summer School 2015, Levico Terme (I).
- (10-12 Jan 2013) *Random Polymers and Localization Strategies* [3 x 2h], School of "Random Polymers", Eurandom, Eindhoven (NL).
- (14-18 May 2012) *Random Polymers and Localization Strategies* [3 x 2h + 1h], Worshop "Random Polymers and Related Topics", Institute for Mathematical Sciences, National University of Singapore.
- (6-10 Sep 2011) *The strange behavior of a random walk* [1.5h + 2h], Mathematics Summer School "Alfa Class" for top undergraduate students by "Progetto Diderot" – Fondazione CRT, Solonghello (AL), Italy.
- (2-7 Aug 2010) *Random Polymers* [5x1h tutorials, in collaboration with Nicolas Pétrélis, for the course given by Frank den Hollander], XIV Brazilian School of Probability and Clay Mathematics Institute 2010 Summer School "Probability and Statistical Physics in Two and more Dimensions", Búzios – Rio de Janeiro (BR).

Ph.D. Courses

- (Fall 2024) *Stochastic Analysis and Applications*, Ph.D. in Mathematics, Universities of Pavia and Milano-Bicocca [30h, with a seminar by Tal Orenshtein]
- (Spring 2020) *Topics from the Gaussian World*, Ph.D. in Mathematics, Universities of Pavia and Milano-Bicocca [30h, with Maurizia Rossi]
- (Spring 2019) *An Introduction to Regularity Structures*, Ph.D. in Mathematics, Universities of Pavia and Milano-Bicocca [30h]

- (Spring 2017) *Rough Paths and Stochastic Differential Equations*, Ph.D. in Mathematics, Universities of Pavia and Milano-Bicocca [30h, with Gianmario Tessitore]

- (Spring 2014) *Random Graphs and Complex Networks*, Ph.D. in Mathematics, joint course ("interdottorato") for the Universities of Milano, Milano-Bicocca, Pavia and Politecnico of Milano [30h, with Federico Bassetti]

- (Spring 2010) *Random Graphs and Complex Networks*, Ph.D. in Mathematics, University of Padova [20h, with Paolo Dai Pra]

- (Spring 2009) *Poisson Point Processes and Applications*, Ph.D. in Mathematics, University of Padova [10h]

- (Fall 2006) *Polymer Models and Random Walks*, Ph.D. in Mathematics, University of Padova [10h]

Undergraduate Courses and Recitations

At the University of Milano-Bicocca

- (Spring 2025) *Probability and Statistics for Informatics* (course), Bachelor's Degree in Informatics [in collaboration with Federica Masiero and Maurizia Rossi]

- (Fall 2024) *Stochastic Calculus and Finance* (course), Master's Degree in Mathematics

- (Fall 2024) *Probability Theory* (course), Bachelor's Degree in Mathematics [in collaboration with Gianmario Tessitore]

- (Spring 2024) *Probability and Statistics for Informatics* (course), Bachelor's Degree in Informatics [in collaboration with Federica Masiero and Maurizia Rossi]

- (Fall 2023) *Probability Theory* (course), Bachelor's Degree in Mathematics

- (Spring 2023) *Probability and Statistics for Informatics* (course), Bachelor's Degree in Informatics [in collaboration with Federica Masiero and Maurizia Rossi]

- (Fall 2022) *Probability Theory* (course), Bachelor's Degree in Mathematics

- (Spring 2022) *Probability and Statistics for Informatics* (course), Bachelor's Degree in Informatics [in collaboration with Federica Masiero and Maurizia Rossi]

- (Fall 2021) *Probability Theory* (course + recitations), Bachelor's Degree in Mathematics

- (Spring 2021) *Probability and Statistics for Informatics* (course), Bachelor's Degree in Informatics [in collaboration with Federica Masiero and Maurizia Rossi]

- (Spring 2021) *Stochastic Methods and Models* (course), Master's Degree in Mathematics [in collaboration with Maurizia Rossi]

- (Fall 2020) *Probability Theory* (course), Bachelor's Degree in Mathematics

- (Fall 2019) *Stochastic Methods for Finance* (course), Master's Degree in Mathematics [in collaboration with Gianmario Tessitore]

- (Fall 2019) *Probability Theory* (course), Bachelor's Degree in Mathematics

- (Spring 2019) *Stochastic Processes* (course), Master's Degree in Mathematics [in collaboration with Gianmario Tessitore]

- (Fall 2018) *Stochastic Methods for Finance* (course), Master's Degree in Mathematics [in collaboration with Gianmario Tessitore]

- (Fall 2018) *Probability Theory* (course), Bachelor's Degree in Mathematics

- (Spring 2018) *Stochastic Processes* (course), Master's Degree in Mathematics [in collaboration with Gianmario Tessitore]

- (Fall 2017) *Probability Theory* (course), Bachelor's Degree in Mathematics
- (Spring 2017) *Stochastic Processes* (course), Master's Degree in Mathematics [in collaboration with Gianmario Tessitore]
- (Fall 2016) *Probability Theory* (course), Bachelor's Degree in Mathematics
- (Spring 2016) *Stochastic Processes* (course), Master's Degree in Mathematics [in collaboration with Gianmario Tessitore]
- (Fall 2015) *Probability Theory* (course), Bachelor's Degree in Mathematics
- (Spring 2015) *Stochastic Processes* (course), Master's Degree in Mathematics [in collaboration with Gianmario Tessitore]
- (Fall 2014) *Probability Theory* (course + recitations), Bachelor's Degree in Mathematics
- (Spring 2014) *Stochastic Processes* (course), Master's Degree in Mathematics [in collaboration with Gianmario Tessitore]
- (Fall 2013) *Probability Theory* (course + recitations), Bachelor's Degree in Mathematics
- (Spring 2013) *Stochastic Processes* (course), Master's Degree in Mathematics [in collaboration with Gianmario Tessitore]
- (Fall 2012) *Probability Theory* (course + recitations), Bachelor's Degree in Mathematics
- (Spring 2012) *Stochastic Processes* (course), Master's Degree in Mathematics [in collaboration with Gianmario Tessitore]
- (Fall 2011) *Probability Theory* (course + recitations), Bachelor's Degree in Mathematics
- (Spring 2011) *Stochastic Processes* (course), Master's Degree in Mathematics [in collaboration with Gianmario Tessitore]
- (Spring 2005) *Stochastic Processes* (recitations), Master's Degree in Mathematics [teacher: Gianmario Tessitore]
- (Spring 2004) *Stochastic Processes* (recitations), Master's Degree in Mathematics [teacher: Daniela Bertacchi]
- (Spring 2004) *Probability and Statistics* (recitations), Bachelor's Degree in Mathematics [teacher: Daniela Bertacchi]

At the University of Padova
- (Spring 2011) *Stochastic Calculus* (course), Master's Degree in Mathematics [in collaboration with David Barbato]
- (Spring 2010) *Statistics* (recitations), Bachelor's Degree in Molecular Biology [teacher: Paolo Dai Pra]
- (Spring 2010) *Stochastic Calculus* (course), Master's Degree in Mathematics
- (Spring 2009) *Probability and Statistics* (recitations), Bachelor's Degree in Mathematics [teacher: Paolo Dai Pra]
- (Spring 2009) *Stochastic Calculus* (course), Master's Degree in Mathematics
- (Spring 2008) *Probability Theory* (course), Bachelor's Degree in Engineering, University of Padova (I) [in collaboration with Caterina Sartori]
- (Spring 2008) *Probability and Statistics* (recitations), Bachelor's Degree in Mathematics [teacher: Paolo Dai Pra]
- (Spring 2008) *Statistical Methods for Biology* (recitations), Bachelor's Degree in Biology [teacher: Paolo Dai Pra]

- (Spring 2007) *Statistical Methods for Biology* (recitations), Bachelor's Degree in Molecular Biology [teacher: Paolo Dai Pra]
- (Spring 2007) *Statistical Methods for Biology* (recitations), Bachelor's Degree in Biology [teacher: Paolo Dai Pra]

At the University of Zurich
- (Spring 2006) *Linear Algebra II* (recitations), Bachelor's Degree in Mathematics [teacher: Erwin Bolthausen]
- (Fall 2005) *Linear Algebra I* (recitations), Bachelor's Degree in Mathematics [teacher: Erwin Bolthausen]

At Politecnico di Milano
- (Spring 2003) *Probability and Statistics* (on-line recitations), Bachelor's Degree in Engineering [teacher: Elio Piazza]
- (Spring 2003) *Probability and Statistics* (numerical laboratory), Bachelor's Degree in Engineering [teacher: Elio Piazza]