

# Alberto Chiarini

## Curriculum Vitae

### Academic positions

- 2024 **Associate Professor**, *University of Padova*.
- 2022–2024 **Assistant Professor**, (*RTDB Tenure Track*) *University of Padova*.
- 2020–2021 **Assistant Professor**, (*Tenure Track*) *TU/e Eindhoven*.
- 2019 **Assistant Adjunct Professor**, *UCLA Los Angeles*, in the group of *Marek Biskup*.
- 2017–2019 **PostDoc**, *ETH-Zürich* in the group of *A.-S. Sznitman*.
- 2015–2017 **PostDoc**, *LabEx Archimède, Université d'Aix-Marseille* in the group of *P. Mathieu*.

### Education

- 2023 **Italian National Abilitation – Full Professor**.  
Abilitazione Scientifica Nazionale: prima fascia  
Settore Concorsuale 01/A3: analisi matematica, probabilità e statistica matematica
- 2020 **Italian National Abilitation – Associate Professor**.  
Abilitazione Scientifica Nazionale: seconda fascia  
Settore Concorsuale 01/A3: analisi matematica, probabilità e statistica matematica
- 2019 **Qualification aux fonctions de maître de conférences**, *Section 25 and 26*.
- 2012–2015 **PhD in Mathematics**, *Technische Universität, Berlin*.  
Title: *Invariance principle for diffusions in degenerate and unbounded random environment*.  
Supervisor: Professor Jean-Dominique Deuschel.  
Overall evaluation: "excellent" (summa cum laude).
- 2010–2012 **Masters in Mathematics**, *Università degli studi di Padova*.  
Title: *Large deviations for Itô processes*.  
Supervisor: Professor Markus Fischer.  
Graduated with honors (110/110 magna cum laude)
- 2007–2010 **Bachelor in Mathematics**, *Università degli studi di Padova*.  
Title: *Optimal transport*.  
Supervisor: Professor Paolo dai Prà.  
Graduated with honors (110/110 magna cum laude)
- 2002–2007 **Secondary school diploma**, *Liceo Primo Levi, Verona*.  
Scientific certificate with the grade 100/100.

### Papers

- A. Chiarini, M. Nitzschner. *Lower bounds for bulk deviations for the simple random walk on  $\mathbb{Z}^d$ ,  $d \geq 3$* . ArXiv (2023).  
<https://arxiv.org/abs/2312.17074>

- A. Chiarini, S. Floreani, F. Sau. *From quenched invariance principle to semigroup convergence with applications to exclusion processes*. ArXiv (2023).  
<https://arxiv.org/abs/2303.04127>
- A. Chiarini, S. Floreani, F. Redig, F. Sau. *Fractional kinetics equation from a Markovian system of interacting Bouchaud trap models*. ArXiv (2023).  
<https://arxiv.org/abs/2302.10156>
- A. Chiarini, G. Conforti, G. Greco and L. Tamanini. *Gradient estimates for the Schrödinger potentials: convergence to the Brenier map and quantitative stability*. Communications in Partial Differential Equations (2023).  
<https://www.tandfonline.com/doi/full/10.1080/03605302.2023.2215527>
- A. Chiarini and M. Nitzschner. *Phase transition for level-set percolation of the membrane model in dimensions  $d \geq 5$* . Journal of Statistical Physics, 190, no. 59, (2023).  
<https://link.springer.com/article/10.1007/s10955-023-03072-z>
- A. Chiarini, G. Conforti, G. Greco and Z. Ren. *Entropic turnpike estimates for the kinetic Schrödinger problem*. Electron. J. Probab. 27, 1-32 (2022).  
<https://doi.org/10.1214/22-EJP850>
- A. Chiarini, G. Conforti and L. Tamanini. *Schrödinger Problem for Lattice Gases: A Heuristic Point of View*. GSI 2021: International Conference on Geometric Science of Information, (2021).  
[https://link.springer.com/chapter/10.1007/978-3-030-80209-7\\_95](https://link.springer.com/chapter/10.1007/978-3-030-80209-7_95)
- A. Chiarini and M. Nitzschner. *Disconnection and entropic repulsion for the harmonic crystal with random conductances*. Communications in Mathematical Physics, 386, 1685–1745 (2021).  
<https://link.springer.com/article/10.1007/s00220-021-04153-4>
- S. Andres, A. Chiarini and M. Slowik. *Quenched local limit theorem for random walks among time-dependent ergodic degenerate weights*. Probab. Theory Relat. Fields, (2021).  
<https://link.springer.com/article/10.1007/s00440-021-01028-6>
- A. Chiarini and M. Nitzschner. *Entropic repulsion for the occupation-time field of random interlacements conditioned on disconnection*. The Annals of Probability, 48 (3) 1317–1351, (2020).  
<https://projecteuclid.org/euclid.aop/1592359230>
- A. Chiarini and M. Nitzschner. *Entropic repulsion for the Gaussian free field conditioned on disconnection by level-sets*. Probab. Theory Relat. Fields, Volume 177, 525–575, (2020).  
<https://link.springer.com/article/10.1007/s00440-019-00957-7>
- P. Bella, A. Chiarini and B. Fehrman. *A Liouville theorem for stationary and ergodic ensembles of parabolic systems*. Probab. Theory Relat. Fields, Volume 173, 759–812, (2019).  
<https://link.springer.com/article/10.1007/s00440-018-0843-z>
- A. Chiarini and P. Mathieu. *Singular weighted Sobolev spaces and diffusion processes: an example (due to V.V. Zhikov)*. Applicable Analysis, Volume 98, Issue 1-2: Homogenization and Qualitative Theory of Differential Equations dedicated to the memory of Vassily Vassilievich Zhikov, (2019).

<https://www.tandfonline.com/doi/full/10.1080/00036811.2018.1484912>

- S. Andres, A. Chiarini, J.-D. Deuschel and M. Slowik. *Quenched invariance principle for random walks with time-dependent ergodic degenerate weights*. The Annals of Probability, 46 (1) 302–336, (2018).  
<https://projecteuclid.org/euclid.aop/1517821224>
- A. Chiarini, A. Cipriani and R. S. Hazra. *Extremes of some Gaussian random interfaces*. Journal of Statistical Physics, 165, 521–544, (2016).  
<https://link.springer.com/article/10.1007/s10955-016-1634-5>
- A. Chiarini, A. Cipriani and R. S. Hazra. *Extremes of the supercritical Gaussian Free Field*. ALEA, Lat. Am. J. Probab. Math. Stat. 13, no. 2, 711–724, (2016).  
<http://alea.impa.br/articles/v13/13-28>
- A. Chiarini and J.-D. Deuschel. *Invariance Principle for symmetric Diffusions in a degenerate and unbounded stationary and ergodic random medium*. Ann. de l'Inst. Henri Poincaré (B), 52(4): 1535–1563, (2016).  
<https://projecteuclid.org/euclid.aihp/1479373239>
- A. Chiarini, A. Cipriani and R. S. Hazra. *A note on the extremal process of the supercritical Gaussian Free Field*. Electron. Commun. Probab. 20, no. 74, 1–10, (2015).  
<http://ecp.ejpecp.org/article/view/4332>
- A. Chiarini and J.-D. Deuschel. *Local Central Limit Theorem for diffusions in a degenerate and unbounded random medium*. Electron. J. Probab. 20, no. 112, 1–30, (2015).  
<http://ejp.ejpecp.org/article/view/4190>
- A. Chiarini and M. Fischer. *On large deviations for small noise Itô processes*. Adv. in Appl. Probab. 46, no. 4, 1126–1147, (2014).  
<http://projecteuclid.org/euclid.aap/1418396246>

## Other works

- A. Chiarini and A. Cipriani. *A note on the Green's function for the transient random walk without killing on the half lattice, orthant and strip*.
- A. Chiarini, A. Cipriani and G. Conforti. *Approximating conditional distributions*.
- A. Chiarini. *Invariance principle for diffusions in degenerate and unbounded random environment*. Phd thesis.
- A. Chiarini. *Large deviations for small noise Itô processes through a weak convergence approach*. Master thesis.

## Talks

- Nov 2023 How efficiently does a simple random walk cover a portion of a macroscopic body? Seminario de Probabilidad y Mecánica Estadística (SPEMS), Online.
- Sep 2023 Gradient estimates for the Schrödinger potentials and convergence to the Brenier map, Probability Seminar, University of Trieste.

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✉ [chiarini@math.unipd.it](mailto:chiarini@math.unipd.it)

- Mar 2023 On the cost of covering a fraction of a macroscopic body by a simple random walk. “Localization Phenomena”, CIRM, Marseille.
- Jan 2023 On the cost of covering a fraction of a macroscopic body by a simple random walk. Probability seminar, Warwick.
- Dec 2022 On the cost of covering a fraction of a macroscopic body by a simple random walk. Università la Sapienza, Rome.
- Nov 2022 How costly is it for the random walk to cover a fraction of a macroscopic set? PRISMA Webseminar. Online.
- Sep 2022 Gradient estimates for the Schrödinger potentials: convergence to the Brenier map and quantitative stability. Interacting Particle Systems and Applications, Trento.
- Jun 2022 Disconnection and entropic repulsion for the harmonic crystal with random conductances. Third italian meeting on Prob. and Stat., Bologna.
- Jan 2022 Phase transition for level-set percolation of the membrane model in dimensions  $d \geq 5$ . Percolation Today seminar, ETH Zürich, Université de Genève, University of Cambridge. Online.
- Nov 2021 Disconnection and entropic repulsion for the harmonic crystal with random conductances. NYU Probability and the City Seminar, New York. Online.
- Oct 2021 Disconnection and entropic repulsion for the harmonic crystal with random conductances. Manchester University, Probability seminar. Online.
- July 2021 Disconnection and entropic repulsion for the harmonic crystal with random conductances. Bézout-Eurandom IHP workshop, Paris, Institut Henri Poincaré.
- Mar 2021 Disconnection and entropic repulsion for the harmonic crystal with random conductances. iPOD seminar, Leiden University. Online.
- Feb 2021 Disconnection and entropic repulsion for the harmonic crystal with random conductances. Applied PDEs seminar, Imperial college. Online.
- Feb 2021 Disconnection and entropic repulsion for the harmonic crystal with random conductances. Percolation Today seminar, ETH Zürich, Université de Genève, University of Cambridge. Online.
- Jun 2020 Entropic repulsion for the occupation-time field of random interlacements by disconnection. Workshop Stochastic Analysis Brats, Pisa. Online.
- Jun 2020 Entropic repulsion for the occupation-time field of random interlacements by disconnection. Probability and Finance Seminar, University of Padova. Online.
- Mar 2020 Entropic repulsion for the occupation-time field of random interlacements by disconnection. Probability seminar, Université Paris-Nanterre. Canceled due to Covid.
- Jan 2020 Homogenization for the degenerate dynamic random conductance model. CASA Colloquium at TU/e, Eindhoven.
- Jun 2019 Entropic repulsion for the Gaussian free field conditioned on disconnection by level sets. Second Italian meeting on Prob. and Math. Statistics, Vietri sul mare.
- Jun 2019 Entropic repulsion for the occupation-time field of random interlacements conditioned on disconnection. Stochastic seminar at TU Delft, Delft

- Jan 2019 Entropic repulsion for the Gaussian free field conditioned on disconnection by level sets. Stochastic seminar at IST Austria, Vienna
- July 2018 Entropic repulsion for the Gaussian free field conditioned on disconnection by level sets. CIMPA school "Geometry and scaling of random structures", Buenos Aires.
- May 2018 Invariance principle for the degenerate dynamic random conductance model. Probability seminar, Basel.
- Feb 2018 Invariance principle for the degenerate dynamic random conductance model. Seminario di Probabilità, Università Sapienza di Roma.
- Nov 2017 Quenched invariance principle for random walks with time-dependent ergodic degenerate weights. Seminar on Stochastics, ETH Zürich.
- Jun 2017 Quenched invariance principle for random walks with time-dependent ergodic degenerate weights. First italian meeting on Prob. and Stat., Torino.
- Dec 2016 Non-regular weighted Sobolev spaces and Dirichlet forms. Workshop "Heat Kernels, Stochastic Processes and Functional Inequalities", Oberwolfach.
- Feb 2016 Quenched invariance principle for random walks with time-dependent ergodic degenerate weights. Winter School in Stoch. Hom., Augsburg.
- Jan 2016 Homogenization of processes in degenerate random environment via Moser's iteration. Aix-Marseille Université.
- Jan 2016 Homogenization of processes in degenerate random environment via Moser's iteration. Max Planck Institute, Leipzig.
- Aug 2015 *Invariance principle for symmetric diffusions in a degenerate and unbounded stationary and ergodic random medium.* Oberseminar biologische Modelle und statistische Mechanik, Berlin.
- Jun 2015 Extremes of the supercritical Gaussian Free Field. RTG Seminar, Berlin.
- Feb 2015 *(Local) CLT for symmetric diffusions in a degenerate random environment.* Seminario di probabilità e finanza matematica, Università degli studi di Padova.
- Jan 2015 *(Local) CLT for symmetric diffusions in a degenerate random environment.* Seminar TUM, Munich.
- Jan 2014 *Invariance Principle for diffusions in random environment.* Seminar TUM, Munich.
- Sep 2013 *Invariance Principle for diffusions in random environment.* Summer School Zürich-Berlin, Zürich.

## Research stays

- 2022 MFO Oberwolfach, Research in pairs with M. Nitzschner, 2nd – 15th October.
- 2022 HIM (Hausdorff Institute for Mathematics), 14th – 18th August, for the Junior Trimester Program "Stochastic Modelling in the Life Science: From Evolution to Medicine".
- 2020 (Canceled due to Covid) ETH Zürich, guest of Prof. A.-S. Sznitman, 15th – 21st March.
- 2019 École polytechnique, guest of Dr. Giovanni Conforti, 15th – 19th December.
- 2019 TU Delft, guest of Dr. Alessandra Cipriani, 2nd – 6th June.

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- 2017 Max Planck Institute, Leipzig, guest of Professor Felix Otto, 30th June – 5th August.
- 2016 Max Planck Institute, Leipzig, guest of Professor Felix Otto, 6th August – 30th September.
- 2016 Technische Universität zu Berlin, Berlin, guest of Professor Jean-Dominique Deuschel, 24th April – 2nd May.
- 2014 Université d'Aix-Marseille, France, guest of Professor Pierre Mathieu, 24th March – 18th April.

## Teaching and professional activities

### Supervision of PhD students:

- 2023 – E. Pasqui, Università degli studi di Padova
- 2020 – G. Greco (with G. Conforti), TU Eindhoven

### Supervision of Master students:

- 2023 G. Scano, Università degli studi di Padova
- 2023 A. Donadini, (with C. Cosco), PSL & UniPD, MAPPA
- 2021 B.E. van Schooten (with M. Fischer), TU Eindhoven
- 2021 A. Mohamed (with O. Tse), TU Eindhoven
- 2017 R. Riviere (with A.-S. Sznitman), ETH Zurich

### Supervision of Bachelor students:

- 2023 A. Bendo, Università degli studi di Padova
- 2021 P. Keer (with A. Cipriani), TU Delft

### Teaching:

- S2 2023/24 Co-Lecturer for the graduate course "A renormalisation group approach to log-Sobolev inequalities".
- S2 2023/24 Lecturer for "Istituzioni di Probabilità" at Università degli studi di Padova. This is a first year Bachelor course for Statisticians ( $\approx 150$  students).
- S1 2023/24 Lecturer for "High dimensional probability" at Università degli studi di Padova. This is a Master's course for the Degree in Data Science ( $\approx 30$  students).
- S2 2022/23 Lecturer for "Istituzioni di Probabilità" at Università degli studi di Padova. This is a first year Bachelor course for Statisticians ( $\approx 150$  students).
- S2 2021/22 Lecturer for "Istituzioni di Probabilità" at Università degli studi di Padova. This is a first year Bachelor course for Statisticians ( $\approx 150$  students).
- Q2 2021/22 Lecturer for 2WA60 "Vector Analysis" at TU/e. This is a second year Mathematics Bachelor course ( $\approx 100$  students).
- Q1 2021/22 Coordination of the student seminar "Stochastic calculus" at TU/e for Master students.
- Q1 2021/22 Lecturer for 2WAG0 "Measure, integration and probability theory" at TU/e. This is a third year Mathematics Bachelor course.
- Q4 2020/21 Instructor for 2WA40 "Analysis 2" at TU/e. This is a first year Mathematics Bachelor course.

- Q4 2020/21 Lecturer for 2WS60 "Extreme value theory and other catastrophes" at TU/e. This is a third Mathematics year Bachelor course.
- Q1 2020/21 Coordination of the student seminar "Stochastic calculus" at TU/e for Master students.
- Q1 2020/21 Lecturer for 2WAG0 "Measure, integration and probability theory" at TU/e. This is a third year Mathematics Bachelor course.
- Q4 2019/20 Instructor for 2WA40 "Analysis 2" at TU/e. This is a first year Mathematics Bachelor course.
- Q4 2019/20 Lecturer for 2WS60 "Extreme value theory and other catastrophes" at TU/e. This is a third year Mathematics Bachelor course.
- Fall 2019 Lecturer for Math 170A, Introduction to probability, at UCLA. This is a third year Mathematics Bachelor course.
- Fall 2019 Lecturer for Math 131B, Real analysis, at UCLA. This is a third year Mathematics Bachelor course.
- Spring 2019 Coordination of the student seminar "Random matrix theory" (organized by J. Bertoin, A.-S. Sznitman and V. Tassion) at ETH Zurich.
- Spring 2018 Coordination of the student seminar "Harmonic functions on groups" (organized by J. Bertoin, A.-S. Sznitman and V. Tassion) at ETH Zurich.
- 2011–2012 Tutorials for Bachelor courses in calculus and linear algebra, 150 hours at Università degli Studi di Padova.

**Organization:**

- 2024 Co-Organizer for the conference "Large scale behavior of interacting diffusions: from stochastic control to functional Inequalities" at the University of Padova 18-20 September 2024.
- 2023 Co-Organizer of the cycle of online seminars OWPS (*One World Probability Seminar*) for the session Spring 2023 (February to June). The One World Probability project is an online platform for research seminars in probability theory. Started during the Covid-19 epidemic in 2020, the project intends to bring together researchers from all over the world in a virtual and inclusive environment. The project is a community wide initiative supported by the Bernoulli Society and the Institute of Mathematical Statistics.
- 2022 Organizer of the contributed session "Stochastic optimal transport" at the Third Italian Meeting on Probability and Mathematical Statistics. 13th – 16th June, Bologna.
- 2014 Member of the organizing committee of the "Berlin – Padova Workshop", 23rd – 25th October 2014, Berlin/Potsdam, Germany.

**PhD committees:**

Dr. Cristina Tagliaferri, PhD in mathematics, Università la Sapienza di Roma (2022).

## Reviewing:

Reviewer for: *Acta Mathematica*, *Annales de l'Institut Henri Poincaré*, *The Annals of Probability*, *The Annals of Applied Probability*, *Bernoulli*, *Electronic Communications in Probability*, *Electronic Journal of Probability*, *Inventiones mathematicae*, *Journal of Statistical Physics*, *Journal of Theoretical Probability*, *Potential Analysis*, *Probability Theory and Related Fields*.

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## Affiliation to mathematical groups

**I.N.δ.A.M.**, in particular, affiliation to the group GNAMPA, in the section of Real Analysis, Measure Theory and Probability since 2022.

Affiliation to the UMI (Unione matematica italiana) and in particular to the group PRISMA since 2022.

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## Awards and grants

- 2022 OWRF Oberwolfach Research Fellow (Research In Pairs), with the project “Disconnection and excess deviations for the Gaussian free field and random walks”, (two weeks of per diem).
- 2022 Principal Investigator for the SID 2022 project “Stochastic mean field control and the Schrödinger problem”, funded by the University of Padova, (15000 Euro).
- 2021 Excellent Course Evaluation 2021/2022 for the course “Measure, integration and probability theory” (2WAG0) at TU/e.
- 2021 Excellent Course Evaluation 2020/2021 for the course “Measure, integration and probability theory” (2WAG0) at TU/e.
- 2021 Van Gogh Programme for the Dutch–French cooperation, with Dr. G. Conforti (2900 Euro).
- 2020 Excellent Course Evaluation 2019/2020 for the course “Extreme values and other catastrophes” (2WS60) at TU/e.
- 2020 STAR (Stochastics — Theoretical and Applied Research) Visitor grant (1500 Euros).
- 2018 Oberwolfach Leibniz Graduate Student.
- 2015–2017 Holder of a scholarship from LabEx Archimède (Laboratoire d'excellence)
- 2016–2017 “Bourse d'accueil au profit de chercheurs” (2000 Euros) from the city of Marseille, to young foreigner researchers on a merit base.
- 2016 Oberwolfach Leibniz Graduate Student. MFO of Oberwolfach selects few post-docs and give to them the opportunity to participate to several Workshops organized by the institute covering the expenses; on a merit base.
- 2012–2015 Scholarship from RTG 1845 (Research Training Group) and member of the Berlin Mathematical School (BMS).
- 2007–2010 Scholarship from INdAM (Istituto Nazionale di Alta Matematica). The scholarship has been won after a national competition. (12000 Euro)



## Languages

Italian (mothertongue), English (fluent), French (advanced), German (good).

## Interests (other than mathematics)

- Piano
- Electronics
- Drawing
- Chess
- Programming
- Cycling/football