Luca Fresta

General Information

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Address:	Mathematics Department, University of Roma Tre Largo San Leonardo Murialdo 1, 00146 Roma, Italy
Place of Birth:	Gallarate, Italy
Nationality:	Italian
Languages:	Italian (native), English (fluent), German (advanced), Dutch (basic knowledge)

Education

Oct 2016 – Sep 2020:	**Ph.D. in Mathematics**, University of Zurich Thesis: *Supersymmetry and Renormalization in the Theory of Random Schrödinger Operators* Advisor: Prof. M. Porta (SISSA Trieste), Prof. B. Schlein
Sep 2019 – Feb 2020:	Visiting Ph.D. candidate, University of Tübingen
Oct 2013 – Feb 2016:	**M.Sc. in Physics**, University of Milan Advisor: Prof. V. Mastropietro, Prof. E. Langmann (KTH Stockholm) Final Mark: 110/110 *cum laude*
Apr 2015 – Dec 2015:	Visiting student, KTH Stockholm
Oct 2010 – Oct 2013:	**B.Sc. in Physics**, University of Milan Advisor: Prof. A. S. Sørensen (NBI Copenhagen) Final Mark: 110/110 *cum laude*
Feb 2013 – Jul 2013:	Visiting student, NBI Copenhagen

Professional Experience

Apr 2025 – present:	Marie Skłodowska Curie Postdoctoral Fellow, University of Roma Tre
Jul 2022 – Mar 2025:	Post-doctoral Researcher, University of Bonn
Jan 2021 – Jun 2022:	SNSF Early Post-doctoral Fellow, University of Bonn
Sep 2020 – Dec 2020:	Post-doctoral Researcher, University of Zurich
Oct 2016 – Sep 2020:	Doctoral Student, University of Zurich with stays at the University of Tübingen (Advisor: Prof. M. Porta)

Awards and Fellowships

- Marie Skłodowska Curie Postdoctoral Fellowship (February 2024)
- SNSF Early Post-Doc mobility Fellowship (November 2020)
- Six-month stipend awarded by the University of Milan for master thesis abroad (January 2015)
- Scholarship assigned by Famiglia Legnanese Foundation to the best master students enrolled at the University of Milan (October 2014)

Research Interests

My research lies at the intersection of mathematical physics and probability theory, with a focus on quantum disordered systems, interacting fermionic systems, and constructive quantum field theory.
Topics I have been working on include:

- Random Schrödinger operators, random band matrices, and supersymmetric nonlinear sigma models
- Many-body fermionic systems and their effective dynamics
- Stochastic quantisation and non-commutative stochastic analysis

Publications

Publications in peer-reviewed journals

9. Spin transport and lack of quantisation in the *A*II class on the honeycomb structure, *Ann. Henri Poincaré* (2026) with G. Marcelli https://link.springer.com/article/10.1007/s00023-026-01656-5.
8. Effective Dynamics of Local Observables for Extended Fermi Gases in the High-Density Regime, *Commun. Math. Phys.* **406**, 247 (2025), with M. Porta and B. Schlein, https://link.springer.com/article/10.1007/s00220-025-05393-4.
7. Non-commutative L^p spaces and Grassmann stochastic analysis, *Prob. Theory Related Fields* **192**, 949 - 1029 (2025), with F. C. De Vecchi, M. Gordina and M. Gubinelli. https://doi.org/10.1007/s00440-025-01379-4.
6. A stochastic analysis of subcritical Euclidean fermionic field theories, *Ann. Probab.* **53** (3): 906–966 (2025), with F. C. De Vecchi and M. Gubinelli. https://doi.org/10.1214/24-AOP1714.
5. Effective Dynamics of Extended Fermi Gases in the High-Density Regime, *Commun. Math. Phys.* **401**, 1701–1751 (2023), with M. Porta and B. Schlein. https://doi.org/10.1007/s00220-023-04677-x.
4. Supersymmetric Cluster Expansions and Applications to Random Schrödinger Operators, *Math. Phys. Anal. Geom.* **24**, 4 (2021). https://doi.org/10.1007/s11040-021-09375-5.
3. Approaching off-diagonal long-range order for 1 + 1-dimensional relativistic anyons, *Phys. Rev. B* **103**, 085140 (2021), with P. Moosavi. DOI:/10.1103/PhysRevB.103.085140.
2. A Supersymmetric Hierarchical Model for Weakly Disordered 3*d* Semimetals, *Ann. Henri Poincaré* **21**, 3499-3574 (2020), with G. Antinucci and M. Porta. https://doi.org/10.1007/s00023-020-00909-1.
1. Elementary test for nonclassicality based on the measurements of position and momentum, *Phys. Rev. A* **92**, 062111 (2015), with J. Borregaard and A. S. Sørensen. DOI:/10.1103/PhysRevA.92.062111.

Preprints, submitted to peer-reviewed Journals

Exponential decay of correlations at high temperature in nonlinear sigma models, *Preprint* (2026), with M. Disertori and J. Durán Fernández arXiv:2603.26157

Doctoral Dissertation

Supersymmetry and renormalization in the theory of random Schrödinger operators, Dissertation Universität Zürich 2020.

Presentations

Conferences and Workshops

- QMath16 (Quantum Many-body Session), Munich – Sep 2025
- Workshop on Effective Theories in Classical and Quantum Particle Systems, SISSA, Trieste – Jun 2025
- Workshop on Mathematics of Condensed Matter Systems, Politecnico di Milano – May 2025 (contributed talk)
- Mini-Workshop on Condensed-Matter Physics, Garmisch – Oct 2024
- European Congress of Mathematics (ECM 2024), Mini-Symposium on Collective Phenomena of Fermionic Systems, Sevilla – Jul 2024
- International Congress on Mathematical Physics (ICMP 2024), Strasbourg – Jul 2024 (contributed talk)
- SPQT 2024, Pula – Jun 2024
- Mini-Workshop on Mathematical Physics in the Heart of Germany, Jena – May 2024
- North-East and Midlands Stochastic Analysis Seminars Workshop, Exeter College, Oxford – Sep 2023
- Young Researchers in Mathematical Physics, IHK Akademie – Jul 2023
- Workshop on Stochastic Analysis Meets QFT – Critical Theory, University of Münster – Jun 2023
- Workshop on Mathematical Quantum Matter, University of Milan – Jan 2023
- Workshop on The Renormalization Group, MFO Oberwolfach – Jul 2022
- Archipelagic Perspectives on Mathematics and Physics, Stockholm – Aug 2021
- Young Researchers Symposium, Geneva – Jul 2021 (contributed talk)
- QMath14, Aarhus University – Aug 2019 (contributed talk)
- Tübingen–Zürich Meeting in Mathematical Physics, University of Tübingen – Jul 2019

Upcoming

- IMPMS 2026, Contributed Session on Singular Stochastic Analysis and Stochastic Quantisation – Jun 2026
- Lake Como School on Dynamics of Quantum Systems and Nonlinear Waves – Jun 2026
- Workshop on The Mathematical Roads to QFT, RIMS Kyoto – Jun 2026

Seminars and Invited Talks

- University of Roma Tre, Mathematical Physics Seminar – Dec 2025
- Virginia Tech, Analysis and Mathematical Physics Seminar (online) – Oct 2025
- IAMP One World Seminar (online) – Jul 2025
- Technical University of Darmstadt, Probability Oberseminar – May 2025
- University of Warwick, Probability Seminar – Feb 2025
- University of Zürich, PDE and Mathematical Physics Seminar – Mar 2024
- University of L'Aquila, SMAQ Seminar – Feb 2024
- University of Paderborn, Mathematical Physics Oberseminar – Nov 2023
- SISSA, Mathematical Physics Seminar – Mar 2023
- University of Milan, Mathematics Seminar – Nov 2022
- University of Basel, Analysis Oberseminar – Jun 2022
- LMU Munich, Mathematical Physics Oberseminar – Jun 2019
- University of Tübingen, Mathematical Physics Oberseminar – November 2017

Teaching Experience

- Master Courses – University of Bonn

Spring 2024:	Graduate seminar – "Recent Developments in Stochastic Quantisation"
Fall 2023:	"Statistical Mechanics of Lattice Systems"
Spring 2023:	Graduate seminar – "Singular Stochastic PDEs"
Fall 2022:	Graduate seminar – "Theory of Regularity Structures"

- Exercise Classes – University of Zürich

Fall 2020:	"Stability of Quantum Mechanical Matter" (Master level)
Spring 2020:	"Introduction to Statistics" (Bachelor level)
Spring 2019:	"Complex Analysis" (Bachelor level)
Spring 2018:	"Complex Analysis" (Bachelor level)
Spring 2017:	"ODE and Dynamical Systems" (Bachelor level)

Supervision Activity

PhD Students

- Javier Durán Fernández, Jan 2025 – present (with Prof. M. Disertori)

Master Students

- Javier Valentin Martin, Nov 2022 – Sep 2023 (with Prof. M. Disertori)
- Lucas Ewert, Mar 2023 – Apr 2024 (with Prof. M. Disertori)
- Javier Durán Fernández, Nov 2023 – Oct 2024 (with Prof. M. Disertori)
- Anna Liza Schonlau, Nov 2023 – Nov 2024 (with Prof. M. Disertori)
- Piro Manco, Oct 2024 – Nov 2025

- Abelard Malvin, Apr 2025 – Mar 2026 (with Prof. M. Disertori)

Service and Organization

Organization

- Co-organiser, *Probability and Mathematical Physics Seminars*, University of Roma Tre (2026)
- Co-organiser, *Mathematical Challenges in Quantum Mechanics - Online Seminars* (2025-2026),
- Co-organiser, *Oberseminar Mathematische Physik*, University of Bonn (2023-2025),
- Co-organiser, *Hausdorff school "Recent developments in disordered systems"*, University of Bonn (Sep 2024)

Refereeing

- Communications in Mathematical Physics
- Annales Henri Poincaré
- Proceedings of the London Mathematical Society
- Forum of Mathematics, Sigma
- Journal of Statistical Physics
- Letters in Mathematical Physics
- Journal of Mathematical Physics

The statements made in the curriculum are made in accordance with Articles 46 and 47 of the DPR No. 445/2000. I hereby authorize the use of my personal data in accordance to the DPR No. 679/16.

Roma, 31.03.2026