Emanuele Pasqui
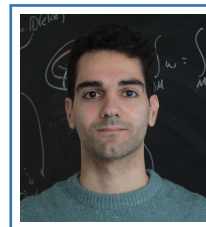
Curriculum Vitae

Via Trieste, 63
35121 Padua, Italy
✉ emanuelepasqui97@gmail.com
🌐 emanuelepasqui.github.io/

Current position

Oct 2023 – Present   **Ph.D. student in Mathematical Sciences**, *University of Padua*
- *Subject:* Probability
- *Supervisor and co-supervisor:* Prof. Alberto Chiarini and Prof. Giambattista Giacomin
- *Research topic:* Gaussian Free Field in Random Environment
- *Expected graduation year:* 2026

Education

Sep 2019 – Mar 2022   **Master's Degree in Mathematics** at Sapienza University of Rome
- *Subject:* Applied Mathematics
- *Thesis title:* Oil And Water and Internal Diffusion Limited Aggregation
- *Supervisor:* Prof. Lorenzo Taggi
- *Summary:* I considered the two interacting particle systems on graphs *Oil And Water* and *Internal Diffusion Limited Aggregation*, and studied existence and critical threshold for their phase transition between the regimes of *fixation* (when on each vertex particles stop jumping in finite time) and *activity* (when fixation does not occur) with respect to the particle density. I then studied a shape theorem for the cluster of visited sites when the graph is $\mathbb{Z}^d$, $d \geq 2$, and all particles start from the origin. Since the asymptotic shape for the cluster of Oil And Water is just conjectured, I introduced a new simplified model with matching cluster growth rate, and analyzed particle distribution in the final cluster and fluctuations, also using simulations. The work used potential theory, martingale theory, and connected the dynamics of the two systems to Abelian Networks and Activated Random Walks.
- *Grade:* 110 cum laude/110.

Sep 2016 – Sep 2019   **Bachelor's Degree in Mathematics** at *Sapienza University of Rome*
- *Subject:* Mathematics
- *Thesis title:* Mathematical formalization of the financial market and CRR Model
- *Supervisor:* Prof. Gustavo Posta
- *Abstract:* I considered a mathematical mathematical formalization of the financial market with a probabilistic approach, to then study the Cox-Ross-Rubinstein model and the Black-Scholes model for derivative pricing, and to introduce the concept of Greeks for derivatives.

Additional education

Apr 2022 – Jul 2022   **"Machine Learning for Finance" course**, *University of Eastern Piedmont*
- *Summary:* Machine Learning techniques applied to the financial field. Supervised Learning (SVMs, DTs, Random Forests), Unsupervised Learning (Clustering, PCA), NNs (modeling, activation functions, regularization methods, Siamese Networks, AutoEncoders)

Articles

2025   **Hard wall repulsion for the discrete Gaussian free field in random environment on $\mathbb{Z}^d$, $d \geq 3$**
with Alberto Chiarini. **arXiv preprint 2510.24562**, currently submitted to a journal.

Interests

What I am working on: **Statistical mechanics, Gaussian free field, percolation, homogenization**

What I am also interested in: Role of the disorder in random interfaces (also with different convex potentials) and in random interlacements, SPDEs, particle systems, automata networks.

Contributions

Talks (past and upcoming)

Jun 2026   5th Italian Meeting on Probability and Mathematical Statistics | University of Palermo, Italy

Mar 2026   Hong Kong University of Science and Technology, Hong Kong

29th Jan 2026   Graduate Seminar | University of Padua, Italy

Jan 2026   Winter school "Random walks: applications and interactions" | CIRM, Marseille, France

20th Nov 2025   Probability reading group | King's College London, United Kingdom
Extremes and hard wall repulsion for the Gaussian free field in random environment on $\mathbb{Z}^d$, $d \geq 3$

11th Nov 2025   Bloomsbury Probability Seminar | University College London, United Kingdom
Hard wall repulsion for the discrete Gaussian free field in random environment on $\mathbb{Z}^d$, $d \geq 3$

29th May 2025   Short talk | University of Padua, Italy
Hard Wall event for the Gaussian free field in random environment on $\mathbb{Z}^d$ with $d \geq 3$

8th & 12th Feb 2024   Reading group | University of Padua, Italy
Activated Random Walks and Abelian Networks

Posters

17th-28th Feb 2025   Winter school on Statistical Mechanics, Nonequilibrium Processes and Probability | Sapienza University of Rome, Italy

10th & 12th Sep 2024   Particle Systems and PDE's XII | University of Trieste, Italy

17th Jun 2024   Workshop on Probabilistic Field Theories | Aalto University, Finland

Academic Visits

Feb 2026 - Mar 2026   **Hong Kong University of Science and Technology**
Visiting Prof. Maximilian Nitzschner.

Oct 2025 - Dec 2025   **University College London**
Visiting Prof. Alessandra Cipriani.

Teaching

Oct 2025 – Jan 2026   **Tutor for the course "Foundations of mathematical analysis and probability" for the a.y. 2025-2026**, *University of Padua*

Dec 2024 – Apr 2025   **Tutor for initiatives of diffusion of the scientific culture of the National Institute for Nuclear Physics**, *Legnaro (Padua)*

Oct 2024 – Jan 2025   **Tutor for the course "Foundations of mathematical analysis and probability" for the a.y. 2024-2025**, *University of Padua*

Sep 2016 – Oct 2022	**University, High School and Middle School Private Tutor**, *Rome* Mathematics and Physics.

Attended doctoral courses

- *Random graphs and networks* (by Giambattista Giacomin)
- *Products of random matrices: theory and applications* (by Giambattista Giacomin)
- *Statistical Mechanics and Disordered Systems* (by Quentin Berger)
- *A renormalisation group approach to log-Sobolev inequalities* (by Alberto Chiarini and Giovanni Conforti)
- *Stability of queuing networks* (by Bernardo D'Auria)
- *Hawkes processes: from theory to financial practice* (by Simone Scotti)
- *Stochastic and mean field optimal control* (by Alekos Cecchin)
- *Bessel, Cox-Ingersoll-Ross, Ornstein-Uhlenbeck and Gaussian-Volterra processes with Wiener and fractional drivers* (by Yuliya Mishura)
- *Introduction to optimal transport* (by Laura Caravenna)
- *Flows of Sobolev vector fields* (by Elio Marconi)
- *Integral operators in Hölder spaces* (by Massimo Lanza De Cristoforis)
- *Perturbative methods in dynamical systems* (by Christos Efthymiopoulos)
- *Mathematical Climate Finance* (by Andrea Macrina)

Honors and Awards

Sep 2023	*Sapienza University of Rome* I won a Ph.D. position.
Sep 2023	*KTH Royal Institute of Technology Stockholm* I was shortlisted and invited for an on-site interview for a Ph.D. position in Applied Mathematics (spec. Mathematical Statistics).
Jan 2023	*Humboldt University - University of Oxford* I won a public competition for a Ph.D. position in the IRTG 2544 "Stochastic Analysis in Interaction", a collaboration between University of Oxford, HU Berlin, TU Berlin, FU Berlin and WIAS Berlin. The position I won was at HU in collaboration with the University of Oxford. Due to family problems, I had to reject the offer for this position.
Nov 2022	*Sapienza University of Rome - Bank of Italy* I won a public competition for a traineeship at the university, in collaboration with Bank of Italy.

Other relevant attended conferences and workshops

30th Jun - 4th Jul 2025	Random Geometric Structures and Statistical Physics | Sapienza University of Rome, Italy
5th-9th May 2025	Conference on Mixing Times between Probability, Computer Science and Statistical Physics | International Centre for Theoretical Physics, Trieste, Italy
11th Apr 2025	A Spring Day in Probability and Statistical Physics 2025 | University of Florence, Italy
23th-27th Sep 2024	Long-range phenomena in Percolation | University of Cologne, Germany
18th-20th Sep 2024	Large scale behaviour of interacting diffusions: from stochastic control to functional inequalities | University of Padua

10th-14th Jun 2024	4th Italian Meeting on Probability and Mathematical Statistics	Sapienza University of Rome, Italy
19th Apr 2024	A Spring Day in Probability and Statistical Physics 2024	University of Florence, Italy

Languages

English	fluent
Italian	fluent
Spanish	advanced
German	basics

Programming

Matlab	excellent
C	excellent
Python	excellent
Mathematica	advanced
FreeFEM	basics
R	excellent
Scilab	basics
VBA	basics

Secondary research experiences

Apr 2020 – Jun 2020	*Analysis of the inflammatory process after hemorrhagic shock* Qualitative study of the effects of several substances on the inflammatory process induced by hemorrhagic shock in mice, using ODEs to identify substances capable of attenuating the acute inflammation sometimes associated with SARS-CoV-2 infection.
Jan 2020	*Code for computing the continued-fraction expansion of numbers without rounding errors*

Other professional experiences

Nov 2022 – Sep 2023	**Deloitte Touche - Analyst in the "Actuarial and Insurance Solutions" division**, *Rome* Consulting service for insurance companies. The main duty was to manage Matlab and R codes that produced projections for the company financial status under shock scenarios, for Solvency II compliance.

Others

Citizenship	Italian
Date & place of birth	28th October 1997	Rome, Italy
Driving licence	Type B in EU standard

Padua, 12 December 2025