Emanuele Pasqui

Curriculum Vitae

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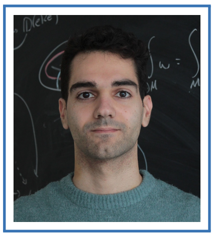

Current position

Oct 2023 – Present **PhD student in Mathematical Sciences**, *University of Padua*
- *Subject:* Probability
- *Supervisor and co-supervisor:* Dr. Alberto Chiarini and Prof. Giambattista Giacomin
- *Research topic:* Gaussian Free Field in Random Environment
- *Expected thesis submission date:* by September 2026

Education

Sep 2019 – Mar 2022 **Master's Degree in Mathematics**, *Sapienza University of Rome*
- *Subject:* Applied Mathematics
- *Thesis title:* Oil And Water and Internal Diffusion Limited Aggregation
- *Supervisor:* Dr. 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 at 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 only 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 particle systems to Abelian Networks and Activated Random Walks.
- *Grade:* 110 cum laude/110.

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

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 (SVMs, Decision Trees, Random Forests), unsupervised (Clustering, PCA), neural networks (modelling, activation functions, regularisation, 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**, submitted.

Research interests

What I am working on: **Statistical mechanics, Gaussian free field, random walk in random environment, percolation, extremes and large deviations in random spin systems, stochastic homogenization**

Other research interests include: Random interlacements, interacting particle systems and abelian networks, disorder effects in random interfaces, branching processes, SPDEs.

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 (invited)

29 Jan 2026 Graduate Seminar | University of Padua, Italy
Effect of bond disorder on the supercritical discrete Gaussian free field

20 Jan 2026 Winter school "Random walks: applications and interactions" | CIRM, Marseille, France
Hard wall repulsion for the supercritical discrete Gaussian free field in random environment

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

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

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

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

Posters

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

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

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

Academic visits (past and upcoming)

Feb 2026 – Mar 2026 **Hong Kong University of Science and Technology**
Visiting with Dr. Maximilian Nitzschner.

Oct 2025 – Dec 2025 **University College London**
Visiting with Dr. Alessandra Cipriani.

Teaching and outreach activities

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

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

Oct 2024 – Jan 2025 **Teaching assistant 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

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

Other relevant attended conferences and workshops

30 Jun – 4 Jul 2025 Random Geometric Structures and Statistical Physics | Sapienza University of Rome, Italy

5–9 May 2025 Conference on Mixing Times between Probability, Computer Science and Statistical Physics | ICTP, Trieste, Italy

11 Apr 2025 A Spring Day in Probability and Statistical Physics 2025 | University of Florence, Italy

23–27 Sep 2024 Long-range phenomena in Percolation | University of Cologne, Germany

18–20 Sep 2024 Large scale behaviour of interacting diffusions: from stochastic control to functional inequalities | University of Padua, Italy

10–14 Jun 2024 4th Italian Meeting on Probability and Mathematical Statistics | Sapienza University of Rome, Italy

19 Apr 2024 A Spring Day in Probability and Statistical Physics 2024 | University of Florence, Italy

Honors and awards

Sep 2023 *Sapienza University of Rome*
PhD position awarded (declined in favour of University of Padua).

Sep 2023 *KTH Royal Institute of Technology Stockholm*
Shortlisted and invited for on-site interview for a PhD position in Applied Mathematics (spec. Mathematical Statistics, declined in favour of University of Padua).

Jan 2023 *Humboldt University - University of Oxford*
PhD position awarded 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 University of Oxford (declined for personal reasons).

Nov 2022 *Sapienza University of Rome - Bank of Italy*
Traineeship at the university, in collaboration with the Bank of Italy, awarded via public competition.

Languages

English	fluent
Italian	native
Spanish	advanced
German	basic

Programming

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

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 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 producing financial projections under stress scenarios, ensuring compliance with Solvency II regulations.

Personal information

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

Padua, 2 February 2026