francesca pieroni

Curriculum Vitae

Sapienza University of Rome
Piazzale Aldo Moro, 5
00185 Rome, Italy
✉ *francesca.pieroni@uniroma1.it*

Personal data

Date of birth: October 27, 1998
Place of birth: Rome (RM), Italy
Nationality: Italian

Research Interests

○ Optimal Transport, Random Matching, Periodic Lorentz Gas.

Current position

2022–present **PhD student in Mathematics**, *Sapienza University of Rome*
Supervisor: Prof. Emanuele Caglioti

Education

2020–2022 **Master Degree in Applied Mathematics**, *Sapienza University of Rome*
Grade: 110/110 cum laude
Date: October 27, 2022
Thesis title: Assegnamento ottimo aleatorio in dimensione 2 (Optimal random matching in dimension 2)
Advisor: Prof. Emanuele Caglioti
2022: Partecipation in "Percorso di Eccellenza (Course of Excellence)".

2017–2020 **Bachelor Degree in Mathematics**, *Sapienza University of Rome*
Grade: 110/110 cum laude
Date: September 22, 2020
Thesis title: Modello di Kuramoto: il fenomeno della sincronizzazione (Kuramoto's model: the phenomenon of synchronization)
Advisor: Prof. Emanuele Caglioti
2019–2020: Partecipation in "Percorso di Eccellenza (Course of Excellence)".

2012–2017 **High School Diploma**, *Liceo Scientifico Statale Augusto Righi*, Rome
Grade: 100/100

Publications

* Caglioti E. and Pieroni F., Random Matching in 2D with Exponent 2 for Gaussian Densities, *Journal of Statistical Physics* **191**, (2024).

Preprints

* Boccato C., Pieroni F. and Trevisan D., On distances among Slater Determinant States and Determinantal Point Processes, *arXiv preprint: 2504.08971*, (2025).

* Pieroni, F., Convergence to the equilibrium for the kinetic transport equation in the two-dimensional periodic Lorentz Gas, *arXiv preprint: 2504.06839*, (2025).

* Caglioti E., Goldman M., Pieroni F. and Trevisan D., Subadditivity and optimal matching of unbounded samples, *arXiv preprint: 2407.06352*, (2024).

Research visits

Nov. 4–8, 2024 — Visiting Prof. Dario Trevisan, University of Pisa (Italy).

Apr. 22–26, 2024 — Visiting Prof. Michael Goldman, Ecole Polytechnique - CNRS, Paris (France).

Invited Talks

Mar. 4, 2025 — Talk title: The Random Euclidean Matching for Gaussian densities
SPASS Seminars, University of Florence (Italy)
Organizers: Gianmarco Bet (University of Florence), Alessandra Caraceni (Scuola Normale Superiore of Pisa), Francesco Grotto (University of Pisa), Giovanni Zanco (University of Siena).
Link to the website: https://sites.google.com/unipi.it/spass

Nov. 7, 2024 — Talk title: Random Euclidean Matching for Gaussian densities
MAP Seminars, University of Pisa (Italy)
Organizers: Jeremy Mirmina (University of Pisa), Filippo Paiano (University of Pisa), Mario Rastrelli (University of Pisa), Leonardo Roveri (University of Pisa)

Conferences as Invited Speaker

Sept. 1–5, 2025 — The Annual 2025 ÖMG-DMV Meeting. Minisymposium: Optimal Transport and Application, *Johannes Kepler University*, (Linz).
Organizers: Camilla Brizzi (Technical University of Munich) and Lorenzo Portinale (University of Milano)
Link to the website: https://www.jku.at/en/faculty-of-engineering-natural-sciences/organization/subject-areas/mathematics/oemg-dmv-2025/

Conferences as Contributed Speaker

Nov. 12–18, 2023 — Oberwolfach Graduate Seminar: Optimal Transport Theory and Hydrodynamics (from Euler to Monge and vice versa), *Będlewo Conference Center* (Poland).
Organizers: Yann Brenier (University Paris-Saclay), Mikaela Iacobelli (ETH Zurich), Filippo Santambrogio (University Claude Bernard Lyon 1)
Link to the website: https://www.mfo.de/www/activity/2346b
Talk title: Random Euclidean Matching in dimension 2.

Internal communications

May 12, 2025 Talk title: Random Matching per densità Gaussiane (Random Matching for Gaussian densities)
Event: May12 Celebrating Women In Mathematics: "Tracciare connessioni tra le matematiche nel tempo", Sapienza University of Rome (Italy).
Link to the website: https://www.mat.uniroma1.it/en/node/968

Apr. 30, 2025 Talk title: Random Matching Euclideo (Euclidean Random Matching),
MATH Talks, Sapienza University of Rome (Italy)
Link to the website: https://sites.google.com/uniroma1.it/math

Participation in other Schools and Conferences

Sept. 1–6, 2024 Workshop: Quantum Optimal Transport and Applications, *Cortona* (Italy).
Organizers: Augusto Gerolin (University of Ottawa), Kasia Pernal (Lodz University of Technology), Alessandro Rudi (INRIA and ENS Paris), Dario Trevisan (University of Pisa).

Sept. 25–29, 2023 Workshop: About Entropy in Large Classical Particle Systems, *Mathematical Institute, University of Oxford* (England).
Organizers: Thierry Bodineau (IHES), Pierre-Emmanuel Jabin (Pennsylvania State University), Sylvia Serfaty (NYU), Laure Saint Raymond (ENS Lyon)), Sergio Simonella (Sapienza University of Rome).
Link to the website: https://www.claymath.org/events/about-entropy-in-large-classical-particle-systems/

Mar. 27–31, 2023 School: Scaling limits and generalized hydrodynamics, *Gran Sasso Science Institute, L'Aquila* (Italy).
Organizers: Giulia Basti (Sapienza University of Rome), Serena Cenatiempo (GSSI), Stefano Olla (University Paris-Dauphine PLS and GSSI), Errico Presutti (GSSI), Marielle Simon (University Lyon 1), Lu Xu (GSSI).
Link to the website: https://indico.gssi.it/event/425/

Funded research projects

2024–present Project **Progetti dipartimentali:** "New research trends in Mathematics at Castelnuovo". PI: Marcello Ponsiglione. Duration: 36 months. Funded by Sapienza University of Rome.

2024–present Project **Avvio alla Ricerca - Tipo 1:** "Random Matching Euclideo in dimensione d>=2 e con esponente p>=1 per densità che decadono esponenzialmente (Random Euclidean Matching in dimension d>=2 with exponent p>=1 for exponentially decaying densities)". PI: Francesca Pieroni. Duration: 12 months. Funded by Sapienza University of Rome.

2024–present Galileo Project 2024 **G24-202**: "Variational methods for geometric and optimal matching problems", University of Pisa and CNRS, Ecole Polytechnique. PI: Matteo Novaga. Duration: 24 months.

Scientific affiliations

2024-present Member of **GNFM** - **INdAM** *Gruppo Nazionale per la Fisica Matematica* (National Group for Mathematical Physics), section "Meccanica dei Sistemi Discreti (Mechanics of Discrete Systems)".

Teaching

Sept. 2025 Classroom Tutor
Course: Precorsi di Matematica (Mathematics pre-courses), Department of Mathemathics "Guido Castelnuovo", Sapienza University of Rome.
Number of hours: 40

March-June 2023 Classroom Tutor
Course: Geometry I for Bachelor Degree in Mathematics, Channel II, Department of Mathemathics "Guido Castelnuovo", Sapienza University of Rome.
Number of hours: 40

Grants

2022 Collaboration grant at the Library of Department of Mathematics "Guido Castelnuovo", Sapienza University of Rome, 150 hours.

Third mission

2025 Member of GEP (Gender Equality Plan), Department of Mathematics "Guido Castelnuovo", Sapienza University of Rome.

2025 Tutor in Penitentiary Institutions of Rebibbia (Rome) and Terni, in collaboration with Polo Universitario Penitenziario (Penitentiary University Center), Sapienza University of Rome.

Languages

Italian *mother tongue*
English *B2*

Computer skills

LaTeX, C++, Matlab, Wolfram Mathematica

October 2, 2025