

Curriculum Vitae

Emanuele Bernardi

Date and place of birth: 19 June 1997, Pistoia (Italy)

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Education

- **PhD student in Pure and Applied Mathematics**, Politecnico di Torino - Università degli Studi di Torino, in partnership with the Interuniversity Consortium for Higher Education in Mathematics and the National Institute for Advanced Mathematics (INdAM) (2022-2025).
Thesis: *Phenotype-structured integro-differential models: derivation and qualitative analysis*.
Supervisors: Prof. Tommaso Lorenzi, Prof. Andrea Tosin
Currently **PhD candidate**.
- **Research Assistant (Assegnista di ricerca)**, University of Pavia, Department of Mathematics F. Casorati (2021 - 2022).
- **Master in Science and Technology**, IUSS Pavia (28 November 2022), grade 100/100 cum laude.
Thesis: *Numerical and statistical analysis for hyperspectral imaging improvement*. Supervisors: Prof. Andrea Taramelli, Dr. Margherita Righini.
- **Master's degree in Mathematics**, University of Pavia, (20 July 2021), grade 110/110 cum laude.
Thesis: *Kinetic model for wealth distribution in presence of epidemic dynamics with asymptomatic cases*. Supervisors: Prof. Mattia Zanella, Prof. José A. Carrillo.
- **Bachelor's degree in Mathematics**, University of Pavia (19 September 2019), grade 110/110 cum laude.
Thesis: *Study of a Non-linear Evolution Problem*. Supervisor: Prof. Giulio F. Schimperna.

Visiting Experience

- February-March 2025: Visiting PhD student, Université Paris Cité, IMJ-PRG, Paris.

Grants and Awards

- Research scholarship Machine Learning for Industry 4.0 and Digital Healthcare, Camelot Biomedical Systems (Dec 2021 - Nov 2022).
- Scholarship for the Masters Degree in Mathematics, University of Pavia (A.Y. 2019-2020).
- Exchange Scholarship, Collegio Ghislieri - St. Hughes College, Oxford (Spring 2021).

Publications

1. E. Bernardi, T. Lorenzi, M. Sensi, A. Tosin. *Heterogeneously Structured Compartmental Models of Epidemiological Systems: From Individual-Level Processes to Population-Scale Dynamics*. *Studies in Applied Mathematics*, 155(2): e70091, 2025. Wiley Online Library.
DOI: <https://doi.org/10.1002/sapm.70091>
2. E. Bernardi, T. Lorenzi, A. Tosin. *Derivation and quasi-invariant asymptotics of phenotype-structured integro-differential models*. *arXiv preprint arXiv:2510.15646*, 2025.
<https://arxiv.org/abs/2510.15646>

3. E. Bernardi, L. Pareschi, G. Toscani, M. Zanella. *Effects of vaccination efficacy on wealth distribution in kinetic epidemic models*. *Entropy*, 22(2):216, 2022.
DOI: <https://doi.org/10.3390/e24020216>

Teaching Experience

Teaching Assistant in Undergraduate Courses

- Calculus for Engineering, BSc, Politecnico di Torino (2024).
- Calculus for Industrial Engineering, BSc, University of Pavia (2022).
- Mathematics for Geology, BSc, University of Pavia (2020).

Teaching Assistant in College Courses

- Geometry 1, Collegio A. Volta, preparation of a complete workbook with solutions (2019).

Self-contained Mini Courses

- Introduzione all'algebra lineare ed applicazioni, Collegio Ghislieri (2020).

Conferences, Workshops & Schools

- June 2024: **Summer School From Cells to Tissues: Models, Analysis and Applications**, contributed talk: *Derivation and asymptotic analysis of integro-differential models of phenotypic evolution*, Como, Italy.
- June 2024: **12th Summer School on Methods & Models of Kinetic Theory**, poster: *Derivation and asymptotic analysis of integro-differential models of phenotypic evolution*, Pesaro, Italy.
- January 2024: **Workshop Integrated Mathematical Approaches to Socio-Epidemiological Dynamics**, contributed talk, Trento, Italy.
- December 2022: **Workshop From Kinetic Theory to Data Science and Related Topics**, Pavia, Italy.
- September 2022: **XLVII Summer School on Mathematical Physics**, contributed talk: *Effects of vaccination efficacy on wealth distribution in kinetic epidemic models*, Ravello, Italy.
- June 2022: **11th Summer School on Methods & Models of Kinetic Theory**, poster: *Effects of vaccination efficacy on wealth distribution in kinetic epidemic models*, Pesaro, Italy.
- September 2021: **1st Young Applied Mathematicians Conference**, contributed talk: *Kinetic models for wealth distribution in presence of epidemic dynamics with asymptomatic cases*, Santa Maria di Leuca, Italy.

Languages and Computer Skills

- **Languages:**
Italian (mother tongue), English (C1, IELTS 7.5), French (basic knowledge).
- **Software:**
Excellent knowledge of MATLAB; good command of \LaTeX ; basic knowledge of RStudio and Python.

Additional Activities

- Founder and President (2018-2021), Student Association **Matematica Pavese**, University of Pavia. Organised seminars and meetings connecting students with academic and professional speakers.
- Member and tutor (2018-2022), **Accademia dei Giovani per la Scienza**, promoting scientific engagement among high-school students.
- Member, **Ghislieri Scienza** (2016-2018), organiser of the scientific festival *Indiscienza*.