Curriculum vitae

PERSONAL INFORMATION

Enzo Maria Merlino

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Nationality Italian

WORK EXPERIENCE

Sept. 2025 – Present — Adjunct Lecturer (course instructor)

Department of Industrial Engineering, University of Bologna

- Course: *Mathematical Methods for Engineering* (6 ECTS, 60 hours) A.Y. 2025-2026
  Second cycle degree program in Aerospace Engineering, Campus of Forlì
- Course: *Mathematical Methods for Engineering* and *Mathematical Models for Industrial Engineering* (6 ECTS, 60 hours) A.Y. 2026-2027
  Second cycle degree program in Aerospace Engineering and Mechanical Engineering for Sustainability, Campus of Forlì

1 Nov. 2024 – Present — Postdoctoral Research Fellow

Department of Mathematics, University of Bologna, Bologna (Italy)

Supervisor: Prof. Eleonora Cinti.

Feb. 2022 – Present — Teaching tutor

Teaching tutor at the University of Bologna within the courses:

- Course: Mathematical Analysis T-B, A.Y. 2021-2022 (30 hours)
  First cycle degree program in Energy Engineering, Prof. Fausto Ferrari.
- Course: Mathematical Analysis, A.Y. 2022-2023 (30 hours)
  First cycle degree program in Computer Science; Prof. Eleonora Cinti.
- Course: Mathematical Analysis T-B, A.Y. 2022-2023 (30 hours)
  First cycle degree program in Energy Engineering, Prof. Fausto Ferrari.
- Course: Mathematical Analysis, A.Y. 2023-2024 (30 hours)
  First cycle degree program in Computer Science; Prof. Eleonora Cinti.
- Course: Mathematical Analysis 3, A.Y. 2023-2024 (30 hours)
  First cycle degree programme in Mathematics, Prof. Fausto Ferrari.
- Course: Mathematical Analysis, A.Y. 2024-2025 (30 hours)
  First cycle degree program in Computer Science;
  Prof. Cristiano Frattagli and Prof. Andrea Bonfiglioli
- Course: Mathematical Analysis 1a (A-L), A.Y. 2024-2025 (30 hours)
  First cycle degree program in Mathematics; Prof. Fausto Ferrari
- Course: Advanced Mathematical Analysis, A.Y. 2024-2025 (20 hours)
  Second cycle degree program in Mathematics; Prof. Nicola Arcozzi
- Course: Superior Analysis, A.Y. 2024-2025 (24 hours)
  Second cycle degree program in Mathematics; Prof. Loredana Lanzani
- Course: Mathematical Analysis, A.Y. 2025-2026 (30 hours)
  First cycle degree program in Computer Science; Prof. Eleonora Cinti
- Course: Advanced Mathematical Analysis, A.Y. 2025-2026 (30 hours)
  Second cycle degree program in Mathematics; Prof. Berardo Ruffini.
- Course: Mathematical Analysis, A.Y. 2026-2027 (30 hours)
  First cycle degree program in Computer Science; Prof. Gregorio Chinni and Prof. Massimo Cicognani

EDUCATION AND TRAINING

Nov. 2021 – Oct. 2024

PhD student in Mathematics (37th cycle)

University of Bologna, Bologna (Italy)

Supervisor: Prof. Fausto Ferrari.

Public defence of PhD thesis: 6 December 2024.

Title of the thesis: "Regularity of almost minimizers of horizontal one-phase Bernoulli problems".

Reviewers: Prof. Juan Manfredi (University of Pittsburgh) and Prof. Enrico Valdinoci (University of Western Australia). Committee: Prof. Gianmaria Verzini (Polytechnic University of Milan), Prof. Serena Dipierro (University of Western Australia) and Prof. Debora Amadori (University of L' Aquila).

Sept. 2018 – Oct. 2021

Master degree in Mathematics LM-40 (Curriculum A: Generale ed Applicativo)

University of Bologna, Bologna (Italy)

Master thesis in Mathematical Analysis. Advisor Prof. Fausto Ferrari (University of Bologna).

Title: "Fractional perimeter and nonlocal minimal surfaces".

Final score: 110/110 with honours.

Sept. 2015 – Dec. 2018

Bachelor degree in Mathematics L-35

University of Bologna, Bologna (Italy)

Bachelor thesis in Mathematical Analysis. Advisor Prof. Bruno Franchi (University of Bologna).

Title: "Insiemi di perimetro finito e superfici minime in gruppi di Carnot".

Final score: 108/110.

Sept. 2010 – July 2015

High School gratuation

Liceo Scientifico - opzione scienze applicate A. Righi, Cesena (Italy). Final score: 97/100.

PUBLICATIONS

- F. Ferrari and E. M. Merlino, *Lipschitz regularity of almost minimizers of p-Bernoulli-type functional in Carnot Group of step two*, *Advances in Calculus of Variations*, to appear - arXiv:2407.00084
- E. Cinti, E. M. Merlino and B. Ruffini, A strong quantitative form of the fractional isoperimetric inequality. *J. London Math. Soc.*, 113: e70578, https://doi.org/10.1112/jlms.70578
- D. Giovagnoli, E. M. Merlino and D. Moreira, A quantitative Hopf-Oleinik lemma for degenerate fully nonlinear operators and applications to free boundary problems, *La Matematica* **5**, 22 (2026). https://doi.org/10.1007/s44007-026-00201-4.
- C. Gambicchia, E. M. Merlino, B. Ruffini and M. Talluri, Barycentric stability of nonlocal perimeters: the convex case, *Journal of Convex Analysis*, **34**(2027) to appear - arXiv:2506.03776
- F. Ferrari, N. Forcillo and E. M. Merlino, Regularity for almost minimizers of a one-phase Bernoulli-type functional in Carnot Groups of step two. *Calc. Var.* **64**, Article number: 107, pp. 1-32, 2025. https://doi.org/10.1007/s00526-025-02959-x

Preprints

- F. Ferrari, D. Giovagnoli and E. M. Merlino, *On a fractional Alt-Caffarelli-Friedman-type monotonicity formula*, arXiv:2509.25891 (under review).
- S. Biagi, E. M. Merlino and E. Vecchi, *Regularizing effects of absorption terms in local-nonlocal mild singular problems*, arXiv:2506.11656 (under review).

Surveys

- E. M. Merlino, *A note on regularity of almost minimizers of horizontal one-phase Bernoulli problem. Boll. Unione Mat. Ital.*, 2025. https://doi.org/10.1007/s40574-025-00483-6.

SEMINARS

Invited seminars

- 3 June 2026, *A strong form of quantitative fractional isoperimetric inequality*, *Calculus of Variations in Modena*, Modena
- 23 Apr. 2026, *A strong form of quantitative fractional isoperimetric inequality*, *Seminario P(n) Problemi Differenziali Non Lineari*, Sapienza University of Rome
- 28 Jan. 2026, *A strong form of quantitative fractional isoperimetric inequality*, *Shape Optimization, Geometric Inequalities and Related Topics*, Naples
- 10 Apr. 2025, *The horizontal one-phase Bernoulli problem*, Seminari di Analisi Matematica Bruno Pini, Bologna
- 10 Mar. 2025, *Regularity of almost minimizers of horizontal one-phase Bernoulli problems*, *Free boundary in action*, Bologna
- 29 July 2024, *Almost minimizers of horizontal one-phase Bernoulli problems*, *Latinos on free boundaries in Bologna*, Bologna
- 26 July 2024, *Regularity of almost minimizers with free boundary in Carnot groups of step two*, *Free boundary problems: viscosity and variational approaches* within *2nd AMS-UMI international meeting*, Palermo
- 14 June 2024, *Regularity for almost minimizers of a one-phase Bernoulli-type functional in Carnot Groups of step two*, *II Meeting UMI for Doctoral Students*, Naples
- 7 June 2024, *Regularity for almost minimizers of a one-phase Bernoulli-type functional in Carnot Groups of step two*, *Nonlocal and nonlinear Partial Differential Equations at the University of Bologna 2024*, Bologna
- 20 Feb. 2024, *A (friendly) invitation to nonlocal geometric variational problems*, ASK seminar, Bologna
- 25 Jan. 2024, *Intrinsic Lipschitz regularity for almost minimizer of a one-phase Bernoulli-type functional in Carnot Groups of step two*, contribution in *Symposium in harmonic & complex analysis, microlocal & geometrical analysis and applications*, Bologna
- 4 Dec. 2023, *Intrinsic Lipschitz regularity for almost minimizer of a one-phase Bernoulli-type functional in Carnot Groups of step two*, Seminario EDP UAM-ICMAT, Madrid

Contributed seminar

- 10 Feb. 2026, *A quantitative fractional isoperimetric inequality in strong form*, *XXXV Convegno Nazionale di Calcolo delle Variazioni*, Riccione

PARTICIPATION IN RESEARCH PROJECTS

- 2022-INDAM-GNAMPA project: "*Regolarità locale e globale per problemi completamente nonlineari*". P. I. Prof. Giulio Galise (Sapienza University of Rome).
- 2023-INDAM-GNAMPA project: "*Equazioni nonlocali di tipo misto e geometrico*". P. I. Prof. Matteo Cozzi (University of Milan) and Prof. Eleonora Cinti (University of Bologna).
- 2022-PRIN project: "*Pattern formation in nonlinear phenomena*". P. I. Prof. Susanna Terracini (University of Turin) and local P. I. Prof. Fausto Ferrari (University of Bologna), until October 31, 2024.
- 2024-INDAM-GNAMPA project: "*Free boundary problems in noncommutative structures*". P. I. Prof. Fausto Ferrari (University of Bologna).
- 2022-PRIN project: "NO^3 - Nodal Optimization, NOnlinear elliptic equations, NOnlocal geometric problems, with a focus on regularity". P.I. Prof. Nicola Soave (University of Turin) and local P.I. Prof. Eleonora Cinti (University of Bologna), from November 1, 2024.
- 2026-INDAM-GNAMPA project: "*Ottimizzazione Geometrica e Frontiere Libere*". P. I. Prof. Berardo Ruffini (University of Bologna).

VISITS TO ITALIAN AND FOREIGN INSTITUTES

As a visiting PhD student

- July 2022 (1 month): Universitat Politecnica de Catalunya (Barcelona, Spain), supervised by Prof. Xavier Cabré.
- Nov.-Dec. 2023 (1 month): Universidad Autónoma de Madrid (Madrid, Spain), supervised by Prof. María del Mar González Nogueras.
- May 2024 (1 month): Universitat de Barcelona (Barcelona, Spain), supervised by Prof. Xavier Ros-Oton.

CONFERENCES

As a participant

- 31 Mar. – 4 Apr. 2025, *Nonlocal variational problems and PDEs*, GSSI, L'Aquila.
- 10–11 Mar. 2025, *Free boundaries in action*, Bologna.
- 10–14 Feb. 2025, *XXXIV Convegno Nazionale di Calcolo delle Variazioni*, Riccione.
- 18–20 Dec. 2024, *ASK conference 2024*, Bologna.
- 29 July 2024, *Latinos on free boundaries in Bologna*, Bologna
- 23–26 July 2024, *2nd AMS-UMI international meeting*, Palermo.
- 24–28 June 2024, *Noncommutativity at the Interface of Topology, Geometry and Analysis*, Bologna.
- 13–14 June 2024, *II Meeting UMI for Doctoral Students*, Napoli.
- 6–7 June 2024, *NonPUB24*, Bologna.
- 12–16 Feb. 2024 *XXXIII Convegno Nazionale di Calcolo delle Variazioni*, Riccione.
- 24–26 Jan. 2024, *SHaCAMiGA 2024*, Bologna.
- 13–15 Dec. 2023, *Non-local minicourses*, UAM, Madrid.
- 20–24 Nov. 2023, *Probabilistic and game theoretical interpretation of PDEs*, UAM-ICMAT, Madrid.
- 18–22 Sep. 2023, *Shape Optimization, Isoperimetric and Functional Inequalities*, Levico Terme.
- 4–9 Sep. 2023, *XXII* Congresso dell'Unione Matematica Italiana, Pisa.
- 6–7 Jul. 2023, *Two nonlinear days in Urbino 2023*, Urbino.
- 3–5 Jul. 2023, *Sub-Riemannian Geometry, Harmonic Analysis, PDEs and Applications*, Bologna.
- 12–16 June 2023, *Calculus of Variations and Geometric Measure Theory*, Pisa.
- 8–9 June 2023, *NonPUB23*, Bologna.
- 22–24 May 2023, *International Conference on Elliptic and Parabolic Problems*, Naples.
- 18-19 May 2023, *Variational and PDE problems in Geometric Analysis IV*, Bologna.
- 8-12 May 2023, *XXXII Convegno Nazionale di Calcolo delle Variazioni* (online)
- 8–9 Sep. 2022, *Nonlocal and Nonlinear PDEs at the University of Bologna*, Bologna.
- 20–24 June 2022, *Isoperimetric Problems*, Pisa.
- 13–17 June 2022, *Advances in Calculus of Variations*, Naples (online).
- 6–7 June 2022, *Nonlinear meeting in Bologna*, Bologna.
- 9–13 May 2022, *XXXI Convegno Nazionale di Calcolo delle Variazioni* (online).
- 21–25 Feb. 2022, *Free Boundary Problems and Related Evolution Equations* (online).
- 28 Jan. 2022, *One day in double phase problems in Ancona* (online).
- 8–9 Nov. 2021, *Ricordando Luciano Modica*, Pisa (online).

PERSONAL SKILLS

Mother tongue Italian

Other languages

- good knowledge of English;
- basic school knowledge of French.

Computer skills

- good command of the language Pyton and C/C++;
- good command of the software Matlab/Octave ;
- good command of LaTeX;
- competent with most Microsoft Office programmes;
- experience with HTML.

Driving licence B