

PERSONAL INFORMATION

Enzo Maria Merlino

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Nationality Italian

WORK EXPERIENCE

1 Nov. 2024 – Present

Postdoctoral Research Fellow

Department of Mathematics

University of Bologna, Bologna (Italy)

Supervisor: Prof. Eleonora Cinti.

The research fellow will be supported by 2022-PRIN project: " NO^3 - Nodal Optimization, Non-linear 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) cod.2022R537CS, CUP: J53D23003850006 from January 1st to July 31st 2025.

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

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".

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

PUBLICATIONS

- F. FERRARI AND E.M. MERLINO, *Lipschitz regularity of almost-minimizer of p -Bernoulli-type functional in Carnot Group of step two*, arXiv:2407.00084.
- 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*, submitted, arXiv:2311.02975.

SEMINARS

- 29 July 2024, *Almost minimizers for horizontal one-phase Bernoulli problems, Latinos on free boundaries in Bologna*, Bologna
- 26 July 2024, *Regularity for almost minimizer 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 minimizer of a one-phase Bernoulli-type functional in Carnot Groups of step two, II Meeting UMI for Doctoral Students*, Napoli (Italy).
- 7 June 2024, *Regularity for almost minimizer 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 (Italy)
- 20 Feb. 2024, *A (friendly) invitation to nonlocal geometric variational problems*, ASK seminar, Bologna (Italy)
- 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 (Italy)
- 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 (Spain)

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) cod.20227HX33Z, CUP: J53D23003610006 (until October 31, 2024)
- 2024-INDAM-GNAMPA project: "*Free boundary problems in noncommutative structures*". P. I. Prof. Fausto Ferrari (University of Bologna).
- 2025-INDAM-GNAMPA project: "*Ottimizzazione Spettrale, Geometrica e Funzionale*". P. I. Prof. Dario Mazzoleni (University of Pavia).

VISITS TO ITALIAN AND
FOREIGN INSTITUTES

As a visiting PhD student

- July 2022 (1 month): Universitat Politècnica de Catalunya (Barcelona, Spain), supervised by Prof. Xavier Cabré.
- Nov.-Dic. 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

- 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 (Italy)
- 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).