# Filippo Paiano

**Ph.D. Student in Mathematics - Department of Mathematics - University of Pisa**

Largo Bruno Pontecorvo, 5, Pisa, Italy

## Education

### PhD student in Mathematics

**Department of Mathematics – University of Pisa**

November 2023 – Ongoing  Pisa, Italy

- Supervisor: Prof. *Bozhidar Velichkov*.

My current research focuses on calculus of variations and PDEs; more specifically, I work on geometric variational problems and elliptic and parabolic free boundary problems.

### MSc in Mathematics

**Department of Mathematics – University of Pisa**

December 2020 – July 2023  Pisa, Italy

- Honours degree (110/110 cum laude).
- February–August 2022: Exchange semester at ETH Zürich, funded by *SEMP Mobility Programme*. During my stay I studied Gradient Flows and Maximal Monotone Operators under the supervision of Prof. *Mikaela Iacobelli*.
- Master's thesis in Geometric Analysis: *"A direct proof of $\mathcal{C}^{k,\alpha}$-regularity of minimal surfaces"*, Supervisor: Prof. *Joaquim Serra*.

### BSc in Mathematics

**Department of Mathematics – University of Pisa**

September 2017 – December 2020  Pisa, Italy

- Funded by the *I.N.$\delta$.A.M. Scholarship*, awarded on a national merit basis to 40 students.
- Honours degree (110/110 cum laude).
- Bachelor's thesis in Differential Geometry: *"Characteristic Classes and Chern–Weil Theory"*, Supervisor: Prof. *Bruno Martelli*.

## Publications

[3] F. Paiano, B. Velichkov: *Energy dissipation and free boundary stability of the Stefan problem*, preprint at `arXiv:2610.06267`;

[2] F. Paiano, B. Velichkov: *An elliptic regularization approach to the Stefan problem*, preprint at `arXiv:2606.00885`;

[1] C. Gasparetto, F. Paiano, B. Velichkov: *Regularity for free boundary surfaces minimizing degenerate area functionals*, **Calc. Var. Partial Differential Equations, Volume 65, article no. 208 (2026)**.

## Invited Talks

- *Young researchers in Ferrara: between Analysis and Geometry (Ferrara, October 12-14, 2026);*
- *Regularity Theory for Free Boundary and Geometric Variational Problems VI (Cervia, June 15-19, 2026);*
- *Shape Optimization & Spectral Minimal Partitions (Aveiro, June 8-12, 2026) (contributed talk);*
- *Bernoulli's Round Table (Basel, June 4, 2026);*
- *An Afternoon of Fluid Dynamics (Basel, June 3 2026);*
- *Workshop Calculus of Variations and Free Boundary Problems: the VAREG edition* (Pisa, December 9, 2025);
- *Young Researchers Meeting on PDEs II* (Milan, September 9-12, 2025);
- *ASK Conference 2024* (Bologna, December 18-20, 2024).

# Projects

### IN$\delta$AM – GNAMPA project

**Struttura fine e regolarità in problemi variazionali non-lineari**

2026

I am a member of the IN$\delta$AM-GNAMPA Project *Struttura fine e regolarità in problemi variazionali non-lineari*. Budget: 3000€. PI: Giorgio Tortone (University of Turin).

# Research Activities

During my PhD, I have been regularly involved in the organization of several research activities.

*2025 – 2026* – *Regularity theory for Varifold with bounded mean curvature*, Reading course based on L. Simon's book *Introduction to Geometric Measure Theory*.

*2023 – Ongoing* – *Seminari MAP*, a series of undergraduate seminars in Mathematical Analysis and Probability, co-organized together with other PhD students of University of Pisa and of Scuola Normale Superiore.

*26-28 Jan 2026* – *Regularity and geometric aspects of nonlinear PDEs II*, 26-28 January 2026, co-organized with: M. G. Ghimenti, G. Siclari and B. Velichkov;

*09 Dec 2025* – *Workshop Calculus of Variations and Free Boundary Problems: the VAREG edition*, 9 December 2025, co-organized with: G. Bevilacqua and B. Velichkov.

# Workshop and conferences organization

*26-28 Jan 2026* – *Regularity and geometric aspects of nonlinear PDEs II*, 26-28 January 2026, co-organized with: M. G. Ghimenti, G. Siclari and B. Velichkov;

*09 Dec 2025* – *Workshop Calculus of Variations and Free Boundary Problems: the VAREG edition*, 9 December 2025, co-organized with: G. Bevilacqua and B. Velichkov.

# Teaching Experience

### Teaching Assistant – Functional Analysis

February 2026 – February 2027 Pisa, Italy

I am currently working as a teaching assistant for the Functional Analysis (MSc in Mathematics). Course held by Prof. *B. Velichkov* and (starting from fall 2026) also by Prof. *G. Alberti*.

### Teaching Assistant

Spring 2022 Zürich, Switzerland

I helped write the lecture notes of the course *Analysis IV* at ETH Zürich (Functional Analysis and Fourier Analysis) held by Prof. M. Iacobelli.

### First year Tutor

Fall 2021 & Fall 2022 Pisa, Italy

I worked as a tutor for first-year BSc students at the University of Pisa. My duties included assisting students with the first year's courses *Algebra*, *Linear Algebra*, and *Calculus*.

# Languages

- Italian, *Mother tongue*; English, *Fluent*.

# Computer Skills

- LaTeX, *Advanced*; MATLAB, *intermediate*; C/C++, *basic*.