

Education

- Sep 2023–ongoing **École Polytechnique Fédérale de Lausanne**,
École doctorale de Mathématiques.
○ PhD candidate in the group of Mathematical Analysis and Calculus of Variations (prof. M. Colombo)
○ **Research interests:** analysis of PDEs, instability and blow-up phenomena in fluid dynamics.
- Sep 2021–Jul 2023 **École Polytechnique Fédérale de Lausanne**,
Computational Science and Engineering, Master of Science.
○ Double Degree Program with Politecnico di Milano
○ **Master Thesis:** “Forward self-similar solutions for the forced 3D Navier Stokes Equations”, supervised by Prof. M. Colombo (EPFL) and Prof. M. Grasselli (Politecnico di Milano).
- Jan 2021–Sep 2022 **Alta Scuola Politecnica**,
Politecnico di Milano, Excellence multidisciplinary path.
- Sep 2020–Jul 2023 **Politecnico di Milano**,
Mathematical Engineering, Master of Science, 110/110 *cum laude*.
- Sep 2017–Sep 2020 **Politecnico di Milano**,
Ingegneria Matematica, Bachelor of Science, 110/110 *cum laude*.

Publications

- Apr 2026 *Topological entropy is generically infinite for non-Lipschitz velocity fields*, Johansson, C., Mescolini, G., arXiv:2507.19257.
- Jul 2025 *Vanishing viscosity non-unique solutions to the forced 2D Euler Equations*, Albritton, D., Colombo, M., Mescolini, G., arXiv:2507.19257.
- Dec 2024 *Self-similar instability and forced nonuniqueness: an application to the 2D Euler equations*, Dolce, M., Mescolini, G., Journal of the London Mathematical Society (2025).
- Dec 2024 *On vanishing diffusivity selection for the advection equation*, Mescolini, G., Pitcho, J., Sorella, M., Annali di Matematica Pura ed Applicata (2025).

Invited Talks

- Jul 2026 *Fluids, Waves and Sand Beach*, Santa Margherita di Pula (IT).
- Jun 2026 *Singularities, non-uniqueness and complex dynamics of incompressible fluids*, University of Bath (UK).
- Apr 2026 *Swiss Mathematical Society Doctoral Day*, ETH Zurich (CH).
- Apr 2026 *FoStEring MATH taLEntS*, University of Freiburg (DE).
- Dec 2025 *Nonlinear PDEs Seminar*, Karlsruhe Institute of Technology (DE).
- Nov 2025 *Junior Analysis Seminar*, Imperial College (UK).
- Sep 2024 *PDE Geometric Analysis seminar*, University of Wisconsin–Madison (US).
- May 2024 *International Conference on Elliptic and Parabolic Problems*, Gaeta (IT).
- Apr 2024 *Bernoullis Tafelrunde*, University of Basel (CH).

Seminar Organization

- Sep 2025 Workshop: *New challenges in Hyperbolic problems* (with De Nitti, N. and Johansson, C.), Bernoulli Center, EPFL, Lausanne (CH).

Achievements

- Oct 2025 SB Dean's Teaching Award, EPFL.

Sep 2023 Best Thesis Poster, EPFL.
July 2021 Basic Sciences Fellowship, EPFL.
Feb 2019 Best Freshmen Prize, Politecnico di Milano.

Participation to conferences

Jan 2026 Workshop: *Turbulence and Mixing in Fluid Dynamics* at SwissMAP Research Station, Les Diablerets, SwissMAP Research Station, Les Diablerets (CH).
July 2025 Workshop: *3rd Simons Math Summer Workshop: Partial Differential Equations of Classical Physics*, Simons Center for Geometry and Physics, Stony Brook (USA).
June 2025 Workshop: *Blurring the lines between pure and applied through mixing*, Sabhal Mor Ostaig, Isle of Skye (UK).
Apr 2025 Workshop: *Coherent structures and (in)stabilities in fluids*, GSSI, L'Aquila (IT).
May 2024 Summer school: *(In)-stability phenomena in fluids*, CY Cergy Paris Université, Paris (FR).
May 2024 Conference: *International Conference on Elliptic and Parabolic Problems*, Gaeta (IT).
Feb 2024 Winter school: *Phase mixing, kinetic theory and fluid mechanics*, SwissMAP Research Station, Les Diablerets (CH).
Sep 2023 Workshop: *Enjoying Probability and Fluids in Lausanne*, EPFL, Lausanne (CH).
Jul 2023 Summer school: *Exotic solutions and well-posedness in ODEs and PDEs*, RISM, Varese (IT).
Jul 2023 Summer school: *Deterministic and random features of fluids*, EPFL, Lausanne (CH).
Jun 2023 Summer school: *New trends in mathematical fluid-dynamics*, Institut Fourier, Grenoble (FR).

Teaching

2025 Introduction to PDEs (Fall), Analysis IV (Spring), EPFL, Teaching assistant.
2024 Introduction to PDEs (Fall), Analysis IV (Spring), EPFL, Teaching assistant.
2023 Calculus of Variations (Fall), Analysis IV (Spring), EPFL, Teaching assistant.

Outreach

Fall 2025 Cours Mathilda, *Gymnase Cantonal de Nyon*. "Nœuds et turbulence" (in French).
Fall 2025 TecDays, *Lycée-Collège de la Planta (Sion)*. "Des curiosités mathématiques" (in French).
Spring 2024 Outreach workshop, *EPFL*. "Teoria dei nodi e equazioni differenziali" (in Italian).
Fall 2023 Journée des gymnasiens, *EPFL*. "L'inégalité isopérimétrique" (in French).

Work Experience

Aug 2022– **R&D Intern**, Nestlé Research, Lausanne.
Feb 2023 ◦ Internship in Machine Learning for Digital Nutrition.

Extra-Curricular Activities

Sep 2022 – **SIAM Chapter at EPFL**.
Jan 2025 ◦ Vice-President (Sep 2023–Jan 2025), Treasurer (Sep 2022–Sep 2023)

Skills

Languages Italian (mother tongue), English (C1), French (B2)
Coding Python, C, C++, SQL, MATLAB, R, FreeFem++
Frameworks TensorFlow, Keras, PyTorch
Utilities Anaconda, Git, LaTeX, Jupyter Notebook, Docker, SQL Server Management Studio
CFD Software COMSOL Multiphysics, Ansys Fluent, PHOENICS