Lorenzo Poggioni

PhD Student in Applied Mathematics & Scientific Computing
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■ Research Interests

Numerical Analysis, High-Performance Computing (HPC), Computational Fluid Dynamics (CFD), High-order numerical methods, Nonlinear Wave Propagation.

■ Publications & Preprints

2025 **L. Poggioni, D. Clamond, Y. D'Angelo**, "A new class of finite difference methods: The zigzag schemes" *arXiv:2505.17969* [math.NA]. (Under Review).

In Prep. **L. Poggioni**, "Improved spectral methods for nonlinear advection models."

■ Education

2023 – **PhD Student**, Numerical Modeling and Fluid Dynamics group, J.A. Dieudonné Lab, Nice, France.
Thesis: Numerical methods for fluid dynamics. Supervised by Didier Clamond & Yves D'Angelo.

2022–2023 **Master 2, "Mathématiques Pures et Appliquées" (Honors)**, Université Côte d'Azur.
Specialization in Theoretical and Applied Mathematics.

2020–2022 **Master 1 & last year of Bachelor**, Université Côte d'Azur, France.
Mathematics curriculum, specialised in scientific computing.

2018–2020 **Classes préparatoires aux Grandes Écoles (CPGE)**, Valbonne, France.
Intensive program in Mathematics, Physics and Computer Science (MPSI/MP).

2015–2018 **Baccalauréat scientifique**, Lycée Guillaume Apollinaire, France.
Programming specialty (ISN).

■ Research Experience

Nov 2025 **Research Guest**, Technological University Dublin, Ireland. (Host: Rossen Ivanov).
Mathematical modeling of internal water waves in layered media.

2023 **Research Internship**, Lagrange Lab, Observatory Côte d'Azur, France.
Developed novel spectral methods for nonlinear conservation laws.

2022 **Research internship**, J.A. Dieudonné Lab, Nice, France.
Studied numerical methods for the propagation of unstable flame fronts.

■ Technical Skills

Programming Fortran, Matlab, Python (NumPy, SciPy), LaTeX.

HPC Parallel computing with MPI and CUDA.

Languages French (Native), English (Fluent), Japanese (JLPT N4).

■ Academic Awards

Dec 2025   **Best Poster Award**, French Group of Rheology (GFR).
Awarded at the Fluids and Complexity conference.

■ Teaching Experience

2023–2025   **Teaching Assistant**, Université Côte d'Azur.
192 hours of Bachelor-level instruction: Linear Algebra, Probability, Statistics.

2023–2024   **Colleur (Oral Examiner)**, Université Côte d'Azur.
Oral examinations in Linear Algebra II for Bachelor students.

■ Talks & Conferences

Dec 2025   **Fluids and Complexity**, Nice, France.
Poster showcasing results about an improved spectral method for nonlinear advection models.

Nov 2025   **Technological University Dublin**, Dublin, Ireland.
Talk about a new hybrid finite difference scheme featuring improved stability constraints for solving advection-dominated problems.

Nov 2025   **Laboratory's Ph.D. Seminar**, Nice, France.
Talk about the construction of new finite difference schemes with arbitrary stencils.

June 2025   **Gray Scott HPC summer school**, Annecy, France.
Advanced training in HPC architectures. Specialised in optimisation, vectorisation, and managing memory hierarchies for large-scale numerical simulations.

June 2025   **Mat du Labo**, Nice, France.
Poster showcasing Ph.D. results.

May 2025   **Applied Analysis Nice–Toulon–Marseille day**, Porquerolles, France.
Talk about an improved finite difference scheme for linear advection problems.

Nov 2024   **Laboratory's Ph.D. Seminar**, Nice, France.
Talk about advanced tools for numerical integration.

May 2024   **Analysis workshop of the laboratory**, Nice, France.
Talk about an introduction to variational principles in physics.

March 2024   **Math PhD Students Colloquium**, Les Cévennes, France.
Talk about an introduction to numerical integration and adaptive time stepping.

June 2023   **Ulysseus Spring School in PDEs**, Sevilla, Spain.