



# Curriculum Vitae

## Emanuele Cristoforoni

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### Scientific Interests

- Analysis of PDEs
- Spectral Inequalities
- Shape Optimization
- Free discontinuity problems.

### Programming

- Julia
- Matlab
- FreeFem

### Languages

- Italian
- English.

## Current Position

Feb. 2026–Present **Postdoctoral researcher** (contrattista di ricerca) at Università degli Studi di Milano La Statale

## Education

Jan. 2026 **PhD** in "Mathematical and Physical Sciences for Advanced Materials and Technologies", Scuola Superiore Meridionale, Napoli. Supervisor: Prof. **Carlo Nitsch**  
Thesis title: "*The Robin Boundary Conditions in Variational Problems and Thermal Insulation*"

Jul. 2021. **Master's degree in Mathematics**, Università degli studi di Napoli Federico II. Final mark: 110/110 e lode (full marks with honors).

Oct. 2019. **Bachelor's degree in Mathematics**, Università degli studi di Napoli Federico II. Final mark: 110/110 e lode (full marks with honors).

## Teaching Activities

Nov. 2024 – Jun. 2025. **Tutoring Assistant** for "Istituzioni di Analisi Superiore", master's degree in Mathematics at Università degli Studi di Napoli Federico II, Prof. Carlo Nitsch, and Pietro Baldi.

Nov. 2024 – Dec. 2024. **Teaching Assistant** for "Real and Functional Analysis", master's degree in Mathematical Engineering at Università degli Studi di Napoli Federico II, Prof. Anna Mercaldo. (4 hours)

Nov. 2023 – Dec. 2023. **Teaching Assistant** for "Real and Functional Analysis", master's degree in Mathematical Engineering at Università degli Studi di Napoli Federico II, Prof. Anna Mercaldo. (4 hours)

Nov. 2022 – Dec. 2022. **Teaching Assistant** for "Real and Functional Analysis", master's degree in Mathematical Engineering at Università degli Studi di Napoli Federico II, Prof. Anna Mercaldo. (10 hours)

Sept. 2020 – Jul. 2021. **Tutor** for "Analisi Matematica 1", bachelor's degree in Mathematics at Università degli Studi di Napoli Federico II. (50 hours).

## Research Activities

Mar. 2024 – May 2024. **Abroad research period** at *LJK, Université Grenoble Alpes* in Grenoble, France.

Supervisor: Prof. Edouard Oudet.

## Participant to research projects

2026. Participant to the INdAM - GNAMPA Project, 2026, "*Equazioni nonlocali e nonlineari: alcune questioni di esistenza, rigidità e regolarità*", coordinator Dott. Matteo Cozzi. CUP\_E53C25002010001
2025. Participant to the INdAM - GNAMPA Project, 2025, "*Esistenza, unicità, simmetria e stabilità per problemi ellittici nonlineari e nonlocali*", coordinator Dott. Gianpaolo Piscitelli. CUP\_E5324001950001
2024. Participant to the INdAM - GNAMPA Project, 2024, "*Modelli PDE-ODE nonlineari e proprietà di PDE su domini standard e non-standard*", coordinator Dott. Edoardo Bocchi. CUP\_E53C23001670001
2023. Participant to the INdAM - GNAMPA Project, 2023, "*Symmetry and Asymmetry in PDE's*", coordinator Prof. Carlo Nitsch. CUP\_E53C22001930001

## Publications

### Published

2026. **J. Diffe. Equ.** **461 (2026)**, P. Acampora, E. Cristoforoni, C. Nitsch, C. Trombetti, An improved version of a spectral inequality by Payne. <https://doi.org/10.1016/j.jde.2026.114138>
2025. **Advances in Calculus of Variations (2025)**, P. Acampora, E. Cristoforoni, On the asymptotic behavior of a diffraction problem with a thin layer. <https://doi.org/10.1515/acv-2024-0052>
2025. **Commun. Contemp. Math. (2025)**, P. Acampora, V. Amato, E. Cristoforoni, Estimates on the Neumann and Steklov principal eigenvalues of collapsing domains. <https://doi.org/10.1142/S0219199725500270>
2025. **J. Geom. Anal.** **35, 183 (2025)**, P. Acampora, A. Celentano, E. Cristoforoni, C. Nitsch, C. Trombetti, A spectral isoperimetric inequality on the  $n$ -sphere for the Robin-Laplacian with negative boundary parameter. <https://doi.org/10.1007/s12220-025-02007-2>
2024. **SIAM J. Math. Anal.** **56 (2024) no. 3, pp. 3509-3536**, P. Acampora, E. Cristoforoni, C. Nitsch, C. Trombetti, On the Optimal Shape of a Thin Insulating Layer. <https://doi.org/10.1137/23M1572544>
2024. **Ann. Mat. Pura Appl.** **203, 1–20 (2024)**, P. Acampora, E. Cristoforoni, A free boundary problem for the  $p$ -Laplacian with nonlinear boundary conditions. <https://doi.org/10.1007/s10231-023-01350-x>
2023. **Atti Accad. Naz. Lincei Rend. Lincei Mat. Appl.** **34 (2023), no. 4, pp. 831–844**, P. Acampora, E. Cristoforoni, An isoperimetric result for an energy related to the  $p$ -capacity. <https://doi.org/10.4171/rlm/1030>
2023. **ESAIM Control Optim. Calc. Var.** **29 (2023) 3**, P. Acampora, E. Cristoforoni, C. Nitsch, C. Trombetti, A free boundary problem in thermal insulation with a prescribed heat source. <https://doi.org/10.1051/cocv/2022081>

## Preprints

2026. **arXiv**, E. Cristoforoni, C. Nitsch, C. Trombetti, On the classical Reinforcement problem and Optimisation. <https://doi.org/10.48550/arXiv.2602.17331>
2025. **arXiv**, E. Cristoforoni, F. Villone, Remarks on the reinforcement of the spectrum of an elliptic problem with Robin boundary condition. <https://doi.org/10.48550/arXiv.2509.22305>

## Scientific Communications

### Talks as invited speaker

2026. **Geometric-Analytic Methods For PDEs And Applications**, *Estimating the first Buckling Eigenvalue of Convex Sets*, Firenze 09/02/2026 - 12/02/2026
2026. **Shape Optimization, Geometric Inequalities and Related Topics**, *an improved version of a spectral inequality by Payne*, Napoli 27/01/2026 - 30/01/2026
2024. **Geometric Analysis and PDEs in Sorrento II**, *A spectral isoperimetric inequality on the  $n$ -sphere for the Robin-Laplacian with negative boundary parameter*, Sorrento 02/12/2024 - 03/12/2024
2024. **Seminari Analisi Junior**, *A spectral inequality for the Robin-Laplacian on the sphere with negative boundary parameter*, Università degli studi di Napoli Federico II 30/10/2024
2023. **Seminari Analisi Junior**, *A thermal insulation problem with a prescribed heat source*, Università degli studi di Napoli Federico II 05/04/2023.

### Talks

2023. **XXXII Convegno Nazionale di Calcolo delle Variazioni**, *On the optimal shape of a thin insulating layer*, Levico Terme 8/05/2023 - 12/05/2023.
2022. **Advances in Calculus of Variations**, *A free boundary problem in thermal insulation with a prescribed heat source*, Università degli studi di Napoli Parthenope 13/06/2022-17/06/2022.

### Poster Sessions

2023. **International Conference on Elliptic and Parabolic Problems**, *On the optimal shape of a thin insulating layer*, Accademia Pontaniana (Napoli) 22/05/2023 - 24/05/2023.
2022. **Summer School in Analysis and PDEs**, *A free boundary problem in thermal insulation with a prescribed heat source*, Università degli studi della Campania Luigi Vanvitelli (Caserta) 04/07/2022 - 08/07/2022.

## Organizing activities

2023 – 2025. **PhD<sup>2</sup>ay** editions 1<sup>st</sup> to 4<sup>th</sup>, Università degli studi di Napoli Federico II.

2023. **Three days on Shape Optimization and PDEs**, Napoli 27/11/2023 – 29/11/2023.

## Editorial Activities

2024 – 2025. **Reviewer**, Journal of differential equations.

## Attendance to International Conferences

2025. **Interactions between convex geometry and spectral analysis**, Université de Montréal, Canada  
28/07/2025 – 01/08/2025.

2024. **Geometric Aspects of Partial Differential Equations**, Okinawa Institute of Science and Technology  
Graduate University (OIST), Japan 15/01/2024 – 18/01/2024.