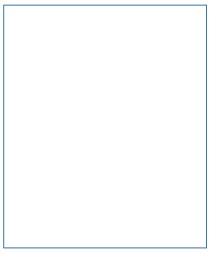
Matteo Zanardini

Curriculum Vitae



Personal information

Name Matteo
Surname Zanardini
Date of Birth
e-mail

Education

2023-present **PhD in Mathematical Analysis**, *at SISSA, Trieste*.
Advisor: Prof. Nicola Gigli. Co-advisor: Prof. Antonio Lerario

2021–2023 **Master degree in Mathematics**, *University of Trieste and SISSA*, Grade: 110/110 cum laude.
Advisor: Prof. Nicola Gigli. Title of the thesis: Optimal transport and geometric inequalities.

2021–2023 **Student of Collegio Luciano Fonda**, *College of merit*, Trieste.

2018–2021 **Bachelor in Mathematics**, *University of Trento*, Grade: 110/110 cum laude with the excellence diploma (diploma del "percorso di eccellenza").
Advisor: Prof. Enrico Pagani. Title of the thesis: Euler Elastica.

2018–2021 **Student of Collegio Bernardo Clesio**, *College of merit*, Trento.

2013–2018 **Scientific high school diploma**, *Liceo Golgi, Breno*, Grade: 100/100.

Fellowships & Awards

2024 ***Award in memory of Prof.Marco Reni*** for the best student in mathematics at the University of Trieste (in the academic years 2021/2022 and 2022/2023)

2021–2023 ***SISSA scholarship*** for "Percorso Formativo Comune" of the Master's course in Mathematics at the University of Trieste

2019–2021 ***Member of BrixiAmaTe*** association that deals with preparation of seminars for the mathematical Olympiads, located in Brescia, Italy

2011-2018 Member of the musical band of Pisogne

2018 ***Award in memory of Mons.Giuseppe Cavalleri*** first place in an italian philosophy contest

2018 ***Silver medal*** at the Italian Olympics of mathematics

2018 ***First place*** in a mathematical modeling contest (Modellizzazione Matematica) at the University of Perugia

2017 ***Bronze medal*** at the Italian Olympics of mathematics

Interests

Calculus of variations, Γ-convergence, optimal transport, metric geometry, Riemannian geometry, Lorentzian geometry, synthetic notions of Ricci and Sectional curvature bounds, geometric inequalities.

Research topic of the PHD: My research is focused on the analysis on smooth and non-smooth spacetimes with particular interest on curvature bounds. Now, I am studying gradient flow theory of convex time functions in spacetimes and its interaction with the causal structure of the manifold with the aim of applying it to a quantitative version of the Splitting Theorem in the Lorentzian signature. Moreover, I am studying also Optimal Transport Theory, in particular the links between its dynamical formulation and the continuity equation on spacetimes.

Partecipations in schools & workshops

next2025 Optimal transport and metric geometry across structures, Bernoulli Center at EPFL, Lausanne

next2025 PRIN school on Geometry and Gravity, SISSA, Trieste

next2025 A new geometry for Einstein's theory of relativity and beyond II, Vienna

2025 Geometrical Aspects of Mathematical Relativity Masterclass, Copenaghen

2025 Meeting for the PRIN in "geometry and gravity", Riccione

2025 A new geometry for Einstein's theory of relativity and beyond, Vienna

2024 Optimal Transportation and Applications, Centro De Giorgi, Pisa

2024 School and Conference on Metric Measure Spaces, Ricci Curvature, and Optimal Transport, Villa Monastero (Varenna, Lake Como)

2024 Three days between Analysis and Geometry in Trento 3° edition, Trento

2024 Synthetic Curvature Bounds for Non-Smooth Spaces: Beyond Finite Dimension, Vienna

2024 XXXIII Convegno Nazionale di Calcolo delle Variazioni, Riccione

2023 Three days between Analysis and Geometry in Trento 2° edition, Trento

2022 Optimal Transportation and Applications, Centro De Giorgi, Pisa

2022 Three days between Analysis and Geometry in Trento, Trento

2022 Geometric Analysis and PDE on Garda Lake, Palazzo Feltrinelli di Gargnano

2017 Participation in a seven-day seminar organised by Scuola Normale superiore, Pisa

2014–2018 Participation in eight three-day courses organised for the Olympiads of mathematics, Brescia

2016-2018 Partecipation in two Summer Math camps, Vicenza

2015-2018 Partecipation in three mathematical campuses, Caldè

Teaching experience

2024-2025 Organizer of the Analysis Junior Seminars at SISSA

2023 Tutor and exerciser of the course Analysis 2 at the University of Trieste for the Bachelor in Mathematics (Prof. Franco Obersnel and Prof. Scipio Cuccagna)

2022 Tutor and exerciser of the course Analysis 2 at the University of Trieste for the Bachelor in Mathematics (Prof. Edi Rosset)

2018–2020 several lessons of algebra, geometry and number theory during the tree-day seminars and summer schools organised in Brescia by BrixiAmaTe for high school students

Talks

next2025 *On the Benamou-Brenier formula in spacetimes*, contributed talk at the workshop: "Optimal transport and metric geometry across structures" at EPFL, Lausanne

2025 *Dynamical optimal transport in spacetimes*, Analysis junior seminar at SISSA, Trieste

Computer skills

Programs R, JAVA, Matlab, SagE, LaTeX

Languages

Italian (native language) English (fluent)

Publications

2024 Andrea Braides, Edoardo Voglino, and Matteo Zanardini. Microstructures and anti-phase boundaries in long-range lattice systems. *Networks and Heterogeneous Media [published version]*, pages 992–1012, 2024.