
Education

- 2023 – Present
Oct **Postdoctoral researcher**, *Karlsruher Institut für Technologie*, Karlsruhe.
- 2019 – 2023
Nov Sep **PhD in Mathematics**, *Scuola Normale Superiore*, Pisa.
○ Final grade: cum laude
○ Thesis title: Bestvina-Brady Morse theory on hyperbolic manifolds
○ Advisor: Bruno Martelli
○ Graduation date: 19/12/2023
- 2014 – 2019
Oct Sep **Student in Corso Ordinario**, *Scuola Normale Superiore*, Pisa.
○ Final grade: 100/100 cum laude
- 2017 – 2019
Sep Sep **Master Student in Pure Mathematics**, *University of Pisa*, Pisa.
○ Final grade: 110/110 cum laude
○ Thesis title: Taut foliations on 3-manifolds
○ Advisor: prof. Bruno Martelli
○ Graduation date: 20/09/2019
- 2014 – 2017
Oct Jul **Bachelor Student in Mathematics**, *University of Pisa*, Pisa.
○ Final grade: 110/110 cum laude
○ Thesis title: L'omologia singolare come teoria di bordismo
○ Advisor: prof. Riccardo Benedetti
○ Graduation date: 14/07/2017

Research interests

Geometric topology: hyperbolic geometry, circle-valued Morse functions and fibrations, PL geometry; geometric group theory: Dehn functions, finiteness properties of groups. I like in particular using combinatorial tools to study geometry, such as, for example, constructing manifolds by attaching polyhedra, or studying their topology by using discrete and PL Morse theory.

Publications

- 2023
Jan **Giovanni Italiano, Bruno Martelli, Matteo Migliorini**, *Hyperbolic 5-manifolds that fiber over S^1* , *Invent. math.*, 231, 1-38.
doi:10.1007/s00222-022-01141-w
- 2022
Nov **Giovanni Italiano, Bruno Martelli, Matteo Migliorini**, *Hyperbolic manifolds that fiber algebraically up to dimension 8*, *Journal of the Institute of Mathematics of Jussieu*, 1-38.
doi:10.1017/S1474748022000536
- 2018
Jan **Clara Antonucci, Massimo Gobbino, Matteo Migliorini, Nicola Picenni**, *On the shape factor of interaction laws for a non-local approximation of the Sobolev norm and the total variation*, *Comptes Rendus Mathématique*.
doi:10.1016/j.crma.2018.05.014

- 2017 Jan **Clara Antonucci, Massimo Gobbino, Matteo Migliorini, Nicola Picenni,** *Optimal constants for a non-local approximation of Sobolev norms and total variation*, Analysis & PDE, 13.
doi:10.2140/apde.2020.13.595

Preprints

- 2025 Apr **Giovanni Italiano, Matteo Migliorini,** *Perfect circle-valued Morse functions on hyperbolic 6-manifolds*.
arXiv:2503.24128
- 2024 Jun **Dario Ascari, Federica Bertolotti, Giovanni Italiano, Claudio Llosa Isenrich, Matteo Migliorini,** *Dehn functions of subgroups of products of free groups. Part I: Uniform upper bounds*.
arXiv:2406.19860
- 2025 Feb **Dario Ascari, Federica Bertolotti, Giovanni Italiano, Claudio Llosa Isenrich, Matteo Migliorini,** *Dehn functions of subgroups of products of free groups. Part II: Precise computations*.
arXiv:2502.03180
- 2024 Jun **Matteo Migliorini,** *Thompson's group T has quadratic Dehn function*.
arXiv:2410.23088

Awards

- 2023 Jul **Frontiers of Science Award,** *International Congress of Basic Science*, Beijing Institute of Mathematics, Science and Applications, Beijing.
The award was assigned for the paper “Hyperbolic 5-manifolds fibering over S^1 ”, in collaboration with Giovanni Italiano and Bruno Martelli.

Talks

Invited talks

- 2023 Mar **Smoothing circle-valued Morse functions,** *Manifolds and Groups in Bologna*, University of Bologna.
- 2022 Jan **Hyperbolic manifolds fibering over S^1 ,** *Differential Geometry Seminar*, Heidelberg University.

Contributed talks

- 2024 Mar **Dehn functions of subgroups of direct products of free groups,** *Topological and Homological Methods in Group Theory 2024*, Bielefeld University.
- 2023 Feb **Hyperbolic manifolds fibering over S^1 ,** *Young Geometric Group theory XI*, Münster.
- 2022 Sep **Hyperbolic manifolds fibering over S^1 ,** *Workshop on Topological Methods in Geometry*, Centre de Recerca Matemàtica, Barcelona.

Other Seminars

- 2021 Nov **Hyperbolic manifolds fibering over S^1 ,** *Young Geometry and Topology Seminars*, University of Pisa.

- 2020 Mar **Thurston norm**, *Young Geometry and Topology Seminars*, University of Pisa.
- 2018 Apr **Surface hierarchies in 3-manifolds**, *Undergraduate colloquia*, Scuola Normale Superiore.

Work experience

- 2023 **Problem Class Teacher**, *Geometric Group Theory II*, Karlsruher Institut für Technologie.
I was responsible for correcting students' submissions of exercises, and for discussing the solutions during the problem class.
- 2021 **Teaching Assistant**, *Istituzioni di Geometria*, University of Pisa.
I was responsible for grading exercises submitted by the students, and was one of the two examiners of this course, which is the main course in Geometry in the Master's degree at the University of Pisa.
- 2020, 2021 **Tutoring**, *Complementi di Matematica*, Scuola Normale Superiore.
I was the tutor to some first year students for the Mathematics course in Scuola Normale; I was therefore responsible for answering any questions they might have had about the course (or about any first-year course in general), as well as helping them solve exercises left during lesson.
- 2019, 2022, 2023 **Teacher for Stage Senior**, *Mathematical Olympiads*, Pisa.
I was responsible for teaching high school students part of the Combinatorics course, held to train them for the International Mathematical Olympiads.
- 2018 **Coordinator**, *European Girls' Mathematical Olympiads*, Florence.
I was coordinator for the third problem of the European Girls' Mathematical Olympiads; I was therefore responsible for grading the contestants' papers, and discussing the assigned scores with the representatives of the various nations.

Competitions

- 2014 **Italian Mathematical Olympiads**, *National Competition*, Cesenatico, 2nd place.

Languages

- Italian Mother tongue
- English Advanced *FCE, Grade A*
- French Conversational
- German Conversational

Programming skills

- Python
- Django
- Typescript
- HTML/CSS
- Javascript
- LaTeX
- MySQL
- Bash