Matteo Migliorini

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Education

2023 Oct – Present **Postdoctoral researcher,** *Karlsruher Institut für Technologie*, Karlsruhe.

2019 Nov – 2023 Sep **PhD in Mathematics,** *Scuola Normale Superiore*, Pisa.

- Final grade: cum laude
- Thesis title: Bestvina-Brady Morse theory on hyperbolic manifolds
- Advisor: Prof. Bruno Martelli
- Graduation date: 19/12/2023

2014 Oct – 2019 Sep **Student in Corso Ordinario,** *Scuola Normale Superiore*, Pisa.

- Final grade: 100/100 cum laude

2017 Sep – 2019 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 Oct – 2017 Jul **Bachelor Student in Mathematics,** *University of Pisa*, Pisa.

- Final grade: 110/110 cum laude
- Thesis title: L'omologia singolare come teoria di bordismo *(Singular homology as bordism theory)*
- Advisor: Prof. Riccardo Benedetti
- Graduation date: 14/07/2017

Research interests

I'm a researcher in Geometric Group Theory and Geometric Topology. I'm interested in Dehn functions and finiteness properties, particularly those of subgroups of hyperbolic and non-positively curved groups. Examples of these groups include kernels of fibrations of hyperbolic groups and manifolds. The techniques I employ are mostly of combinatorial nature, such as Bestvina-Brady Morse theory for constructing fibrations, and van Kampen diagrams for studying Dehn functions.

Publications

2025 Jul 1. **Matteo Migliorini,** *Thompson's group T has quadratic Dehn function*, Forum of Mathematics, Sigma, vol. 13.

doi:10.1017/fms.2025.10075

2023 Jan 2. **Giovanni Italiano, Bruno Martelli, Matteo Migliorini,** *Hyperbolic 5-manifolds that fiber over S^1*, Invent. math., vol. 231, pp. 1-38.

doi:10.1007/s00222-022-01141-w

2022 Nov 3. **Giovanni Italiano, Bruno Martelli, Matteo Migliorini,** *Hyperbolic manifolds that fiber algebraically up to dimension* 8, Journal of the Institute of Mathematics of Jussieu, vol. 23, no. 2, pp. 1-38.

doi:10.1017/S1474748022000536

2018 Jan

4. **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 Mathematique.

doi:10.1016/j.crma.2018.05.014

2017 Jan

5. **Clara Antonucci, Massimo Gobbino, Matteo Migliorini, Nicola Picenni,** *Optimal constants for a non-local approximation of Sobolev norms and total variation*, Analysis & PDE, vol. 13.

doi:10.2140/apde.2020.13.595

Preprints

2025 Jul

6. **Yu-Chan Chang, Jerónimo García-Mejía, Matteo Migliorini,** *Complete classification of the Dehn functions of Bestvina-Brady groups*, to appear in Geom. Funct. Anal..

arXiv:2507.07566

2025 Apr

7. **Giovanni Italiano, Matteo Migliorini,** *Perfect circle-valued Morse functions on hyperbolic 6-manifolds.*

arXiv:2503.24128

2025 Feb

8. **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

9. **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

Awards

2025 Jun

Award "Franco Tricerri", *Unione Matematica Italiana*, Bologna.

My thesis was selected as the winner of this award, which is assigned to one PhD thesis, defended during one of the previous three years, on a topic related to Differential Geometry.

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

2025 Apr

The Dehn function of Thompson's group T, *Geometric Group Theory Seminar*, University of Bonn.

2025 May

Dehn functions of Bestvina–Brady groups, *Algebra Seminar*, University of Oxford.

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

2025 Sep — **Dehn functions of Bestvina–Brady groups,** *Higher dimensional hyperbolic geometry*, Ventotene.

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.

Teaching

2023, 2024, 2025 — **Problem Class Teacher,** *Karlsruhe Institute of Technology*.

I taught the problem class for the courses Geometric Group Theory, Complex Geometry, and will be holding the problem class in Algebraic Topology in the upcoming Winter Semester 2025/2026. I am responsible for correcting students' submissions of exercises, and for discussing the solutions during the problem class.

2024, 2025 — **Student Seminar Organiser,** *Karlsruhe Institute of Technology*.

I organised the student seminars "Advanced Topics in Geometric Group Theory" and "Fundamental groups of compact Kähler manifolds" together with Claudio Llosa Isenrich. I was responsible for supporting the students in the preparation of their seminar talk, and for giving them feedback afterwards.

2024 — **Teacher for the RTG Lecture "Hyperbolic manifolds and fibrations",** *Karlsruhe Institute of Technology and Heidelberg University*.

I taught the RTG Lecture "Hyperbolic manifolds and fibrations", a minicourse of six lectures held during the RTG Days. The lecture took place biweekly, alternating between Heidelberg University and Karlsruhe Institute of Technology, thanks to the support of the RTG 2229 "Asymptotic Invariants and Limits of Groups and Spaces".

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.

Other Experience

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	Mothertongue	
English	Advanced	*FCE, Grade A*
German	Conversational	
French	Basic	

Programming skills

- Python
- Typst
- HTML/CSS
- Sagemath
- Django
- LaTeX
- Typescript

(Last updated: October 2025)