Francesco Milizia

Curriculum Vitae

fmilizia.github.io

I am a postdoc research fellow at the University of Bologna.

Education

Nov 2020–Jan 2025 **PhD student in mathematics**, *Scuola Normale Superiore*, Pisa.
Supervisor: Roberto Frigerio (Università di Pisa). Expected end: Jan 2025.

2015–2020 **Student in mathematics and informatics at Scuola Normale Superiore**, Pisa, graduated with honours in 2021.
Scuola Normale Superiore is an institution in Pisa where a small number of selected university students attend additional advanced classes, and get free meals and accommodation, while having to maintain top scores at university exams.

2018–2020 **Master's degree in mathematics**, *Università di Pisa*, 110/110 with honours. Title of the thesis: *Coomologia a valori limitati [Cohomology with bounded values]*. Supervisor: Roberto Frigerio.

2015–2018 **Bachelor's degree in mathematics**, *Università di Pisa*, 110/110 with honours. Title of the thesis: *Proprietà automatiche di gruppi di isometrie Euclidee [Automatic properties of groups of Euclidean isometries]*. Supervisor: Roberto Frigerio.

Research

My research interests in geometry and topology revolve around geometric group theory, simplicial volume of manifolds, bounded cohomology and related topics.
I have been a member of a research project funded by INdAM (the main non-profit institution supporting research in mathematics in Italy). Title: "Bounded cohomology and simplicial volume: new computations and applications" (2023, coordinator: Marco Moraschini).

Published works and preprints

[1] D. Ascari and F. Milizia. *Weakly bounded cohomology classes and a counterexample to a conjecture of Gromov*, **Geom. Funct. Anal. 34** (2024), 631–658. doi:10.1007/s00039-024-00676-9

[2] G. Bargagnati, F. Bertolotti, P. Capovilla and F. Milizia. *The action of mapping class groups on de Rham quasimorphisms*, **Geom. Dedicata 218** (2024), article n. 106. doi:10.1007/s10711-024-00939-7

[3] F. Milizia. *ℓ^∞-cohomology: amenability, relative hyperbolicity, isoperimetric inequalities and undecidability*, arXiv preprint, 2021. arXiv:2107.09089

[4] F. Milizia. *Bounded differential forms and coinvariants of bounded functions*, arXiv preprint, 2023. arXiv:2311.07731

[5] F. Milizia. *Simplicial maps between spheres and Davis' manifolds with positive simplicial volume*, arXiv preprint, 2024. arXiv:2409.08336

[6] F. Milizia, N. Petrosyan, A. Sisto and V. Vankov. *Cohomological characterisation of hyperbolicity*, arXiv preprint, 2024. arXiv:2409.18871

Talks given at conferences and seminars

May 2021 Coomologia limitata e coomologia a valori limitati [Bounded cohomology and cohomology with bounded values]. *Seminario dei Baby Geometri*, Università di Pisa.

Dec 2021 ℓ^∞-cohomology of discrete groups. *International Young Seminar on Bounded Cohomology and Simplicial Volume*, online.

Dec 2021 ℓ^∞-cohomology of discrete groups. *Oberseminar Topology/Geometry*, Universität Göttingen (online).

Sep 2022 Weakly bounded, but unbounded, 2-classes in finitely presented groups. *Recent Advances in Bounded Cohomology*, Universität Regensburg.

Nov 2022 Weakly bounded cohomology classes. *Geometry Seminar*, Uniwersytet Wrocławsky.

Nov 2022 Minimal Volume. *International Young Seminar on Bounded Cohomology and Simplicial Volume*, online.

Mar 2023 Simplicial volume and the reflection trick. *Manifolds and groups in Bologna*, Università di Bologna.

Jun 2024 Davis' manifolds with positive simplicial volume. *Modern Methods in Infinite Groups*, University of Bristol.

Jun 2024 Davis' manifolds with positive simplicial volume. *Groups and Topological Groups*, Universidad del País Vasco, Bilbao.

Jan 2025 The simplicial volume of Davis manifolds. *International Young Seminar on Bounded Cohomology and Simplicial Volume*, online.

Jan 2025 The simplicial volume of Davis manifolds. *Logic, Categories, and Applications Seminar*, Università di Bologna.

Some short-term visits

- University of Wrocław (Poland), invited by Światosław R. Gal (12/11/2022 – 15/11/2022).
- University of Bristol (UK), invited by Vladimir Vankov (28/08/2023 – 1/09/2023).
- University of the Basque Country (Bilbao, Spain), invited by Dario Ascari (23/06/2024 – 7/07/2024).

Other activities

2013 First place winner at the Italian Olympiads in Informatics.

2014–2015 Bronze and silver medals at the International Olympiads in Informatics (IOI).

2014 Stage at IBM Hursley (UK), in which I worked on a web application.

2017–2019 Competed in the International Collegiate Programming Contest, which is a competition for teams of university students, winning third (Paris 2017) and fourth (Paris 2018) place in the south-western Europe region, and competing in the world finals (Beijing 2018, Porto 2019) with very good results.

2019	I teached a short class (6 hours) for high-school students, as preparation for mathematics competitions.
2019–2020	I contributed in the formation (giving lessons) and selection (preparing problems) of the Italian team of high-school students who had to compete in international competitions in informatics.
2021	Tutor of a group of first-year students at Scuola Normale Superiore.
2020–2023	Coached several teams of students competing in the International Collegiate Programming Contest.
2022	I gave a talk in my hometown, addressed to a general public, about topics in topology.
2022–2024	Collaboration with the mathematics journal "Annali della Scuola Normale Superiore di Pisa, Classe di Scienze": I check the articles before they are sent to the typography lab.
2024	I helped grading the written exams of the admission competition for Scuola Normale Superiore.

I have attended the following conferences and schools:

Sep 2020	Simplicial volumes and bounded cohomology, online.
May 2021	Trisections and the Thom Conjecture, Matemale (France).
Jul 2021	Young Geometric Group Theory X, online.
Sep 2021	Counting Problems, Ventotene.
Mar 2022	Topological and Homological Methods in Group Theory, Bielefeld.
Jul 2022	Metric Geometry and Geometric Analysis Summer School, Oxford.
Sep 2022	Recent Advances in Bounded Cohomology, Regensburg.
Feb 2023	Young Geometric Group Theory XI, Münster.
Mar 2023	Manifolds and groups in Bologna, Bologna.
Mar 2023	Non-positive curvature in manifolds and groups, Bologna.
Jun 2023	Sub-Riemannian Geometry and Beyond III, Pisa.
Jun 2023	Geometry and analysis of groups and manifolds, Pisa.
Jul 2023	Geometric and Asymptotic Group Theory with Applications 2023 - Groups and Dynamics, Vienna.
Sep 2023	GRAZP: Groups and Rigidity Around the Zimmer Program, Ventotene.
Sep 2023	Leaning Into Topology, Pisa.
Nov 2023	Combinatorial Algebraic Topology and Applications, Pisa.
Apr 2024	Manifolds and Groups in Bologna II, Bologna.
Jun 2024	Modern Methods in Infinite Groups, Bristol.
Jun 2024	Groups and topological Groups, Plentzia (Bilbao, Spain).
Sep 2024	LiT II: Lost in Topology, Pisa.
Oct 2024	Seminar: Metric Topology of Aspherical Spaces, Oberwolfach.