FILIPPO SARTI

Curriculum vitae

PERSONAL DATA

Born in Castel San Pietro Terme, Bologna, Italy on December 15, 1993.
Email: filippo.sarti@dm.unipi.it
Personal website: sites.google.com/view/filipposarti/home-page

POSITIONS

University of Pisa, Pisa *April, 2024 - present*
PostDoctoral researcher (supervisor: Bruno Martelli)

University of Bologna, Bologna *July, 2023 - March, 2024*
PostDoctoral researcher (supervisor: Stefano Francaviglia)

University of Torino, Torino *October, 2022 - July, 2023*
PostDoctoral researcher

EDUCATION

University of Bologna, Bologna *November 2018 - June 2022*
PhD in Mathematics
Advisors: Stefano Francaviglia, Alessio Savini
Thesis: *Numerical invariants for measurable cocycles*

University of Pisa, Pisa *September 2015 - July 2018*
Master degree in Mathematics 110/110 cum laude
Supervisor: Carlo Petronio
Thesis: *Surface branched covers and Hurwitz numbers*

University of Bologna, Bologna *September 2012 - July 2015*
Bachelor degree in Mathematics 110/110
Supervisor: Massimo Ferri
Co-supervisor: Alessia Cattabriga
Thesis: *Branched covers in dimension 3*

PREPRINTS

[SS24] F. Sarti - A. Savini, *Boundaries and equivariant maps for ergodic groupoids, submitted* (2024) arxiv:2402.15355.

[SS23b] F. Sarti - A. Savini, *Measurable bounded cohomology of measured groupoids, submitted* (2023) arxiv:2304.07765.

[SS21] F. Sarti - A. Savini, *Boundary maps and reducibility for cocycles into the isometries of CAT(0)-spaces, submitted* (2021), arXiv:2005.10529.

PUBLISHED OR ACCEPTED PAPERS

[SS23a] F. Sarti - A. Savini, *Parametrized Kähler class and Zariski dense orbital 1-cohomology,* **Mathematical Research Letters 30** (2023), *1895-1929* arXiv:2106.02411.

[BFMSS] L. Battista - S. Francaviglia - M. Moraschini - F. Sarti - A. Savini, *Bounded cohomology classes of exact forms,* **Proceedings of the American Mathematical Society 152** (2024)*, 71-80,* arxiv:2211.16125*.*

[SS22] F. Sarti - A. Savini, *Superrigidity of maximal measurable cocycles of complex hyperbolic lattices,* **Mathematische Zeitschrift 300** (2022)*, n. 1, 421-443 ,* arXiv:2002.03628*.*

[PS19] C. Petronio - F. Sarti, *Counting surface branched covers,* **Studia Scientiarum Mathematicarum Hungarica 56(3)** (2019)*, 309-322,* arXiv:1901.08316*.*

BOOK CHAPTERS

[...] F. Sarti, *The Proportionality Principle via Hyperbolic Geometry. (2022).* In C. Campagnolo, F. Fournier-Facio, N. Heuer & M. Moraschini (Eds.), *Bounded Cohomology and Simplicial Volume* **London Mathematical Society Lecture Note Series***, pp. 20-27* DOI*.*

PHD THESIS

[S22] F. Sarti, *Numerical invariants for measurable cocycles,* PhD thesis, Bologna (2022) pdf*.*

RESEARCH INTERESTS

Numerical invariants for measurable cocycles. In 2020/21, Moraschini and Savini formalized the notion *numerical invariants* for measurable cocycles. Inspired by Zimmer's superrigidity result about higher rank lattices, the aim is to exploit numerical invariants to study cocycles from lattices in rank one groups. [S22, SS22, SS23a, SS21]

Measurable bounded cohomology for groupoids. Moved by the interest in numerical invariants for Borel 1-cocycles, I am trying to develop a theory of bounded cohomology for measured groupoids, which could give results in the study of the dynamical system given by actions of discrete groups on measure spaces. This is a joint project with Alessio Savini. [SS23b]

Simplicial volume and foliations. Inspired by an idea of Gromov, Sauer introduced and studied a foliated version of singular simplices on particular foliations with transverse measure. Motivated by some assertions by Gromov, I am investigating possible interactions between such simplices and simplicial volume. On the other hand, following classic constructions in the singular case, my goal is to relate foliated simplices with the bounded cohomology of groupoids.

Boundaries and Boundary maps for groupoids. A fruitful approach in the study of numerical invariants makes use of boundary maps, that are equivariant maps between boundaries, to implement the pullback in bounded cohomology. I am interested in proving existence results for such maps in the context of measurable cocycles. I am also interested into extend the notion of boundaries to measured groupoids and to relate it with bounded cohomology for groupoids. [SS22a, SS21]

TALKS

- *February, 13 2025* - **An overview of bounded cohomology of measured groupoids** - Groups, Geometry and Dynamics seminars, Karlsruhe Institute of Technology.
- *November, 30 2023* - **(Measured) groupoids: from the beginning to recent constructions** - Seminari di Algebra e Geometria, Politecnico di Milano.
- *September, 19 2023* - **Bounded cohomology in Measured Group Theory** - Leaning into Topology Workshop, University of Pisa.

- *September, 11 2023* - **Measurable cocycles and bounded cohomology of groupoids** (lightening talk) - Groups and Rigidity Around the Zimmer Program - Ventotene .
- *April, 17 2023* - **Measurable cocycles and rigidity via bounded cohomology** - Groups and operators algebra seminar - University of Paris-Saclay, Orsay.
- *January, 31 2023* - **A gentle introduction to measurable cocycles, rigidity and recent advances** - Seminari di Algebra e Geometria - University of Bologna.
- *January, 23 2023* - **Milnor-Wood inequalities for volume of representations** - International young seminar on bounded cohomology and simplicial volume WS22 - online seminar.
- *May, 25 2022* - **Numerical invariants for measurable cocycles** - First UMI meeting of Ph.D. students - Padova.
- *April, 26 2022* - **Numerical invariants for measurable cocycles and rigidity** - Séminaire Groupes et géométrie - University of Geneva.
- *September, 6 2021* - **Numerical invariants for measurable cocycles** (lightening talk) - Counting problems - Ventotene .
- *November, 9 2020* - **The proportionality principle via hyperbolic geometry** - International young seminar on bounded cohomology and simplicial volume WS20 - online seminar.
- *June, 15 2020* - **Numerical invariants and bounded cohomology** - International young seminar on bounded cohomology and simplicial volume SS20 - online seminar.
- *December, 5 2019* - **Problema di esistenza di Hurwitz e Cut&Paste tra rivestimenti** - Baby Geometry - University of Pisa.
- *March, 7 2019* - **The Hurwitz existence problem and bipartite graphs** - Talk given for the course Graph Theory (Prof. Marilena Barnabei), University of Bologna.
- *April, 7 2017* - **Invariante di Witten per 3-varietá** - Baby Geometri - University of Pisa.

TEACHING EXPERIENCE

- Fall 2024 - Teacher for the course **Geometria e Algebra**, Ingegneria Aerospaziale - Ingegneria Meccanica, University of Bologna - Campus di Forlì (60 h).
- Spring 2024 - Co-teacher (with M. Moraschini) for the PhD course **Introduction to bounded cohomology and simplicial volume**, PhD course in Mathematics, University of Bologna (10 h (25 in total)).
- *Fall 2023* - Teaching assistant for the course **Istituzioni di Matematica - Geometria**, Ingegneria meccatronica, University of Bologna (30 h).
- *Fall 2021* - Teaching assistant for the course **Linear Algebra**, Ingegneria informatica, University of Bologna (30 h).
- *Fall 2021/Spring 2022* - Teaching assistant for the course **Mathematics**, Management and Marketing, University of Bologna (30 h).
- *Fall 2021/Spring 2022* - Teaching assistant for the course **Mathematics**, Business and Economics, University of Bologna (50 h).
- *Fall 2020/Spring 2021* - Teaching assistant for the course **Mathematics**, Management and Marketing, University of Bologna (40 h).
- *Fall 2020* - Teaching assistant for the course **Linear Algebra**, Ingegneria informatica, University of Bologna (30 h).

- *Fall 2020* - Teaching assistant for the course **Mathematics**, Management and Marketing GII, University of Bologna (50 h).
- *Spring 2019* - Teaching assistant for the course **Linear Algebra**, Informatica per il Management, University of Bologna (15 h).
- *Fall 2019* - **Alignment math course**, Management and marketing, University of Bologna (60 h).

VISITING PERIODS

- *February, 2025* - Visiting hosted by Tobias Hartnick - Karlsruhe Institute of Technology, Karlsruhe.
- *April, 2023* - Invited by Camille Horbez for a collaboration with Camille Horbez, Jean Lécureux and Bruno Duchesne - University of Paris-Saclay, Orsay (Funded by ERC grant *Artin-Out-ME-OA*, PI: Camille Horbez).
- *September, 2021 - December 2021* - Research period hosted by Michelle Bucher and Alessio Savini - University of Genéve (Funded by University of Bologna through *Marco Polo* fellowship and by Michelle Bucher' *SNSF* grant).
- *June, 2019* - Collaboration with Carlo Petronio - University of Pisa.

ORGANIZATIONAL EXPERIENCE

- *April, 14-16 2025* - Workshop: **Manifolds and groups in Bologna, III**, University of Bologna, Co-organizers: Giuseppe Bargagnati, Marco Moraschini and Stefano Riolo, webpage.
- *Fall 2024 - today* - Co-organizer of the **Geometry and Topology seminars**, University of Pisa.
- *April, 17-19 2024* - Workshop: **Manifolds and groups in Bologna, II**, University of Bologna, Co-organizers: Marco Moraschini and Stefano Riolo, webpage.
- *Spring 2023* - **Seminari di Topologia e Geometria delle Varietá (TGV)**, University of Bologna, Co-organizer: Marco Moraschini, webpage.
- *March, 24 2023* - INdAM Activity: **Non-positive curvature in manifolds and groups**, University of Bologna, Co-organizers: Ludovico Battista, Pierluigi Contucci, Stefano Francaviglia, Marco Moraschini and Stefano Riolo, webpage.
- *March, 22-23 2023* - Workshop: **Manifolds and groups in Bologna**, University of Bologna, Co-organizers: Ludovico Battista, Stefano Francaviglia, Marco Moraschini and Stefano Riolo, webpage.
- *2019-2021* - Co-organizer of the **BAD seminars** for graduate students, University of Bologna.
- *Spring 2020* - Co-organizer of the PhD course **Lie groups and lattices** given by Alessio Savini, University of Bologna.

PROJECTS

- *2024 - 2026* - Member of **PRIN CUP J53D23003820001** *Geometry and topology of manifolds* funded by Italian Government (PI: Bruno Martelli).
- *March, 2023 - February, 2024* - Member of **INdAM - GNSAGA Project E55F22000270001** *Bounded cohomology and simplicial volume: new computations and applications* (PI: Marco Moraschini).
- *January, 2019 - present* - Member of **GNSAGA**, funded by INDAM.

- *February, 2019 - 2021* - Member of **PRIN 2017** *Real and Complex Manifolds: Topology, Geometry and Holomorphic Dynamics*, funded by Italian Government (PI: Filippo Bracci).

PRIZE AND AWARDS

- *June 2019* - Fondazione Premi, Borse di studio e Provvidenze dell'Universitá di Pisa; prize for graduate students.
- *May 2019* - Credito Cooperativo Ravennate, Forlivese e Imolese and Fondazione Giovanni dalle Fabbriche; prize for graduate students cum laude.

SCHOLARSHIPS AND GRANTS

- *March, 6-17 2023* - **GNSAGA Scholarship** - INDAM (euro 1000).
- *July, 4, 8 2022* - **GNSAGA Scholarship** - INDAM (euro 500).
- *July, 6-14 2022* - **Kovalevskaya Grant for ICM 2022 in Saint Petersburg** - IMU
- *November, 2018 - January, 2022* - **Ph.D Scholarship**, University of Bologna.
- *September, 20 2021 - December, 23 2021* - **Marco Polo Scholarship** - University of Bologna (euro 3450).
- *February, 23-28 2020* - **GNSAGA Scholarship** - INDAM (euro 400).
- *July, 8-12 2019* - **GNSAGA Scholarship** - INDAM (euro 400).
- *June, 30 - July, 5 2019* - **GNSAGA Scholarship** - INDAM (euro 400).
- *April, 8-12 2019* - **GNSAGA Scholarship** - INDAM (euro 400).

CONFERENCES ATTENDED

- *October, 20-25 2024* - **Metric topology of aspherical spaces** - Oberwolfach, Germany.
- *September, 17-20 2024* - **Lost in Topology Workshop** - Pisa, Italy.
- *July, 15-19 2024* - **Moving to higher rank: from hyperbolic to Anosov** - Cetraro, Italy.
- *September, 18-19 2023* - **Leaning into Topology Workshop** - Pisa, Italy.
- *September, 11-16 2023* - **Groups and Rigidity Around the Zimmer Program** - Ventotene, Italy.
- *March, 6-17 2023* - **Measured Group Theory** - CRM Montréal, Canada.
- *July, 4-8 2022* - **Complex hyperbolic geometry and related structures** - CIRM Luminy, France.
- *September, 6-11 2021* - **Counting problems** - Ventotene, Italy.
- *September, 20-25 2020* - **Virtual workshop: Simplicial Volumes and Bounded Cohomology** - online.
- *February, 23-28 2020* - **Young Geometric Group Theory** - Saint Jacut de la mer, France.
- *September, 8-14 2019* - **Of coarse! Quasi-isometries and groups: rigidity and classification** - Ventotene, Italy.
- *July, 8-12 2019* - **Arbeitstagung 2019 on Geometry** - MPIM, Bonn.
- *June, 30 - July, 5 2019* - **Young Geometric Group Theory** - Bilbao.
- *April, 8-12 2019* - **Workshop: Riemannian and Simplicial Volume** - KIT, Karlsruhe.

- *February, 21-23 2019* - **Workshop su varietá reali e complesse: geometria, topologia e analisi armonica** - SNS, Pisa.

OTHER SKILLS

Software skills
I'm quite familiar with the following software: LaTeX, Python, Mathematica, Excel.

Language skills
Italian - mother tongue
English - good