



Mattia Fogagnolo

Personal data

Date of birth January 13-th, 1991
Place of birth Rovigo
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Academic career

September 2020-present position **Junior Visiting Position**, *Centro De Giorgi, Pisa*.
A 2-years postdoc position in *Topology, Differential Geometry and/or Geometric Analysis*

Education

February 2020 **PhD thesis defense**, *University of Trento*, Awarded of the PhD title with merits.
Thesis: *Geometric Applications of Linear and Nonlinear Potential Theory*

2016 **PhD in Mathematics Admission**, *University of Trento*,
Admitted by titles and exams to the Doctorate School in Mathematics, XXXII ciclo.
I worked on Geometric Analysis under the guide of L. Mazziere.

2015 **Master Degree in Mathematics**, *University of Padova*,
Score: 110/110 cum laude.
Thesis: *Variation Formulas for H -perimeter in Heisenberg groups*.
Advisor: R. Monti.

2013 **Bachelor Degree in Mathematics**, *University of Padova*.
Thesis: *Una nuova dimostrazione del teorema di Kolmogorov-Riesz-Fréchet*.
Advisor: A. Marson.

2010 **High School Degree**, *Liceo Scientifico P. Paleocapa, Rovigo*.

Research interests

I work in Geometric Analysis, and I am interested in Geometric Flows, Riemannian (with some interest also in sub-Riemannian) geometry, Calculus of Variations and in particular in the mutual connections among these fields. More precisely, I study boundary value problems and curvature flows with particular attention to extrinsic flows, geometric variational problems and geometric/analytic inequalities. These topics are considered in relation to the underlying, usually nonflat, geometry.

Scientific Publications and Preprints

- 2021 **G. Antonelli, E. Bruè, M. Fogagnolo and M. Pozzetta**, *Sharp existence theorems for isoperimetric sets in manifolds with nonnegative Ricci curvature*, <https://arxiv.org/abs/2107.07318>.
Preprint
- 2021 **M. Fogagnolo and A. Pinamonti**, *New Integral Estimates on Substatic Riemannian Manifolds and the Alexandrov Theorem*, <https://arxiv.org/abs/2105.04672>.
Preprint
- 2021 **G. Antonelli, M. Fogagnolo and M. Pozzetta**, *The isoperimetric problem on Riemannian manifolds via Gromov-Hausdorff asymptotic analysis*, <https://arxiv.org/abs/2101.12711>.
Preprint
- 2021 **L. Benatti, M. Fogagnolo and L. Mazziere**, *Minkowski Inequality on Complete Riemannian Manifolds with Nonnegative Ricci Curvature*, <https://arxiv.org/abs/2101.06063>.
Preprint
- 2020 **M. Fogagnolo and L. Mazziere**, *Minimising hulls, p -capacity and isoperimetric inequality on complete Riemannian manifolds*, <https://arxiv.org/abs/2012.09490>.
Preprint
- 2020 **M. Fogagnolo and A. Pinamonti**, *Strict starshapedness of solutions to the horizontal p -Laplacian in the Heisenberg group*, *Mathematics in Engineering*, 10.3934/mine.2021046.
- 2020 **M. Fogagnolo**, *Geometric applications of Linear and Nonlinear Potential Theory*.
PhD thesis
- 2020 **V. Agostiniani, M. Fogagnolo and L. Mazziere**, *Minkowski Inequalities via Nonlinear Potential Theory*, <https://arxiv.org/abs/1906.00322>.
- 2020 **V. Agostiniani, M. Fogagnolo and L. Mazziere**, *Sharp geometric inequalities for closed hypersurfaces in manifolds with nonnegative Ricci curvature*, *Inventiones Mathematicae*, <https://link.springer.com/article/10.1007/s00222-020-00985-4>.
- 2018 **M. Fogagnolo, L. Mazziere and A. Pinamonti**, *Geometric aspects of p -capacitary potentials*, *Ann. Inst. H. Poincaré Anal. Non Linéaire*. <https://doi.org/10.1016/j.anihpc.2018.11.005>,
ArXiv : <https://arxiv.org/abs/1803.10679v2>.
- 2016 **M. Fogagnolo, R. Monti and D. Vittone**, *Variation Formulas for H -rectifiable Sets*, *Annales Academiæ Scientiarum Fennicæ*, <https://doi.org/10.5186/aasfm.2017.4220>.

Works in progress

M. Fogagnolo and A. Pinamonti, *A new conformal characterization of warped products and a quantitative version of Brendle's Alexandrov Theorem*.

M. Fogagnolo and A. Malchiodi, *Symmetry results for the Laplace equation with critical exponent in nonnegative Ricci curvature*.

L. Benatti, M. Fogagnolo and L. Mazziere, *Asymptotic behaviour at infinity of p -capacitary potentials in asymptotically conical Riemannian manifolds*.

M. Fogagnolo and A. Pluda, *Sharp Li-Yau type inequalities for weak solutions to the p -Laplacian heat equation*.

Funded Projects

GNAMPA Project: "Aspetti geometrici in teoria del potenziale lineare e nonlineare",
Joint project with V. Agostiniani, L. Mazziere and A. Pinamonti.
<http://www.di.univr.it/?ent=progetto&id=5380>

Conferences, Schools, Workshops and Seminars

Organized events

- October 2021 **A Pisan Workshop in Geometric Analysis**, *Pisa, Centro De Giorgi*, Co-organized with A. Pluda, <http://www.crm.sns.it/event/492/>.
- December 2020 **Online Workshop in Geometric Analysis**, *Online*, Co-organized with A. Pluda, <https://cvgmt.sns.it/event/623/>.
- [Talks and seminars as speaker](#)
- October 2021 **Seminar**, *University of Oxford (online)*, Invitation by R. Perales and D. Semola, Title of the talk: The Minkowski inequality in manifolds with nonnegative Ricci curvature via nonlinear potential theory.
- October 2021 **9th GAMM-Workshop on Analysis of PDEs**, *University of Freiburg*, Title of the talk: The strictly outward minimizing hull in Riemannian manifolds and its relation with p -Capacities .
- May 2021 **Variational and PDE problems in Geometric Analysis, III. online edition**, *Università di Bologna (online)*, Title of the talk: New integral estimates in substatic Riemannian manifolds with boundary and the Alexandrov Theorem.
- February 2021 **Seminar**, *Columbia University of New York (online)*, Invitation by S. Brendle and F. Johne, Title of the talk: Geometric inequalities through linear and nonlinear potential theory.
- February 2021 **Seminar**, *Università di Trento (online)*, Invitation by A. Marchese and A. Pinamonti, Title of the talk: The isoperimetric problem on manifolds with nonnegative Ricci curvature: geometric inequalities and asymptotic Gromov-Hausdorff analysis.
- October 2020 **Seminar**, *Scuola Normale Superiore*, Title of the talk: Strictly outward minimizing hulls, p -capacities and isoperimetric inequalities.
- October 2020 **Seminar**, *Università di Pisa*, Invitation by M.S. Gelli and A. Pluda, Title of the talk: Geometric applications of (non)Linear Potential Theory.
- September 2019 **Workshop on Spectral Geometry and Analysis of Differential Operators**, *Padova*, Title of the talk: Geometric Inequalities through p -harmonic potentials.
- May 2019 **III Brescia-Trento Nonlinear Days**, *Trento*, Title of the talk: Geometric inequalities through p -harmonic potentials.
- March 2019 **Ciclo di seminari M.A.P.**, *Pisa*, Title of the talk: Classical and new problems in Geometric Analysis.
- February 2019 **XXIX Convegno Nazionale di Calcolo delle Variazioni**, *Levico Terme*, Title of the talk: A sharp isoperimetric inequality on manifolds with nonnegative Ricci curvature.
- September 2018 **Progressi recenti in Geometria Reale e Complessa-XI**, *Levico Terme*, Title of the talk: Applications of monotonicity formulas to manifolds with non-negative Ricci curvature.
- May 2018 **New trends in PDEs**, *Catania*, Title of the talk: Geometric aspects of p -capacitary potentials.
- March 2018 **Geometric evolution equations**, *Regensburg*, Title of the talk: A Willmore inequality on ALE manifolds.
- [Poster sessions](#)
- September 2021 **Geometric theory of PDE's and sharp functional inequalities**, *Accademia Nazionale dei Lincei (online)*, Poster title: The strictly outward minimising hull in Riemannian Manifolds and its relation with p -capacities.
- June 2018 **Geometric analysis**, *CIME School in Cetraro*, Poster title: A Willmore type inequality on manifolds with non-negative Ricci curvature.
Lectures by Topping, Neves, Fraser, Young
- [Participation](#)
- September 2021 **Variational methods and applications**, *Centro De Giorgi, Pisa*.

- February 2020 **XXX Convegno Nazionale di Calcolo delle Variazioni**, *Levico Terme*.
- July 2019 **ICTP School on Geometry and Gravity**, *ICTP, Trieste*.
Lectures by, among the others: Cederbaum, Chrusciel, Dafermos, Schoen, Wald
- June 2019 **Geometric Analysis and General Relativity. A conference in honour of Gerhard Huisken's 60th birthday**, *Zurich, ETH*.
Seminars by, among the others: Yau, Colding, Minicozzi, Neves, Coda-Marques, Hamilton, Andrews..
- June 2018 **International School on Extrinsic Curvature Flows**, *Trieste, ICTP*.
Lectures by, among the others, Huisken, Sinestrari, Otto, Angenent, Daskalopoulos
- January 2018 **XXVIII Convegno Nazionale di Calcolo delle Variazioni**, *Levico Terme*.
- November 2017 **Geometric aspects of PDEs**, *Firenze*.
- July 2017 **Between Geometry and Relativity**, *ESI Summer School in Vienna*.
I have attended lectures by, among others, R. Schoen, M. Eichmair, G. Galloway, J. Corvino
- June 2017 **Geometry of PDEs and related problems**, *CIME School in Cetraro*.
Admitted with partial financial support. I have attended lectures by X. Cabré, D. Peralta-Salas, W. Reichel, H. Shahgholian, A. Henrot.
- May 2017 **Brescia-Trento Nonlinear days**, *Trento*.
- January 2017 **XXVII Convegno Nazionale di Calcolo delle Variazioni**, *Levico Terme*.
- July 2016 **Cortona Summer School 2016**, *SMI*.
I have been admitted and I have participated to the two-week course "Existence and regularity for the Plateau problem", taught by Professors Luigi Ambrosio and Camillo De Lellis, at Palazzone of Cortona.

Teaching Experience

- March 2021 **Monographic lessons**, *Scuola Normale Superiore*, For Master and PhD students in Mathematics, Geometric Flows.
I delivered a couple of monographic lessons about Huisken-Ilmanen's weak notion of Inverse Mean Curvature Flow, supporting Prof. A. Malchiodi's course "Geometric Flows"
- 2019-2020 **Teaching Assistant**, *University of Trento*, Department of Engineering, DICAM, Analysis 2.
I supported Professor L. Mazziere
- 2018-2019 **Teaching Assistant**, *University of Trento*, Department of Mathematics, Geometric Analysis.
I supported (exercise sessions, theory complements, preparation and correction of tests) Professor L. Mazziere
- 2017-2018 **Teaching Assistant**, *University of Trento*, Department of Engineering, Analisi 2.
I supported (exercise sessions, theory complements, preparation and correction of tests) Professor A. Valli and Dr. A. Pinamonti
- 2017 **CLIL Project**, *Liceo Scientifico DaVinci, Trento*.
- 2016 **Teaching assistant**, *University of Padova*, Department of Physics and Astronomy, Analisi 2.
I supported (exercises sessions, theory complements) the course taught by R. Monti.
- 2016 **E-tutor for the project "Integrating Technology in Higher Education to enhance work life balance"**, *University of Padova*, Department of Mathematics, Analisi 1.
I integrated the course taught by G. Treu by exercises and online tests uploaded on Moodle.
- 2016 **Tutor for Docsity**, www.docsity.com.
I gave online lesson at any level, even in preparation to University exams (Analysis, Linear Algebra..).
- 2015-2016 **Teacher at UniD**, *Padova*.
I taught a course about mathematics and physics in preparation to the entrance exams for the courses in Medicine and Odontology.

2014-2016 **Tutor service**, *University of Padova*, Department of Mathematics, School of Engineering.
I prepared exercises sessions of Analysis and Linear Algebra for first year students of Mathematics and Engineering.

2015 **Online Pre-Calculus**, *Iiversity*, www.iversity.org.
I have been part of a team of mathematicians guided by Professors C. Mariconda and A. Tonolo for the realization of video-lessons aimed at the recovery of basic mathematical notions necessary for various courses in Engineering and Sciences, uploaded on the online platform Iiversity.

Other informations

Reviewer, Since 2020 I am reviewer for various international mathematical journals (Annali di Matematica Pura e Applicata, Calculus of Variations and Partial Differential Equations, Nonlinear Analysis).

Known Languages

Italian Mother tongue

Written English Advanced

Spoken English Advanced

Written French Basic

I can understand very simple texts.

I authorize the treatment of the personal data contained in this curriculum vitae, in relation with art.13 of D.Lgs 196/2003.

ROVIGO, 21/10/2021