Curriculum Vitae
Roberto Monti

Name:	Roberto Monti
Place and date of birth:	Novafeltria (PU), Italy, 1968 August 1st Married with 2 children, 8 and 16 years old
Position:	Full Professor in Mathematical Analysis University of Padova, Italy Dipartimento di Matematica Tullio Levi-Civita
Academic qualifications:	Privat Dozent (Habilitation, Bern CH 2004) PhD in Mathematics (Trento IT 2001) Master Degree cum laude in Mathematics (Bologna IT 1997) Master Degree cum laude in Philosophy (Macerata IT 1991)
Address:	Roberto Monti Dipartimento di Matematica via Trieste 63 35121 Padova, Italy
e–mail:	monti@math.unipd.it
homepage:	http://www.math.unipd.it/∼monti/index.html
Languages:	Italian, English, German, French (basic)

1 Studies and positions

Starting 2019, Full Professor at the University of Padova
October 2010, Associate Professor at the University of Padova
September 2008 – August 2009, Visiting Professor at the Math. Institut, Uni. Bern
November 2004, Habilitation at the University of Bern
January 2004 – September 2010, Assistant professor of Analysis at the University of Padova
November 2001 – January 2004, postdoc position at the Mathematisches Institut, Bern
1997-2001, Graduate studies in Mathematics, University of Trento
1993-1997, Undergraduate studies in Mathematics, University of Bologna
1988-1991, Undergraduate studies in Philosophy, University of Macerata

2 List of pubblications

Published and accepted papers

[51] V. Franceschi, R. Monti, A. Righini, M. Sigalotti, The isoperimetric problem for regular and crystalline norms in H^1, J. Geom. Anal. 2022

[50] R. Monti, A. Socionovo, Non-minimality of spirals in sub-Riemannian manifolds, Calc. Var. and PdEs, 60, 2021

[49] D. Gerosa, R. Monti, D. Morbidelli, Trace theorem for the Martinet distribution, Comm. Cont. Math. Vol. 23, pp. 1 - 28, 2021

[48] F. Boarotto, R. Monti, F. Palmurella, Third order open mapping theorems and applications to the end-point map, Nonlinearity 2020

[47] F. Boarotto, R. Monti, F. Palmurella, Third order open mapping theorems and applications to the end-point map, Nonlinearity 2020

[46] E. Battaglia, R. Monti, A. Righini, Stable hypersurfaces in the complex projective space, Ann. Mat. Pura Appl., pp. 231- 251, 2020

[45] R. Monti, M. Zaccaron, Height estimate and Lipschitz approximation for geodesics in Carnot groups, Le Matematiche, Vol. LXXV pp. 91-103 , 2020

[44] R. Monti, D. Morbidelli, John and uniform domains in generalized Siegel boundaries, Potential Analysis 53, 4-5, 2020

[43] V. Franceschi, F. Montefalcone, R. Monti, CMC Spheres in the Heisenberg Group. Anal. Geom. Metr. Spaces 7 (2019), no. 1, 109–129

[42] R. Monti, The regularity problem for geodesics of the control distance. Bruno Pini Mathematical Analysis Seminar, 2018, 9, 137–146

[41] R. Monti, A. Pigati, D. Vittone, Existence of tangent lines to Carnot-Carathéodory geodesics, Calc. Var. Partial Differential Equations 57 (2018), no. 3, Art. 75, 18 pp.

[40] R. Monti, A. Pigati, D. Vittone, On tangent cones to length minimizers in Carnot-Carathéodory spaces, SIAM J. Control Optim. 56 (2018), no. 5, 3351–3369.

[39] E. Le Donne, G. P. Leonardi, R. Monti, D. Vittone, Extremal polynomials in stratified groups. Comm. Anal. Geom. 26 (2018), no. 4, 723–757.

[38] R. Monti, G. Stefani, Improved Lipschitz approximation of H-perimeter minimizing boundaries, J. Math. Pures Appl. (9) 108 (2017), no. 3, 372–398.

[37] M. Fogagnolo, R. Monti, D. Vittone, Variation formulas for H-rectifiable sets, Ann. Acad. Sci. Fenn. Math. 42 (2017), no. 1, 239–256

[36] V. Franceschi, R. Monti, Isoperimetric problem in H-type groups and Grushin spaces, Revista Mat. Iberoam. 32 (2016), no. 4, 1227–1258.

[35] V. Franceschi, R. Monti, G. P. Leonardi, Quantitative isoperimetric inequalities in $\mathbb{H}^n$, Calc. Var. Partial Differential Equations 54 (2015), no. 3, 3229–3239.

[34] R. Monti, Minimal surfaces and harmonic functions in the Heisenberg group. Nonlinear Anal. 126 (2015), 378–393.

[33] R. Monti, D. Vittone, Height estimate and slicing formulas in the Heisenberg group. Anal. PDE 8 (2015), no. 6, 1421–1454.

[32] R. Monti, Isoperimetric problem and minimal surfaces in the Heisenberg group, in *Geometric Measure Theory and Real Analysis*, pp. 57–130, L. Ambrosio Ed., CRM Series, Vol. 17 (2015).

[31] E. Le Donne, G. P. Leonardi, R. Monti, D. Vittone, Corners in non-equiregular sub-Riemannian manifolds. ESAIM Control Optim. Calc. Var. 21 (2015), no. 3, 625–634.

[30] R. Monti, A family of nonminimizing abnormal curves, Ann. Mat. Pura Appl. (4) 193 (2014), no. 6, 1577–1593.

[29] R. Monti, Rearrangements in metric spaces and in the Heisenberg group, J. Geom. Anal. (2014) 24: 1673–1715.

[28] R. Monti, The regularity problem for sub-Riemannian geodesics, in *Geometric Control Theory and Sub-Riemannian Geometry*, Springer INDAM Series, Stefani, G., Boscain, U., Gauthier, J.-P., Sarychev, A., Sigalotti, M. (Eds.) 2014, 313–332.

[27] R. Monti, Lipschitz approximation of H-perimeter minimizing boundaries, Calc. Var. 50 (2014), no. 1-2, 171–198.

[26] R. Monti, Regularity results for sub-Riemannian geodesics, Calc. Var. 49 (2014), no. 1-2, 549–582.

[25] E. Le Donne, G. P. Leonardi, R. Monti, D. Vittone, Extremal curves in nilpotent Lie groups, Geom. Funct. Anal. 23 (2013), no. 4, 1371–1401.

[24] Z. Balogh, R. Monti, J. Tyson, Frequency of Sobolev and quasiconformal dimension distortion, J. Math. Pures Appl. (9) 99 (2013), no. 2, 125–149.

[23] R. Monti, D. Vittone, Sets with finite H-perimeter and controlled normal, Math. Z. 270 (2012), no. 1-2, 351–367.

[22] R. Monti, D. Morbidelli, Pseudohermitian invariants and classification of CR mappings in generalized ellipsoids, J. Math. Soc. Japan 64 (2012), no. 1, 153–179

[21] G. Arena, A. O. Caruso, R. Monti, Regularity properties of H-convex sets, J. Geom. Anal. 22 (2012), Number 2, 583–602

[20] Z. Balogh, R. Berger, R. Monti, J. Tyson, Exceptional sets for the self-similar dimension in Carnot groups, Math. Proc. Cambridge Philos. Soc. 149 (2010), no. 1, 147–172.

[19] R. Monti, M. Rickly, Convex isoperimetric sets in the Heisenberg group, Ann. Sc. Norm. Super. Pisa Cl. Sci. (5) 8 (2009), no. 2, 391–415

[18] R. Monti, F. Serra Cassano, D. Vittone, A negative answer to the Bernstein problem for intrinsic graphs in the Heisenberg group, Boll. Unione Mat. Ital. (9) 1 (2008), no. 3, 709–727

[17] G. P. Leonardi, R. Monti, End-point equations and regularity of sub-Riemannian geodesics, Geom. Funct. Anal. 18 (2008), no. 2, 552–582

[16] R. Monti, Heisenberg isoperimetric problem. The axial case, Adv. Calc. Var. 1 (2008), 93–121

[15] R. Monti, D. Morbidelli, Positive solutions of anisotropic Yamabe–type equations in $\mathbb{R}^n$, Proc. Amer. Math. Soc. 136 (2008), no. 12, 4295–4304

[14] R. Monti, D. Morbidelli, Levi umbilical surfaces in complex space, J. Reine Angew. Math. 603 (2007), 113–131

[13] R. Monti, D. Morbidelli, Kelvin transform for Grushin operators and semilinear critical equations, Duke Math. J. 131, no. 1 (2006), 167–202

[12] R. Monti, Sobolev inequalities for weighted gradients, Comm. Part. Diff. Eq. 31 (2006), 1479–1504

[11] R. Monti, D. Morbidelli, Non-tangentially accessible domains for vector fields. Indiana Univ. Math. J. 54 (2005), no. 2, 473–498

[10] R. Monti, D. Morbidelli, Regular domains in homogeneous groups, Trans. Amer. Math. Soc. 357 (2005), no. 8, 2975–3011

[9] R. Monti, M. Rickly, Geodetically convex sets in the Heisenberg group, J. Convex Anal. 12 (2005), no. 1, 187–196

[8] R. Monti, D. Morbidelli, Isoperimetric inequality in the Grushin plane. J. Geom. Anal. 14 (2004), no. 2, 355–368

[7] Z. Balogh, R. Monti, Accessible domains in the Heisenberg group, Proc. Amer. Math. Soc. 132, No.1, 97–106 (2004)

[6] R. Monti, D. Morbidelli, John domains for the control distance of diagonal vector fields, J. Anal. Math. 92 (2004), 259–284

[5] R. Monti, Brunn–Minkowski and isoperimetric inequality in the Heisenberg group, Ann. Acad. Sci. Fenn. Math. 28 (2003), no. 1, 99–109

[4] R. Monti, F. Serra Cassano, Degenerate perturbations of a two-phase transition model. J. Convex Anal. 10 (2003), no. 1, 1–34

[3] R. Monti, D. Morbidelli, Trace theorems for vector fields, Math. Z. 239 (2002), 747–776

[2] R. Monti, F. Serra Cassano, Surface measures in Carnot-Carathéodory spaces, Calc. Var. 13 (2001), no. 3, 339–376

[1] R. Monti, Some properties of Carnot–Carathéodory balls in the Heisenberg group, Rend. Mat. Accad. Lincei, s.9 v.11 (2000) 155–167

Submitted papers

[1] F. Boarotto, R. Monti, A. Socionovo, Higher order Goh conditions, 2022 submitted

Academic works

[4] R. Monti, Isoperimetric inequality, semilinear equations and regular domains in Grushin spaces, Habilitationsschrift, Bern 5 January 2004.

[3] R. Monti, Distances, boundaries and surface measures in Carnot-Carathéodory spaces, PhD Thesis in Mathematics, Università di Trento, 2001. Advisor: Prof. F. Serra Cassano

[2] R. Monti, Teorema di Rellich–Kondrachov per spazi di Sobolev generalizzati, Degree Thesis in Mathematics, Università di Bologna, 1997. Advisor: Prof. E. Lanconelli.

[1] R. Monti, Husserl: evidenza e ragione, Degree Thesis in Philosophy, Università di Macerata, 1991. Advisor: Prof. F. Voltaggio.

Other pubblications

[3] R. Monti, Ordine e disordine. Analisi epistemologica ed ideologica, in “Chaos”, Quaderni della Biblioteca di Chiaravalle, n. 5 (2001), 25–37.

[2] R. Monti, Origini delle guerre e democrazia internazionale, in "L'arte del conflitto", Quaderni del Consiglio Regionale delle Marche, n. 2 (1997), 121–141.

[1] R. Monti, La teoria Husserliana dell'io trascendentale, Aquinas **36** (1993), 181–192.

Link to the papers

http://www.math.unipd.it/∼monti/pubblicazioni.html

3 Research directions

i) Stable surfaces in the complex hyperbolic space.

ii) Regularity of sub-Riemannian geodesics.

iii) Mean value formulas on hypersurfaces.

iv) Isoperimetric problems. Pansu's conjecture.

v) Regularity of H-minimal surfaces.

4 Postdocs

Francesco Boarotto, 2019
Erika Battaglia, 2017-2018
Valentina Franceschi, May 2016 - October 2016

5 PhD Students

A. Socionovo, finishing 2023
A. Righini, finished 2020
A. Merlo, SNS Pisa, co-advisor with Prof. G. Alberti, finished 2020
V. Franceschi, Isoperimetric problems in Heisenberg and Grushin spaces, finished 2016. Now RTDb in Padova.

6 Undergraduete students

See https://www.math.unipd.it/∼monti/tesi.html

Master Thesis

Stefan Strebel, Singular extremals of constrained variational problems, February 2023, Basel Switzerland
Marco Dall'Alba, The Besicovitch-Federer projection theorem, 11 Dicembre 2020
Giacomo Vianello, Reflection techniques and applications to the singular Yamabe equation, 16 Ottobre 2020
E. Battistin, Solution of Plateau's problem via Hausdorff measures, 26 settembre 2019
N. Girotto, Minimizing Clusters: Existence and Planar Examples, 26 settembre 2019
M. Michetti, Minimizers of the Ginzburg-Landau functional and De Giorgi's Conjecture, 19th July 2019.
F. Marconi, Preiss' Theorem on the Geometry of Measures in $\mathbb{R}^n$, 19 Aprile 2019.
M. Vedovato, Quantitative Estimates for the Singular Strata of Minimizing Harmonic Maps, 20th July 2018.
G. Vecchiato, Dimensione dell'insieme singolare di una misura n-uniforme, 20th July 2018.
E. Shaqiri, Non-minimality of the double logarithm spiral, 20th July 2018.
M. Zaccaron, Height estimate and Lipschitz-graph approximation of length minimizers, 19th April 2018.
M. De Zotti, Il funzionale di Mumford-Shah, December 2017.
D. Gerosa, Trace theorems for the Martinet distribution, July 2017.
A. Merlo, Non-differentiability set of typical Lipschitz functions, September 2016 (coadvisor with D. Preiss).
G. Stefani, Intrinsic Lipschitz approximation of H-perimeter minimizing boundaries, July 2016.
M. Fogagnolo, Second variation of H-perimeter, 2015.
G. Vescovo, Length minimality of corners in SR geometry, 2015.
A. Noiato, Rademacher theorem in metric spaces, 2014.
F. Palmurella, Length-Minimizing Curves on Sub-Riemannian Manifolds: Necessary Conditions Involving the End-Point Mapping, 2014.
C. Rigoni, Rectifiable sets and their characterization through tangent measures, 2013.
D. Maragno, Esistenza e unicità di soluzioni per l'equazione di Monge-Ampère. 2012.
A. Pirrello, Problema isodiametrico, 2011. Now teacher of mathematics in Sweden
Dario Prandi, Rearrangements in metric spaces, 2010.

Degree Thesis

P. Aldrigo, De Giorgi's theorem on the isoperimetric property of the sphere, 2022
D. Massenz, Congettura di Rayleigh: la miglior forma di un tamburo, Settembre 2021
G. Cozzi, Caratterizzazione delle sfere nello spazio iperbolico complesso, 2021
A. Parmeggiani, Ground states for Schrödinger equations, 2021

G. Vizzari, Uniforme rettificabilità ed operatore integrale di Cauchy, 2021
D. Accadia, Fndamental solution for the Kolmogorov equation, 2021
N. Bosio, Maximal function and Lebesgue differentiation theorem, Luglio 2021
V. Gapyak, Differenziabilitá di funzioni Lipschitziane, 18 Ottobre 2019
E. Battistin, Trasporto ottimo. Pb. di Monge-Kantorovic e teorema di Brenier, 2017
G. Vecchiato, Le ipersuperfici immerse in $\mathbb{R}^n$ compatte e stabili sono sfere, luglio 2016.
M. Vedovato, Contenuto di Minkowski e misure di Hausdorff in $\mathbb{R}^n$, luglio 2016.
S. Farinelli, Soluzione Fondamentale per il Laplaciano di Kohn, Febbraio 2016.
S. Mammola, Γ-convergenza, 2015.
L. Falcone, Disuguaglianza isoperimetrica quantitativa in $\mathbb{R}^n$, 2015.
M. Zaccaron, Funzioni con gradiente prescritto, 2015.
D. Gerosa, Metrica di Hausdorff-Gromov ed esistenza di geodetiche, 2015.
J. Dianetti, Misure uniformi in $\mathbb{R}^n$, 2014.
M. F. Pivetta, Reti separate ed equazione del determinante Jacobiano, 2014.
M. Fraccaroli, Equazione di Yamabe: analisi con il Metodo delle Sfere Mobili, 2014.
A. Merlo, Struttura di insiemi di misura nulla, 2014.
M. Stecconi, Teorema di Sard e controes. in dim. infinita, 2014.
D. Valloni, Distribuzione dei numeri primi e funzione Zeta, 2014.
G. Stefani, ODEs. Da Cauchy-Lipschitz a DiPerna-Lions, 2014.
L. Meneghello, Il problema isoperimetrico con densità Gaussiana, September 2011.
A. Pirrello, Brunn-Minkowski inequality for capacity: the case of equality, 2009.

7 Teaching

For all courses I wrote lecture notes: http://www.math.unipd.it/∼monti/didattica.html

Teaching at the Galilei School of Higher Studies, Padova

2022 Introduction to Optimal Transportation (30 hours)
2005-2006 Assistant of Mathematics (240 hours)

Teaching at the Department of Mathematics, Padova

2021 and 2022 Analysis 2 (52 hours) 2 year
2013 and 2020 Analysis 2 (70 hours) 2 years
2017-2018-2020-2021-2022 Calculus of Variations (64 hours) 4 years
2014 and 2016 Real Analysis (56 hours) 2 years
2011-2012-2018-2020 Analysis 1 (62 hours) 4 years
2011-2012 Theory of Functions 2 (64 hours)
2010-2011 Partial Differential Equations (24 hours)
2009-2010 Partial Differential Equations (64 hours)
2007-2008 Partial Differential Equations (48 hours)

Teaching at the Department of Physics, Padova

2011 and from 2015 to 2019, and 2021 Analysis 2 (64 hours) 6 years

Teaching at the School of Engineering, Padova

2012-1015 Analysis 1 (72 hours) 3 years
2009-2010 Analysis 2 (78 hours)
2004-2008 Analysis 1 (90 hours) 4 years
2003-2004 Analysis 2 (30 hours)

Teaching at the Doctoral School of Mathematics, Padova

2007 Course "Inequalities in Analysis" (20 hours)
2006 Course "Vector Fields And Metric Spaces" (20 hours)

Teaching at the Mathematisches Institut, Bern

2009 Summer semester: Ordinary Differential Equations
2009 Summer semester: Analysis 2
2008 Winter semester: Analysis 1
2006 Summer semester: Block-course "Introduction to the Yamabe equation"

Assistantship, Bern

2003-2004, Winter semester: Assistant of Analysis 3
2002-2003, Summer semester: Assistant of Harmonic Analysis
2002-2003, Winter semester: Assistant of Minimal Surfaces
2001-2002, Summer semester: Assistant of Partial Differential Equations
2001-2002, Winter semester: Assistant of Analysis 1

Other teaching

2007 Uni. Padova "Introduction to the Yamabe equation" (4 hours)
2006 Uni. Padova "Serrin's overdetermined problem" (4 hours)
2005 Uni. Fribourg (CH) "Introduction to BV functions" (4 hours)
2002 Uni. Bern "Two dimensional Mumford–Shah functional" (6 hours)

Nonmathematical teaching

1995-1996 (2 years) Teacher of Modern History and History of Philosophy, Ancona

8 Department offices

Collegio dei docenti della Scuola di dottorato di Matematica
Commissione Scientifica, dal 2022
Commissione Pari Opportunità, dal 2022
Commissione di Programmazione Didattica, fino al 2022
Commissione Didattica CCS Matematica
GAV del Corso di Laurea in Matematica, fino al 2021
Referente per la Disabilità nel Dipartimento di Matematica (fino al 2018)
Presidente Commissione revisione Regolamento di Dipartimento (2018)
Fino al 2015 Commissione Paritetica della Scuola di Scienze

9 Music

Clarinet, guitar, piano and composition.
See: https://www.math.unipd.it/∼monti/musica.html

10 Other scientific interests

Philosophy and epistemology.
Neurophysiology of the brain with special interest in vision, hearing, and language.

Padova, February 2023

Roberto Monti