CV of Luca Massimo Andrea MARTINAZZI

Contacts

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Personal Data

Citizenship	Italian
Spoken languages	English, Italian, German, French, Spanish, Portuguese

Degrees

M.Sc. in Mathematics	**Scuola Normale Superiore, Pisa, 05/2004**
Grade	110/110 Cum Laude
Title of the Master Thesis	*The non-parametric Plateau problem in arbitrary codimension*
Advisor	Prof. M. Giaquinta
Ph.D. in Mathematics	**ETH Zurich, 03/2009**
Title of the Ph.D. Thesis	*Concentration-Compactness phenomena in conformal geometry*
Advisor	Prof. M. Struwe
Co-Advisor	Prof. T. Rivière

Education

10/2000 - 09/2004	**Scuola Normale Superiore, Pisa**	Undergraduate student
09/2004 - 08/2005	**Stanford University, CA**	Graduate student
10/2005 - 03/2009	**ETH Zurich**	Graduate student

Jobs

04/2009 – 09/2009	Postdoc at **ETH Zurich**
10/2009 – 08/2011	Junior visitor at **Centro di Ricerca Matematica De Giorgi, Pisa**
09/2011 – 06/2013	Hill assist. professor at **Rutgers, The State Univ. of New Jersey**
07/2013 – 09/2017	SNF Förderungsprofessor at the **University of Basel**
10/2017 – 08/2021	Associate Professor at the **University of Padua**
09/2021 – 11/2024	Associate Professor at **Sapienza University of Rome**
Since 12/2024	Full Professor at **Sapienza University of Rome**
2022 – 2025	Junior Fellow of the **Scuola Superiore di Studi Avanzati Sapienza**

Publications

Monographs

1. *The non-parametric problem of Plateau in arbitrary codimension* - Master thesis (2004).
2. (With M. Giaquinta) *An introduction to the regularity theory for elliptic systems, harmonic maps and minimal graphs*, 2nd Edition, Edizioni della Normale, Pisa 2012 (1st edition 2005).
3. *Concentration-Compactness phenomena in conformal geometry*, Ph.D. Thesis, ETH Zurich (2009).

Research papers

1. *Classification of solutions to the higher order Liouville's equation on* $\mathbb{R}^{2m}$, Math. Z. **263** (2009), 307-329.
2. *Conformal metrics on* $\mathbb{R}^{2m}$ *with constant Q-curvature*, Rend. Lincei. Mat. Appl. **19** (2008), 279-292.
3. *Concentration-compactness phenomena in higher order Liouville's equation*, J. Funct. Anal. **256** (2009), 3743-3771.
4. *A threshold phenomenon for embeddings of* H_0^m *into Orlicz spaces*, Calc. Var. Partial Differential Equations. **36** (2009), 493-506.
5. (With Mircea Petrache) Asymptotics and quantization for a mean-field equation of higher order, Comm. Partial Differential Equations **35** (2010), 1-22.
6. (With M. Struwe) Quantization for an elliptic equation of order $2m$ with critical exponential nonlinearity. Math. Z. **270** (2012), 453-487.
7. (with M. Petrache) *Existence of solutions to a higher dimensional mean-field equation on manifolds*, Manuscripta Math. **133** (2010), 115-130.
8. *Quantization for the prescribed Q-curvature equation on open domains*, Commun. Contemp. Math. **13** (2011), 533-551.
9. (With L. Ambrosio and G. De Philippis) *Gamma-convergence of nonlocal perimeter functionals*, Manuscripta Math. **134** (2011), 377-403.
10. *A note on n-axially symmetric harmonic maps minimizing the relaxed energy*, J. Funct. Anal. **261** (2011), 3099-3117.
11. (With C. Mantegazza) *A note on quasilinear parabolic equations on manifolds.* Ann. Scuola Norm. Sup. Pisa Cl. Sci. (5) Vol **XI** (2012), 1-18.
12. (with A. Malchiodi) *Critical points of the Moser-Trudinger functional on a disk*, J. Eur. Math. Soc. (JEMS) **16** (2014), 893-908.
13. *Conformal metrics on* $\mathbb{R}^{2m}$ *with constant Q-curvature and large volume*, Ann. Inst. Henri Poincaré (C), **30** (2013), 969-982.
14. (with T. Jin, A. Maalaoui, J. Xiong) *Existence and asymptotics for solutions of a non-local Q-curvature equation in dimension three*, Calc. Var. Partial Differential Equations **52** (2015), 469-488.

15. (with A. Hyder) *Conformal metrics on $\mathbb{R}^{2m}$ with constant Q-curvature, prescribed volume and asymptotic behavior*, Discr. Cont. Dynamical Systems - A **35** (2015), 283-299.

16. (with F. Da Lio, T. Rivière) *Blow-up analysis of a nonlocal Liouville-type equation*, Analysis & PDE. **8** no. 7 (2015), 1757-1805.

17. (with A. Maalaoui, A. Schikorra) *Blow-up behaviour of a fractional Adams-Moser-Trudinger type inequality in odd dimension*, Comm. Partial Differential Equations **41** (2016), 1593-1618.

18. (with S. Iula, A. Maalaoui), *A fractional Moser-Trudinger type inequalitiy in one dimension and its critical points*, Differential and Integral Equations **29** (2016), 455-492.

19. *Fractional Adams-Moser-Trudinger inequalities*, Nonlinear Analysis **127** (2015) 263-278.

20. (with F. Da Lio), *The nonlocal Liouville-type equation in $\mathbb{R}$ and conformal immersions of the disk with boundary singularities*, Calc. Var. Partial Differential Equations (2017), 56:152.

21. (with G. Mancini), *The Moser-Trudinger inequality and its extremals on a disk via energy estimates*, Calc. Var. Partial Differential Equations (2017), 56:94.

22. (with A. Hyder, S. Iula) *Large blow-up sets for the prescribed Q-curvature equation in the Euclidean space*, Commun. Contemp. Math. **20** (2018), 1750026 (19 pages).

23. (with A. Hyder) *Gluing metrics with prescribed Q-curvature and different asymptotic behaviour in dimension* 6, Annali Sc. Norm. Sup. Pisa (5) **22** (2021), 505-547.

24. (with A. de la Torre, A. Hyder, Y. Sire), *The non-local mean-field equation on an interval*, Commun. Contemp. Math. 1950028 (2019).

25. (with A. Hyder, G. Mancini), *Local and nonlocal singular Liouville equations in Euclidean spaces*, Intern. Math. Res. Notices Vol. 2021, No. 15, pp. 11393–11425.

26. (con G. Mancini), *Extremals for fractional Moser-Trudinger inequalities in dimension 1 via harmonic extensions and commutator estimates*, Adv. Nonlin. Studies **20** (2020), 599-632.

27. (with. A. DelaTorre, M. Gonzalez, A. Hyder), *Concentration phenomena for the fractional Q-curvature equation in dimension* 3 *and fractional Poisson formulas*, J. London Math. Soc. **104** (2021), 423-451.

28. (with A. Hyder), *Normal conformal metrics on $\mathbb{R}^4$ with Q-curvature having power-like growth*, J. Diff. Equ., **301** (2021), 37-72.

29. (with P.-D. Thizy, J. Vétois), *Sign-changing blow-up for the Moser-Trudinger equation in $\mathbb{R}^2$*, J. Funct. Anal. 282 (2022), 109288.

30. (with F. De Marchis, A. Malchiodi, P-D. Thizy), *Critical points of the Moser-Trudinger functional on closed surfaces*, Invent. Math. **230** (2022), 1165-1248.

31. (with F. De Marchis, A. Malchiodi, P-D. Thizy), *Critical points of arbitrary energy for the Trudinger-Moser embedding in planar domains*, Adv. Math. **442** (2024), 109548.

32. (with T. Rivière), *Instanton's Insertions to arbitrary non flat Connections in $\mathbb{R}^4$*, preprint (2024), arXiv:2404.16426.

33. (with A. Hyder), *One-dimensional half-harmonic maps into the circle and their degree*, preprint (2024), arXiv:2405.18037.

Conference proceedings

1. *An application of Q-curvature to an embedding of critical type*, Oberwolfach Reports **6** (2009). 1997-2000.

2. *Recent results and open problems on conformal metrics on $\mathbb{R}^n$ with constant Q-curvature*, Extended Conference Abstracts, Spring 2013, CRM Barcelona.

3. (with F. Da Lio, T. Rivière), *The fractional Liouville equation in dimension 1 Geometry, Compactness and quantization*, RIMS Kokyuroku **2082** (2018), 168-176.

Fellowships and Research Grants

10/2000 - 09/2004	INdAM Fellowship for undergraduate students in mathematics, by National contest (ranked 2nd).
09/2004 - 08/2007	Stanford Graduate Fellowship (dropped when moving to ETH Zurich).
04/2008 - 09/2009	ETH Research Grant "TH" no. ETH-02 08-2 (90'000 CHF $\sim$ 92'380 EUR).
02/2010 - 01/2011	Swiss National Foundation fellowship for prospective researchers no. PBEZP2-129520 (42'000 CHF $\sim$ 43'100 EUR).
07/2013 - 06/2017	Swiss National Foundation Professorship (1'411'031 CHF $\sim$ 1'450'000 EUR).
07/2017 - 06/2019	Swiss National Foundation Professorship (546'387 CHF $\sim$ 560'800 EUR).
02/2022	Obtained score **A** in the 2nd step of evaluation of **ERC Consolidator Grant**.
01/2023 - 31/2024	Research Grant of CARIPLO and CDP (30'000 EUR)

Organized activities

— June 10-14, 2014: Conference *"Recent advances in non-local and non-linear analysis: theory and applications"*, organized with Francesca Da Lio, Rafe Mazzeo, Tristan Rivière at FIM, ETH Zurich.

— June 22-26, 2014 and July 14-18, 2014: Summer school on Geometric Measure Theory and Geometric Analysis, organized with Camillo De Lellis and Gianluca Crippa at the University of Basel.

— December 15-17, 2014: Workshop *"Nonlocal days"* on non-local equations, organized with Enno Lenzmann and Tristan Rivière at the University of Basel.

— November 25-28, 2019: Workshop *Recent trends in Geometric analysis and applications*, organized with Andrea Malchiodi and Luciano Mari at CRM E. De Giorgi, SNS, Pisa.

— November 11-22, 2024: Workshop and Winter school "Geometric Analysis and Curvature in Rome", at Sapienza Università di Roma.

— January 20 - February 7, 2025: Workshop and two Winter schools: "Calculus of Variations and PDE's in Geometric Analysis", at Sapienza Università di Roma..

Invited speaker

Speaker to selected international conferences

— 2009 – Workshop "Geomtric flows and Geometric operators", **CRM De Giorgi, SNS Pisa**.

— 2009 – Workshop "Partielle Differentialgleichungen", **MFO Oberwolfach**.

— 2009 – Workshop "Variational problems of higher order in geometry", **Freie Universität Berlin**.

— 2011 – Conference "Higher order operators in geometry and physics", **SISSA** Trieste.

— 2013 – Conference "Geometric analysis", **CRM Barcelona**.

— 2016 – Conference "Qualitative Aspects of the Theory of Nonlocal Equations, **Fields institute**, Toronto.

— 2016 – Conference "Geometric and Physical aspects of Trudinger-Moser type inequalities", **Mittag-Leffler Institute**.

— 2017 – Workshop "Analysis on Shapes of Solutions to Partial Differential Equations", **RIMS, Kyoto**.

— 2018 – Birs workshop "Physical, Geometrical and Analytical Aspects of Mean Field Systems Type", **Banff**, Canada.

— 2018 – Copenhagen-Lund Lectures, **University of Copenhagen**.

— 2019 – Birs workshop "Nonlinear geometric PDEs", **Banff**, Canada.

— 2019 – Workshop on Sharp Geometric Inequalities and applications to PDEs and Geometry, **TSIMF, Sanya, China**

— 2019 – Symposium "Recent advances in nonlinear problems", **CUNY**, City University of New York.

— 2020 – Workshop "Variational analysis on critical problems of non- linear partial differential equations", **Osaka City University**.

— 2021 – Online Workshop "Geometric PDE and applications to problems in conformal and CR geometry", **BIRS, Institute for Advanced Study in Mathematics (IASM), China**.

— 2022 – Summer School on Variational Problems and Functional Inequalities, **Osaka Metropolitan University** (OCAMI).

— 2022 – Workshop on Non-compact Variational Problems and Related Topics, **RIMS, Kyoto**

— 2023 – The First International Conference on Geometric and Functional Inequalities and their Applications in PDEs, **Beijing Institute of Technology**

— 2024 – JapanIta, Italian-Japanese conference at the **University of Milan, Italy**

— 2024 – Valentia Geometrica, workshop on differential geometry at the **University of Valencia (Spain)**

Mini-courses

— 11-12/02/2011 – "Concentration-compactness in conformal geometry", **MIT (Boston)**

— 19-20/05/2011 – "Compactness and quantization phenomena in conformal geometry and in the limiting cases of the Sobolev embeddings", Rencontre de Mathématique, **Université de Lyon**

— 13-14/02/2023 – "A degree theory for the Moser-Trudinger embedding", **OCAMI, Osaka**

Other seminars

— 23/10/2007 – ETH Zurich, weekly seminar of the Analysis group.

— 25/05/2009 – Cergy-Pontoise, conference "Geometric and nonlinear analysis".

— 11/06/2009 – Centro De Giorgi, Scuola Normale Superiore di Pisa, research period "Geometric Flows and Geometric Operators".

— 04/11/2009 – Pisa, weekly seminar of Calculus of Variations.

— 05/05/2010 – SISSA, weekly seminar of the Functional Analysis group.

— 15/12/2010 – Pisa, weekly seminar of Calculus of Variations.

— 09/02/2011 – MIT (Boston), weekly geometry seminar.

— 16/02/2011 – Rutgers University (New Jersey), weekly non-linear analysis seminar.

— 18/02/2011 – Princeton University (New Jersey), weekly geometry seminar.

— 24/02/2011 – Columbia University (New York), weekly geometry seminar.

— 29/11/2011 – Rutgers University (NJ), weekly non-linear analysis seminar.

— 23/05/2012 – Universität Basel, weakly analysis seminar.

— 25/05/2012 – EPF Lausanne, weekly analysis seminar.

— 29/05/2012 – ETH Zürich, weekly analysis seminar.

— 14/06/2012 – Hausdorff Center, Bonn, weekly analysis seminar.

— 18/10/2012 – City University of New York, weekly analysis seminar.

— 05/02/2013 – University of Pennsylvania, weekly analysis seminar.

— 15/04/2013 – John Hopkins Univeristy, Baltimore, weekly analysis seminar.

— 30/04/2013 – Rutgers University, weekly nonlinear analysis seminar.

— 08/10/2013 – University of Rome - Tor Vergata.

— 03/02/2014 – University of Tübingen, colloquium.

— 13/01/2015 – TIFR Bangalore, colloquium.

— 24/02/2015 – University of Lyon, analysis seminar.

— 27/04/2015 – University of Bern, colloquium.

— 14/07/2015 – Scuola Normale Superiore di Pisa.

— 13/08/2015 – PUC-Rio (Rio de Janeiro).

— 10/11/2015 – University of Nancy, weekly analysis seminar.

— 01/12/2015 – ETH Zurich, weekly analysis seminar.

— 23/06/2016 – University of Konstanz, Oberseminar.

— 20/12/2016 – Università di Milano.

— 17/01/2017 – University of Frankfurt, weekly analysis seminar

— 18/01/2017 – University of Giessen, weekly analysis seminar

— 23/01/2017 – University of Salzburg, weekly analysis seminar

— 16/02/2017 – Scuola Normale Superiore di Pisa, weekly analysis seminar

— 06/03/2017 – University of Cergy-Pontoise, analysis seminar

— 09/03/2017 – University of Pau, analysis seminar

— 10/06/2017 – Osaka City University, "37th South Osaka Applied Mathematics Seminar"

— 10/04/2018 – UBC Vancouver.

— 01/05/2018 – Rutgers, Nonlinear analysis seminar.

— 02/05/2018 – CUNY, Nonlinear Analysis and PDEs seminar.

— 03/05/2018 – Princeton, Special seminar in geometric analysis.

— 22/05/2018 – University of Copenhagen, Copenhagen-Lund Lectures.

— 23/05/2018 – University of Freiburg (Germany).

— 24/09/2018 – University of Cagliari

— 09/10/2018 – University of Lyon

— 31/10/2018 – University of Ferrara

— 06/11/2018 – ETH Zurich, Analysis seminar

— 15/11/2018 – University of Bologna

— 22/11/2018 – University of Rome La Sapienza.

— 03/05/2019 – University of Montreal, Canada.

— 30/05/2019 – Workshop "Partial Differential Equations in Analysis and Mathematical Physics", Santa Margherita di Pula (CA), Italy.

— 13/06/2019 – University of Granada, Spain.

— 02/08/2019 – XI Brazilian-Italian workshop on Nonlinear Differential Equations, Varese.

— 13/12/2019 – Workshop "6th Weekend on Variational Methods and Differential Equations" University of Catania, Italy.

— 08/01/2020 – University of Turin, Italy.

— 20/02/2020 – Osaka City University, workshop "Variational analysis on critical problems of nonlinear partial differential equations".

— 11/02/2021 – University of Rome 2, Tor Vergata, Analisys seminar

— 18/02/2021 – Sapienza University of Rome, P(n) seminar

— 28/04/2021 – University of Western Australia (online seminar)

— 06/07/2021 – Sapienza, University of Rome, Analysis seminar

— 11/10/2022 – PDE Colloquium of Central South University (online)

— 13/10/2022 – IIT Bombay Geometric Analysis Seminar

— 16/11/2022 – University of Rome 3, Analysis Seminar

— 10/03/2023 – University of Freiburg, Analysis Seminar

— 03/04/2023 – Sapienza, University of Rome, Analysis seminar

— 05/05/2023 – Basel-Zurich joint seminar

— 28/11/2023 – University Rome 2, Tor Vergata

— 02/05/2024 – ONE2024, Workshop at the University of Bari

Advising activity

PhD students and postdocs

— Ali Hyder, from TIFR Bangalore (PhD student 07/2013-06/2017)

— Stefano Iula, from Università di Roma, La Sapienza (PhD student 07/2013-06/2017)

— Dr. Ali Maalaoui, from Rutgers university (Postdoc 07/2013-06/2014)

— Dr. Armin Schikorra, from MPI Leipzig (Postdoc 07/2014-01/2015)

— Dr. Gabriele Mancini, from SISSA (Postdoc 10/2015-08/2018)

— Dr. Federica Sani, from Università di Milano (Postdoc 08/2016-11/2016)

— Dr. Azahara de la Torre Pedraza, from UPC Barcelona (Postdoc 01/2017-03/2018)

— Dr. Luca Battaglia, from Università di Roma La Sapienza (Postdoc 06/2017-07/2017)

— Dr. Cheikh Ndiaye, from University of Giessen (Postdoc 03/2017-09/2017)

— Chiara Bernardini, from University of Bologna (PhD student since 09/2020, coadvised with Prof. Annalisa Cesaroni)

— Yamin Wang, visiting PhD student from Renmin University, Beijing (11/2021-10/2022)

Undergraduate students

— Giovanni Giacomin (Master thesis defended 02/2021). Now PhD student at the University of Perth (Advisor: E. Valdinoci)

— Simone Masserini (Bachelor thesis defended 09/2021)

— Leonardo Del Grande (Master thesis defended in 2022)

— Andrea Lugini (Bachelor thesis defended in 09/2025)

— Giulia Pedica (Master Thesis defended in 02/2025)

— Davide Alessandrini (Master Thesis defended in 03/2025)

Co-advising of bachelor students at ETH Zurich

— 04/06/2008 Stephan Bass

— 05/02/2009 Stefan Kraft

— 22/06/2009 Sabrina Gross

Tutoring of students of Scuola Superiore di Studi Avanzati Sapienza

— Since 2025 Carlo Cetrone, Maria Faro and Carlo Iandolo.

— Since 2023 Lorenzo Citterio and Francesco Orbisaglia

— Since 2022 Elisabetta Romeo and Giacomo Landi

External referee for PhD Thesis

— April 2016, Xia Huang, East China Normal University, "Polyharmonic equations with exponential nonlinearity".

— February 2023, Maria Ahrend, University of Basel, "Fractional Liouville Equations and Calogero-Moser NLS".

Institutional activity

— Member of the "collegio docenti di dottorato" at the University of Padova for the cycles XXXIII, XXXIV, XXXV, XXXVI

— Member of the “Commissione Comunicazione” of the Department of Mathematics, University of Padova

— Head of the 2020 “Commissione Dipartimentale Progetti e Assegni”, Università di Padova.

— Head of the “Commissione Olimpiadi” of the Department of Mathematics Guido Castelnuovo, since 2022.

Teaching

Rutgers, The State University of New Jersey

At Rutgers I taught the following courses:

1. Calculus (Fall 2011)
2. Multivariable Calculus (Fall 2011)
3. Advanced Calculus for Engineering (Spring 2012)
4. Calculus (Fall 2012)
5. Ordinary differential equations (Spring 2013)

Universität Basel

At the university of Basel I taught the following courses

1. Differential geometry (Spring 2015)
2. Probability (Spring 2016)
3. Calculus of Variations (Spring 2017)

PUC - Rio de Janeiro

I visited PUC-Rio in Fall 2016 (September-October), giving an advanced course on elliptic regularity.

Università di Padova

1. Analysis 1 (Fall 2017)
2. Advanced Analysis (with Giovanni Colombo) (Fall 2017)
3. Analysis 1 (Fall 2018)
4. Complements of Analysis – @ Scuola Galileiana (Fall 2018)
5. Calculus of Variations (Spring 2019)
6. Analysis 1 (Fall 2019)
7. Degree Theory (Fall 2019) – PhD course
8. Complements of Analysis – @ Scuola Galileiana (Fall 2019)
9. Analysis 1 (Fall 2020)
10. Calculus of Variations (Spring 2021)

Sapienza Università di Roma

1. Calculus – @ Dept. of Computer Science (Fall 2021)
2. Mathematics – @ Dept. of Chemistry II (Spring 2022)
3. Analysis I – @ Mathematical Sciences for Artificial Intelligence (Fall 2022)
4. Calculus – @ Dept. of Computer Science (Fall 2022)
5. Analysis I – @ Mathematical Sciences for Artificial Intelligence (Fall 2023)
6. Partial Differential Equations – @ Dept. of Mathematics (Spring 2024)
7. Analysis I – @ Mathematical Sciences for Artificial Intelligence (Fall 2024)
8. Partial Differential Equations – @ Dept. of Mathematics (Spring 2025)
9. Analysis I – @ Dept. of Physics (Fall 2025)
10. Partial Differential Equations – @ Dept. of Mathematics (Spring 2026)

Third Mission

As Head of the **"Commissione Olimpiadi"** (committee for the Olympiads of Mathematics), I organized at the Department of Mathematics Guido Castelnuovo the following events:

— 11/02/2022: Gara a squadre, with around 60 teams from high-schools, for a total of around 400 students

— 03/03/2023: Gara a squadre, with 68 teams from high-schools, for a total of 476 students

— 27/04/2023: Gara individuale, with 78 high-school students

— 01/03/2024: Gara a squadre, with 70 teams from high-schools, for a total of 490 students

— 17/05/2024: Gara individuale, with 92 high-school students (mostly organized by Prof. Emanuele Spadaro)