

Luigi De Masi - Curriculum Vitae et Studiorum

Università degli studi di Padova, Dipartimento di Tecnica e Gestione dei Sistemi Industriali
Room 4BC9 at Dipartimento di Matematica “Tullio Levi Civita”, Via Trieste 63, Padova, 35121, Italy

emails: luigi.demasi@unipd.it, ldemasi@math.unipd.it
Cell Phone: +39 389 7894638

Born: October 9, 1989 — Sant’Agata de’ Goti (BN), Italy
Nationality: Italian

Current position

present *Post-doc Research Grant Holder* at University of Padova.
Supervisor: Prof. Annalisa Massaccesi.

Research interests

My research interests are in Geometric Measure Theory and Partial Differential Equations. My work during my PhD studies concerned the existence and regularity of minimal surfaces in compact domains of euclidean space using min-max and techniques applied to the area and capillarity functional. I also studied boundary properties of varifolds with free boundaries, in particular concerning the rectifiability of the free boundary. Currently I am doing researches in branched optimal transport and other questions related to the structure of measures satisfying a constraint given by a linear PDE.

Education

20/12/2016 BACHELOR DEGREE in Mathematics, Magna cum laude, University of Naples “Federico II”
Thesis: “*La misura di Hausdorff e la formula dell’area*”
Advisor: Prof. Nicola Fusco

20/09/2018 MSc in Mathematics, Magna cum laude, University of Trieste
Thesis: “*Min-max construction of minimal hypersurfaces*”
Advisor: Prof. Guido De Philippis

29/09/2022 PhD in Mathematical Analysis, Modeling and Applications, SISSA, Trieste
Thesis: “*Existence and properties of minimal surfaces and varifolds with contact angle conditions*”.
Advisor: Prof. Guido De Philippis

Scholarships

2016 - 2018 SISSA Scholarship for MSc in Mathematics, joint curriculum with University of Trieste.

Publications

DE MASI, L. (2021). “Rectifiability of the free boundary for varifolds”. In: *Indiana Univ. Math. J.* 70 (6), pp. 2603–2651. ISSN: 0022-2518.

DE MASI, L. and G. DE PHILIPPIS (2021). *Min-max construction of minimal surfaces with a fixed angle at the boundary*. Submitted to *J. Differ. Geom.*, acceptance up to required revisions. arXiv: [2111.09913](https://arxiv.org/abs/2111.09913) [[math.DG](#)].

DE MASI, L. (2022). “Existence and properties of minimal surfaces and varifolds with contact angle conditions”. PhD thesis. SISSA. URL: <https://hdl.handle.net/20.500.11767/129590>.

DE MASI, L. and C. GASPARETTO (2023). *Non-rigidity of the absolutely continuous part of \mathcal{A} -free measures*. arXiv: [2312.06026](https://arxiv.org/abs/2312.06026) [[math.AP](#)].

Speaker

Speaker to the following workshops:

- *Three days between Analysis and Geometry in Trento*, Trento (TN), 30 August 2022.
- *Geometric Analysis: Past, Present and Future*, Online (Youtube), September-October 2022.
- *Calculus of Variations and Free Boundary Problems IV*, Pisa (PI), 8 November 2022.
- *XXXII Convegno Nazionale di Calcolo delle Variazioni*, Levico Terme (TN), 8-12 May 2023.
- *ICIAM 2023, Minisymposium on “Variational methods for thin structures and free-boundary problems”*, Tokyo (Japan), 24 August 2023.

Talks

- *Variational inequalities*, SISSA Trieste, 7 June 2018;
- *An introduction to surfaces and varifolds with free boundaries and their structure*, SISSA Trieste, 12 June 2020;
- *Min-max theory for minimal surfaces*, SISSA Trieste, 28 January 2022;
- *Min-max theory for minimal surfaces*, University of Padova, 28 April 2022.
- *Min-max construction of minimal surfaces with contact angle conditions*, University of Trento, 30 November 2022.
- *Robust optimal networks*, SISSA Trieste, 19 May 2023.

Organization of Workshops

- *Geometric Measure Theory: a workshop in Bressanone*, Bressanone (BZ), 29 May - 2 June 2023; in collaboration with Annalisa Massaccesi and Mattia Fogagnolo.
- *Geometric Measure Theory in Cortona*, Cortona (AR), 17-21 June 2024; in collaboration with Antonio De Rosa, Annalisa Massaccesi, Andrea Marchese and Gianmarco Caldini.

Participation to Workshops

Participation to the following workshops:

- *Geometric Measure Theory in Verona*, Verona, 11-15 June 2018;
- *XXIX Convegno Nazionale di Calcolo delle Variazioni*, Levico Terme (TN), 04-08 February 2019;
- *Geometric Measure Theory and Applications: From Geometric Analysis to Free Boundary Problems*, Cetraro (CS), 02-06 September 2019;
- *Calculus of Variations and Applications (on the Occasion of Gianni Dal Maso’s Birthday)*, Trieste, 27 January 2020 - 01 February 2020;
- *XXX Convegno Nazionale di Calcolo delle Variazioni*, Levico Terme (TN), 03-07 February 2020.
- *XXXI Convegno Nazionale di Calcolo delle Variazioni*, Levico Terme (TN), 09-13 May 2022.
- *Geometric Analysis and PDE on Garda lake*, Gargnano sul Garda (BS), 08-10 June 2022.
- *Geometric and analytic aspects of functional variational principles*, Cetraro (CS), 26 June 2022 - 01 July 2022.
- *Research in pairs in occasion of the virtual ICM 2022*, Recanati (MC), 4-14 July 2022.

- *Three days between Analysis and Geometry in Trento*, Trento (TN), 29-31 August 2022.
- *Geometric Analysis: Past, Present and Future*, Online (Youtube), September-October 2022.
- *Calculus of Variations and Free Boundary Problems IV*, Pisa (PI), 8 November 2022.
- *XXXII Convegno Nazionale di Calcolo delle Variazioni*, Levico Terme (TN), 8-12 May 2023.
- *Regularity Theory for Free Boundary and Geometric Variational Problems III*, Levico Terme (TN), 19-23 June 2023.
- *ICIAM 2023*, Tokyo (Japan), 24 August 2023.

Teaching

2017 - 2018	Exercise classes in “Analisi 3 - A” at University of Trieste.
2018 - 2019	Training for Mathematical Olympiads coordinated by University of Trieste.
2022 - 2023	Classes in “Analisi Matematica” for the Laurea Triennale in Informatica at University of Padova (joint with F.P. Montefalcone).
2023 - 2024	Classes in “Analisi Matematica 1” for the Laurea Triennale in Ingegneria Biomedica at University of Padova (joint with V. Franceschi).

Projects

2022 - 2024	STARS-StG project “QUASAR - Question About Structure And Regularity of currents” (participant). PI: Prof. Annalisa Massaccesi.
2024	GNAMPA project “Minimizers for the area functional: existence, regularity and geometrical properties”(participant). PI: Giulia Bevilacqua.

Other informations

2023	Eligibility for the selection procedure for 2 RTDa positions at the Department of Mathematics of University of Trento.
2023	Eligibility for the selection procedure for 2 Post-doc positions at GSSI.
2023	Eligibility for the selection procedure for 1 Post-doc position at the Department of Mathematics of University of Trento.
2024	Eligibility for the selection procedure for 1 Post-doc position at SISSA, Trieste.

Udine, 21/01/2024