Salvatore Stuvard

Curriculum Vitae et Studiorum

Personal Information

Full name	Salvatore Stuvard
Citizenship	Italian
Languages	English (fluent), Italian (native), German (intermediate)

Current Appointment

Jun 2024 - present **Associate Professor**, *University of Milan (Italy)*

Previous Appointments

Jun 2021 - May 2024 **Ricercatore a Tempo Determinato – Lettera B (tenure-track Assistant Professor)**, *University of Milan (Italy)*

Sep 2018 - May 2021 **Instructor of Mathematics & Bing Fellowship Holder**, *The University of Texas at Austin (USA)*

Sep 2017 - Aug 2018 **Postdoctoral Researcher**, *The University of Texas at Austin (USA)*,
Principal Investigator: Prof. Francesco Maggi.
Supported by the NSF funded program FRG: 'Vectorial and geometric problems in the Calculus of Variations"

Education and Training

Sep 2013 - Aug 2017 **Ph.D. in Mathematics**, *University of Zurich (Switzerland)*,
Advisor: Prof. Camillo De Lellis.
Supported by the ERC grant 306247: Regularity of area-minimizing currents.
Title of the Ph.D. thesis: "*Geometric variational problems on spaces of multiple valued functions*".
Graduation date: November, 1st 2017

Nov 2010 - Jul 2013 **M.Sc. in Mathematics**, *University of Naples "Federico II" (Italy)*,
Thesis advisor: Prof. Massimiliano Berti.
Title of the master thesis: "*On the Cauchy Problem for Nonlinear Wave Equations*".
Graduation date: July, 24th 2013.
Summa cum Laude

Università degli Studi di Milano – Dipartimento di Matematica
Via Saldini 50, I-20133 Milano (MI), Italy
sstuvard.wixsite.com/math

Oct 2007 - Oct 2010 **B.Sc. in Mathematics**, *University of Naples "Federico II" (Italy)*,
Thesis advisor: Prof. Vittorio Coti Zelati.
Title of the thesis: "*Topological Dynamical Systems*".
Graduation date: October, 28th 2010.
Summa cum Laude

Grants, Fellowships, and Peer Recognition

Jun 2025 National Scientific Habilitation to the role of Full Professor in Mathematical Analysis by the Italian Ministry of University and Research

Feb 2025 Grantee within the competitive call *FIS 2 Starting Grant* for the funding of research project "*SiGmA - Singularities in Geometric Analysis: Minimal Surfaces and Mean Curvature Flows*" by the Italian Science Foundation (Ministry of University and Research). Total funds 1.322.385,33 EUR

Sep 2023 - Sep 2025 Scientific coordinator of the research unit at the University of Milan within project PRIN 2022PJ9EFL - "*Geometric Measure Theory: Structure of Singular Measures, Regularity Theory and Applications in the Calculus of Variations*" with PI Andrea Marchese. Total funds 217.473 EUR; Milan unit 18.061 EUR

Oct 2022 MATRIX Travel grant (2.500 AUD) from the MATRIX Research Institute and the Simons Foundation

Jun 2022 - May 2023 P.I. of INdAM-GNAMPA project "*Geometric Measure Theory and Applications*" (3.000 EUR)

Jul 2020 - Jun 2022 Simons Travel Grant (5.000 USD) from the American Mathematical Society and the Simons Foundation

Sep 2018 - Aug 2021 R. H. Bing Fellowship at the University of Texas at Austin (with 1.000 USD per year of travel allowance)

Sep 2013 - Aug 2017 Fellowship of the ZGSM (Zurich Graduate School in Mathematics)

Professional societies

- Member of the *American Mathematical Society (AMS)* since 2019
- Member of *Unione Matematica Italiana* since 2021
- Member of *INdAM - Gruppo Nazionale per l'Analisi Matematica, la Probabilità e le loro Applicazioni (GNAMPA)* since 2019

Research Interests

- Geometric Analysis
- Geometric Measure Theory
- Calculus of Variations
- Partial Differential Equations

Scientific Production

[23] A. Skorobogatova, L. Spolaor, S. Stuvard. Structure of two-dimensional mod(q) area-minimizing currents near flat singularities: the codimension one case. Preprint arXiv:2506.17813 (Jun 2025).

[22] G. Bevilacqua, S. Stuvard, B. Velichkov. Classical solutions to the soap film capillarity problem for plane boundaries. **Math. Ann.** (2025). Preprint arXiv:2407.09193 (Jul 2024)

[21] S. Stuvard. New advances on the existence and regularity of Brakke's mean curvature flows. To appear on **MATRIX Book Series**. Preprint arXiv: 2311.05370 (Nov 2023).

[20] C. De Lellis, J. Hirsch, A. Marchese, L. Spolaor, S. Stuvard. Excess decay for minimizing hypercurrents $\mod 2Q$. **Nonlinear Anal.** *247 (2024)*. Preprint arXiv: 2308.08704 (Aug 2023).

[19] S. Stuvard, Y. Tonegawa. End-time regularity theorem for Brakke flows. **Math. Ann.** *390, 3317-3353 (2024)*. Preprint arXiv:2212.07727 (Dec 2022).

[18] C. De Lellis, J. Hirsch, A. Marchese, L. Spolaor, S. Stuvard. Fine structure of the singular set of area minimizing hypersurfaces modulo p. *Submitted*. Preprint arXiv:2201.10204 (Jan 2022).

[17] S. Stuvard, Y. Tonegawa. On the existence of canonical multi-phase Brakke flows. **Adv. Calc. Var.** *17 (2024), no.1, 33-78*. Preprint arXiv:2109.14415 (Sep 2021).

[16] C. De Lellis, J. Hirsch, A. Marchese, L. Spolaor, S. Stuvard. Area minimizing hypersurfaces modulo p: a geometric free-boundary problem. *Submitted*. Preprint arXiv:2105.08135 (May 2021).

[15] D. King, F. Maggi, S. Stuvard. Plateau's problem as a singular limit of capillarity problems (Revised). **Comm. Pure Appl. Math.** *75 (2022), no. 5, 895-969*. Preprint arXiv:1907.00551v3 (May 2021).

[14] S. Stuvard, Y. Tonegawa. Dynamical instability of minimal surfaces at flat singular points. **J. Differential Geom.** 130(2), 477-516 (2025). Preprint arXiv:2008.13728 (August 2020).

[13] D. King, F. Maggi, S. Stuvard. Smoothness of collapsed regions in a capillarity model for soap films. **Arch. Ration. Mech. Anal.** *243 (2022), no.2, 459-500*. Preprint arXiv:2007.14868 (July 2020).

[12] D. King, F. Maggi, S. Stuvard. Collapsing and the convex hull property in a soap film capillarity model. **Ann. Inst. H. Poincaré Anal. Non Linéaire** *38 (2021), no. 6, 1929-1941*. Preprint arXiv:2002.06273 (February 2020).

[11] S. Stuvard, Y. Tonegawa. An existence theorem for Brakke flow with fixed boundary condition. **Calc. Var. Partial Differential Equations** *60 (2021), no. 43*. Preprint arXiv:1912.02404 (December 2019).

[10] C. De Lellis, J. Hirsch, A. Marchese, S. Stuvard. Regularity of area minimizing currents mod p. **Geom. Funct. Anal.** *30 (2020), no. 5, 1224-1336*. Preprint arXiv:1909.05172 (September 2019).

[9] C. De Lellis, J. Hirsch, A. Marchese, S. Stuvard. Area minimizing currents mod $2Q$: linear regularity theory. **Comm. Pure Appl. Math.** *75 (2022), no. 1, 83-127*. Preprint arXiv:1909.03305 (September 2019).

[8] D. King, F. Maggi, S. Stuvard. Plateau's problem as a singular limit of capillarity problems. **Comm. Pure Appl. Math.** *75 (2022), no. 3, 541-609*. Preprint arXiv:1907.00551 (July 2019).

[7] F. Maggi, A. Scardicchio, S. Stuvard. Soap films with gravity and almost-minimal surfaces. **Discrete Cont. Dyn. Syst.** *39 (2019), no. 12, 6877-6912*. Preprint arXiv:1807.05200 (July 2018).

[6] A. Marchese, A. Massaccesi, S. Stuvard, R. Tione. A multi-material transport problem with arbitrary marginals. **Calc. Var. Partial Differential Equations** *60 (2021), no. 88*. Preprint arXiv:1807.10969 (July 2018).

[5] J. Hirsch, S. Stuvard, D. Valtorta. Rectifiability of the singular set of multiple valued energy minimizing harmonic maps. **Trans. Amer. Math. Soc.** *371 (2019), no. 6, 4303-4352*. Preprint arXiv:1708.02116 (August 2017).

[4] S. Stuvard. Multiple valued sections of vector bundles: the reparametrization theorem for Q-valued functions revisited. **Comm. Anal. Geom.** *30 (2022), no. 1, 207-255*. Preprint arXiv:1705.00054 (May 2017).

[3] M. Colombo, A. De Rosa, A. Marchese, S. Stuvard. On the lower semicontinuous envelope of functionals defined on polyhedral chains. **Nonlinear Anal.** *163 (2017), 201-215*. Preprint arXiv:1703.01938 (March 2017).

[2] S. Stuvard. Multiple valued Jacobi fields. **Calc. Var. Partial Differential Equations** *58 (2019), no. 3*. Preprint arXiv:1701.08753 (January 2017).

[1] A. Marchese, S. Stuvard. On the structure of flat chains modulo p. **Adv. Calc. Var.** *11 (2018), no. 3, 309-323*. Preprint arXiv:1607.05138 (July 2016).

Selected Invited Presentations or Participations

2018 - present: Invited speaker to several top-level universities and research centers, including California Institute of Technology, Columbia University, MPI-MiS Leipzig, Purdue University, La Sapienza University of Rome, Stanford University, Tokyo Institute of Technology, Tokyo University, Universität Münster, University of California San Diego, University of Chicago, University of Pisa, University of Warwick, University of Washington.

06/2025 Workshop on the Regularity of Free Boundary and Geometric Variational Problems V, Cervia, Italy

03/2025 Workshop on "Nonlocal variational problems and PDEs", Gran Sasso Science Institute, L'Aquila, Italy

01/2025 Westlake Winter School in Geometric Measure Theory, Westlake University, China

06/2024 Workshop on the Regularity of Free Boundary and Geometric Variational Problems IV, Levico Terme, Italy

06/2024 Workshop on Geometric Measure Theory and Applications, Cortona, Italy

03/2024 Workshop on "Measures & Materials", University of Warwick

09/2023 XXII Congresso dell'Unione Matematica Italiana, session on Calculus of Variations and Control and session on Real Analysis and Functional Inequalities, Pisa, Italy

08/2023 ICIAM, minisymposium on Variational methods for thin structures and free-boundary problems, Waseda University, Tokyo, Japan

07/2023 Oberwolfach workshop in Partial Differential Equations, MFO - Mathematisches Forschungsinstitut Oberwolfach, Germany

06/2023 Workshop on the Regularity of Free Boundary and Geometric Variational Problems III, Levico Terme, Italy

02/2023 Workshop on Minimal Surfaces and Geometric Flows: interaction between the local and the nonlocal world, MATRIX Research Institute, Creswick, Victoria, Australia

08/2022 Oberwolfach workshop in Calculus of Variations, MFO - Mathematisches Forschungsinstitut Oberwolfach, Germany

07/2022 Workshop on the Regularity of Free Boundary and Geometric Variational Problems II, Pisa, Italy

05/2022 XXXI Convegno Nazionale di Calcolo delle Variazioni, Levico Terme, Italy

09/2021 Workshop on Geometric Measure Theory and Applications, Cortona, Italy

06/2021 Workshop on Minimal Surfaces and Related Topics, Shanghai, China

09/2020 AMS Fall Central Sectional Meeting, special session on the "Geometry of Submanifolds and Integrable Systems", El Paso (TX), USA

01/2020 AMS Joint Mathematics Meeting, AMS Special Session on Interfaces Between PDEs and Geometric Measure Theory, Denver (CO), USA

06/2019 Workshop on "New trends in variational models: from superconductors to liquid crystals", The Fields Institute, Toronto, Ontario, Canada

Workshops and Schools Organization

November 2024 "*PDE Festival@UniMi*" (co-organized with Andrea Aspri, Claudia Bucur, Marta Calanchi, Cecilia Cavaterra, Riccardo Montalto, and Kevin Payne), University of Milan, Italy.

June 2022 "*Geometric Analysis and PDE on Garda Lake*" (co-organized with Giulio Ciraolo and Matteo Cozzi), Gargnano del Garda, Italy.

March 2020 "*Texas Differential Equations 2020*" (co-organized with Irene Gamba and Francesco Maggi), The University of Texas at Austin

Teaching

- University of Milan (since June 2021)
  - *Introduction to the Mean Curvature Flow and its Regularity Theory*, Ph.D. in Mathematics, 2023
  - *Argomenti Avanzati di Analisi Reale*, Master in Mathematics, since 2025
  - *Analisi Matematica 3* (Lezioni), Bachelor in Physics, since 2024
  - *Analisi Matematica 3* (Esercitazioni), Bachelor in Physics, 2023
  - *Analisi Matematica 1* (Esercitazioni), Bachelor in Mathematics, since 2021
  - *Didattica del Calcolo Infinitesimale*, Master in Mathematics, 2021 and 2022

- The University of Texas at Austin (Sep 2018 - May 2021, 2 courses per year)
  - M408K - *Differential Calculus*, 2020
  - M393C - *Geometric Harmonic Maps*, Ph.D. in Mathematics, 2019
  - M341 - *Linear Algebra and Matrix Theory*, 2019
  - M346 - *Applied Linear Algebra*, 2019
  - Conference course *Topics in Geometric Measure Theory*, 2019
  - M361 - *Theory of Functions of a Complex Variable*, 2018 and 2021
- University of Zurich (as T.A., Sep 2013 - Aug 2017, 2 courses per year)
  - *Mathematical Statistics*, Master in Mathematics, 2016
  - *Einführung in die Wahrscheinlichkeit* (Introduction to Probability), Bachelor in Physics and Life Sciences, 2015 and 2016
  - *Mathematik für die Chemie I* (Calculus 1), Bachelor in Chemistry, 2015
  - *ODEs and Dynamical Systems*, Bachelor and Master in Mathematics, 2015
  - *Analysis II*, Bachelor in Mathematics, 2014 and 2017
  - *Geometrie / Topologie I* (Geometry and Topology), Bachelor in Mathematics, 2013

Ph.D. Students

Oct 2024 - present: Advisor of the Ph.D. thesis of Alessandro Scapin at the University of Milan

Jan 2019 - May 2021: Co-advisor of the Ph.D. thesis of Darren King at the University of Texas at Austin (main advisor Francesco Maggi)

Students

Sep 2023 - Sep 2024: Advisor of the master thesis of Alessandro Scapin at the University of Milan. Title: "*Curvature estimates and a Bernstein type theorem for stable minimal immersions*"

Sep 2023 - Apr 2024: Advisor of the master thesis of Tommaso Vassura at the University of Milan. Title: "*The partial regularity of stationary varifolds: Allard's theorem*"

Sep 2018 - May 2019: Co-advisor of the bachelor thesis of Hunter Stufflebeam at the University of Texas at Austin (main advisor Francesco Maggi). Topic: Allard's ε-regularity theorem for varifolds with bounded mean curvature

Sep 2016 - Jan 2017: Co-advisor of the master thesis of Emanuele Caputo at the EPFL and the University of Zurich (main advisor Camillo De Lellis). Topic: Analysis of Dirichlet minimizing multiple valued functions

Academic Activities

2023 - present: Co-organizer of the Analysis Seminar at the Department of Mathematics of the University of Milan (with Claudia Bucur and Mattia Calzi)

2023 - present: Member of the Steering Committee of the Center of Excellence in Mathematics to be soon established at the University of Milan within the "2023-2027 Department of Excellence program" funded by MUR (Italian Ministry of University and Research)

2023 - 2024: Member of the academic board of the Ph.D. School in Mathematical Sciences at the University of Milan

Jun 2023 Doctoral Committee Member for the Ph.D. of Daniel Weser at the University of Texas at Austin

Sep 2018 - May 2021 Co-organizer of the Analysis Seminar at the Department of Mathematics of UT Austin (with Stefania Patrizi)

Service

- Referee activity (journals): *Duke Math. J., J. Differential Geom., J. Funct. Anal., Mem. AMS, Anal. PDE, Ann. Inst. H. Poincaré Anal. Non Linéaire, Trans. AMS, Calc. Var. PDE, SIAM J. Math. Anal., Indiana Univ. Math. J., Commun. Contemp. Math., Potential Anal, Discr. Cont. Dyn. Syst, J. Geom. Anal.*
- MR / MathSciNet Reviewer since 2020

Updated to June 25th 2025