

# CURRICULUM VITAE

**Francesco Maggi**

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Professor of Mathematics, University of Texas at Austin

Italian and US citizen

Languages: Italian (native), English (fluent)

## 1. GENERAL INFORMATION

### **Appointments and education**

*Full professor* UT Austin, USA, 2016/present

*Member* Institute for Advanced Study, Princeton, USA, January-April 2019

*Research scientist* ICTP Trieste (UNESCO), Italy, 2016/2017

*Associate professor* UT Austin, USA, 2012/2015

*Professore associato* (Associate prof.), U. Firenze, Italy, 2011/2012

*Ricercatore* (Assistant prof.), U. Firenze, Italy, 2005/2011

*Wissenschaftlichen Assistenten CI* (Assistant prof.) U. Duisburg-Essen, Germany, 2005

*Postdoctoral associate*, MPI-MIS Leipzig, Germany, 2004

*Ph.D. in Mathematics*, U. Firenze, Italy, 2004

*Visiting graduate student* MPI-MIS Leipzig, Germany, Fall 2002 and Fall 2003

*Visiting graduate student* Carnegie Mellon University, Pittsburgh, USA, Spring 2003

*M.S. in Mathematics*, U. Firenze, Italy, 2000

### **Awards, honors, fellowships and others:**

*Holder of the Cook professorship*, UT Austin, 2019/2021 term and 2021/23 term.

*Fellow of the Cook professorship, UT Austin, 2015/2016*

*Frank E. Gerth III faculty fellowship, UT Austin, 2014/2017*

*Introduction to the work of Alessio Figalli for the general public, Fields Institute, 2020*  
([video](#))

*Italian Mathematical Union Colloquium, Roma Sapienza, 2017*

*Plenary speaker, SIAM-SIAG PDE Conference 2015*

*Plenary speaker, INdAM (Italian National Institute for Higher Mathematics) day 2015*

*Simon visiting professorship, U. Zurich and MFO Oberwolfach, July 2014*

*Premio Carlo Miranda 2008, Accademia di Scienze Fisiche e Matematiche di Napoli*

## **2. RESEARCH**

### **2.1 GRANTS**

#### **Current funding**

*Rigidity, Stability, Regularity, and Resolution Theorems in the Geometric Calculus of Variations, NSF Grant DMS-2247544, 2023/2028 (\$372,943)*

*RTG: Analysis of Partial Differential Equations, NSF Grant DMS-1840314, as PI with Arie Israel, Natasa Pavlovic, Stefania Patrizi and Alexis Vasseur as co-PIs, starting date 6/2019 (\$2,495,920)*

#### **Past funding**

**With NSF:** *Geometric Variational Problems for Surface Tension Driven Systems, NSF Grant DMS-2000034, 2020/2023. (\$249,988)*

*Quantitative analysis of rigidity theorems and geometric inequalities, NSF Grant DMS-1565354, 2017/2020. (\$179,999)*

*Stability, symmetry and regularity issues in geometric variational problems, NSF Grant DMS-1265910, 2013/2016. (\$238,499)*

*FRG: New Challenges in Geometric Measure Theory, NSF Grant DMS-1854344, as PI for UT Austin; PI Tatiana Toro, PI for Princeton Camillo De Lellis; 2019/2023. (\$141,532)*

*FRG: Collaborative Research: Vectorial and geometric problems in the Calculus of Variations*, NSF DMS-1361122, as coPI, with Evans (Berkley, coPI), Figalli (UT Austin, PI), and Savin (Columbia U, coPI) 2014/2018. (\$560,000)

**With ERC:** *Analysis of optimal sets and optimal constants: old questions and new results*, ERC Starting Grant 258685, as coPI; PI, Aldo Pratelli; 2010/16.

*Analytic techniques for geometric and functional inequalities*, ERC Advanced Grant 246923, as coPI; PI Nicola Fusco; 2009/15.

**With INdAM:** *Geometric-functional inequalities in sharp and quantitative form*, GNAMPA-INdAM, from 2007.

## 2.2 PUBLICATIONS

Mathscinet reports 1982 citations by 1056 authors over 1127 publications. Preprints are available on the arXiv and cvgmt.sns.it servers.

### Books and lecture notes

**3** Maggi, Francesco (2023). *Optimal Mass Transport on Euclidean Spaces*. In preparation. *Cambridge Studies in Advanced Mathematics 207*, Cambridge University Press, 2023.

**2** Maggi, Francesco (2012). *Sets of Finite Perimeter and Geometric Variational Problems: an Introduction to Geometric Measure Theory*, *Cambridge Studies in Advances Mathematics 135*, Cambridge University Press, 2012.

**1** Maggi, Francesco (2008). *Symmetrization, Optimal Transport and Quantitative Isoperimetric Inequalities*. This is a chapter in: *Optimal transportation, Geometry and Functional inequalities* (Edited by Luigi Ambrosio). *Centro di Ricerca Matematica Ennio De Giorgi (CRM) Series, 11*. Edizioni della Normale, Pisa, 2010.

### Research papers

**67** Maggi, Francesco; Novack, Michael; Restrepo, Daniel. A hierarchy of Plateau's problems and the approximation of Plateau's laws via the Allen—Cahn equation. Preprint [arXiv:2312.11139](https://arxiv.org/abs/2312.11139).

**66** Maggi, Francesco; Novack, Michael; Restrepo, Daniel. Plateau borders in soap films and Gauss' capillarity theory. Preprint [arXiv:2310.20169](https://arxiv.org/abs/2310.20169).

**65** Fusco, Nicola; Maggi, Francesco; Morini, Massimiliano; Novack, Michael. Rigidity and Large Volume Residues in Exterior Isoperimetry for Convex Sets. Preprint [arXiv:2310.13569](https://arxiv.org/abs/2310.13569).

- 64** Maggi, Francesco; Santilli, Mario. Rigidity and compactness with constant mean curvature in warped product manifolds. Preprint [arXiv:2303.03499](#).
- 63** Maggi, Francesco; Neumayer, Robin; Tomasetti, Ignacio. Rigidity theorems for best Sobolev inequalities. Submitted paper. Preprint [arXiv:2206.12386](#). Accepted on *Advances in Mathematics* (2023).
- 62** Maggi, Francesco; Novack, Michael. Isoperimetric residues and a mesoscale flatness criterion for hypersurfaces with bounded mean curvature. Submitted paper. Preprint [arXiv:2205.02951](#).
- 61** Maggi, Francesco; Restrepo, Daniel. Uniform stability in the Euclidean isoperimetric problem for the Allen-Cahn energy. *Analysis & PDE* (2023). Preprint [arXiv:2202.11583](#).
- 60** King, Darren; Maggi, Francesco; Stuard, Salvatore. 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](#).
- 59** Dipierro, Serena; Maggi, Francesco; Valdinoci, Enrico. Minimizing cones for fractional capillarity problems. *Rev. Mat. Iberoam.* 38 (2022), no. 2, 635–658. Preprint [arXiv:2008.06175](#).
- 58** King, Darren; Maggi, Francesco; Stuard, Salvatore. Collapsing and the convex hull property in a soap film capillarity model. *Ann. Inst. H. Poincaré C Anal. Non Linéaire* 38 (2021), no. 6, 1929–1941. Preprint [arXiv:2002.06273](#).
- 57** Bernstein, Jacob; Maggi, Francesco; Rigidity theorems for minimal surfaces with singularities. *Arch. Ration. Mech. Anal.* 239 (2021), no. 2, 1177–1210. Preprint [arXiv:2003.01784](#).
- 56** King, Darren; Maggi, Francesco; Stuard, Salvatore. Plateau's problems as a singular limit of capillarity problems. *Comm. Pure Appl. Math.* 75 (2022), no. 5, 895–969. Preprint [arXiv:1907.00551](#).
- 55** Maggi, Francesco; Scardicchio, Antonello; Stuard, Salvatore. Soap films with gravity and almost-minimal surfaces. *Disc. Cont. Dynamical Systems* 39 (2019), no. 12, 6877–6912. Volume in honor of Luis Caffarelli's 70th birthday. Preprint [arXiv:1807.05200](#).
- 54** Delgadino, Matias; Maggi, Francesco. Alexandrov's theorem revisited. *Anal. PDE* 12 (2019), no. 6, 1613–1642. Preprint [arXiv:1711.07690](#)
- 53** Cavalletti, Fabio; Maggi, Francesco; Mondino, Andrea. Quantitative isoperimetry à la Lévy-Gromov, *Comm. Pure Appl. Math.* 72 (2019), no. 8, 1631–1677. Preprint [arXiv:1707.04326](#)

**52** Delgadino, Matias G.; Maggi, Francesco; Mihaila, Cornelia; Neumayer, Robin; Bubbling with L2-Almost Constant Mean Curvature and an Alexandrov-Type Theorem for Crystals. *Arch. Ration. Mech. Anal.* 230 (2018), no. 3, 1131–1177. Preprint [arXiv:1705.10117](#)

**51** Cavalletti, Fabio; Maggi, Francesco; Mondino, Andrea; Rigidity for critical points in the Lévy-Gromov inequality, *Math. Z.* 289 (2018), no. 3-4, 1191–1197. Preprint [arXiv:1612.04119](#)

**50** Figalli, Alessio; Maggi, Francesco; Mooney, Connor The sharp quantitative Euclidean concentration inequality. *Camb. J. Math.* 6 (2018), no. 1, 59–87. Preprint [arXiv:1601.04100v2](#)

**49** Dipierro, Serena; Maggi, Francesco; Valdinoci, Enrico Asymptotic expansions of the contact angle in nonlocal capillarity problems. *J. Nonlinear Sci.* 27 (2017), no. 5, 1531–1550. Preprint [arXiv:1610.00075](#)

**48** Maggi, Francesco; Valdinoci, Enrico Capillarity problems with nonlocal surface tension energies. *Comm. Partial Differential Equations* 42 (2017), no. 9, 1403–1446. Preprint [arXiv:1606.08610](#)

**47** Ciraolo, Giulio; Figalli, Alessio; Maggi, Francesco. A quantitative analysis of metrics on  $\mathbb{R}^n$  with almost constant positive scalar curvature, with applications to fast diffusion flows. *Int. Math. Res. Not. IMRN*, no. 21 (2018), 6780–6797. Preprint [arXiv:1602.01916](#)

**46** Cicalese, Marco; Leonardi, Gian Paolo; Maggi, Francesco Sharp stability inequalities for planar double bubbles. *Interfaces Free Bound.* 19 (2017), no. 3, 305–350. Preprint [arXiv:1211.3698](#)

**45** Ciraolo, Giulio; Figalli, Alessio; Maggi, Francesco; Novaga, Matteo; Rigidity and sharp stability estimates for hypersurfaces with constant and almost-constant nonlocal mean curvature. *J. Reine Angew. Math.* 741 (2018), 275–294. Preprint [arXiv:1503.00653](#)

**44** Carlen, Eric; Maggi, Francesco. Stability for the Brunn-Minkowski and Riesz rearrangement inequalities, with applications to Gaussian concentration and finite range non-local isoperimetry. *Canad. J. Math.* 69 (2017), 1036-1063. Preprint [arXiv:1507.03454](#).

**43** Maggi, Francesco; Neumayer, Robin. A bridge between Sobolev and Escobar inequalities and beyond, *J. Funct. Anal.* 273(6) (2017), 2070-2106. Preprint [arXiv:1609.02346](#)

**42** Krummel, Brian; Maggi, Francesco. Isoperimetry with upper mean curvature bounds and sharp stability estimates, *Calc. Var. PDE.* 56(2) (2017), Paper no. 53, 43 pp. Preprint [arXiv:1606.00490](#)

- 41** Ciraolo, Giulio; Maggi, Francesco. On the shape of compact hypersurfaces with almost constant mean curvature, *Comm. Pure Appl. Math.* 70(4) (2017), 665-716. Preprint [arXiv:1503.06674](#)
- 40** Colombo, Maria; Maggi, Francesco. Existence and almost everywhere regularity of isoperimetric clusters for fractional perimeters, *Nonlinear Anal.* 153 (2017), 243-274. Preprint [arXiv:1605.05641](#)
- 39** Leonardi, Gian Paolo; Maggi, Francesco. Improved convergence theorems for bubble clusters. II. The three-dimensional case. *Indiana Univ. Math. J.* 66(2) (2017), 559-608. Preprint [arXiv:1505.06709](#).
- 38** De Lellis, Camillo; Ghiraldin, Francesco; Maggi, Francesco. A direct approach to Plateau's problem. *J. Eur. Math. Soc. (JEMS)* 19(8) (2017), 2219-2240. Preprint [arXiv:1408.4047](#)
- 37** Cagnetti, Filippo; Colombo, Maria; De Philippis, Guido; Maggi, Francesco. Essential connectedness and the rigidity problem for Gaussian symmetrization. *J. Eur. Math. Soc. (JEMS)* 19(2) (2017), 395-439. Preprint [arXiv:1304.4527](#)
- 36** De Philippis, Guido; Maggi, Francesco. Dimensional estimates for singular sets in geometric variational problems with free boundaries. *J. Reine Angew. Math. (Crelle's Journal)*, 725 (2017), 217-234. Preprint [arXiv:1407.4834](#)
- 35** Maggi, Francesco; Mihaila, Cornelia. On the shape of capillarity droplets in a container, *Calc. Var. PDE.* 55(5) (2016), Paper no. 122, 42 pp. Preprint [arXiv:1509.03324](#)
- 34** Cicalese, Marco; Leonardi, Gian Paolo; Maggi, Francesco. Improved convergence theorems for bubble clusters. I. The planar case. *Indiana Univ. Math. J.* 65(6) (2016), 1979-2050. Preprint [arXiv:1409.6652](#).
- 33** Caroccia, Marco; Maggi, Francesco. A sharp quantitative version of Hales' isoperimetric honeycomb theorem, *J. Math. Pures Appl. (9)* 106(5) (2016), 935-956. Preprint [arXiv:1410.6128](#).
- 32** Figalli, Alessio; Fusco, Nicola; Maggi, Francesco; Millot, Vincent; Morini, Massimiliano. Isoperimetry and stability properties of balls with respect to nonlocal energies. *Comm. Math. Phys.* 336(1) (2015), 441-507. Preprint [arXiv:1403.0516](#)
- 31** De Philippis, Guido; Maggi, Francesco. Regularity of free boundaries in anisotropic capillarity problems and the validity of Young's law. *Arch. Ration. Mech. Anal.* 216(2) (2015), 473-568. Preprint [arXiv:1402.0549](#)
- 30** Cagnetti, Filippo; Colombo, Maria; De Philippis, Guido; Maggi, Francesco. Rigidity of equality cases in Steiner's perimeter inequality. *Anal. PDE*, 7(7) (2014), 1535-1593.

Preprint [arXiv:1309.1639](https://arxiv.org/abs/1309.1639)

**29** De Philippis, Guido; Maggi, Francesco. Sharp stability inequalities for the Plateau problem. *J. Differential Geom.* 96(3) (2014), 399-456.

**28** Maggi, Francesco; Ponsiglione, Marcello; Pratelli, Aldo. Quantitative stability in the isodiametric inequality via the isoperimetric inequality. *Trans. AMS* 366(3) (2014), 1141-1160.

**27** Figalli, Alessio; Maggi, Francesco; Pratelli, Aldo. A geometric approach to correlation inequalities in the plane. *Ann. Inst. Henri Poincaré Probab. Stat.* 50(1) (2014), 1-14.

**26** Figalli, Alessio; Maggi, Francesco; Pratelli, Aldo. Sharp stability theorems for the anisotropic Sobolev and log-Sobolev inequalities on functions of bounded variation, *Adv. Math.* 242 (2013), 80-101.

**25** Figalli, Alessio; Maggi, Francesco. On the isoperimetric problem for radial log-convex densities, *Calc. Var. Partial Differential Equations* 48(3-4) (2013), 447-489.

**24** Figalli, Alessio; Maggi, Francesco. On the shape of liquid drops and crystals in the small mass regime. *Arch. Ration. Mech. Anal.* 201(1) (2011), 143-207.

**23** Fusco, Nicola; Maggi, Francesco; Pratelli, Aldo. On the isoperimetric problem with respect to a mixed Euclidean-Gaussian density. *J. Funct. Anal.* 260(12) (2011), 3678-3717.

**22** Cianchi, Andrea; Fusco, Nicola; Maggi, Francesco; Pratelli, Aldo. On the isoperimetric deficit in Gauss space. *Amer. J. Math.* 133(1) (2011), 131-186.

**21** Fonseca, Irene; Leoni, Giovanni; Maggi, Francesco; Morini, Massimiliano. Exact reconstruction of color images by a total variation model, *Ann. Inst. H. Poincaré Anal. Non Linéaire* 27 (2010), 1291-1331.

**20** Figalli, Alessio; Maggi, Francesco; Pratelli, Aldo. A mass transportation approach to quantitative isoperimetric inequalities, *Invent. Math.* 182 (2010), 167-211.

**19** Figalli, Alessio; Maggi, Francesco; Pratelli, Aldo (2009). A refined Brunn-Minkowski inequality for convex sets, *Ann. Inst. H. Poincaré Anal. Non Linéaire*, 26, 2511-2519.

**18** Figalli, Alessio; Maggi, Francesco; Pratelli, Aldo. A note on Cheeger sets, *Proc. AMS* 137(6) (2009), 2057-2062.

**17** Cianchi, Andrea; Fusco, Nicola; Maggi, Francesco; Pratelli, Aldo, The sharp Sobolev inequality in quantitative form, *J. Eur. Math. Soc.* (5) (2009), 1105-1139.

**16** Fusco, Nicola; Maggi, Francesco; Pratelli, Aldo. Stability estimates for certain Faber-Krahn, isocapacitary and Cheeger inequalities. *Ann. Sc. Norm. Super. Pisa Cl. Sci. (5)* (2009), 51–71.

**15** Maggi, Francesco. Some methods for studying stability in isoperimetric type problems, *Bull. AMS* 45(3) (2008), 367-408.

**14** Fusco, Nicola; Maggi, Francesco; Pratelli, Aldo. The sharp quantitative isoperimetric inequality, *Ann. of Math. (2)* 168(3) (2008), 941-980.

**13** Maggi, Francesco; Villani, Cédric.. Balls have the worst best Sobolev inequalities. Part two: variants and extensions, *Calc. Var. PDE* 31(1) (2008), 47-74.

**12** Conti, Sergio; Maggi, Francesco. Confining thin elastic sheets and folding paper. *Arch. Ration. Mech. Anal.* 187(1) (2008), 1-48.

**11** Fusco, Nicola; Maggi, Francesco; Pratelli, Aldo. The sharp quantitative Sobolev inequality for functions of bounded variation *J. Funct. Anal.* 244(1) (2007), 315-341.

**10** Conti, Sergio; Maggi, Francesco; Müller, Stefan. Rigorous derivation of Föppl's theory for clamped elastic membranes leads to relaxation, *SIAM J. Math. Anal.* 38(2) (2006), 657-680.

**9** Fusco, Nicola; Gori, Michele; Maggi, Francesco. A remark on Serrin's theorem. *NoDEA* 13(4) (2006), 425-433.

**8** Conti, Sergio; Faraco, Daniel; Maggi, Francesco; Müller, Stefan. Rank-one convex functions on  $2 \times 2$  symmetric matrices and laminates on rank-three lines. *Calc. Var. PDE* 24(4) (2005), 479-493.

**7** Conti, Sergio; Faraco, Daniel; Maggi, Francesco. A new approach to counterexamples to L1 estimates: Korn's inequality, geometric rigidity and regularity for gradients of separately convex functions, *Arch. Ration. Mech. Anal.* 175(2) (2005), 287-300.

**6** Gori, Michele; Maggi, Francesco. The common root of the geometric conditions in Serrin's lower semicontinuity theorem. *Ann. Mat. Pura e Applicata* 184(1) (2005), 95-114.

**5** Maggi, Francesco; Villani, Cédric. Balls have the worst best Sobolev inequalities. *J. Geom. Anal.* 15(1) (2005), 83-121.

**4** Maggi, Francesco; Morini, Massimiliano. A  $\Gamma$ -convergence result for variational integrators of quadratic lagrangians. *ESAIM: COCV* 10(4) (2004), 656-665.

**3** Maggi, Francesco. On the relaxation on BV of certain non-coercive integral functionals, *J. Convex Anal.* 10(2) (2003), 477-489.



2 Gori, Michele; Maggi, Francesco. On the lower semicontinuity of supremal functionals, *ESAIM: COCV* 9 (2003), 135-143.

1 Gori, Michele; Maggi, Francesco; Marcellini, Paolo. On some sharp conditions for lower semicontinuity in L1. *Diff. Int. Equations* 16(1) (2003), 51-76.

### 3. SERVICE

#### 3.1 PROFESSIONAL SERVICE

##### **Editorial work:**

*Journal de l'École polytechnique – Mathématiques*. Member of the editorial board since January 2024.

*Transactions of the AMS & Memoirs of the AMS*. Member of the editorial board since May 2022.

*Ars Inveniendi Analytica*. Founder and editor-in-chief (joint with Enrico Valdinoci) since August 2020. This is a “diamond” open access journal that, in order to explore the viability of the open access model, aims at establishing itself as a leading journal in Analysis.

*Nonlinear Analysis*. Editor-in-chief since April 2020.

Guest editor of the *Bollettino dell'Unione Matematica Italiana* for a special issue on *Geometric Measure Theory and Variational problems. Some recent trends and open problems*.

##### **Referee activity (journals):**

Comm. Pure Applied Math., Comm. Math. Physics, Ann. Math., Inv. Math., Duke Math. Journal, J. Diff. Geometry, Arch. Rat. Mech. Anal., J. Funct. Analysis, Advances in Mathematics, SIAM J Math Analysis, J Math Pure Appl, J European Math Society, J American Math Society, Crelle's Journal, Proc. Royal Soc. Edinburgh, Geometriae Dedicata, Geom. Funct. Analysis, Annali SNS Pisa, Indiana U Mathematics Journal, Journal of Elasticity, J Nonlinear Science, J Potential Theory, J Diff Equations, Discr. Cont. Dynamical Systems, Ann. IHP Analysis, Calc. Var. PDE, Adv. Calc. Var., Comm. PDE, ESAIM COCV, NoDEA, Nonlinearity, Monatshefte für Mathematik, Annali di Ferrara.

##### **Referee activity (grants):**

*NSF DMS 2021* National Science Foundation

*ERC Advanced Grants 2021* European Research Council

*FONDECYT 2015* Chilean National Science and Technology Commission, Chile

*PRIN 2013, PRIN 2015* Ministero Italiano Università e Ricerca, Italy

*VQR 2004-2010, VQR 2011-2014, VQR 2015-2019* Ministero Italiano Università e Ricerca, Italy

*Blanc SIMI 1 2011* Programme, Agence Nationale de la Recherche, France.

### **Workshops and schools organization:**

[\*Summer Program in Partial Differential Equations\*](#). Virtual program, 2 weeks in May 2021. Co-organizer: Philip Isett.

[\*School on Extrinsic Curvature Flows\*](#). ICTP Trieste, 2 weeks in June 2018. Co-organizers: Claudio Arezzo, Giovanni Bellettini and Carlo Sinestrari.

[\*Nonlocal Partial Differential Equations and Applications to Geometry, Physics and Probability\*](#). ICTP Trieste, 2 weeks in May 2017. Co-organizers: Luis Caffarelli, Eric Carlen, Irene Gamba, and Guido De Philippis

[\*New Trends in Elliptic and Partial Differential Equations\*](#). Minisymposium during the SIAM Conference on the Analysis of PDE, Phoenix, AZ, December 2015. Co-organizer: Mark Allen.

[\*Calculus of Variations and nonlinear partial differential equations\*](#). UT Austin-ICES, 2 weeks, May 2015. Co-organizer: Alessio Figalli.

[\*Calculus of Variations, Continuum Mechanics and Geometric Inequalities\*](#). Ischia, Italy, one week, June 2011. Co-organizer: Aldo Pratelli

### **3.2 INSTITUTIONAL SERVICE**

Faculty Annual Review committee (chair) for Math Dpt, UT Austin (2023/24)

Peer review and open science in humanities – online interdisciplinary debate organized by the University of Milano, (2023)

Open access publishing panel with Q&A, UT Austin (2022)

Presentation of the Sustainable Open Scholarship report to the UT Austin Faculty

Council Executive Committee + UT Provost and President, (2022)

Open access consultant for the Office of the Provost, UT Austin (2022)

College of Natural Sciences New Dean Search committee, UT Austin (2021)

Faculty Annual Review committee (chair) for Math. Dept., UT Austin (2021/22)

Sustainable Open Scholarship, Open Access committee (co-chair), UT Austin (2020/21)

Faculty Annual Review committee (chair) for Math Dpt, UT Austin (2018/19)

College of Natural Sciences Workload Policy committee, UT Austin (2018/19)

Advisory committee, Department of Mathematics, UT Austin (2017/18)

Hiring committee, Department of Mathematics, UT Austin (2014/15, 2015/16, 2017/18).

Administrative Section of the Graduates Studies committee (2013/15 and 2014/15)

Postdoc hiring committee, Department of Mathematics, UT Austin (2012/13 and 2013/14).

Collegio dei docenti (Graduate school committee), Dipartimento di Matematica U. Dini, U. Firenze, (2010/11 and 2011/12).

### **3.3 ADVISING**

#### **Post-doc mentoring:**

Michael Novack at UT Austin, 2020/23

Salvatore Stuvard at UT Austin, 2017/21

Matias Delgadino at ICTP Trieste, 2016/17

Brian Krummel at UT Austin, 2015/16

#### **Graduate students advising:**

Daniel Restrepo at UT Austin, joint with L. Caffarelli, graduated in 2023. Next position: postdoc at Johns Hopkins U.

Daniel Weser at UT Austin, joint with M. Delgadino, graduated in 2023. Next position: postdoc at UNC Chapel Hill.

Ignacio Tomasetti at UT Austin, joint with L. Caffarelli, graduated in 2022.

Darren King at UT Austin, graduated in 2021. Next position: postdoc at New York University.

Cornelia Mihaila at UT Austin, graduated in 2018. Next position: postdoc at U Chicago.

Robin Neumayer at UT Austin, joint with A. Figalli; graduated in 2017. Next position: postdoc Northwestern University

Marco Caroccia at U. Pisa, joint with G. Alberti; graduated in 2015. Next position: postdoc at Carnegie Mellon University

### **Undergraduate students mentoring:**

Zerrin Vural (UT Austin), CNS Undergraduate Research Forum presentation, 2020/21. Next position: graduate student at UCLA.

Hunter Stufflebeam (UT Austin) Master degree thesis, 2018/19. Next position: graduate student at the University of Pennsylvania.

Denis Deniz Gonzalez (ICTP Trieste) *Symmetry properties of overdetermined properties with fractional laplacians*, Diploma in Mathematics, 2016/17. Next position: graduate student at the Politecnico di Milano, Italy.

Sumiya Basaandorj (ICTP Trieste) *The existence of area minimizing graphs and minimal surfaces*, Diploma in Mathematics, 2016/17. Next position: graduate student at Seoul National University, South Korea.

Marco Caroccia (U. Firenze) Master degree thesis *Stime asintotiche per partizioni minimali del piano*, 2011. Next position: graduate student at the University of Pisa, Italy.

Berardo Ruffini (U. Firenze) Master degree thesis *Riduzione al caso radiale per una versione quantitativa della disuguaglianza di Gagliardo-Nirenberg*, 2010. Next position: graduate student at the Scuola Normal Superiore di Pisa.

## **3.4 DISSEMINATION**

### **Presentations for the general public**

1 *Introduction to the work of Alessio Figalli*, Fields Medal Symposium 2020 ([video](#))

### **Invited graduate courses and short-courses in schools**

- 14 *Three lectures on isoperimetric and Plateau's type problems*, U Statale Milano, 6/22  
13 *An introduction to the Calculus of Variations*, RTG Program at UT Austin, 5/21  
12 *An introduction to Geometric Measure Theory*, U P. Catalunya, 6/18  
11 *Some key ideas from Geometric Measure Theory in action*, U Chicago, 6/17  
10 *Geometric inequalities and stability problems*, SISSA Trieste, 3/17  
9 *Mass transportation and applications to geometric inequalities*, U Montpellier, 6/15  
8 *Mass transportation, inequalities and applications to PDE*, U Autónoma Madrid, 3/15  
7 *Geometric inequalities in quantitative form and applications*, U Florence, 6/14.  
6 *Perimeter minimizing bubble clusters*, Kinetics, non standard diffusions and stochastics: emerging challenges in the sciences, Austin, 5/14.  
5 *The rigidity problem for symmetrization inequalities*, ERC school "Geometric functional inequalities and shape optimization", Napoli, Accademia Pontaniana, 9/13.  
4 *Geometric variational problems*, U Florence, 6/13.  
3 *Equilibrium shapes for anisotropic surface tension energies*, Heriot-Watt U Edinburgh, 2/10.  
2 *Symmetrization, optimal transport and quantitative isoperimetric inequalities*, during the school Optimal transportation, geometry and functional inequalities, SNS Pisa 10/08.  
1 *Geometric-functional inequalities in sharp and quantitative form*, PhD course, U Napoli "Federico II", 5/07.

### **Invited talks at workshops**

- 54 *Partial Differential Equations*, Oberwolfach, 7/23  
53 *Regularity Theory for Free Boundary and Geometric Variational Problems*, Levico, 6/23  
52 *In honor of Prof. Giles Auchmuty*, Texas A&M, College Station, 10/22  
51 *Regularity Theory for Free Boundary and Geometric Variational Problems*, Pisa, 7/22.  
50 *Shape Optimization and Related Topics*, Roscoff, 6/22  
49 *Partial Differential Equations*, Oberwolfach, 7/21  
48 *Calculus of Variations & PDE: Recent Developments + Future Directions*, ETH Zurich, 6/21  
47 *Homogenization, Interfaces and the Calculus of Variations*, MIT, 8/20  
46 *Texas Differential Equations*, UT Austin, 3/20  
45 *Partial Differential Equations*, Oberwolfach, 7/19  
44 *On nonlinear PDEs and their applications (honoring Luis Caffarelli's 70th birthday)* UT Austin, 3/19  
43 *Calculus of Variations and PDE*, Pacific Institute Math. Sciences, Vancouver 2/19  
42 *Alessio Figalli, Fields Medalist 2018*, Pisa, 1/19  
41 *Calculus of Variations*, Oberwolfach, 8/18

- 40 *Aggregation-diffusion PDEs: variational principles, nonlocality and systems*, Anacapri, 7/17
- 39 *New Trends on Calculus of Variations and PDE*, Firenze-Montecatini, Italy, 6/17
- 38 *James Serrin: from his legacy to the new frontiers*, Perugia, Italy, 1/17
- 37 *Geometric inequalities on Riemannian manifolds*, Busan, Korea, 11/16
- 36 *Calculus of Variations*, MFO Oberwolfach, 7/16
- 35 *Calculus of Variations and nonlinear PDE*, Columbia University, 5/16
- 34 *SIAM-SIG PDE* (plenary speaker), 12/15
- 33 *SIAM-SIG PDE - Minisymposium on Convex Integration*, 12/15.
- 32 *Geometric analysis, free boundaries and measure theory*, MPI-MIS Leipzig, 6/15
- 31 *Geometric Measure Theory: theory and applications*, Institut Fourier, Grenoble, 6/15
- 30 *INDAM day 2015*, 6/15.
- 29 *Calculus of Variations: Geometry, Inequalities and Design*, Fields Inst. Toronto, 11/14
- 28 *Calculus of Variations*, MFO Oberwolfach, 7/14.
- 27 *Analysis of PDEs: Theory-Methods and Applications*, Protaras, Cyprus, 7/14.
- 26 *Isoperimetric problems between analysis and geometry*, Pisa, 6/14.
- 25 *Basel-Freiburg-Zurich Analysis seminar*, University of Zurich, 10/13.
- 24 *Partial Differential Equations*, MFO Oberwolfach, 8/13.
- 23 *Geometric Measure Theory and Optimal Transport*, ICTP Trieste, 7/13
- 22 *Geometric inequalities in the Calculus of Variations*, Pisa, 7/12.
- 21 *Warwick-Cambridge-Imperial seminar in Geometric Analysis*, Warwick 5/12
- 20 *XXI Convegno Nazionale di Calcolo delle Variazioni*, Levico Terme, 2/11
- 19 *Calculus of Variations, Singular Integrals and Incompressible Flows*, Madrid, 9/10.
- 18 *GNAMPA- ERC Summer school*, Ischia, Italy 6/10.
- 17 *Recent advances in optimal transportation and applications*, Nice, 10/09.
- 16 *Optimal transportation: theory and applications*, Institut Fourier, Grenoble, 6/09.
- 15 *Mini-symposium in PDEs*, Maxwell Institute, Edinburgh, 5/09.
- 14 *Advances in Mathematical Analysis*, EPFL Lausanne, 3/09.
- 13 *Glimpses of Geometry*, ENS-Lyon, 5/08.
- 12 *XVIII Convegno Nazionale di Calcolo delle Variazioni*, Levico Terme, 2/08.
- 11 *XVIII Congresso dell'Unione Matematica Italiana*, Bari 10/07.
- 10 *New trends in PDEs and Calculus of Variations*, Cortona, 5/07.
- 9 *XVII Convegno Nazionale di Calcolo delle Variazioni*, Levico Terme, 2/07.
- 8 *Calculus of Variations and Applications*, Ponta Delgada, Azores, 9/06.
- 7 *Optimal Transport and Geometric PDE's*, Nice, 6/06.
- 6 *Multiscale Problems in Quantum Mechanics and Averaging Techniques*, Berlin 9/05.
- 5 *Recent Advances in Calculus of Variations and PDE's*, U Pisa, 3/05.
- 4 *Calcolo delle Variazioni e Teoria Geometrica della Misura*, Lizzano, 10/04.
- 3 *Dislocation Patterns in Plastic Materials*, Warwick, 5/04.
- 2 *XIV Convegno Nazionale di Calcolo delle Variazioni*, Levico Terme, 2/04
- 1 *XII Convegno Nazionale di Calcolo delle Variazioni*, Levico Terme, 2/02

**Research seminars and colloquia:**

- 67 Nonlinear Analysis Colloquium, Carnegie Mellon University, 10/23
- 66 Geometric Analysis Seminar, Princeton University, 9/23
- 65 Colloquium, Rutgers University, 12/22
- 64 Colloquium, Columbia University, 11/22
- 63 Nonlinear Analysis Seminar, Rutgers University, 11/22
- 62 Nonlinear Analysis Seminar, National Taiwan Normal U, 10/22
- 61 Colloquium, University of Florida, 4/22
- 60 Colloquium, Rice University, 2/22
- 59 Analysis Seminar, Università di Pisa, 6/21
- 58 Analysis Seminar, Università di Trento, 1/21
- 57 Asia-Pacific Analysis and PDE seminar, 11/20
- 56 Rio de Janeiro Webinar on Analysis and PDE, 9/20
- 55 One World PDE Seminar, University of Bath, 5/20
- 54 Colloquium talk, Università di Perugia, 6/19
- 53 Analysis seminar, ICTP Trieste, 6/19
- 52 Applied Mathematics Colloquium, NJIT, 4/19
- 51 Nonlinear Analysis seminar, Rutgers U, 4/19
- 50 Geometric Analysis seminar, MIT, 3/19
- 49 Analysis Seminar, IAS Princeton, 2/19
- 48 Variational Methods in Geometry Seminar, IAS Princeton, 2/19
- 47 Mathematical Conversation, IAS Princeton, 1/19
- 46 Colloquium talk on Fields Medalist Alessio Figalli, UT Austin, 8/18
- 45 Analysis seminar, U Firenze, 6/18
- 44 Geometric Analysis seminar, Rice U, Houston, 3/18
- 43 Partial Differential Equations seminar, Brown University, 2/18
- 42 Italian Mathematical Union colloquium, Roma Sapienza, 6/17
- 41 ICTP colloquium, ICTP Trieste, 2/17
- 40 Nonlinear Analysis seminar, Rutgers U, New Brunswick, 2/17
- 39 Colloquium talk, Courant Institute, New York, 2/17
- 38 Analysis seminar, Texas State U, San Marcos, 4/16
- 37 Analysis seminar, Johns Hopkins U, Baltimore, 11/15
- 36 Colloquium talk, U Berkeley, 10/15
- 35 Analysis seminar, U Pisa, 6/15
- 34 Analysis seminar, U Autonoma Madrid, 3/15
- 33 Analysis seminar, George Washington U, 2/15
- 32 Geometry seminar, Stanford U, 10/14
- 31 Analysis seminar, Purdue U, 10/14
- 30 Colloquium talk, Indiana U at Bloomington, 4/14
- 29 Colloquium talk, Michigan State U, 11/13
- 28 Mathematical Physics seminar, Rutgers U, New Brunswick, 10/13
- 27 Analysis seminar, UCLA, Los Angeles, 5/13
- 26 Analysis seminar, U Sussex, Brighton, 5/13
- 25 Analysis seminar, U of Houston, Texas, USA, 3/12
- 24 Colloquium talk, Erlangen-Nurnberg U, Germany, 1/12
- 23 Colloquium talk, Carnegie Mellon U, 12/11
- 22 Analysis Applied Math Seminar, U Toronto, 11/11

- 21 Analysis seminar, U Texas at Austin, 10/11
- 20 Analysis seminar, U Roma Tor Vergata, [SEP]2/11
- 19 Analysis seminar, U Padova, 1/11
- 18 Analysis seminar, U Roma la Sapienza, 1/11
- 17 Physics seminar, U Roma Tor Vergata, 11/09
- 16 Analysis seminar, U Ferrara, 11/09
- 15 Analysis seminar U Napoli "Federico II", 1/09
- 14 Functional analysis seminar, UMPC (Paris 6), 12/07
- 13 Analysis seminar, [SEP]U Pisa, 12/07
- 12 Analysis seminar, CMU Pittsburgh, 11/07
- 11 Analysis seminar U Duisburg-Essen, 6/07
- 10 Analysis seminar U Roma Tor Vergata, 3/07
- 9 Analysis seminar U Firenze, 1/07
- 8 Analysis seminar CMU Pittsburgh, 11/06
- 7 Analysis seminar SISSA, Trieste, 3/06
- 6 Analysis seminar, U Zürich, 2/06
- 5 Analysis seminar U Napoli "Federico II", 4/05
- 4 Arbeitsgemeinschaft Mikrostrukturen, MPI-MIS, Leipzig, 1/05
- 3 Analysis seminar, U Firenze, 4/04
- 2 Arbeitsgemeinschaft Mikrostrukturen, MPI-MIS, Leipzig, 11/03
- 1 Analysis seminar U Firenze, 2/04

### 3. TEACHING

#### Awards

*Clock Award*, Services for Students with Disabilities, UT Austin, Fall 2017

#### University of Texas at Austin, USA

The numbers in parentheses are the overall instructor/course evaluations according to the students, expressed on the scale 0-5.

- Spring 24 M391K Introduction to Real Analysis
- Fall 23 M393C Partial Differential Equations I (5/4.7)
- Spring 23 M393C Partial Differential Equations II (4.6/4.3)
- Fall 21 M393C Minimal Surfaces in Geometric Measure Theory (4.7/4.7)
- Spring 21 M346 Applied Linear Algebra (4.7/4.4)
- Fall 20 M393C Optimal Mass Transportation (4.8/4.8)
- Fall 19 M393C Partial Differential Equations I (5/5)
- Fall 19 M381C Real Analysis (4.9/4.8)



Fall 18 M393C Minimal Surfaces (5/5)  
Fall 18 M346 Applied Linear Algebra (4.1/4/0)  
Spring 18 M393C Partial Differential Equations II (4.8/4.7)  
Fall 17 M346 Applied Linear Algebra (3.9/3.9)  
Fall 17 M361 Functions of One Complex Variable (4.5/4.4)  
Spring 16 M361K Introduction to Real Analysis (2.8/2.8)  
Fall 15 M408M Multivariable Calculus (3.8/3.8)  
Fall 15 M361 Functions of One Complex Variable (4.4/4.3)  
Spring 15 M427K Honors, Advanced Calculus for Applications (4.0/3.7)  
Fall 14 M393C Geometric Measure Theory (4.8/4.8)  
Spring 14 M372K Partial Differential Equations and Applications (4.4/4.0)  
Fall 13 M361 Functions of One Complex Variable (4.1/3.8)  
Spring 13 M361K Introduction to Real Analysis (4.4/4.0)  
Fall 12 M361 Functions of One Complex Variable (4.3/4.0)

### **Abdus Salam International Centre for Theoretical Physics, Italy**

Spring 17, Partial Differential Equations. Videos available at [ictp.tv](http://ictp.tv)  
Fall 16, Real Analysis. Videos available at [ictp.tv](http://ictp.tv)

### **Università degli Studi di Firenze, Italy**

Calculus of Variations, Spring 08, 09, 10, Fall 10.  
Calculus for students in Biology, Fall 05, 06, 07, 08, 09, 10.  
Calculus for students in Chemistry, Fall 05, 06, 07.

### **Univeristät Duisburg-Essen, Germany**

Spring 05 Introduction to sets of finite perimeter and functions of bounded variation  
Spring 05 Functional Analysis (TA-discussion sessions)