Curriculum Vitae of Maria Giovanna Mora

Affiliation

Università degli Studi di Pavia
Dipartimento di Matematica
Via Ferrata 1, 27100 Pavia, Italy
(e-mail) `mariagiovanna.mora@unipv.it`
(phone) +39 0382 985687 (url) `http://www-dimat.unipv.it/mora/`

Nationality Italian

Appointments

2012 – present

Associate Professor in Mathematical Analysis at the Università di Pavia, Italy

2004 – 2011

Ricercatore (Assistant Professor) in Mathematical Analysis at SISSA, Trieste, Italy

2001 – 2003

Post-doctoral fellow at the Max-Planck Institute for Mathematics in the Sciences, Leipzig, Germany

Distinctions

2013

Italian National Scientific Habilitation as Full Professor in Mathematical Analysis, Probability, and Mathematical Statistics

Long-Term Visiting Positions

Fall semester 2007

Visiting Professor at the Institute for Mathematics and its Applications (IMA), Minneapolis, USA (Thematic Year on Mathematics of Molecular and Cellular Biology)

Education

2001

Ph.D. in Mathematics, SISSA, Trieste, Italy
Thesis: *The calibration method for free-discontinuity problems on small domains*
Advisor: Gianni Dal Maso (SISSA)

1997

Degree in Mathematics *summa cum laude*, Università di Parma, Italy
Thesis: *Nonlocal approximation of free discontinuity problems*
Advisors: Emilio Acerbi (Università di Parma), Massimo Gobbino (Università di Pisa)

Language Skills

Italian (native), English (very good), French (good), German (beginner)

Research Interests

Calculus of Variations, Free Discontinuity Problems, Mathematical Theory of Elasticity, Plasticity, Rate-Independent Evolution Processes, Dislocation Theory, Nonlinear Partial Differential Equations

Visits for Scientific Collaboration (one week or longer)

Max-Planck Institute for Mathematics in the Sciences, Leipzig, Germany (2005, 2006, 2007)

University of Minnesota, Minneapolis, USA (2008)

Carnegie Mellon University, Pittsburgh, USA (2008, 2010, 2012, 2016)

Hausdorff Center for Mathematics, Bonn, Germany (2009)

Université de Paris Nord, France (2009)

Université de Fribourg, Switzerland (2009)

Courant Institute, New York University, USA (2009)

Université de Paris 6, France (2011)

Universidad Autonoma de Madrid, Spain (2012)

SISSA, Trieste, Italy (2013, 2014, 2015, 2016)

University of Glasgow, UK (2013)

University of Bath, UK (2017)

Universität Wien, Austria (2017)

Citations

Maria Giovanna Mora has written 36 articles in peer-reviewed scientific journals. According to MathSciNet her publications have been cited 454 times by 237 authors. According to ISI Web of Science they have been cited 458 times (h-index 11, average citations per item 13.88).

Publications

1. G. Dal Maso, M.G. Mora, M. Morini: Local calibrations for minimizers of the Mumford-Shah functional with rectilinear discontinuity sets. *J. Math. Pures Appl.* **79** (2000), 141–162.

2. M.G. Mora, M. Morini: Functionals depending on curvatures with constraints. *Rend. Sem. Mat. Univ. Padova* **104** (2000), 173–199.

3. M. Gobbino, M.G. Mora: Finite difference approximation of free discontinuity problems. *Proc. Roy. Soc. Edinburgh Sect. A* **131** (2001), 567–595.

4. M.G. Mora, M. Morini: Local calibrations for minimizers of the Mumford-Shah functional with a regular discontinuity set. *Ann. Inst. H. Poincaré Anal. Non Linéaire* **18** (2001), 403–436.

5. M.G. Mora: Local calibrations for minimizers of the Mumford-Shah functional with a triple junction. *Commun. Contemp. Math.* **4** (2002), 297–326.

6. M.G. Mora: The calibration method for free-discontinuity problems on vector-valued maps. *J. Convex Anal.* **9** (2002), 1–29.

7. G. Friesecke, R.D. James, M.G. Mora, S. Müller: Derivation of nonlinear bending theory for shells from three-dimensional nonlinear elasticity by Γ-convergence. *C. R. Math. Acad. Sci. Paris* **336** (2003), 697–702.

8. M.G. Mora, S. Müller: Derivation of the nonlinear bending-torsion theory for inextensible rods by Γ-convergence. *Calc. Var. Partial Differential Equations* **18** (2003), 287–305.

9. M.G. Mora, S. Müller: A nonlinear model for inextensible rods as a low energy Γ-limit of three-dimensional nonlinear elasticity. *Ann. Inst. H. Poincaré Anal. Non Linéaire* **21** (2004), 271–293.

10. G. Dal Maso, A. DeSimone, M.G. Mora: Quasistatic evolution problems for linearly elastic - perfectly plastic materials. *Arch. Rational Mech. Anal.* **180** (2006), 237–291.

11. M.G. Mora, S. Müller: Derivation of a rod theory for multiphase materials. *Calc. Var. Partial Differential Equations* **28** (2007), 161–178.

12. G. Dal Maso, A. DeSimone, M.G. Mora, M. Morini: Time-dependent systems of generalized Young measures. *Netw. Heterog. Media* **2** (2007), 1–36.

13. M.G. Mora, S. Müller, M.G. Schultz: Convergence of equilibria of planar thin elastic beams. *Indiana Univ. Math. J.* **56** (2007), 2413–2438.

14. G. Dal Maso, A. DeSimone, M.G. Mora, M. Morini: A vanishing viscosity approach to quasistatic evolution in plasticity with softening. *Arch. Rational Mech. Anal.* **189** (2008), 469–544.

15. F. Cagnetti, M.G. Mora, M. Morini: A second order minimality condition for the Mumford-Shah functional. *Calc. Var. Partial Differential Equations* **33** (2008), 37–74.

16. G. Dal Maso, A. DeSimone, M.G. Mora, M. Morini: Globally stable quasistatic evolution in plasticity with softening. *Netw. Heterog. Media* **3** (2008), 567–614.

17. M.G. Mora, S. Müller: Convergence of equilibria of three-dimensional thin elastic beams. *Proc. Roy. Soc. Edinburgh Sect. A.* **138** (2008), 873–896.

18. M. Lewicka, M.G. Mora, M.R. Pakzad: A nonlinear theory for shells with slowly varying thickness. *C. R. Math. Acad. Sci. Paris* **347** (2009), 211–216.

19. M. Lewicka, M.G. Mora, M.R. Pakzad: Shell theories arising as low energy Gamma-limit of 3d nonlinear elasticity. *Ann. Sc. Norm. Super. Pisa Cl. Sci.* **9** (2010), 253–295.

20. H. Abels, M.G. Mora, S. Müller: The time-dependent von Kármán plate equation as a limit of 3d nonlinear elasticity. *Calc. Var. Partial Differential Equations* **41** (2011), 241–259.

21. M. Lewicka, M.G. Mora, M.R. Pakzad: The matching property of infinitesimal isometries on elliptic surfaces and elasticity of thin shells. *Arch. Rational Mech. Anal.* **200** (2011), 1023–1050.

22. H. Abels, M.G. Mora, S. Müller: Large time existence for thin vibrating plates. *Comm. Partial Differential Equations* **36** (2011), 2062–2102.

23. M.G. Mora, L. Scardia: Convergence of equilibria of thin elastic plates under physical growth conditions for the energy density. *J. Differential Equations* **252** (2012), 35–55.

24. E. Davoli, M.G. Mora: Convergence of equilibria of thin elastic rods under physical growth conditions for the energy density. *Proc. Roy. Soc. Edinburgh Sect. A.* **142** (2012), 501–524.

25. L. Freddi, M.G. Mora, R. Paroni: Nonlinear thin-walled beams with a rectangular cross-section - Part I. *Math. Models Methods Appl. Sci.* **22** (2012), 1150016 (34 pp).

26. J.-F. Babadjian, G.A. Francfort, M.G. Mora: Quasistatic evolution in non-associative plasticity - the cap model. *SIAM J. Math. Anal.* **44** (2012), 245–292.

27. L. Freddi, M.G. Mora, R. Paroni: Nonlinear thin-walled beams with a rectangular cross-section - Part II. *Math. Models Methods Appl. Sci.* **23** (2013), 743–775.

28. E. Davoli, M.G. Mora: A quasistatic evolution model for perfectly plastic plates derived by Gamma-convergence. *Ann. Inst. H. Poincaré Anal. Non Linéaire* **30** (2013), 615–660.

29. J.-F. Babadjian, M.G. Mora: Approximation of dynamic and quasi-static evolution problems in elasto-plasticity by cap models. *Quart. Appl. Math.* **73** (2015), 265–316.

30. E. Davoli, M.G. Mora: Stress regularity for a new quasistatic evolution model of perfectly plastic plates. *Calc. Var. Partial Differential Equations* **54** (2015), 2581–2614.

31. L. Freddi, P. Hornung, M.G. Mora, R. Paroni: A corrected Sadowsky functional for inextensible elastic ribbons. *J. Elasticity* **123** (2016), 125–136.

32. M.G. Mora: Relaxation of the Hencky model in perfect plasticity. *J. Math. Pures Appl.* **106** (2016), 725–743.

33. G.B. Maggiani, M.G. Mora: A dynamic evolution model for perfectly plastic plates. *Math. Models Methods Appl. Sci.* **26** (2016), 1825–1864.

34. L. Freddi, P. Hornung, M.G. Mora, R. Paroni: A variational model for anisotropic and naturally twisted ribbons. *SIAM J. Math. Anal.* **48** (2016), 3883–3906.

Other Publications

35. H. Abels, M.G. Mora, S. Müller: Thin vibrating plates: long time existence and convergence to the von Kármán plate equations. *GAMM-Mitt.* **34** (2011), 97–101.

36. L. Freddi, P. Hornung, M.G. Mora, R. Paroni: One-dimensional von Kármán models for elastic ribbons. *Meccanica,* to appear.

Preprints

37. M.G. Mora, M. Peletier, L. Scardia: Convergence of interaction-driven evolutions of dislocations with Wasserstein dissipation and slip-plane confinement. Preprint September 2014.

38. I. Fonseca, G. Leoni, M.G. Mora: A second order minimality condition for water-waves functionals. Preprint May 2016.

39. M.G. Mora, L. Rondi, L. Scardia: The equilibrium measure for a nonlocal dislocation energy. Preprint December 2016.

40. J.-F. Babadjian, M.G. Mora: Stress regularity in quasi-static perfect plasticity with a pressure dependent yield criterion. Preprint January 2017.

41. G.B. Maggiani, M.G. Mora: Quasistatic evolution of perfectly plastic shallow shells: a rigorous variational derivation. Preprint March 2017.

42. J.A. Carrillo, J. Mateu, M.G. Mora, L. Rondi, L. Scardia, J. Verdera: The ellipse law: Kirchhoff meets dislocations. Preprint March 2017.

Grants

Principal investigator of the project "Dimension Reduction Problems for Thin Elastic Structures", supported by GNAMPA (Italian National Group of Mathematical Analysis), 2008

Principal investigator of the project "Variational Methods and Models in Materials Science", supported by GNAMPA, 2010

Other Grants

Senior Personnel in the PRIN project "Calculus of Variations", supported by the Italian Ministry of University and Research, in the years 2005 – 2006 and 2013 – 2015

Senior Personnel in the Internationalization project "Variational Problems in Mechanics and in Materials Science", supported by the Italian Ministry of University and Research, by Carnegie Mellon University, and by SISSA, 2005 – 2010

Senior Personnel in the PRIN project "Variational Problems with multiple scales", supported by the Italian Ministry of University and Research, in the years 2007 – 2008 and 2009 – 2010

Key Foreign Collaborator in the PIRE project "Science at the triple point between mathematics, mechanics and materials science", supported by the US National Science Foundation, 2011 – 2015

Team member in the ERC project "Quasistatic and Dynamic Evolution Problems in Plasticity and Fracture", supported by the European Research Council, 2012 –2017

Research Talks and Seminars

1. Plenary Talks and Seminars as Invited Speaker

2002

University of Bonn, Germany

Università di Trieste, Italy

Università di Udine, Italy

2004

Università Roma La Sapienza, Italy

Workshop "Problemi di Gamma-convergenza nella meccanica delle strutture sottili", Udine, Italy

Conference "Analysis of Rate Independent Processes", Université de Paris Nord, France

2005

Conference "Recent Advances in Calculus of Variations and PDEs", Università di Pisa, Italy

Conference "Mathematical Modeling in Continuum Mechanics and Structures", Alghero, Italy

2006

Università di Pavia, Italy

Università Cattolica di Brescia, Italy

Summer School on Calculus of Variations and Applications, Açores, Portugal

2007

Workshop "Analysis and Numerics for Rate-Independent Processes", Oberwolfach, Germany

University of Minnesota, Minneapolis, USA

Worcester Polytechnic Institute, USA

2008

MULTIMAT meeting "Multi-scale modelling and characterization of materials", Roma, Italy

Carnegie Mellon University, Pittsburgh, USA

2009

National Conference on Geometric Measure Theory and Calculus of Variations, Levico Terme (Trento), Italy

Université de Paris 6, France

Université de Fribourg, Switzerland

Courant Institute of Mathematical Sciences, New York University, USA

2010

Workshop "Microstructures in Solids: From Quantum Models to Continua", Oberwolfach, Germany

Second Workshop on Thin Structures, Napoli, Italy

2011

National Conference on Geometric Measure Theory and Calculus of Variations, Levico Terme (Trento), Italy

Conference on Applied Mathematics and Scientific Computing, Trogir, Croatia

Workshop "Pattern Formation and Multiscale Phenomena in Materials", Oxford, UK

Université de Paris 6, France

Universität Wien, Austria

2012

University of Minnesota, Minneapolis, USA

University of Bristol, UK

Center for Nonlinear Analysis, Carnegie Mellon University, Pittsburgh, USA

Universidad Autonoma de Madrid, Spain

BCAM–Basque Center for Applied Mathematics, Bilbao, Spain

Conference on PDEs for multiphase advanced materials, Cortona (Arezzo), Italy

2013

Hausdorff Center for Mathematics, Bonn, Germany

Universität Augsburg, Germany

Universität Würzburg, Germany

Università di Milano Bicocca, Italy

University of Glasgow, UK

Conference "Mathematics and Mechanics in the Search for New Materials", Banff, Canada

Third Workshop on Thin Structures, Napoli, Italy

Workshop on Energy/Entropy-Driven Systems and Applications, WIAS, Berlin, Germany

2014

Hausdorff Center for Mathematics, Bonn, Germany

Università Roma La Sapienza, Italy

Workshop on Advances in Nonlinear PDEs, Vienna Center for PDEs, Vienna, Austria

Université de Paris 6, France

2015

University of Bath, UK

Conference "Trends in Non-Linear Analysis", SISSA, Italy

Workshop "Scales in Plasticity", Oberwolfach, Germany

Workshop on Gradient flows, Large deviations and Applications, Technische Universiteit Eindhoven, Netherlands

2016

NYU-Oxford Workshop on Mathematical Models of Defects and Patterns, Courant Institute, New York, USA

National conference on Calculus of Variations, Levico Terme (Trento), Italy

University of Bath, UK

Carnegie Mellon University, Pittsburgh, USA

Università di Pisa, Italy

SISSA, Trieste, Italy

Workshop "New Challenges for the Calculus of Variations", Montréal, Canada

Workshop "Recent Contributions of Women to PDEs", Vienna, Austria

2017

National conference on Calculus of Variations, Levico Terme (Trento), Italy

Miniworkshop on dislocations, plasticity, and fracture, SISSA, Trieste, Italy

2. Other Talks

2000

National Conference on Geometric Measure Theory and Calculus of Variations, Levico Terme (Trento), Italy

2001

National Conference on Geometric Measure Theory and Calculus of Variations, Levico Terme (Trento), Italy

2002

Max-Planck Institute for Mathematics in the Sciences, Leipzig, Germany

2003

National Conference on Geometric Measure Theory and Calculus of Variations, Levico Terme (Trento), Italy

Workshop "PDEs and Materials", Oberwolfach, Germany

2005

National Conference on Geometric Measure Theory and Calculus of Variations, Levico Terme (Trento), Italy

2006

National Conference on Geometric Measure Theory and Calculus of Variations, Levico Terme (Trento), Italy

SIAM Conference on Analysis of Partial Differential Equations, Boston, USA (Minisymposium "Contemporary Developments in Calculus of Variations and PDE")

2007

SIAM Conference on Analysis of Partial Differential Equations, Mesa, USA (Minisymposium "Energy Based Approaches to Nonlinear PDEs")

2008

SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia, USA (Minisymposium "Damage and Fracture Evolution")

SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia, USA (Minisymposium "Thin Elastic Structures")

2009

ISIMM Workshop on Mathematical Problems of Solid Mechanics, Darmstadt, Germany

SIAM Conference on Analysis of Partial Differential Equations, Miami, USA (Minisymposium "Variational Methods in Materials Science")

2010

SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia, USA (Minisymposium "New Frontiers in Calculus of Variations and Applications to Materials Science")

2011

ICIAM Conference, Vancouver, Canada (Minisymposium "Modern Methods and Applications of the Calculus of Variations")

Other Professional Activities

Member of the Academic Board of the Ph.D. School in Mathematics and Statistics of the Università di Pavia, 2013-present

Member of the Academic Board of the Ph.D. School in Mathematics of SISSA, 2004-2011

Referee of the Ph.D. theses of: Mach Nguyet Minh (Università di Pisa, June 2012), Andrés A. León Baldelli (Université de Paris 6, September 2013), Flaviana Iurlano (SISSA, October 2013), Giovanni Bonaschi (Technische Universiteit Eindhoven, November 2015), Gianluca Orlando (SISSA, September 2016)

Referee for: Annali della Scuola Normale Superiore di Pisa, Archive for Rational Mechanics and Analysis, SIAM Journal on Mathematical Analysis, SIAM Journal on Applied Mathematics, Calculus of Variations and PDEs, Journal of Nonlinear Science, Continuum Mechanics and Thermodynamics, Mathematical Models and Methods in the Applied Sciences, ESAIM COCV, Journal of Elasticity, ZAMM – Journal of Applied Mathematics and Mechanics, Proceedings of the Royal Society of Edinburgh, Journal of Differential Equations, Communications in PDEs, Nonlinearity, Nonlinear Differential Equations and Applications, Journal de Mathmatiques Pures et Appliquées, Annales de l'Institut Henri Poincaré

Organizer of the Minisymposium "Variational Methods in Materials Science" at the SIAM Conference on Analysis of Partial Differential Equations, Miami, December 2009

Organizer of the ERC Workshop "Variational Views in Mechanics and Materials" in Pavia, June 2013

Teaching Experience

1. Student Advising

Advisor of the Ph.D. thesis of Elisa Davoli (SISSA) 2009 – 2012

Advisor of the Ph.D. thesis of Giovanni B. Maggiani (Università di Pavia) 2013 – 2017

Co-advisor of the Ph.D. thesis of Lucia Scardia (SISSA) 2003 – 2007

Advisor of the Master thesis of Elisa Davoli (Università di Trieste) 2009

Advisor of the Master thesis of Juri Stella (Università di Pavia) 2016

Advisor of the Master thesis of Simone Tinelli (Università di Pavia) 2017

Co-advisor of the Master thesis of Gaetano Passannanti (Università di Trieste) 2009

Supervisor of the Diploma thesis of Shahla Molahajloo (International Center for Theoretical Physic, ICTP) 2007

2. Ph.D. Courses

2003/04

Course on *Dimension reduction in elasticity by* Γ*-convergence*, Ph.D. program in Mathematics, SISSA (18h)

2006/07

Course on *Sobolev Spaces*, Ph.D. program in Mathematics, SISSA (18h)

2007/08

Course on *Gamma-convergence and applications*, Ph.D. program in Mathematics, SISSA (18h)

2008/09

Course on *Geometric measure theory and BV functions*, Ph.D. program in Mathematics, SISSA (18h)

2009/10

Course on *Mathematical Theory of Elasticity*, Ph.D. program in Mathematics, SISSA (18h)

2010/11

Course on *Gamma-convergence and applications*, Ph.D. program in Mathematics, SISSA (36h)

2012/13

Course on *Mathematical Theory of Elasticity*, Ph.D. program in Mathematics, SISSA (20h)

2013/14

Course on *Gamma-convergence and applications*, Ph.D. program in Mathematics, SISSA (20h)

Course on *Gamma-convergence and Homogenization*, Ph.D. program in Mathematics and Statistics, Università di Pavia (18h)

2014/15

Course on *Mathematical theory of plasticity*, Ph.D. program in Mathematics, SISSA (20h)

Course on *BV functions*, Ph.D. program in Mathematics and Statistics, Università di Pavia (16h)

3. Other Courses

2004/05

Course on *Real Analysis 2*, Diploma in Mathematics, International Center of Theoretical Physics (ICTP), Trieste (20h)

2005/06

Course on *Real Analysis 2*, Diploma in Mathematics, ICTP, Trieste (20h)

2008/09

Course on *Calculus in* $\mathbb{R}^N$, Diploma in Mathematics, ICTP, Trieste (20h)

2009/10

Course on *Introduction to PDEs*, Diploma in Mathematics, ICTP, Trieste (30h)

2012/13

Course on *Calculus and Statistics*, Degree in Medical Chemistry and Pharmaceutical Technology, Università di Pavia (48h)

Course on *Calculus and Statistics*, Degree in Pharmacy, Università di Pavia (48h)

2013/14

Course on *Calculus and Statistics*, Degree in Medical Chemistry and Pharmaceutical Technology, Università di Pavia (48h)

Course on *Calculus and Statistics*, Degree in Pharmacy, Università di Pavia (48h)

2014/15

Course on *Calculus of Variations*, Master Degree in Mathematics, Università di Pavia (48h)

Course on *Calculus and Statistics*, Degree in Pharmacy, Università di Pavia (48h)

2015/16

Course on *Mathematical Analysis 1*, Degree in Industrial Engineering, Bioengineering, and Electrical Engineering, Università di Pavia (90h)

Course on *Calculus and Statistics*, Degree in Pharmacy, Università di Pavia (48h)

2016/17

Course on *Calculus of Variations*, Master Degree in Mathematics, Università di Pavia (48h)

Course on *Mathematical Analysis 1*, Degree in Industrial Engineering, Bioengineering, and Electrical Engineering, Università di Pavia (90h)

Pavia, 24 April 2017