Curriculum vitæ et studiorum

of *Marco Morandotti*

Personal data

Work address

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Languages spoken Italian (native language); English, Portuguese, Spanish (fluent); French (fair knowledge).

Positions

- **July 1, 2022 – Present**: *Associate professor* at the Dipartimento di Scienze Matematiche of Politecnico di Torino, Italy.
- **July 1, 2019 – June 30, 2022**: *Ricercatore di tipo B* (tenure-track assistant professor) at the Dipartimento di Scienze Matematiche of Politecnico di Torino, Italy.
- **October 1, 2018 – June 30, 2019**: *Ricercatore di tipo A* (non-tenure-track assistant professor) at the Dipartimento di Scienze Matematiche of Politecnico di Torino, Italy.
- **December 15, 2016 – September 30, 2018**[1]: Postdoc in Mathematics at TU München.
- **September 1, 2014 – December 14, 2016**[2]: Postdoc in Applied Mathematics at SISSA.
- **October 1, 2011 – August 31, 2014**[3]: ICTI Postdoctoral Research Associate in Applied Mathematics
  - *April 1, 2013 – August 31, 2014*: Departamento de Matemática, Instituto Superior Técnico.
  - *October 1, 2011 – March 31, 2013*: Department of Mathematical Sciences, Carnegie Mellon University.

[1]Support for this position fully provided by the ERC Starting Grant High-Dimensional Sparse Optimal Control (until November 30, 2017) and the DFG Project *Identifikation von Energien durch Beobachtung der zeitlichen Entwicklung von Systemen* (FO 767/7).
[2]Support for this position fully provided by the ERC Advanced Grant QuaDynEvoPro.
[3]Support for this position fully provided by the Fundação para a Ciência e a Tecnologia (Portuguese Foundation for Science and Technology) through the Carnegie Mellon Portugal Program under Grant FCT-UTA/CMU/MAT/0005/2009 *Thin Structures, Homogenization, and Multiphase Problems.*

Career of studies

- October 27, 2011 Ph.D. in Applied Mathematics, SISSA — International School for Advanced Studies. *Self-propulsion in viscous fluids through shape deformation*; Advisors Prof. G. Dal Maso and Prof. A. DeSimone.
- September 22, 2011 MCA (Master in Complex Actions, SISSA) diploma.
- February 5, 2008 IUSS diploma.
- July 17, 2007 M.Sc. in Mathematics, University of Pavia, with mark 110/110 cum laude.
- July 15, 2005 B.Sc. in Mathematics, University of Pavia, with mark 110/110 cum laude.
- Alumnus of IUSS — Institute for Advanced Study, Pavia, class B/1, 7th cycle.
- Alumnus of Collegio Ghislieri in Pavia from October 2002 to October 2007.
- July 2002, high school degree, Liceo Scientifico Statale "N. Copernico", Pavia; mark 100/100 cum laude.

Students supervised

postdocs

2024/03/01 – Antonio Giuseppe Grimaldi.

2021/12/01 – 2023/11/30 Anderson Melchor Hernandez.

doctoral theses

2023-2026 Alessandro Baldi – *TBD* (co-supervised with Giuseppe D'Onofrio).
Chen Zhang — *TBD* (co-tutelle with Ningbo University).

2020-2023 Anna Kubin – *Curvature-dependent functionals: applications to membrane models and geometric flows* (co-supervised with Luca Lussardi). Postdoc at TU Wien.

master theses

2024 Rebecca Semeria (PCS) – *The replicator equation and some applications.*

2023 Alessandro Baldi (Math Eng) – *Buona positura e propagazione del caos per modelli multi-agente con strategie ed effetti diffusivi* (co-supervised with Anderson Melchor Hernandez). 3/10. Ph.D. student at Politecnico di Torino.
Luca Pignatelli (Math Eng) – *Anti-plane analysis of Francfort–Marigo model for quasi-static brittle fracture.* 14/7. Ph.D. student at Radboud University.

2022 Claudio D'Eramo (Math Eng) – *Mean-field limits of entropic multi-population dynamical systems* (co-supervised with Francesco Solombrino). 15/7.

2018 Francesco Olivari – *Analysis and simulation of the dynamics of a flagellated micro-swimmer* – IUSS Master thesis (co-advised with Henry Shum), 19/2. Ph.D. from the University of Groningen.

bachelor theses – at Politecnico di Torino

2024 Concetta Carpino (Math Eng) – *TBD.*
Andrea Monagheddu (Aero Eng) – *TBD.*
Simone Domenico Morandi (Math Eng) – *TBD.*
Umberto Morzone (Math Eng) – *TBD.*

2024 Andrea Vasco Grieco (Math Eng) – *Introduzione ai giochi differenziali e applicazioni all'economia.* 13/3.
Chiara Lunazzi (Math Eng) – *Analisi della dinamica preda-predatore in presenza di epidemie.* 13/3.
Axel Badouel Simo Kengne (Math Eng) – *Cantor Sets as the Closure of The Set of Periodic Points of a Dynamical System With Infinite Periodic Points and Some Applications.* 13/3.

2023 Luca Camagna (Phys Eng) – *The butterfly effect: chaos and fractal geometry from weather prediction.* 20/10.
Leonardo Gavazzi (Math Eng) – *Analisi stocastica delle grandi deviazioni e dei sistemi rate-indipendent.* 18/10.
Filippo Masotti (Math Eng) – *Evolutionary stability and well-posedness of the replicator dynamics.* 14/7.
Marco Campini (Automotive Eng) – *Design of adaptive cruise control using model prediction.* 15/3.
Emaan Khan (Automotive Eng) – *Torino's public transportation system: a study via multilayer networks.* 15/3.
Alessio Attanasi (Math Eng) – *Gli insiemi frattali: analisi dimensionale, algoritmi e applicazioni nelle scienze* 9/3.
Giuseppe Impedovo (Math Eng) – *Il modello preda-predatore con coefficienti variabili.* 9/3.

2022 Silvia Piatino (Math Eng) – *Sistemi dinamici su grafi: analisi del modello epidemiologico SIR definito su un grafo di grandi dimensioni.* 25/11.
Alessandro Baronti (Math Eng) – *The Banach–Tarski paradox.* 4/10.
Francesco Rumiano (Math Eng) – *Funzioni BV di una variabile e applicazioni a deformazioni strutturate.* 4/10.
Lorenzo Ingaramo (Math Eng) – *Algebraic and analytical aspects of de Rham's Theorem* (co-supervised with Ada Boralevi). 19/9.
Domenico Muscillo (Math Eng) – *Fractals: from the fractional dimension to the heat equation.* 15/7.

2021 Lorenzo Pagliero (Math Eng) – *Analisi variazionale del modello a goccia di liquido di Gamow.* 10/3.

2020 Raoul Prisant (Math Eng) – *Il modello preda-predatore: analisi e applicazioni.* 6/10.
Francesco Solazzo (Math Eng) – *Fractals and tessellations of the plane.* 6/10.

2019 Emanuele Bombardi (Math Eng) – Γ-*convergence of energies defined on lattices.* 8/10.
Claudio D'Eramo (Math Eng) – Γ-*convergenza di funzionali integrali e applicazioni alla partizione di grafi.* 8/10.
Roberto Marchello (Math Eng) – *Analysis and control of the motion of the N-link micro-swimmer.* 8/10.

Awards, grants, and prizes

- GNAMPA Project 2024 *Analisi asintotica di modelli evolutivi di interazione*, P.I.
- PRIN Project 2022 *Geometric-Analytic Methods for PDEs and Applications*, member (P.I. Elvise Berchio).
- 05/06/2023 – 05/06/2034: Abilitazione Scientifica Nazionale, fascia I[1] (art. 16, comma 1, Legge 240/10).
- GNAMPA Project 2023 *Modelli variazionali ed evolutivi per problemi di adesione e di contatto*, member (P.I. Gianluca Orlando).
- 27/07/2018 – 27/07/2024: Abilitazione Scientifica Nazionale, fascia II[2] (art. 16, comma 1, Legge 240/10).
- PRIN Project 2020 *Mathematics for Industry 4.0*, member (P.I. Pasquale Ciarletta).
- GNAMPA Project 2022 *Approccio multiscala all'analisi di modelli di interazione*, member (P.I. Gianluca Orlando).
- GNAMPA Project 2020 *Variational analysis of non-local models in applied sciences*, member (P.I. Marco Bonacini).
- Funding for a visit to the Institute of Mathematics for Industry at Kyushu University within the *Japan meets Italian Scientists* scheme of the Embassy of Italy in Tokyo, 15-23/12/2019.
- Travel support for participating to ICIAM 2019.
- GNAMPA Project 2019 *Analysis and optimisation of thin structures*, P.I.
- GNAMPA Project 2015 *Critical Phenomena in the Mechanics of Materials: a Variational Approach*, P.I.
- Winner of a study prize from Istituto Nazionale di Alta Matematica "F. Severi" (INdAM) in the year 2008.
- Winner of a PhD position (XXIII cycle) with scholarship at SISSA, Trieste, 2007-2011.
- Scholarship from Istituto Nazionale di Alta Matematica "F. Severi" (INdAM) for students of Laurea Specialistica degree course (M.Sc.) for the years 2005-2007.
- Scholarship from Collegio Ghislieri for a stay in July and August 2005 at St. John's College, Cambridge.
- Winner of the IUSS - Institute for Advanced Study, Pavia study prize for the years 2002-2003, 2003-2004, 2004-2005, 2005-2006, 2006-2007.
- Scholarship from Istituto Nazionale di Alta Matematica "F. Severi" (INdAM) for undergraduate students for the year 2002-2003, maintained by merit for the following two years.

[1]Italian habilitation for the position of Full Professor. [2]Italian habilitation for the position of Associate Professor.

Memberships and databases ID's

EMS; GNAMPA (INdAM); SIMAI; SNP; UMI.
MR Author ID: 945829. OrcID: 0000-0003-3528-6152. ResearchID: J-7862-2017. Scopus ID: 55985620600.

Publications — [preprint versions available on arXiv]

[42] D. Engl, C. Kreisbeck, and M. Morandotti: *Characterizing BV- and BD-ellipticity for a class of positively 1-homogeneous surface energy densities.* arXiv:2402.15450 *Submitted.*

[41] S. Krömer, M. Kružík, M. Morandotti, and E. Zappale: *Measure structured deformations.* arXiv:2402.14790 *Submitted.*

[40] L. Lussardi, A. Melchor Hernandez, and M. Morandotti: *Γ-convergence of discrete energies modeling self-aggregation of stochastic particles.* arXiv:2305.05761 *Submitted.*

[39] A. Kubin, L. Lussardi, and M. Morandotti: *Direct minimization of the Canham–Helfrich energy on generalized Gauss graphs.* J. Geom. Anal. **34** (2024), 121.

[38] P. Cesana, L. De Luca, and M. Morandotti: *Semi-discrete modeling of systems of wedge disclinations and edge dislocations via the Airy stress function method.* SIAM J. Math. Anal. **56**(1) (2024), 79–136.

[37] S. Almi, M. Morandotti, and F. Solombrino: *Optimal control problems in transport dynamics with additive noise.* Journal of Differential Equations **373** (2023), 1–47.

[36] S. Almi, C. D'Eramo, M. Morandotti, and F. Solombrino: *Mean-field limits for entropic multi-population dynamical systems.* Milan Journal of Mathematics, **91** (2023), 175–212.

[35] J. Matias, M. Morandotti, and D. R. Owen: *Energetic Relaxation to Structured Deformations. A Multiscale Geometrical Basis for Variational Problems in Continuum Mechanics*, SpringerBriefs on PDEs and Data Science, 2023.

[34] A. C. Barroso, J. Matias, M. Morandotti, D. R. Owen, and E. Zappale: *The variational modeling of hierarchical structured deformations.* J. Elast., *online December 7, 2022.*

[33] M. Zoppello, M. Morandotti, and H. Bloomfield-Gadêlha: *Controlling non-controllable scallops.* Meccanica **57** (2022), 2187–2197.

[32] M. Amar, J. Matias, M. Morandotti, and E. Zappale: *Periodic homogenization in the context of structured deformations.* Z. Angew. Math. Phys. **73** (2022), 173.

[31] G. Albi, S. Almi, M. Morandotti, and F. Solombrino: *Mean-field selective optimal control via transient leadership*. Appl. Math. Optim., **85** (2022), 9.

[30] R. Marchello, M. Morandotti, H. Shum, and M. Zoppello: *The N-link swimmer in three dimensions: controllability and optimality results*. Acta Applicandae Mathematicae, **178**(6) (2022), *published online 8 March 2022*.

[29] S. Almi, M. Morandotti, and F. Solombrino: *A multi-step Lagrangian scheme for spatially inhomogeneous evolutionary games*. Journal of Evolution Equations, **21**(2) (2021), 2691–2733.

[28] J. Matias, M. Morandotti, D. R. Owen, and E. Zappale: *Upscaling and spatial localization of non-local energies with applications to crystal plasticity*. Mathematics and Mechanics of Solids, **26**(7) (2021), 963–997.

[27] L. Ambrosio, M. Fornasier, M. Morandotti, and G. Savaré: *Spatially Inhomogeneous Evolutionary Games*. Comm. Pure Appl. Math., **74**(7) (2021), 1353–1402.

[26] I. Lucardesi, M. Morandotti, R. Scala, and D. Zucco: *Upscaling of screw dislocations with increasing tangential strain*. Rend. Lincei Mat. Appl. **31**(2) (2020), 419–443.

[25] M. Morandotti and F. Solombrino: *Mean-field analysis of multi-population dynamics with label switching*. SIAM J. Math. Anal. **52**(2) (2020), 1427–1462.

[24] M. Bonacini, E. Davoli, and M. Morandotti: *Analysis of a perturbed Cahn-Hilliard model for Langmuir-Blodgett films*. Nonlinear Differ. Equ. Appl. (2019) 26:36.

[23] P. van Meurs and M. Morandotti: *Discrete-to-continuum limits of particles with an annihilation rule*. SIAM J. Appl. Math. **79**(5) (2019), 1940–1966.

[22] I. Lucardesi, M. Morandotti, R. Scala, and D. Zucco: *Confinement of dislocations inside a crystal with a prescribed external strain*. Riv. Mat. Univ. Parma, **9**(2) (2018), 283–327.

[21] G. Carita, J. Matias, M. Morandotti, and D. R. Owen: *Dimension reduction in the context of structured deformations*. J. Elast. **133**(1) (2018), 1–35.

[20] M. Morandotti: *Structured Deformations of Continua: Theory and Applications*. In Mathematical Analysis of Continuum Mechanics and Industrial Applications II. Proceedings of the conference CoMFoS16, van Meurs, Kimura, Notsu *Editors*. Mathematics for Industry **30**, 125–136. Springer Singapore, 2018.

[19] M. Morandotti: *Qualitative and quantitative properties of the dynamics of screw dislocations*. AIMETA 2017 Proceedings of the XXIII Conference of the Italian Association of Theoretical and Applied Mechanics. L. Ascione, V. Berardi, L. Feo, F. Fraternali, A. M. Tralli (eds.) vol. 2 (2017), 1062–1073.

[18] M. Morandotti: *Structured deformations and applications*. PAMM Proc. Appl. Math. Mech. **17**(1) (2017), 711–712. Special Issue: 88th Annual Meeting of the International Association of Applied Mathematics and Mechanics (GAMM), Weimar 2017; Editors: C. Könke, Weimar, and C. Trunk, Ilmenau.

[17] T. Hudson and M. Morandotti: *Properties of screw dislocation dynamics: time estimates on boundary and interior collisions*. SIAM J. Appl. Math. **77**(5) (2017), 1678–1705.

[16] M. Morandotti: *Boundary Behaviour and Confinement of Screw Dislocations*. MRS Advances **48** (2017), 2633–2638.

[15] A. C. Barroso, J. Matias, M. Morandotti, and D. R. Owen: *Second-order structured deformations: relaxation, integral representation and applications*. Arch. Rational Mech. Anal. **225** (2017), 1025–1072.

[14] J. Matias, M. Morandotti, and E. Zappale: *Optimal Design of Fractured Media with Prescribed Macroscopic Strain*. Journal of Mathematical Analysis and Applications **449** (2017), 1094–1132.

[13] A. C. Barroso, J. Matias, M. Morandotti, and D. R. Owen: *Explicit Formulas for Relaxed Disarrangement Densities Arising from Structured Deformations*. Math. Mech. Complex Syst. **5**(2) (2017), 163–189.

[12] G. A. Bonaschi, P. van Meurs, and M. Morandotti: *Dynamics of screw dislocations: a generalised minimising-movements scheme approach*. Eur. J. Appl. Math. **28**(4), (2017), 636–655.

[11] T. Blass and M. Morandotti: *Renormalized Energy and Peach-Köhler Forces for Screw Dislocations with Antiplane Shear*. J. Convex Anal. **24**(2) (2017), 547–570.

[10] G. Dal Maso and M. Morandotti: *A model for the quasistatic growth of cracks with fractional dimension*. Nonlinear Analysis Series A: Theory, Methods & Applications **154** (2017), 43–58.

[9] J. Matias and M. Morandotti: *Homogenization problems in the calculus of variations: an overview*. São Paulo Journal of Mathematical Sciences **9**(2) (2015), 162–180.

[8] M. G. Persico, L. Lodola, F. E. Buroni, M. Morandotti, P. Pallavicini, C. Aprile: *99mTc - Human Serum Albumin nanocolloids: particle sizing and radioactivity distribution*. Journal of Labelled Compounds and Radiopharmaceuticals **58**(9) (2015), 376–382.

[7] J. Matias, M. Morandotti, and P. M. Santos: *Homogenization of functionals with linear growth in the context of $\mathcal{A}$-quasiconvexity*. Appl. Math. Optim. **72**(3) (2015), 523–547.

[6] T. Blass, I. Fonseca, G. Leoni, and M. Morandotti: *Dynamics for Systems of Screw Dislocations*. SIAM J. Appl. Math. **75** (2015), 393–419.

[5] G. Dal Maso, A. DeSimone, and M. Morandotti: *One-dimensional swimmers in viscous fluids: dynamics, controllability, and existence of optimal control*. ESAIM Control Optim. Calc. Var. **21** (2015), 190–216.

[4] R. Choksi, M. Morandotti, and M. Veneroni: *Global minimizers for axisymmetric multiphase membranes*. ESAIM Control Optim. Calc. Var. **19** (2013), 1014–1029.

[3] M. Morandotti: *Self-propelled micro-swimmers in a Brinkman fluid*. Journal of Biological Dynamics **6** Iss. sup1 (2012), 88–103.

[2] G. Bertolini, C. Rossi, D. Crespi, S. Finazzi, M. Morandotti, S. Rossi, M. Peta, M. Langer, and D. Poole: *Is A(H1N1) influenza pneumonia more severe than other community-acquired pneumonias? The result of the GiViTI survey on 155 Italian ICUs*. Intensive Care Medicine **37** (2011), 1746–1755.

[1] G. Dal Maso, A. DeSimone, and M. Morandotti: *An existence and uniqueness result for the dynamics of micro-swimmers*. SIAM J. Math. Anal. **43** (2011), 1345–1368.

Invited seminars

forthcoming *SIAM Conference on Mathematical Aspects of Materials Science (MS24)*, Pittsburgh, 19-23/5/2024. *3rd International Conference on Nonlinear Solid Mechanics (ICoNSoM 2024)*, Cagliari, 11-14/6/2024. *9th European Congress of Mathematics*, Sevilla, 15-19/7/2024.

2024 Nečas Seminar, Prague 19/2.

2023 Politecnico di Bari, 29/11 • University of Vienna, 14/11 • *Atlantic Conference on Nonlinear PDEs*, Lisbon, 2/11 • 57th meeting of the Society for Natural Philosophy, Paris, 16/10 • OIST, Okinawa, 28/8 • The 10th International Congress on Industrial and Applied Mathematics (ICIAM 2023) (MS: *Variational methods for thin structures and free boundary problems*), Tokyo, 24/8 • University of Udine, 29/6 • Nečas Seminar, Prague, 3/4 • ESI workshop *Between Regularity and Defects: Variational and Geometrical Methods in Materials Science*, Vienna, 20/2 • *Variational models in Materials Science*, University of Naples, 8/2.

2022 56th Meeting of the Society for Natural Philosophy, Pisa, 22/9 • Università "L. Vanvitelli" Caserta, 19/9 • TUWien, Vienna, 29/6 • International Conference on Nonlinear Solid Mechanics ICoNSOM 2022 (MS25: *Geometry and Continuum Mechanics* and MS36: *Mathematical models for composite materials and heterogeneous media in Engineering and applied sciences*), Alghero, 13–16/6 • Radboud University, Nijmegen, 28/4 • IST Lisbon, 5/4 • KU Eichstätt, 29/3.

2021 Problemi variazionali in domini a struttura geometrica complessa, Politecnico di Torino, 18/12 • International Conference on Mathematics and its Application (ICoMathApp), Malang, 26/10 (keynote speaker) • 15th International Conference on *Free Boundary Problems: Theory and Applications*, Berlin, 16/9 • SIMAI conference (MS37: *Trends in nonlinear PDEs and applications*), Parma, 3/9 • *8th European Congress of Mathematics*, Portorož, 23/6 • SBAI, Sapienza Università di Roma, 1/6 • SIAM Conference on *Mathematical Aspects of Materials Science* (MS14: *Textures, interfaces, and defects in crystalline and magnetic materials: the variational viewpoint*), Bilbao (online), 20/5 • CAA online seminar series, FAU Erlangen-Nürnberg, 25/2.

2020 Lisbon WADE seminar, 4/9 • CNA Seminar, Carnegie Mellon University, 18/2 • XXX Convegno Nazionale di Calcolo delle Variazioni, Levico Terme, 4/2.

2019 Mini-symposium *Elastic defects and structures. Modeling and experiments*, Kyushu University, 20/12 • *Modeling of Crystalline Interfaces and Thin Film Structures: A Joint Mathematics-Physics Symposium*, ESI Vienna, 14/11 • *Calculus of Variations and Applications in Trani*, 29/10 • *The 9th International Congress on Industrial and Applied Mathematics (ICIAM 2019)* (MS: *Mathematical Models for Solid Mechanics and Soft Structures*), Valencia, 18/7 • *The 9th International Congress on Industrial and Applied Mathematics (ICIAM 2019)* (MS: *Mean Field Games: New Trends and Applications*), Valencia, 17/7 • *Calculus of Variations on Schiermonnikoog*, 2/7 • *International Conference on Elliptic and Parabolic Problem* (MS17: *Nonlinear evolutions problems and mathematical modeling*), Gaeta, 21/5 • *Workshop on Calculus of Variations and Applications*, Salerno, 18/5 • DeustoTech, Bilbao, 21/3 • University of Utrecht, 14/3 • *The mathematical design of new materials*, Isaac Newton Institute, 26/2 • *AMS-MAA JMM* (SS46: *Multiscale Problems in the Calculus of Variations*), Baltimore, 18/1.

2018 *Joint PTM-SIMAI-UMI mathematical meeting*, Wrocław, 19/9 • *Fifth Workshop on Thin Structures*, Naples, 14/9 • Instituto Superior Técnico, 28/8 • *New trends in the variational modeling of failure phenomena*, ESI Vienna, 20/8 • Kanazawa Analysis Seminar, University of Kanazawa, 20/7 • *The 12th AIMS Conference on Dynamical Systems, Differential Equations and Applications* (SS131: *Mean Field Games and Applications* and SS144: *Analytic properties and numerical approximation of differential models arising in applications*), Taipei, 5–9/7 • CNA Seminar, Carnegie Mellon University, 29/5 • *Topics in the Calculus of Variations: Recent Advances and New Trends*, BIRS, Banff, 22/5 • University of Waterloo, 14/5 • Università di Pisa, 18/4 • Séminaire Equations aux dérivées partielles, Université de Strasbourg, 27/3 • Langenbach-Seminar, WIAS Berlin, 21/2.

2017 Groupe de Travail CalVa, Paris VII, 25/9 • Università del Sannio, 14/9 • AIMETA 2017, Salerno, 4/9 • *Analysis of Dislocation Models for Crystal Defects*, BIRS-CMO, Oaxaca, 25/6 • Ohio University, 25/4 • University of Warwick, 22/2 • *Miniworkshop on dislocations, plasticity, and fracture*, SISSA, 13/2.

2016 University of Kanazawa, 28/10 • International conference *CoMFoS16: Mathematical Analysis of Continuum Mechanics and Industrial Applications II*, Kyushu University, 23/10 • Workshop *Variational and hamiltonian structures: models and methods*, ESI, Vienna, 12/7 • *The 11th AIMS Conference on Dynamical Systems, Differential Equations and Applications* (SS8: *New Trends in Calculus of Variations and Partial Differential Equations*), Orlando, 2/7 • *9th European Conference on Elliptic and Parabolic Problems*, Gaeta, 24/5 • University of Bristol, 17/3 • *Variational Perspectives*, Politecnico di Torino, 8/3.

2015 University of Vienna, 10/9 • *AMS-EMS-SPM Joint International Meeting*, Porto, 11/6 • University of Évora, 3/6 • Ohio University, 8/4 • *Analytic approaches to scaling limits for random system*, HIM, Bonn, 27/1.

2014 *CAMGSD Seminar*, Instituto Superior Técnico, 16/12 • ICMS seminar on particle systems, Eindhoven University of Technology, 17/10 • *CASA colloquium*, Eindhoven University of Technology, 15/10 • *The 10th AIMS Conference on Dynamical Systems, Differential Equations and Applications* (SS85: *Transport Processes in Biology: Modelling and Analysis*), Madrid, 8/7 • University of Sussex, 19/5 • CNA Seminar, Carnegie Mellon University, 28/1.

2013 *BMS Intensive Course on Evolution Equations and their Applications*, TU Berlin, 28/11 • Universidade Nova de Lisboa, 15/5 • *The Eighth IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory*, Athens, GA, 27/3.

2012 Instituto Superior Técnico, 21/11 • MMC Seminar, Mechanical Engineering, Carnegie Mellon University, 26/10 • University of Modena and Reggio Emilia, 27/9 • University of Parma, 25/9 • *The 9th AIMS Conference on Dynamical Systems, Differential Equations and Applications* (SS76: *On PDEs from Biology*), Orlando, 2/7 • CNA Seminar, Carnegie Mellon University, 17/4 • Instituto Superior Técnico, 7/3.

2011 McGill University, 28/11 • University of Padua, 19/9.

2010 *The 8th AIMS Conference on Dynamical Systems, Differential Equations and Applications* (SS45: *Evolution Equations and Mathematical Biology*), Dresden, 27/5.

Teaching activity

At Politecnico di Torino

2023–2024 *Equazioni a derivate parziali* for the degree course in Mathematics for Engineering.
Sobolev spaces on non-smooth domains and their applications, PhD course.

2023–2024 *Analisi matematica 1* for the degree courses in Mathematics, Physical, Computer Science, Electric, Electronics, and Cinema Engineering • *Analisi matematica 2* for the degree course in Physical Engineering • *Laboratorio Problem Solving 1* (*percorso Intraprendenti* - honors class) • *An introduction to asymptotic methods for multi-scale problems*, PhD course.

2022–2023 *Analisi matematica 1* for the degree courses in Mathematics, Physical, Computer Science, Electric, Electronics, and Cinema Engineering • *Analisi matematica 2* for the degree course in Physical Engineering • *Mathematical Analysis 2* for the degree courses in Engineering at Turin Polytechnic University in Tashkent • *Metodi matematici per l'ingegneria* for the degree course in Physical Engineering • *Equazioni a derivate parziali* for the degree course in Mathematics for Engineering • *Laboratorio Problem Solving 1* (*percorso Intraprendenti* - honors class) • *An introduction to* Γ*-convergence: theory and applications*, PhD course • *An introduction to generalised Gauss graphs and their applications*, PhD course.

2021–2022 *Analisi matematica 1* for the degree courses in Engineering. • *Analisi matematica 2* for the degree course in Physical Engineering. • *Laboratorio Problem Solving 1* (*percorso Intraprendenti* - honors class). • *An introduction to generalised Gauss graphs and their applications*, PhD course.

2020–2021 *Analisi matematica 1* for the degree courses in Engineering • *Laboratorio Problem Solving 1* (*percorso Intraprendenti* - honors class) • *Mathematical Analysis 2* for the degree courses in Automotive and Mechanical Engineering • *Mathematical Analysis 2* for the degree courses in Engineering at Turin Polytechnic University in Tashkent • *An introduction to* Γ*-convergence: theory and applications*, PhD course.

2019–2020 *Analisi matematica 2* (*percorso per i giovani talenti* – honors class) for the degree courses in Engineering • *Analisi matematica 1* for the degree courses in Engineering • *An introduction to* Γ*-convergence: theory and applications*, PhD course.

2018–2019 *Analisi matematica 2* (*percorso per i giovani talenti* – honors class) for the degree courses in Engineering • Recitations for *Analisi matematica 1* for the degree courses in Engineering.

At the University of Torino

2021–2022 TA for *Analysis* for the degree course in Stochastics and Data Science.

2020–2021 TA for *Analysis* for the degree course in Stochastics and Data Science.

2019–2020 TA for *Analysis* (courses *A* and *B*) for the degree course in Stochastics and Data Science.

At the University of Trieste

2016–2017 *Istituzioni di Matematiche* for the degree course in Architecture.

2015–2016 *Istituzioni di Matematiche* for the degree course in Architecture • Recitations for the course *Meccanica analitica* for the degree course in Mathematics.

2014–2015 *Istituzioni di Matematiche* for the degree course in Architecture.

2009–2010 Tutor for the course of *Matematica I* for the degree course in Chemistry.

At SISSA

2015–2016 Reading course on Measure and Integration.

At Instituto Superior Técnico

2014 Recitations for the course Complex Analysis and Differential Equations, Spring semester.

At the University of Pavia

2006–2007 TA for the course of *Istituzioni di Matematiche* for the degree course in Biological Sciences • Introductory course in Mathematics for the first-year students in Mathematics and Physics, 2006–2007 • Tutor for the course of *Matematica con elementi di statistica* for the degree courses in Pharmacy.

2005–2006 Introductory course in Mathematics for the first-year students in Mathematics and Physics.

2004–2005 Tutor for the course of *Istituzioni di Matematiche* for the degree course in Biological Sciences • Introductory course in Mathematics for the first-year students in Natural Sciences and Geology.

Participation to conferences, congresses, and schools

forthcoming *SIAM Conference on Mathematical Aspects of Materials Science (MS24)*, Pittsburgh, 19–23/5/2024. *3rd International Conference on Nonlinear Solid Mechanics (ICoNSoM 2024)*, Cagliari, 11-14/6/2024. *9th European Congress of Mathematics*, Sevilla, 15–19/7/2024.

past ten *XXXIII Convegno Nazionale di Calcolo delle Variazioni*, Riccione, 12–16/2/2024. • *Calculus of Variations in Siena*, 31/1–2/2/2024 • Workshop *Modeling, analysis, and control of multi-agent systems across scales*, Centro De Giorgi, Pisa, 22–26/1/2024 • *Atlantic Conference on Nonlinear PDEs*, Lisbon, 30/10–3/11/2023 • 57th meeting of the Society for Natural Philosophy, Paris, 16–18/10/2023 • The 10th International Congress on Industrial and Applied Mathematics (ICIAM 2023) (MS: *Variational methods for thin structures and free boundary problems*), Tokyo, 20–25/8/2023 • ESI workshop *Between Regularity and Defects: Variational and Geometrical Methods in Materials Science*, Vienna, 20–24/2/2023 • *Variational models in Materials Science*, University of Naples, 8–10/2/2023 • 56th Meeting of the Society for Natural Philosophy, Pisa, 21–23/9/2022 • *Variational challenges in materials science and imaging*. A workshop to celebrate Irene Fonseca's 65th birthday, Vienna, 20–24/6/2022.

Organizing activity

2024 Workshop *Modeling, analysis, and control of multi-agent systems across scales*, Centro De Giorgi, Pisa, 22–26/1 (with G. Albi, S. Almi, N. Loy, and F. Solombrino).

2022 Workshop *Beyond elasticity: advances and research challenges*, CIRM Luminy, 16–20/5 (with M. Bonacini, R. Cristoferi, and E. Davoli).

2020 Online workshop *Understanding locomotion: Nature-inspired mathematical models*, 11/12 (with P. Gidoni and M. Zoppello) • Mini-workshop *Mathematical Models in Continuum Mechanics*, Politecnico di Torino, 20/1.

2019 Mini-symposium *Elastic defects and structures. Modeling and experiments*, Kyushu University, 20/12 (with P. Cesana) • Minisymposium *Mathematical Models for Solid Mechanics and Soft Structures* at the 9th International Congress on Industrial and Applied Mathematics (ICIAM 2019), Valencia, 15–19/7 (with L. Lussardi) • Minisymposium *Advances in Mathematical Analysis stemming from Applications* at the International Conference on Elliptic and Parabolic Problems, Gaeta, 20–24/5 (with E. Zappale) • *Analysis and applications. Contributions from young researchers*, Politecnico di Torino, 8–9/4 (with D. Zucco).

2018 SS75 *Mathematics and materials: models and applications* at the 12th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Taipei, Taiwan, 5–9/7 (with M. Barchiesi and T. Hudson) • Oberseminar M15 at TUM, Spring 2018 (with C. E. Améndola Cerón, M. Fornasier, and P. Massopust).

2016 Mini-Symposium 16 *Dislocations: recent results and perspectives* at the 7th European Congress of Mathematics, TU Berlin, 18–22/7 (with I. Lucardesi) • Special Session 27 *Advances in the mathematical modeling of failure phenomena and interfaces in materials* at the 11th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Orlando, 1–5/7 (with M. Barchiesi and J. Matias) • *Advances in the Mathematical Analysis of Material Defects in Elastic Solids*, SISSA, Trieste, 6–10/6 (with G. Dal Maso and A. DeSimone) • CalcVar seminar cycle at SISSA, Trieste, Fall 2015–Spring 2016.

2015 *Trends in Non-Linear Analysis 2015*, SISSA, Trieste, 1–3/7 (with J. Matias) • Special Session *Mathematical models for materials* at the AMS-EMS-SPM Joint International Meeting, Porto, 10–13/6 (with G. Hayrapetyan and J. Matias) • Intensive Trimester *Variational Models for Plasticity and Dislocations*, SISSA, Trieste, 23/2–15/5 (with G. Dal Maso).

2014 *Trends in Non-Linear Analysis*, Instituto Superior Técnico, Lisbon, 31/7–1/8 (with J. Matias).

2012 CNA-PIRE Working Group *Variational methods for phase transitions and copolymers* at Carnegie Mellon University, Spring semester (with T. Blass, M. Goldman, G. Hayrapetyan, and B. Zwicknagl).

2007 Conference *La matematica fra i modelli e la realtà* at Collegio Ghislieri, Pavia, 14/5. Speaker: Alfio Quarteroni (Politecnico of Milan and Ecole Polytechnique Fédérale of Lausanne) • Conference *Matematica e Scienze sociali* at Collegio Ghislieri, Pavia, 9/5. Speaker: Stefano Demichelis (University of Pavia).

Refereeing service

scientific journals I serve (or have served) as a referee for the following journals:
Acta Applicandae Mathematicae • Applied Wave Mathematics • Automatica • Calculus of Variations and Partial Differential Equations • Communications in Pure and Applied Analysis • ESAIM: Control, Optimisation and Calculus of Variations • European Journal of Applied Mathematics • IEEE Transactions on Automatic Control • International Journal of Applied Mathematics and Computer Science • Journal de l'École polytechnique • Journal of Computational Physics • Journal of Elasticity • Journal of Mathematical Analysis and Applications • Journal of Nonlinear Science • Mathematical Models and Methods in Applied Sciences • Mathematics and Computers in Simulation • Milan Journal of Mathematics • Nonlinear Analysis • Nonlinearity • Physica D • Rendiconti del Seminario Matematico. Università e Politecnico di Torino • SIAM Journal on Mathematical Analysis • SMAI Journal of Computational Mathematics • Transactions of Mathematics and Its Applications • Transactions of the American Mathematical Society • Wave Motion.

doctoral theses

2022 03 02 Dominik Engl (Doctor of Mathematics, Utrecht University) – *Variational analysis of multiscale problems with differential constraints. Material models involving incompressibility.* (advisors: Prof. dr. Carolin Kreisbeck and Prof. dr. Sjoerd M. Verduyn Lunel).