

Curriculum vitæ et studiorum

of Marco Morandotti

Personal data

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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.

¹Support 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).

²Support for this position fully provided by the ERC Advanced Grant [QuaDynEvoPro](#).

³Support 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

2021/12/01 – Anderson Melchor Hernandez.

doctoral theses

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

master theses

- 2023** Alessandro Baldi (Math Eng) – *TBD* (co-supervised with Anderson Melchor Hernandez).
Luca Pignatelli (Math Eng) – *Quasi-static antiplane fracture*.
- 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

- 2023** Luca Camagna (Phys Eng) – *TBD*.
Concetta Carpino (Math Eng) – *TBD*.
Andrea Vasco Grieco (Math Eng) – *TBD*.
Chiara Lunazzi (Math Eng) – *Il modello preda-predatore*.
Filippo Masotti (Math Eng) – *TBD*.
Umberto Morzone (Math Eng) – *TBD*.
Axel Badouel Simo Kengne (Math Eng) – *Dynamical systems for machine learning*.
- 2023** 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.
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.
- 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 2023 *Modelli variazionali ed evolutivi per problemi di adesione e di contatto*, member (P.I. Gianluca Orlando).
- PRIN project 2020 *Mathematics for Industry 4.0*, member (P.I. Pasquale Ciarletta).
- 27/07/2018 – 27/07/2024: Abilitazione Scientifica Nazionale, fascia II¹ (art. 16, comma 1, Legge 240/10).
- 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.

¹Italian 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]

- [39] S. Almi, M. Morandotti, and F. Solombrino: *Optimal control problems in transport dynamics with additive noise*. [arXiv:2303.04877](#) Submitted.
- [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*. [arXiv:2207.02511](#) Submitted.
- [37] A. Kubin, L. Lussardi, and M. Morandotti: *Direct minimization of the Canham–Helfrich energy on generalized Gauss graphs*. [arXiv:2201.06353](#). Submitted.
- [36] S. Almi, C. D’Eramo, M. Morandotti, and F. Solombrino: *Mean-field limits for entropic multi-population dynamical systems*. Milan Journal of Mathematics, (online April 24, 2023).
- [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**, 173 (2022).
- [31] G. Albi, S. Almi, M. Morandotti, and F. Solombrino: *Mean-field selective optimal control via transient leadership*. Appl. Math. Optim., **85**, 9 (2022).
- [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.
- [26] 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: *^{99m}Tc - 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 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** 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. OIST, Okinawa, 28-31/8/2023.
- 2023** Institute of Information Theory and Automation, Czech Academy of Sciences, 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.

Presentations

- 2017** *Nonconvexity, Nonlocality and Incompatibility: From Materials to Biology*, University of Pittsburgh, 5/5 • *2017 MRS Spring Meeting and Exhibit*, Phoenix, 18/4 • *16th GAMM-Seminar on Microstructures*, TU Dortmund, 20/1.
- 2016** *7th European Congress of Mathematics*, TU Berlin, 21/7 • *Convegno Scientifico GNAMPA 2016*, Montecatini Terme, 21/6 • *XXVI Convegno Nazionale di Calcolo delle Variazioni*, Levico Terme, 19/1.
- 2015** International Workshop *Calculus of Variations and its Applications*, Universidade Nova de Lisboa, 17/12 • *AMS-EMS-SPM Joint International Meeting*, Porto, 12/6.
- 2014** Spring School on *Microscopic descriptions and mean-field equations in physics and social sciences* (poster), University of Bath, 13/5 • Winter School *Calculus of Variations in Physics and Materials Science* (poster), Würzburg 13/2 • 2014 Joint Mathematics Meeting, Baltimore, 16/1.

- 2012** CMU CNA Working Group, 4/12 • *Evolution problems in damage, plasticity and fracture: mathematical models and numerical analysis*, Udine, 20/9 • *Heterostructured Nanocrystalline Materials* (poster), ICERM, Brown University, 30/5 • *Winter School Calculus of Variations in Physics and Materials Science* (poster), Würzburg, 12/1.
- 2011** *Incompressible Fluids, Turbulence and Mixing*, Carnegie Mellon University, 15/10.
- 2010** *Individual and Collective Fluid Mechanics of Swimming Microorganisms*, Glasgow, 8/7.
- 2009** *International Conference on Elliptic and Parabolic Equations* (poster), WIAS, Berlin, 1/12 • *Workshop Multiscale Analysis of Self-Organization in Biology* (poster), BIRS, Banff, 14/7.

Teaching activity

At Politecnico di Torino

- 2022–2023** *Metodi matematici per l'ingegneria* for the degree course in Physical Engineering.
Equazioni a derivate parziali for the degree course in Mathematics for Engineering.
Mathematical Analysis 2 for the degree courses in Engineering at Turin Polytechnic University in Tashkent.
An introduction to generalised Gauss graphs and their applications, 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 • *Laboratorio Problem Solving 1* (*percorso Intraprendenti* - honors class) • *An introduction to Γ -convergence: theory and 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 ESI workshop *Between Regularity and Defects: Variational and Geometrical Methods in Materials Science*, Vienna, 20–24/2/2023.

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.

past ten *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 • International Conference on Nonlinear Solid Mechanics ICoNSOM 2022, Alghero, 13–16/6/2022 • Workshop *Beyond elasticity: advances and research challenges*, CIRM Luminy, 16–20/5/2022 • XXXI Convegno nazionale di calcolo delle variazioni, Levico Terme, 8–13/5/2022 • Problemi variazionali in domini a struttura geometrica complessa, Politecnico di Torino, 18/12/2021 • International Conference on Mathematics and its Application (ICoMathApp), Malang, 26–27/10/2021 • 15th International Conference on *Free Boundary Problems: Theory and Applications*, Berlin, 13–17/9/2021 • SIMAI conference (MS37: *Trends in nonlinear PDEs and applications*), Parma, 30/8–3/9/2021.

Organizing activity

- 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).