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Born in Zevio (Verona, Italy) on April 17, 1972

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## Academic positions

2015-today	Associate professor, Politecnico di Milano
2004-2015	Ricercatore di ruolo (first level permanent position), Politecnico di Milano
1999-2004	Postdoc position, Politecnico di Milano
1995-1999	PhD student, Università di Milano

## Education

- 2014 “Abilitazione scientifica nazionale (2013) – prima fascia, SC 01/A3, SSD MAT/05” (italian qualification required to become full professor in Mathematical Analysis)
- 2013 “Abilitazione scientifica nazionale (2012) – seconda fascia, SC 01/A3, SSD MAT/05” (italian qualification required to become associate professor in Mathematical Analysis)
- 2000 PhD in Mathematics, Università di Milano, advisor Prof. Susanna Terracini
- 1995 “Diploma di licenza” in Mathematics, Scuola Normale Superiore, Pisa
- 1995 Master degree *cum laude* in Mathematics, Università di Pisa, advisor Prof. Antonio Ambrosetti

## Scientific research

### Interests - Keywords

Nonlinear differential equations and systems: existence, multiplicity, qualitative properties and regularity of solutions.

- Variational and topological methods, critical points theory, bifurcation theory. Characterization of solutions via nodal properties, variational principles, Morse index. Natural constraints, Nehari method.
- Periodic, almost-periodic and bounded trajectories for dynamical systems, Littlewood boundedness problem, symbolic dynamics. Complex solutions for singular hamiltonian systems (e.g. for the  $N$ -body problem).
- Systems of semilinear elliptic equations with strongly competing interaction. Optimal partition problems and free boundaries, regularity issues. Blow-up techniques, monotonicity formulæ, classification of entire solutions, Liouville-type theorems.
- Solitary waves for Schrödinger equations and systems, orbital stability. Normalized solutions.
- Nonlocal operators, anomalous diffusion, fractional derivatives (in space and/or time). Reaction-diffusion equations and systems in population dynamics.
- Mean Field Games.

### Publications

Some draft versions are posted on [arXiv](#).

Submitted

- [45] (With T. Bartsch, R. Molle, and M. Rizzi). *Normalized solutions of mass supercritical Schrödinger equations with potential*. Submitted. arXiv: [2008.07431 \[math.AP\]](#).
- [44] (With V. Barutello and R. Ortega). *Regularized variational principles for the perturbed Kepler problem*. Submitted. arXiv: [2003.09383 \[math.CA\]](#).

Accepted for publication

- [43] (With D. Pierotti and N. Soave). *Local minimizers in absence of ground states for the critical NLS energy on metric graphs*. To appear on *Proc. Roy. Soc. Edinburgh Sect. A*. arXiv: [1909.11533 \[math.AP\]](#).

Published

- 2021 [42] 2021 (with B. Pellacci, A. Pistoia, and G. Vaira).  
 “Normalized concentrating solutions to nonlinear elliptic problems”.  
*Journal of Differential Equations* 275, 882–919.
- [41] 2021 (with S. Dipierro, B. Pellacci, and E. Valdinoci).  
 “Time-fractional equations with reaction terms: Fundamental solutions and asymptotics”.  
*Discrete & Continuous Dynamical Systems* 41, 257–275.
- 2020 [40] 2020 (with D. Mazzoleni and B. Pellacci).  
 “Asymptotic spherical shapes in some spectral optimization problems”.  
*J. Math. Pures Appl. (9)* 135, 256–283.
- [39] 2020 (with D. Mazzoleni and B. Pellacci).  
 “Quantitative Analysis of a Singularly Perturbed Shape Optimization Problem in a Polygon”.  
 In: *2018 MATRIX Annals*. Ed. by D. Wood, J. de Gier, C. E. Praeger, and T. Tao. Cham: Springer International Publishing, 275–283.
- 2019 [38] 2019 (with B. Noris and H. Tavares).  
 “Normalized solutions for nonlinear Schrödinger systems on bounded domains”.  
*Nonlinearity* 32, 1044–1072.
- [37] 2019 (with S. Terracini and A. Zilio).  
 “Spiraling asymptotic profiles of competition-diffusion systems”.  
*Comm. Pure Appl. Math.* 72, 2578–2620.
- 2018 [36] 2018 (with B. Pellacci).  
 “Best dispersal strategies in spatially heterogeneous environments: optimization of the principal eigenvalue for indefinite fractional Neumann problems”.  
*J. Math. Biol.* 76, 1357–1386.
- [35] 2018 (with S. Salsa and F. Tulone).  
 “Existence of viscosity solutions to two-phase problems for fully nonlinear equations with distributed sources”.  
*Mathematics in Engineering* 1, 147–173.
- [34] 2018 (with D. Bucur, I. Fragalà, and B. Velichkov).  
 “On the honeycomb conjecture for a class of minimal convex partitions”.  
*Trans. Amer. Math. Soc.* 370, 7149–7179.
- 2017 [33] 2017 (with M. Cirant).  
 “Bifurcation and segregation in quadratic two-populations Mean Field Games systems”.  
*ESAIM Control Optim. Calc. Var.* 23, 1145–1177.
- [32] 2017 (with D. Pierotti).  
 “Normalized bound states for the nonlinear Schrödinger equation in bounded domains”.  
*Calc. Var. Partial Differential Equations* 56, Paper No. 133, 27.
- 2016 [31] 2016 (with S. Terracini and A. Zilio).  
 “Uniform Hölder bounds for strongly competing systems involving the square root of the laplacian”.  
*J. Eur. Math. Soc. (JEMS)* 18, 2865–2924.
- 2015 [30] 2015 (with C. D. Pagani, D. Pierotti, and A. Zilio).  
 “A nonlinear Steklov problem arising in corrosion modeling”.  
 In: *Contributions to nonlinear elliptic equations and systems*. Vol. 86. Progr. Nonlinear Differential Equations Appl. Birkhäuser/Springer, Cham, 371–387.
- [29] 2015 (with V. L. Barutello and A. Boscaggin).  
 “Positive solutions with a complex behavior for superlinear indefinite ODEs on the real line”.  
*J. Differential Equations* 259, 3448–3489.

- [28] 2015 (with B. Noris and H. Tavares).  
 “Stable solitary waves with prescribed  $L^2$ -mass for the cubic Schrödinger system with trapping potentials”.  
*Discrete Contin. Dyn. Syst.* 35, 6085–6112.
- 2014 [27] 2014 (with N. Soave).  
 “Bounded solutions for a forced bounded oscillator without friction”.  
*J. Differential Equations* 256, 2526–2558.
- [26] 2014 (with V. Barutello and S. Terracini).  
 “Entire parabolic trajectories as minimal phase transitions”.  
*Calc. Var. Partial Differential Equations* 49, 391–429.
- [25] 2014 (with B. Noris and H. Tavares).  
 “Existence and orbital stability of the ground states with prescribed mass for the  $L^2$ -critical and supercritical NLS on bounded domains”.  
*Anal. PDE* 7, 1807–1838.
- [24] 2014 (with A. Zilio).  
 “Strong competition versus fractional diffusion: the case of Lotka-Volterra interaction”.  
*Comm. Partial Differential Equations* 39, 2284–2313.
- [23] 2014 (with S. Terracini and A. Zilio).  
 “Uniform Hölder regularity with small exponent in competition-fractional diffusion systems”.  
*Discrete Contin. Dyn. Syst.* 34, 2669–2691.
- 2013 [22] 2013 (with B. Noris).  
 “A remark on natural constraints in variational methods and an application to superlinear Schrödinger systems”.  
*J. Differential Equations* 254, 1529–1547.
- [21] 2013 (with V. Barutello and S. Terracini).  
 “Entire minimal parabolic trajectories: the planar anisotropic Kepler problem”.  
*Arch. Ration. Mech. Anal.* 207, 583–609.
- [20] 2013 (with E. Montefusco and B. Pellacci).  
 “Fractional diffusion with Neumann boundary conditions: the logistic equation”.  
*Discrete Contin. Dyn. Syst. Ser. B* 18, 2175–2202.
- 2012 [19] 2012 (with B. Noris, H. Tavares, and S. Terracini).  
 “Convergence of minimax structures and continuation of critical points for singularly perturbed systems”.  
*J. Eur. Math. Soc. (JEMS)* 14, 1245–1273.
- 2011 [18] 2011 (with P. Biscari, S. Minisini, D. Pierotti, and P. Zunino).  
 “Analysis of an evolution problem for controlled drug release”.  
*SeMA J.*, 63–79.
- [17] 2011 (with P. Biscari, S. Minisini, D. Pierotti, and P. Zunino).  
 “Controlled release with finite dissolution rate”.  
*SIAM J. Appl. Math.* 71, 731–752.
- [16] 2011 (with H. Tavares, S. Terracini, and T. Weth).  
 “Existence and nonexistence of entire solutions for non-cooperative cubic elliptic systems”.  
*Comm. Partial Differential Equations* 36, 1988–2010.
- 2010 [15] 2010 (with B. Noris, H. Tavares, and S. Terracini).  
 “Uniform Hölder bounds for nonlinear Schrödinger systems with strong competition”.  
*Comm. Pure Appl. Math.* 63, 267–302.
- 2009 [14] 2009 (with S. Terracini).  
 “Multipulse phases in  $k$ -mixtures of Bose-Einstein condensates”.  
*Arch. Ration. Mech. Anal.* 194, 717–741.

- 2006 [13] 2006 (with M. Conti and S. Terracini).  
 “Uniqueness and least energy property for solutions to strongly competing systems”.  
*Interfaces Free Bound.* 8, 437–446.
- 2005 [12] 2005 (with M. Conti and S. Terracini).  
 “A regularity theory for optimal partition problems”.  
 In: *SPT 2004—Symmetry and perturbation theory*. World Sci. Publ., Hackensack, NJ, 91–98.
- [11] 2005 (with M. Conti and S. Terracini).  
 “A variational problem for the spatial segregation of reaction-diffusion systems”.  
*Indiana Univ. Math. J.* 54, 779–815.
- [10] 2005 (with M. Conti and S. Terracini).  
 “Asymptotic estimates for the spatial segregation of competitive systems”.  
*Adv. Math.* 195, 524–560.
- [9] 2005 (with M. Conti and S. Terracini).  
 “On a class of optimal partition problems related to the Fučík spectrum and to the monotonicity formulae”.  
*Calc. Var. Partial Differential Equations* 22, 45–72.
- 2004 [8] 2004 (with R. Ortega).  
 “A variational method for the existence of bounded solutions of a sublinear forced oscillator”.  
*Proc. London Math. Soc.* (3) 88, 775–795.
- [7] 2004 (with M. Conti and S. Terracini).  
 “Infinitely many solutions to fourth order superlinear periodic problems”.  
*Trans. Amer. Math. Soc.* 356, 3283–3300.
- 2003 [6] 2003 (with M. Conti and S. Terracini).  
 “An optimal partition problem related to nonlinear eigenvalues”.  
*J. Funct. Anal.* 198, 160–196.
- [5] 2003.  
 “Bounded solutions to superlinear ODEs: a variational approach”.  
*Nonlinearity* 16, 2013–2028.
- 2002 [4] 2002 (with M. Conti and S. Terracini).  
 “Nehari’s problem and competing species systems”.  
*Ann. Inst. H. Poincaré Anal. Non Linéaire* 19, 871–888.
- [3] 2002 (with M. Conti and S. Terracini).  
 “Nodal solutions to a class of nonstandard superlinear equations on  $\mathbb{R}^N$ ”.  
*Adv. Differential Equations* 7, 297–318.
- 2001 [2] 2001 (with S. Terracini).  
 “Solutions of prescribed number of zeroes to a class of superlinear ODE’s systems”.  
*NoDEA Nonlinear Differential Equations Appl.* 8, 323–341.
- 2000 [1] 2000 (with S. Terracini).  
 “Oscillating solutions to second-order ODEs with indefinite superlinear nonlinearities”.  
*Nonlinearity* 13, 1501–1514.

#### Thesis

- 2000 [2] 2000.  
 “Oscillating solutions to differential equations via the Nehari method”. PhD Thesis. Università di Milano.
- 1995 [1] 1995.  
 “Teoria della biforcazione ed applicazioni alle equazioni alle derivate parziali”. Tesi di laurea. Università di Pisa.

## Grants and projects, mentoring

Post-doc mentoring:

- 2021-22 *Direttore della ricerca* for the 1-year post-doc position of Stefano Vita (the position, at Politecnico di Milano, is funded by INdAM; dr. Vita has won such position in an international competition open to all fields of Mathematics, for 4 positions to be directed by a professor hosted in an Italian institution; expected to begin in May 2021)

Principal investigator of funded projects:

- 2017-20 Coordinator of the local research unit at Politecnico di Milano for the *P.R.I.N.* “Variational methods, with applications to problems in mathematical physics and geometry”, national coordinator A. Malchiodi
- 2016 *G.N.A.M.P.A. project* “Fenomeni di segregazione in sistemi stazionari di tipo Mean Field Games a più popolazioni”
- 2013 *G.N.A.M.P.A. project* “Formazione di pattern in sistemi soggetti a diffusione anomala e forte competizione”
- 2011 *G.N.A.M.P.A. project* “Dinamica di popolazioni soggette a diffusione anomala, reazione ed interazione di tipo preda-predatore”

Member of funded project:

- 2021-23 project “Nonlinear Dispersive and Elliptic Systems - new horizons in regularity, dynamics and asymptotic analysis”, Fundação para a Ciência e a Tecnologia (Portugal), principal investigator H. Tavares
- 2020-22 project “Vain-Hopes” within the program *VALERE - Università degli Studi della Campania “Luigi Vanvitelli”*, principal investigator B. Pellacci
- 2013-19 *ERC Advanced Grant Project 2013* “Complex Patterns for Strongly Interacting Dynamical Systems - COMPAT”, principal investigator S. Terracini, full time member
- 2019 *G.N.A.M.P.A. project* “Ottimizzazione Spettrale Non Lineare”, principal investigator D. Mazzoleni
- 2018 *G.N.A.M.P.A. project* “Equazioni di Schrödinger nonlineari: soluzioni con indice di Morse alto o infinito”, principal investigator R. Molle
- 2014-2016 *P.R.I.N.* 2012 “Aspetti variazionali e perturbativi nei problemi differenziali nonlineari”, principal investigator S. Terracini
- 2015 *G.N.A.M.P.A. project* “Modelli ed equazioni non-locali di tipo frazionario”, principal investigator G. Molica Bisci
- 2012 *G.N.A.M.P.A. project* “Diffusione anomala e diffusione standard: coerenze e contrasti in dinamica delle popolazioni”, principal investigator B. Pellacci
- 2011-2012 *P.R.I.N.* 2009 “Teoria dei punti critici e metodi perturbativi per equazioni differenziali nonlineari”, principal investigator S. Terracini
- 2010 *G.N.A.M.P.A. project* “Dinamica di popolazioni e interazioni saturabili: esistenza di soluzioni e aspetti asintotici”, principal investigator E. Montefusco
- 2006-2007 *P.R.I.N.* 2006 “Metodi Variazionali ed Equazioni Differenziali Nonlineari”, principal investigator A. Ambrosetti
- 2004-2005 *P.R.I.N.* 2004 “Metodi Variazionali ed Equazioni Differenziali Nonlineari”, principal investigator A. Ambrosetti
- 2002-2003 *P.R.I.N.* 2002 “Metodi Variazionali ed Equazioni Differenziali Nonlineari”, principal investigator A. Ambrosetti
- 2000-2001 *P.R.I.N.* 2000 “Metodi Variazionali ed Equazioni Differenziali Nonlineari”, principal investigator A. Ambrosetti

1998-1999 *P.R.I.N.* 1998 “Metodi Variazionali ed Equazioni Differenziali Nonlineari”, principal investigator A. Ambrosetti

(*P.R.I.N.* stands for “Research Project of National Interest”, being big projects with several local units, funded by the Italian Government; *G.N.A.M.P.A.* projects are small projects, with about five members, funded by the Italian Institute for Mathematical Studies I.N.D.A.M.)

### Visits

- 2019 Dipartimento di Matematica, Sapienza Università di Roma, one week
- 2019 Department of Mathematics and Statistics, The University of Western Australia at Perth, one week
- 2019 Laboratoire Jacques Louis Lions (LJLL), Université de Paris (Diderot), France, one week
- 2018 Department of Mathematics and Statistics, The University of Western Australia at Perth, one week
- 2017 Departamento de Matemática Aplicada, Universidad de Granada, Spain, one week
- 2017 Laboratoire Amiénois de Mathématique Fondamentale et Appliquée, Université de Picardie Jules Verne, France, one week
- 2017 Dipartimento di Matematica “Giuseppe Peano”, Università di Torino, one week
- 2017 School of Mathematics and Statistics, University of Melbourne, Australia, two weeks
- 2016 Dipartimento di Matematica, Sapienza Università di Roma, Italy, one week
- 2016 Institut für Mathematik, Goethe-Universität, Frankfurt, Germany, one week
- 2015 Dipartimento di Matematica e Informatica, Università di Palermo, Italy, one week
- 2013 Laboratoire de Mathématiques, Université de Versailles-St Quentin, France, one week
- 2013 Dipartimento di Matematica, Sapienza Università di Roma, Italy, one week
- 2012 Centro de Matemática e Aplicações Fundamentais, Universidade de Lisboa, Portugal, one week
- 2011 Dipartimento di Matematica, Sapienza Università di Roma, Italy, one week
- 2010 Departamento de Matemática Aplicada, Universidad de Granada, Spain, two weeks
- 2009 Institut für Mathematik, Goethe-Universität, Frankfurt, Germany, one week
- 2007 Dipartimento di Matematica, Sapienza Università di Roma, Italy, one week
- 2006 Université de Paris Sud (Orsay), France, one week
- 2006 International E. Schrödinger Institute for Mathematical Physics, Wien, Austria, one week
- 2004 Departamento de Matemática Aplicada, Universidad de Granada, Spain, two weeks
- 2002 Departamento de Matemática Aplicada, Universidad de Granada, Spain, one month
- 2001 Departamento de Matemática Aplicada, Universidad de Granada, Spain, two months

### Talks

Invited talks at conferences:

- 2020 *Intensive Week on PDEs on the WEB*, Zoom platform ([video](#))
- 2019 *Variational methods, with applications to problems in mathematical physics and geometry, per i 75 anni di Antonio Ambrosetti*, Istituto Canossiano San Trovaso, Venezia, Italy
- 2019 *Calculus of Variations and Free Boundary Problems III*, Università di Napoli Federico II, Italy
- 2019 *Journées Optimisation de Formes et Applications (JOFA 4)*, Ecole Polytechnique, Palaiseau, France
- 2019 *Mean Field Games and Related Topics - 5*, Levico Terme (Trento), Italy
- 2019 *Partial Differential Equations in Analysis and Mathematical Physics*, Santa Margherita di Pula (Cagliari), Italy
- 2018 *Recent trends on nonlinear PDEs of elliptic and parabolic type*, MATRIX Institute, Melbourne, Australia
- 2018 *Topics in Nonlinear Analysis: Calculus of Variations and PDEs*, Universidade de Lisboa, Portugal
- 2018 *ICM 2018 – Satellite Conference on Nonlinear Partial Differential Equations*, Fortaleza, Brasil

- 2017 *Nonlinear Days in Turin*, Politecnico di Torino, Italy
- 2017 *Brescia-Trento Nonlinear Days, Edition I*, Università di Trento, Italy
- 2017 *Roma Caput PDE*, Università Sapienza di Roma, Italy
- 2016 *Asymptotic Patterns in Variational Problems: PDE and Geometric Aspects*, BIRS-Casa Matemática Oaxaca, Mexico ([video](#))
- 2016 *Pdè's at the Grand Paradis – International conference on Variational Methods and Nonlinear PDE's*, Cogne, Aosta, Italy
- 2015 *2nd Conference on Recent Trends in Nonlinear Phenomena*, Università di Napoli Parthenope, Italy
- 2015 *VII Symposium on Nonlinear Analysis*, Nicolaus Copernicus University, Toruń, Poland
- 2015 *Nonlinear Elliptic Systems and Applications*, special session in the *2015 AMS-EMS-SPM Joint Meeting*, Porto, Portugal
- 2015 *Spectral theory and shape optimization problems for elliptic PDEs*, Università di Milano Bicocca, Italy
- 2015 *Análisis no lineal y EDPs elípticas*, special session in the *Congreso de la RSME 2015*, Universidad de Granada, Spain
- 2014 *Recent Trends in Nonlinear Schrödinger Systems*, special session in the *10th AIMS Conference on Dynamical Systems, Differential Equations and Applications*, Universidad autónoma de Madrid, Spain
- 2014 *Jornades d'interacció entre sistemes dinàmics i equacions en derivades parcials – JISD2014*, Universitat Politècnica de Catalunya, Barcelona, Spain
- 2014 *ERC Advanced Grant Project 2013 “COMPAT” meeting*, Università di Torino, Italy
- 2014 *Variational Methods in Elliptic Equations and Systems*, Centro de Matemática e Aplicações Fundamentais (CMAF), Lisboa, Portugal
- 2013 *Nona Giornata di Studio Politecnico di Milano - Università di Pavia*, Pavia, Italy
- 2012 *Singular limit problems in nonlinear PDEs*, Centre International de Rencontres Mathématiques, Marseille, France
- 2012 *Self-organized Behavior of Nonlinear Elliptic Equations and Pattern Formation of Strongly Interacting Systems*, special session n. 29 in the *9th AIMS Conference on Dynamical Systems, Differential Equations and Applications*, Orlando, Florida, USA
- 2012 *Qualitative Theory of Nonlinear ODEs and Applications*, special session n. 35 in the *9th AIMS Conference on Dynamical Systems, Differential Equations and Applications*, Orlando, Florida, USA
- 2012 *Variational Methods in N-Body and Vortex Dynamics*, Università del Salento, Lecce, Italy
- 2011 *Variational and perturbative methods for nonlinear differential equations*, Istituto Canossiano Le Romite, Venezia, Italy
- 2010 *Solitary and dispersive days*, Dipartimenti di Matematica delle Università di Milano, Italy
- 2010 *Differential and topological problems in modern theoretical physics*, SISSA, Trieste, Italy
- 2009 *Conference in memory of Professor S.L. Yadava*, TIFR Centre for Applicable Mathematics, Bangalore, India
- 2008 *Primo Incontro delle Donne del Laplaciano*, Cortona (AR), Italy
- 2007 *Existence and stability properties of solitary and standing waves in nonlinear differential equations and related spectral problems*, Dipartimento di Matematica, Università di Pisa, Italy
- 2006 *Workshop on Free Boundaries and PDEs in Biology*, Wolfgang Pauli Institute, Wien, Austria
- 2005 *CVGMT: Recent Advances in Calculus of Variations and PDE's - A young researchers meeting*, Dipartimento di Matematica, Università di Pisa, Italy
- 2004 *Symmetry and Perturbation Theory*, Cala Gonone (NU), Italy
- 2001 *Turin fortnight on nonlinear analysis*, Dipartimento di Matematica, Università di Torino, Italy

Invited talks in university seminars:

- 2019 Dipartimento SBAI, Sapienza Università di Roma, Italy
- 2019 Dipartimento di Matematica e Fisica, Università di Roma Tre, Italy
- 2018 Dipartimento di Scienze Matematiche “G. L. Lagrange”, Politecnico di Torino, Italy
- 2017 Dipartimento di Matematica, Università di Roma “Tor Vergata”, Italy



- 2017 Laboratoire Amiénois de Mathématique Fondamentale et Appliquée, Université de Picardie Jules Verne, France
- 2017 School of Mathematics and Statistics, University of Melbourne, Australia
- 2016 Dipartimento di Matematica, Università di Padova, Italy
- 2016 Dipartimento di Matematica, Sapienza Università di Roma, Italy
- 2016 Institut für Mathematik, Goethe-Universität, Frankfurt, Germany
- 2015 Dipartimento di Matematica e Informatica, Università di Palermo, Italy
- 2013 Dipartimento di Matematica e Applicazioni, Università di Milano Bicocca, Italy
- 2013 Dipartimento di Matematica, Università di Torino, Italy
- 2012 Centro de Matemática e Aplicações Fundamentais, Universidade de Lisboa, Portugal
- 2011 Dipartimento di Matematica, Sapienza Università di Roma, Italy
- 2010 Departamento de Matemática Aplicada, Universidad de Granada, Spain
- 2009 Institut für Mathematik, Goethe-Universität, Frankfurt, Germany
- 2007 Dipartimento di Matematica e Applicazioni, Università di Milano Bicocca, Italy
- 2007 Dipartimento di Matematica, Sapienza Università di Roma, Italy
- 2006 Dipartimento di Matematica e Informatica, Università di Perugia, Italy
- 2004 Departamento de Matemática Aplicada, Universidad de Granada, Spain
- 2004 Dipartimento di Matematica e Applicazioni, Università di Milano Bicocca, Italy
- 2004 Dipartimento di Matematica, Politecnico di Milano, Italy
- 2002 Departamento de Matemática Aplicada, Universidad de Granada, Spain
- 2001 Departamento de Matemática Aplicada, Universidad de Granada, Spain

Contributed talks:

- 2013 *Recent Development of nonlinear PDEs*, Australian National University, Canberra, Australia
- 2008 *Spring school in nonlinear partial differential equations*, Université catholique de Louvain, Louvain-La-Neuve, Belgium (plenary talk)
- 2006 *Topological and Variational Methods in Partial Differential Equations*, CIMAT, Guanajuato, Mexico
- 2003 *XVII Congresso Nazionale UMI*, Milano, Italy
- 1999 *Giornate SISSA di Analisi Nonlineare*, Trieste, Italy
- 1999 *Well posed Variational Problems*, Gargnano (BS), Italy
- 1998 *Giornate nonlineari*, Politecnico di Torino, Italy

**Organization of scientific activities**

- 2021 *One day in PDEs*, Politecnico di Milano (con M.C. Cerutti, F. Ferrari)
- 2020 *Brescia Winter School on Reaction Diffusion PDEs and Optimization*, Catholic University in Brescia (with D. Mazzoleni, B. Pellacci)
- 2019 *Analytic and Geometric Aspects of PDEs*, Politecnico di Milano (with G. Catino, D.D. Monticelli, N. Soave)
- 2019 *Variational approaches to PDEs*, Università di Roma “Tor Vergata” (with R. Molle, G. Tarantello)
- 2018 *Variational methods in Analysis, Geometry and Physics*, Scuola Normale Superiore, Pisa (with D. Bartolucci, B. Franchi, A. Malchiodi, D. Mugnai, F. Pacella, S. Secchi)
- 2018 *Interaction models: Mean Field Games, pattern formation and related topics*, Dipartimento di Matematica “Tullio Levi-Civita”, Università di Padova (with M. Cirant)
- 2015 *Three days on geometric PDEs*, Dipartimento di Matematica, Politecnico di Milano (with G. Catino)
- 2014 *Recent Trends in Nonlinear Schrödinger Systems*, special session in the *10th AIMS Conference on Dynamical Systems, Differential Equations and Applications*, Madrid, Spain (with B. Pellacci)
- 2014 *Spring School on PDEs*, Dipartimento di Matematica, Sapienza Università di Roma (with E. Montefusco, B. Pellacci)
- 2013 *Winter School on Fast and Anomalous Diffusion*, Dipartimento di Matematica, Sapienza Università di Roma (with E. Montefusco, B. Pellacci)

- 2012 *A week on fractional diffusion*, Dipartimento di Matematica, Politecnico di Milano (with E. Montefusco, B. Noris, B. Pellacci)
- 2009 *Trends in nonlinear analysis and PDE's, on the occasion of Luis A. Caffarelli's 60th birthday*, Dipartimento di Matematica, Politecnico di Milano (with S. Salsa, M. Conti)

### Editorial activity

- 2019-2021 Guest Editor of the special volume “[Contemporary PDEs between theory and modeling – Dedicated to Sandro Salsa, on the occasion of his 70th birthday](#)” of *Mathematics in Engineering*; the volume covers 2 actual issues of the journal (2020 (4), 2021 (1)), consisting in 21 research papers written by 48 authors.
- 2004-today Referee for  
*Abstract and Applied Analysis*,  
*Advances in Nonlinear Analysis*,  
*Analysis & PDE*,  
*Annales Academiæ Scientiarum Fennicæ Mathematica*,  
*Annales de l'Institut Henri Poincaré (C) - Analyse non linéaire*,  
*Annali della Scuola Normale di Pisa - Classe di Scienze*  
*Annali di Matematica Pura ed Applicata*,  
*Applicable Analysis*,  
*Applied Mathematics and Computation*,  
*Arab Journal of Mathematical Sciences*,  
*Asymptotic Analysis*,  
*Boundary Value Problems*,  
*Bulletin of Mathematical Biology*,  
*Bulletin of the Belgian Mathematical Society*,  
*Calculus of Variations and PDE*,  
*Celestial Mechanics and Dynamical Astronomy*,  
*Canadian Journal of Mathematics*,  
*Communications in Contemporary Mathematics*,  
*Communications in Mathematical Physics*,  
*Communications in Partial Differential Equations*,  
*Communications on Pure and Applied Analysis*,  
*Comptes rendus Mathématique*,  
*Computers and Mathematics with Applications*,  
*Discrete and Continuous Dynamical Systems*,  
*Discrete and Continuous Dynamical Systems–B*,  
*Electronic Journal of Qualitative Theory of Differential Equations (EJQTDE)*,  
*Electronic Journal of Differential Equations (EJDE)*,  
*ESAIM: Control, Optimisation and Calculus of Variations*,  
*Il Nuovo Cimento B*,  
*Interfaces and Free Boundaries*,  
*International Mathematics Research Notices*,  
*Journal d'Analyse Mathématique*,  
*Journal de Mathématiques Pures et Appliquées*,  
*Journal of Differential Equations*,  
*Journal of Fixed Point Theory and Applications*,  
*Journal of Mathematical Analysis and Application*,  
*Journal of Mathematical Physics*,  
*Journal of the American Mathematical Society*,  
*Journal of the London Mathematical Society*,

*Mathematical Methods in the Applied Sciences*,  
*Mathematische Nachrichten*,  
*Milan Journal of Mathematics*,  
*Nonlinear Analysis Series A: Theory, Methods & Applications*,  
*Nonlinear Analysis Series B: Real World Applications*,  
*Nonlinear Differential Equations and Application NoDEA*,  
*Nonlinearity*,  
*Numerical Methods for Partial Differential Equations*,  
*Proceedings of the Indian Academy of Sciences - Mathematical Sciences*,  
*Proceedings of the London Mathematical Society*,  
*Proceedings of the Royal Society of Edinburgh Section A*,  
*Pure and Applied Mathematics Quarterly*,  
*Springer INDAM Series*,  
*Transactions of the American Mathematical Society*,  
*Zeitschrift fuer Angewandte Mathematik und Physik - ZAMP*.

2012-13 Member of the editorial board of *Abstract and Applied Analysis*  
 Reviewer for *Mathematical Reviews*.

### **Bibliometrics, other assessments**

Databases checked on February 11, 2021.

ISI-WoS 39 publications, 1059 citations (523 citing articles), 955 without self-citations (493), h-index 16

Scopus 45 publications, 1020 citations (529 citing articles), h-index 15

MathSciNet 42 publications, 978 citations (455 citing authors), h-index 16

- ▷ The paper “Uniform Hölder Bounds for Nonlinear Schrödinger Systems with Strong Competition”, by B. Noris, H. Tavares, S. Terracini, and myself, published on *Communications on Pure and Applied Mathematics*, Vol. 63, appeared on the [journal website](#) among the 5 most-cited articles from 2009/10 and 2010/11. It is also listed in the ISI Web of Knowledge *Higly Cited Papers*.
- ▷ In 2007 the Math Department of Politecnico di Milano underwent an international peer review. The committee members —John Ball (Oxford, Chair), Wolfgang Dahmen (Aachen), Giuseppe Geymonat (Montpellier II), Gil Kalai (Hebrew University, Jerusalem), Wendelin Werner (Paris-Sud)— examined each research group, and in particular the one named “Geometric methods in free boundary problems”, composed of Sandro Salsa, Maria Cristina Cerutti, and myself, evaluating it as “a very strong group at a very good international level. Its taste in problems is admirable, and it is open to new questions arising in different scientific fields”. About my research, “the work on studying the competition parameter tends to infinity limit in reaction-diffusion systems is strong research, interesting as regards applications and technically demanding. The results on bounded solutions of forced nonlinear oscillators are also good”.

### **Academic services**

- 2017-today Member of the committee of the PhD School “Mathematical models and methods in engineering”, Politecnico di Milano
- 2013-2016 Member of the committee for tutoring services, School of Industrial and Information Engineering, Politecnico di Milano
- 2010-2013 Coordinator of the tutoring services, School of Systems Engineering, Politecnico di Milano
- 2006-2016 Coordinator of the tutoring services, Mathematical Engineering educational program, Politecnico di Milano
- 2006-2011 Member of the didactic committee, Department of Mathematics, Politecnico di Milano

## Evaluation activity

I have been anonymous referee for the evaluation of scientific products and projects, of either national or local interest, for: some Italian universities, INdAM, the Italian Government, the Chilean Government. Moreover I have participated in the following evaluation committees.

At Politecnico di Milano, for the selection of the following positions:

- 2020 Tutoring services (3 calls)
- 2019 Teaching Assistants (T.A.) for Basic Mathematical Analysis course
- 2019 Tutoring services (3 calls)
- 2017 Tutoring services
- 2015 Tutoring services (2 calls)
- 2014 Tutoring services (3 calls)
- 2013 T.A. for the Advanced Mathematical Analysis courses
- 2012 T.A. for the Basic Mathematical Analysis courses
- 2012 One research appointment about “Una metodologia per l’individuazione di effetto contagio nei mercati finanziari”
- 2012 One research appointment about “Ottimizzazione dell’allocazione delle garanzie di un intermediario creditizio”
- 2011 MATLAB Tutors
- 2010 T.A. for the Basic Mathematical Analysis courses
- 2010 MATLAB Tutors
- 2010 General tutoring services for the School of Systems Engineering
- 2009 General tutoring services for the School of Systems Engineering
- 2005 One post-doc position about “Tecniche variazionali per problemi di esistenza e di approssimazione in modelli con discontinuità libere”

At other universities, for the selection of the following positions:

- 2021 Ricercatore a tempo determinato (tipo B), settore MAT/05 (assistant professor in mathematical analysis, tenure track), Università di Torino
- 2020 Ricercatore a tempo determinato (tipo B), settore MAT/05 (assistant professor in mathematical analysis, tenure track), Università di Bologna
- 2019 Post-doc position “Pdes, Free Boundaries, Nonlocal Equations And Applications”, Istituto Nazionale di Alta Matematica INdAM
- 2018 Ricercatore a tempo determinato (tipo A), settore MAT/05 (assistant professor in mathematical analysis, temporary position), Sapienza Università di Roma
- 2017 Ricercatore a tempo determinato (tipo A), settore MAT/05 (assistant professor in mathematical analysis, temporary position), Università Cattolica del Sacro Cuore, Brescia

## Academic teaching

### Courses (undergraduate program)

Since 1999 I have been responsible for 30 courses and teaching assistant for 24 ones, on basic and advanced analysis (all at Politecnico di Milano, Schools of Engineering, taught in italian). In 7 of the latter ones I had to train students for exercises, while in the other 17 I have been responsible for a part of the theoretical program. In details:

- 2020-2021 Analytical and Numerical Methods for Eng. (course); Reaction-Diffusion Equations (course)

2019-2020 Analysis II (course); PDEs (course); PDEs (T.A.)  
 2018-2019 Analysis II (course); PDEs (course); PDEs (T.A.)  
 2017-2018 Analysis II (course); PDEs (T.A.)  
 2016-2017 Analysis II (course); PDEs (T.A.)  
 2015-2016 Analysis II (course); PDEs (T.A.)  
 2014-2015 Analysis I (course); PDEs (T.A.)  
 2013-2014 Analysis I (course); PDEs (T.A.)  
 2012-2013 Analysis I (course); PDEs (T.A.)  
 2011-2012 Analysis II (course); PDEs (T.A.)  
 2010-2011 Analysis II (course); PDEs (T.A.)  
 2009-2010 Analysis II (course); PDEs (T.A.)  
 2008-2009 Analysis I (course); ODEs (course); PDEs (T.A.)  
 2007-2008 Analysis I (course); ODEs (course); PDEs (T.A.)  
 2006-2007 Analysis I (course); ODEs (course); PDEs (T.A.)  
 2005-2006 Analysis II (course); ODEs (course); PDEs (course); PDEs (T.A.)  
 2004-2005 Analysis II (course); ODEs (course); PDEs (T.A.)  
 2003-2004 Analysis II (course); ODEs (course); PDEs (T.A.)  
 2002-2003 ODEs (course); Analysis I (T.A.), Analysis II (T.A.)  
 2001-2002 ODEs (course); Analysis II (T.A.)  
 2000-2001 Analysis I (T.A.), Analysis II (T.A.)  
 1999-2000 Analysis I (T.A.), Analysis II (T.A.)

#### Programs

Analysis I: differential and integral calculus for functions of one variable (60 hours)

Analysis II: differential and integral calculus for functions of several variables (60 hours)

ODEs: Cauchy problem for ODE systems (local and global results, qualitative properties of solutions), linear systems, autonomous systems (Lyapunov and asymptotic stability of equilibria/limiting cycles) (30 hours)

PDEs (course): heat equation, Laplace and Poisson equation, first order (quasilinear) conservation laws, wave equation, weak formulation of one-dimensional stationary second order boundary value problems (30 hours)

PDEs (T.A.): Hilbert spaces, Lax-Milgram Lemma, introduction to Sobolev spaces, weak formulations of homogeneous boundary value problems for the Poisson equation (20 hours, part of a course for the Mathematical Engineering educational program taught by S. Salsa)

#### Courses (PhD program)

2019-20 *Semilinear elliptic equations*, with N. Soave  
 2017-18 *Semilinear elliptic equations*, with N. Soave  
 2012 *Nonlinear elliptic and parabolic equations involving fractional Laplacians*, with X. Cabré e J-M. Roquejoffre  
 2011 *Semilinear elliptic equations*, with S. Terracini (Universities of Milano, Milano Bicocca, Pavia and Politecnico di Milano)

#### Advisor (undergraduate)

Since 2005 I have advised 46 students for the Mathematical Engineering educational program at Politecnico di Milano, the final proof to obtain the degree consisting in either writing a thesis, or studying some research paper/book chapter (reading course)

2019 Fabrizio Bernardi (rc), Pietro De Bernardini (rc), Luca Caivano (rc), David Gussoni (rc), Giovanni Pigani (rc), Alessandro Pirozzi (rc)  
 2018 Michele Bellomo (rc), Beatrice Tremolada (rc)

- 2017 Luca Aiello (rc), Alessandra Arrigoni (rc), Giacomo Bardi (rc), Matteo Caldana (rc), Luca Mombelli (rc)
- 2016 Luca Bardella (rc), Giovanni Conni (rc), Christopher Vincenzo Febo (rc), Michele Pellegrino (rc), Claudio Raffaele (rc), Giona Soldati (rc)
- 2015 Mario Beraha (rc), Cereghetti Corinne Elena (rc), Peli Riccardo (rc), Spreafico Marta (rc)
- 2014 Matteo Pesarin (rc), Luca Giussani (rc), Giacomo Milan (rc)
- 2013 Fabio Concina (rc), Domenico Notaro (rc)
- 2012 Niccolò Dal Santo (rc), Andrea Giorgini (rc), Giorgio Pennesi (rc), Luigi Pirola (rc), Diletta Ricci (rc)
- 2011 Giorgio Bertolini (thesis), Maximilian Castellani (rc), Maria Cristina Colombo (rc), Luca Oldani (rc)
- 2010 Ruben Binda (rc), Giuditta Caffara (rc), Alberto Ferroni (rc), Emanuele Mercuri (rc), Roberto Porcù (rc)
- 2009 Silvia Manera (thesis), Emanuela Francesca Piazza (thesis)
- 2007 Valentina Albanesi (thesis)
- 2005 Alberto Edoardo Ballio (thesis)

### **Advisor (PhD)**

- 2011-2014 Alessandro Zilio, *On monotonicity formulae, fractional operators and strong competition* (coadvised with S. Terracini)

### **External referee or committee member for the PhD thesis**

- 2020 Elisa Affili (advisors: Enrico Valdinoci, Luca Rossi)
- 2020 Jacopo Di Iorio, Andrea Martino (Politecnico di Milano)
- 2018 Gabriele Cora, Giorgio Tortone, Stefano Vita, Marco Zoboli (Università di Torino)
- 2018 Giorgio Tortone (advisor: Susanna Terracini)
- 2018 Nahuel Foresta, Andrea Giorgini (Politecnico di Milano)
- 2017 Matteo Sacchet (advisors: Susanna Terracini, Thomas Bartsch)

### **Textbooks**

- 2015 S. Salsa, G. V., *Partial Differential Equations in Action. Complements and Exercises*. Springer
- 2008 V. Barutello, M. Conti, D.L. Ferrario, S. Terracini, G. V., *Analisi Matematica 2. Con Elementi di Geometria e Calcolo Vettoriale*. Apogeo
- 2006 M. Conti, D.L. Ferrario, S. Terracini, G. V., *Analisi Matematica 1. Dal Calcolo all'Analisi*. Apogeo
- 2005 S. Salsa, G. V., *Equazioni a Derivate Parziali. Complementi ed Esercizi*. Springer
- 2002 italian translation of J. Stewart, *Calculus - Concepts and Contexts*, in collaboration with M. Conti and F. Vegni and supervised by S. Terracini, published in Italy by Apogeo, in two volumes *Calcolo: funzioni di una variabile* and *Calcolo: funzioni di più variabili*.