

CURRICULUM VITAE VIVINA L. BARUTELLO

PERSONAL INFORMATION



Date of birth 12-11-1976
Nationality: Italian
Children: 2 (2008 and 2011)

Department of Mathematics, University of Turin
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EDUCATION

10/2004 Ph.D. in Pure and Applied Mathematics, University of Milano-Bicocca

07/2000 Master Degree in Mathematics, University of Turin

ACADEMIC POSITIONS

10/2015-now Associate Professor, Department of Mathematics, University of Turin

11/2007-09/2015 Researcher, Department of Mathematics, University of Turin

04/2007-11/2007 Post-doc, Department of Pure and Applied Mathematics, University of Milano-Bicocca

04/2005-03/2007 Post-doc, I.N.d.A.M.

11/2004-01/2005 Visitor at I.M.C.E.E., Observatoire de Paris

08/2000-07-2001 Assistant professor, Département de Mathématique, Université Catholique de Louvain, Belgium

GRANTS

2015 P.I. for G.N.A.M.P.A. research project *Stability and Index Theory in Celestial Mechanics*

2005 Two-year post-doc I.N.d.A.M. fellowship

SCIENTIFIC PROJECTS

2023-25 Coordinator of the local unit of the prin project "Stability in Hamiltonian Dynamics and Beyond" (P.I. A. Sorrentino)

2013-18 Full-time member, E.R.C. Advanced Grant Project 2013 *Complex Patterns for*

2002-17 Member of 6 P.R.I.N. 2-years projects (P.I. A. Ambrosetti, A. Marchiodi, S. Terracini)

2010 Member of G.N.A.M.P.A. research project (P.I. V. Felli)

ASSIGNMENTS

2022-now Director of the second level Master in Mathematical and Physical Methods for Aviation Sciences, University of Turin

2012-now Elected member "Commissione Didattica", Department of Mathematics, University of Turin

2018-19 Member of the scientific Committee of the Ph.D. in Mathematics, University of

2017-19 Elected member “Comitato Unico di Garanzia”, University of Turin

SCIENTIFIC INTERESTS – KEY WORDS _____

- ∞ Nonlinear functional analysis, Variational Methods, Topological methods, Abstract critical points theory, Variational index
- ∞ N-body type problems: Equivariant dynamical systems, Singular solution, Regularization theory, Asymptotic estimates, Zero-energy trajectories, N-center problem, anisotropic Kepler problems, Keplerian billiards, symbolic and chaotic dynamics
- ∞ Hamiltonian systems, Linear Stability, Spectral flow, Maslov Index

PUBLICATIONS (complete lists in the last page) _____

- ∞ 22 papers on peer-reviewed international journals
- ∞ 260 citations (Scopus)
- ∞ H-index 11 (Scopus)
- ∞ 1 book in Mathematical Analysis – degree level

CONGRESS and SCHOOLS ORGANIZATION _____

- 6/2023** Congress *Highlights in Nonlinear Analysis*, Cetraro
- 10/2022** Congress *Dynamics, Chaos and Singularities*, Turin
- 08/2021** *MAC 2021 – Mathematical Congress o Americas*, Special Session “Geometric and Variational Methods in Celestial Mechanics, Brasilia
- 06/2019** *New Trends in Celestial Mechanics*, Cogne
- 12/2017** *Workshop in Celestial Mechanics*, Turin
- 07/2014** 10th A.I.M.S. Conference in Dynamical Systems, Differential Equations, and Applications, Special Session “Geometric and Variational Techniques in the N-body
- 10/2011** *Nonlinear day*, Turin

Ph.D. THESIS AND SCIENTIFIC RESPONSABILITY _____

- 2023-2026** Scientific manager for RTDa PON 2014-2022 *Mathematics for a sustainable approach to the space environment*
- 2022-2025** Scientific manager for RTDa PON 2014-2022 *Mathematics for a sustainable approach to the space environment*
- 2022-2025** Scientific manager for Ph.D. PON 2014-2022 *Mathematical tools for a sustainable use of the space*. University of Turin
- 2020-2023** Co-supervisor Ph.D. thesis Irene De Blasi

2019-2022 Co-supervisor Ph.D. thesis Gian Marco Canneori

2012-2015 Co-supervisor Ph.D. thesis Riccardo Jadanza,

INVITED TALKS in INTERNATIONAL CONFERENCES

2023 UMI Congress, Pisa

2022 Celmec VIII, Rome

2022 Theory, models and simulations in Celestial Mechanics, Pisa

2022 Oberseminar on Differential Geometry, Augsburg

2021 Matemairacorana – in honour of prof. Cabral, Recife

2020 Dipartimento di Matematica, Università di Roma-Tor Vergata

2018 Bi-Urb congress, Milano

2017 Dipartimento di Matematica, Università di Roma-Sapienza

2016 Nonlinear meeting in Milan, Milano

2015 VII Symposium on nonlinear analysis, Torun

2015 The 2015 AMMCS-CAIMS Congress, Interdisciplinary AMMCS Conference Series, Waterloo.

2015 Complex Patterns in Nonlinear Phenomena Conference, Torino

2014 Dipartimento di Matematica, Università di Roma-Sapienza

2013 BIRS Workshop 13w5055, New Perspectives on the N-body Problem, Banff

2013 Dipartimento di Matematica Pura e Applicata, Università di Milano-Bicocca

2012 Workshop on variational methods in N-body and N-vortex dynamics, Lecce.

2011 Variational and perturbative methods for nonlinear differential equations, Venezia

2010 8th AIMS Congress, Dresden

2009 Variational and computational methods in nonlinear analysis, Bertinoro

2008 Dipartimento di Matematica Pura e Applicata, Università di Pisa

2007 Symmetry and Perturbation Theory 2007, Otranto

2006 Computation and topology, Bedlewo

2005 CELMEC IV, San Martino al Cimino

2005 Topological and variational methods in differential equations, Guanajuato

2004 Institut de Mécanique Céleste et de Calcul des éphémérides (IMCCE), Observatoire de Paris

2004 Symmetry and Perturbation Theory 2004, Cala Gonone.

2004 Dipartimento di Matematica Pura e Applicata, Università di Modena e Reggio Emilia

2003 Workshop on the n-body problem, Palo Alto.

REVIEWER _____

- ∞ I'm a usual reviewer for the following journal: *Nonlinearity*, *Annales I.H.P.*, *Arch. Rational Mech. and Anal.*, *J. Diff. Eq.*, *J. Geometry and Physics*, *Nonlinear Analysis A: Theory, Methods and Applications*, *Cel. Mech. and Dyn. Astr.*, *J. Math. Analysis and Appl.*, *Mathematics of Computation*, *SIGMA*, *ZAMP*.

TEACHING ACTIVITY _____

Degree courses _____

2008-now I teach in many Mathematical Analysis and Differential Equations courses for the degree in Mathematics, Mathematics for Finance, Physics and Computer Science

2001-2008 Calculus for Engineering, Politecnico di Torino and Politecnico di Milano

2001-01 Calculus and Complex Analysis, Université Catholique de Louvain, Louvain-la-Neuve

Master and Ph.D courses _____

2022-23 Ph.D. course: Selected Topics in Celestial Mechanics

2019-now Basics in Celestial Mechanics, Master MPM Space Sciences

2013-now I periodically teach Nonlinear Analysis and Analytic Methods in Celestial Mechanics for the Master Degree in Mathematics

2019-20 Ph.D. course: Topics in nonlinear analysis, Calculus of Variations and Optimization

2017-18 Ph.D. course: The variational approach to the N-body problem

2015-16 Ph.D. course: Aspects of stability theory in Hamiltonian dynamics

BOOKS _____

2008 *Analisi Matematica – Dal Calcolo all'Analisi – Vol. 2*, Apogeo. With: M. Conti, D. Ferrario, S. Terracini, G. Verzini.

LIST OF PAPERS _____

[BDT] Barutello, V., De Blasi I., Terracini, S., Chaotic Dynamics in Refraction Galactic Billiards, *Nonlinearity*, 36, 8, (2023), 4209.

[BOV] Barutello, V., Ortega, R., Verzini, G.; Regularized variational principles for the perturbed Kepler problem, *Advances in Mathematics*, 383 (2021), article number 107694.

[BCT2] Barutello V., Canneori G.M., Terracini S.; Symbolic Dynamics for the Anisotropic N-Centre Problem at Negative Energies, *Archive for Rational Mechanics and Analysis* 242, 3, (2021), 1749-1834.

- [BOPW] Barutello, V.L., Offin, D., Portaluri, A., Wu, L.; Sturm theory with applications in geometry and classical mechanics, *Mathematische Zeitschrift* 299, 1-2 (2021), 257-297.
- [BCT1] Barutello V., Canneori G.M., Terracini S.; Minimal collision arcs asymptotic to central configurations, *Discrete & Continuous Dynamical Systems - A* 41, 1, (2020), 61-86.
- [BHTP] Barutello, V.L., Hu, X., Portaluri, A., Terracini, S.; An index theory for asymptotic motions under singular potentials, *Advances in Mathematics* 370, article number 107230.
- [BBD] Barutello, V., Boscaggin, A., Dambrosio; On the Minimality of Keplerian Arcs with Fixed Negative Energy, *Qualitative Theory of Dynamical Systems* 19, 1 (2020), article number 42.
- [BJP2] Barutello V., Jadanza R., Portaluri A.; Morse index and Linear Stability of the Lagrangian circular orbit in a 3-body-type problem via Index Theory, *Arch. Rat. Mec. Anal.* 219, 1 (2016), 387--444.
- [BBV] Barutello V., Boscaggin A., Verzini G.; Positive solutions with a complex behaviour for superlinear indefinite ODEs on the real line, *J. Differential Equations* 259 (2015), 3448--3489.
- [BJP1] Barutello V., Jadanza R., Portaluri A.; Linear instability of relative equilibria for n-body problems in the plane, *J. Differential Equations* 257, (2014), 1773--1813.
- [BTV1] Barutello V., Terracini S., Verzini, G.; Entire Parabolic Trajectories as Minimal Phase Transitions, *Calc. Var.* 49, 1-2 (2014), 391--429.
- [BTV2] Barutello V., Terracini S., Verzini, G.; Entire Minimal Parabolic Trajectories: the Planar Anisotropic Kepler Problem, *Arch. Rat. Mec. Anal.* 207, 2 (2013), 583--609.
- [BS] Barutello V., Secchi S., Minimality properties of colliding orbits for the n-body problem, *Ann. Inst. H. Poincaré Anal. Non Linéaire*, 25 (2008), no. 3, 539--565.
- [BFT1] Barutello V., Ferrario D.L., Terracini S., Symmetry groups of the planar 3-body problem and action--minimizing trajectories, *Arch. Rational Mech. Anal.*, 190 (2008), no. 2, 189--226.
- [BSS] Barutello V., Secchi E., Serra E., Radial solutions to Hénon equation with Neumann boundary conditions, *J. Math. Anal. Appl.* 341 (2008), 720--728.
- [BFT2] Barutello V., Ferrario D.L., Terracini S.; On the singularities of generalized solutions to n--body type problem, *Int. Math. Res. Not.* (2008), no.1, Art. ID rnn 069, 78 pp.
- [BT2] Barutello V., Terracini S., A bisection algorithm for the numerical Mountain Pass, *NoDEA* 14, (2007), 527--539.
- [BT3] Barutello V., Terracini S., Double choreographical solutions for the n-body problem, *Cel. Mech. and Dyn. Astr.* 95 (2006), 67--80.
- [ABT] Arioli G., Barutello V., Terracini S., A new branch of mountain pass solutions for the choreographical 3-body problem, *Comm. Math. Phys.* 268 (2) (2006), 439--463.
- [B] Barutello V., Several aspects of the n-body problems, *Bollettino dell'Unione Matematica Italiana* 8A (3) (2005), 449--452.
- [BT] Barutello V., Terracini S., Action minimizing orbits in the n-body problem with simple choreography constraint, *Nonlinearity* 17 (6) (2004), 2015--2039.
- [BCH] Barutello V., Capietto A., Habets P., Existence and multiplicity of positive solutions for a Dirichlet boundary value problem in \mathbb{R}^2 , *Adv. Nonlinear Stud.* 2 (3) (2002), 263--278.

